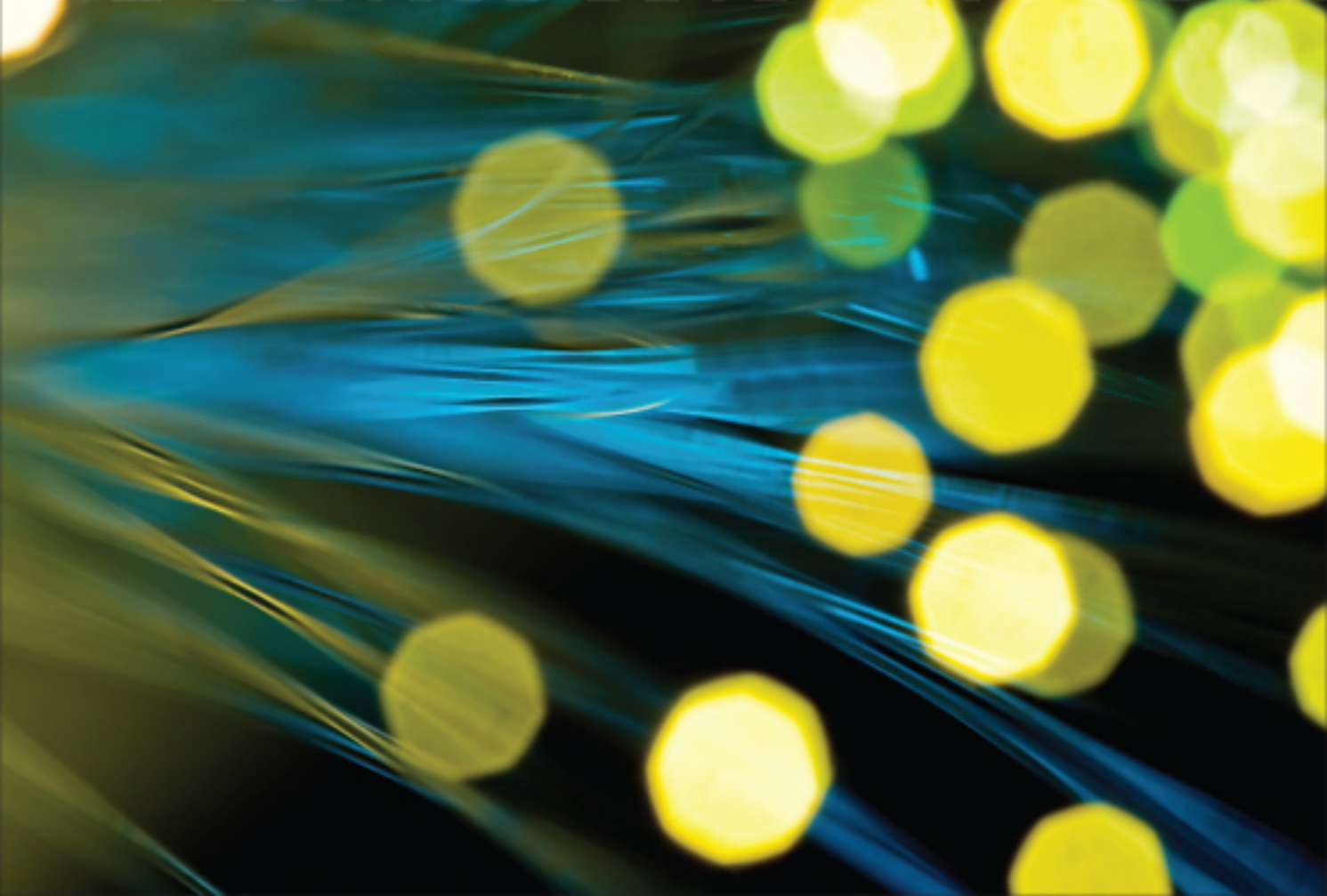


tenth edition

Mike Markel

technical **COMMUNICATION**

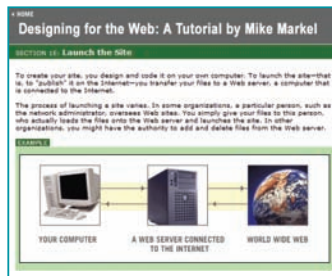


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Technical Communication, Tenth Edition, and its companion Web site, *TechComm Web* are designed to work together, with lots of free and open resources that you can use anywhere, anytime.

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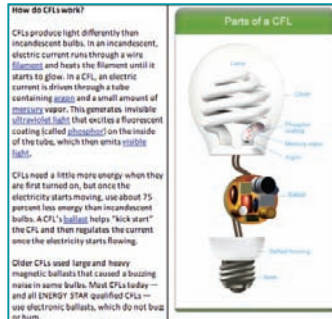
▶ Look for the **On TechComm Web** labels in the margins of the book to find free online content.



▶ Click through the **online tutorials** to learn more about preparing effective charts and graphs, evaluating online sources, preparing presentation slides, designing documents, and designing Web sites.

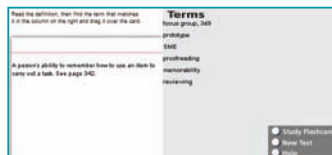
Analyze Interactive Sample Documents

and submit your responses to your instructor.

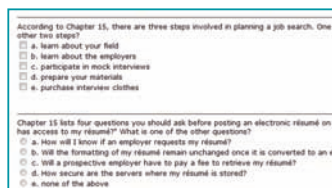


▶ Download all of the book's **case documents and forms** for use in completing your assignments.

Explore links to all of the Web resources listed in the book as well as to additional helpful resources.



▶ Study **key terms** from each chapter with interactive flashcards.



▶ Test your **knowledge** of important concepts with self-study quizzes.

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TENTH EDITION

Technical Communication

Mike Markel

Boise State University

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Acknowledgments and copyrights are continued at the back of the book on pages 769–71, which constitute an extension of the copyright page.

Preface for Instructors

The role of social media continues to expand in the world of technical communication. Virtually every news outlet has stories about how new electronic tools are being used in business, engineering, the health sciences, politics, and government or about how large organizations are using Twitter and Facebook to connect with their customers.

This development shows how far people in the working world have come in their thinking about how to relate to their customers. Only a decade ago, the relationship was essentially one-way: although an organization might have done some test marketing of a new product or service, customers and other stakeholders did not play a large role in research and development.

Today, by contrast, almost everyone in the working world understands that customers and other stakeholders—including the general public, government regulators, and suppliers—play an enormous role in shaping organizations, their products, and their services. Through social media, organizations seek to form relationships with their stakeholders, drawing customers into a community that helps set the values of the organization.

Social-media tools also shape the professional identities and roles of technical communicators. Within individual organizations, technical professionals are no longer merely members of one or two project groups. Rather, they contribute ideas, comments, and insights to many other people in the organization, thus enlarging the talent pool that contributes to every project.

I have revised this new edition of *Technical Communication* to reflect the many exciting developments that have occurred in technical communication—and in ways to teach it—in the past few years. However, the principles of good technical communication on which this book is based have not changed. For a description of the organization and enduring features of this book, see the Introduction for Writers on page xiii.

NEW TO THIS EDITION

While developing the tenth edition, I reexamined every chapter and relied on the input of fellow technical-communication instructors to inform my decisions about revising the text. The result is many new Interactive Sample Documents, exercises, and cases, as well as new and expanded discussions of various topics throughout the text.

Most of the expanded discussions relate to how social media have changed the opportunities and responsibilities of workplace communicators. For instance, the first chapter now focuses on a new role for everyone in an organization: providing information and resources for others. The chapter on audience analysis contains an expanded discussion of ways to use social media to learn more about an audience's needs and interests. The chapter on research includes a new discussion of how to use social media to learn more about a subject. And the chapter on persuasion now discusses a new goal of most people: connectedness. From designing Web sites to writing job-application materials and other kinds of applications, the text now contains new and expanded discussions of how to use social media responsibly and effectively.

The following table presents more details about new material in this edition.

<i>Chapter</i>	<i>What's new</i>
Chapter 1: Introduction to Technical Communication	An emphasis on the role of the technical communicator as a resource for other writers Interactive Sample Document ("Studying How Technical Communication Combines Words, Graphics, and Design") Case ("Using the Measures of Excellence in Evaluating a Résumé")
Chapter 2: Understanding Ethical and Legal Considerations	Advice on abiding by your organization's policy on the use of social media Interactive Sample Document ("Linking Values and Conduct") Case ("The Ethics of Requiring That Students Subsidize a Plagiarism-Detection Service")
Chapter 3: Writing Technical Documents	Case ("Understanding Why Revision Software Cannot Revise and Edit Your Document")
Chapter 4: Writing Collaboratively	Advice on using a word processor as a collaboration tool Advice for using social media and other electronic tools for collaboration, including messaging technologies, wikis and shared document workspaces, and virtual worlds Ethics Note ("Maintaining a Professional Presence Online") Case ("Accommodating a Team Member's Scheduling Problems")
Chapter 5: Analyzing Your Audience and Purpose	Advice on using social media to learn about an audience Case ("Reaching Out to a New Audience")

<i>Chapter</i>	<i>What's new</i>
Chapter 6: Researching Your Subject	Advice for using discussion boards, wikis, and blogs as research tools Interactive Sample Document (“Evaluating Information from Internet Sources”) Case (“Revising a Questionnaire”)
Chapter 7: Organizing Your Information	Interactive Sample Document (“Comparing and Contrasting Honestly”) Case (“Organizing a Document for Clarity — and Diplomacy”)
Chapter 8: Communicating Persuasively	A discussion of understanding a sense of connection as one of an audience’s broader goals A discussion of the role of culture in persuasion Interactive Sample Document (“Analyzing Evidence in an Argument”) Case (“Analyzing the Fitness of Arguments”)
Chapter 9: Writing Coherent Documents	Advice for reviewing the whole document for coherence Case (“Highlighting the Coherence of a Passage”)
Chapter 10: Writing Effective Sentences	Case (“Revising a Document for Nonnative Speakers and for Translation”)
Chapter 11: Designing Documents and Web Sites	Advice on incorporating social-media tools into Web site designs to help readers connect with others Interactive Sample Document (“Analyzing a Page Design”) Case (“Designing a Flyer”)
Chapter 12: Creating Graphics	Interactive Sample Document (“Analyzing a Graphic”) Case (“Creating Appropriate Graphics to Accompany a Report”)
Chapter 13: Reviewing, Evaluating, and Testing Documents and Web Sites	Interactive Sample Document (“Obtaining Informed Consent”) Case (“Revising a Document for a New Audience”)
Chapter 14: Writing Correspondence	Advice on the appropriate and effective use of microblogs such as Twitter Case (“Employing the ‘You Attitude’ in a ‘Bad News’ Letter”)
Chapter 15: Writing Job-Application Materials	Case (“Adding ‘Social’ to ‘Networking’”)
Chapter 16: Writing Proposals	A new sample internal proposal Case (“Revising a Brief Proposal”)
Chapter 17: Writing Informational Reports	A new sample progress report Case (“Writing a Directive About Using Agendas for Meetings”)



<i>Chapter</i>	<i>What's new</i>
Chapter 18: Writing Lab Reports	Case ("Introducing the Scientific Method Through a Lab Report")
Chapter 19: Writing Recommendation Reports	An explanation of the role of recommendation reports A new sample recommendation report Case ("Analyzing Decision Matrices")
Chapter 20: Writing Definitions, Descriptions, and Instructions	Interactive Sample Document ("Presenting Clear Instructions") Case ("Balancing Clarity, Conciseness, and Usability in a Description")
Chapter 21: Making Oral Presentations	Case ("Understanding the Claim-and-Support Structure for Presentation Graphics")
Chapter 22: Connecting with the Public	A discussion of the various reasons and motivations for connecting with the public Expanded advice on collaborating with the public through social media Interactive Sample Document ("Evaluating the Design of a Newsletter") Case ("Considering a One-to-Many Model on Your Company's Site")

YOU GET MORE CHOICES WITH *TECHNICAL COMMUNICATION*, TENTH EDITION

Technical Communication, Tenth Edition, doesn't stop with a book. Online, you'll find both free and affordable premium resources to help students get even more out of the book and your course. You'll also find convenient instructor resources, such as a downloadable instructor's manual, additional exercises and cases, and PowerPoint slides. To learn more about or order any of the products below, contact your Bedford/St. Martin's sales representative, e-mail sales support (sales_support@bfpwpub.com), or visit bedfordstmartins.com/techcomm/catalog.

***TechComm Web* bedfordstmartins.com/techcomm**

Free and open resources for *Technical Communication* are integrated into the text through cross-references in the margins of the book:

- Interactive Sample Documents for analysis

- Tutorials on evaluating online sources, creating presentation slides, designing documents, designing Web sites, and creating effective graphics
- Downloadable case documents and forms for use in completing assignments
- Links to all of the Web resources listed in the book as well as to additional helpful resources
- Flashcards for reviewing key terms from each chapter
- Self-study quizzes to reinforce students' understanding

Get more free resources with an access package. For the tenth edition, we've collected and annotated additional multimedia models of technical communication such as video instructions, an oral presentation, and an on-line portfolio for a job application. Each model is accompanied by questions for analysis. To order the textbook with *Multimedia Models for Technical Communication* for free, use ISBN 978-1-4576-1843-7.

E-book Options

Assign an interactive e-book. Bedford e-books let students do more and pay less. For about half the price of a print book, *Technical Communication e-Book* offers the complete text of the print book combined with additional digital content, including multimedia documents and cases, and convenient digital tools such as highlighting, note taking, and search. To order the print text packaged with the e-book, use ISBN 978-1-4576-1187-2. To order *Technical Communication e-Book* by itself, use ISBN 978-1-4576-0032-6.

Let students choose their format. Students can purchase *Technical Communication* in popular e-book formats for computers, tablets, and e-readers. For more details, visit <bedfordstmartins.com/ebooks>.

TechCommClass: yourtechcommclass.com

An easy-to-use online course space designed for technical communication students and instructors, *TechCommClass for Technical Communication* comes preloaded with the *Technical Communication e-Book* as well as other Bedford/St. Martin's premium digital content, including *Document-Based Cases for Technical Communication*, Second Edition; *Team Writing*; *Multimedia Models for Technical Communication*; and *VideoCentral: English*. Powerful assignment and assessment tools make it easier to customize content and to keep track of your students' progress. *TechCommClass for Technical Communication* can be purchased separately at <yourtechcommclass.com> or packaged with the print book at a significant discount. An activation code is required. To order *TechCommClass for Technical Communication* with the print book, use ISBN 978-1-4576-1189-6.

More Options for Students

Add more value to your text by packaging one of the following resources with *Technical Communication*, Tenth Edition. To learn more about package options for any of the products below, contact your Bedford/St. Martin's sales representative or visit <bedfordstmartins.com/techcomm/catalog>.

Document-Based Cases for Technical Communication, Second Edition, by Roger Munger, Boise State University, offers realistic writing tasks based on seven context-rich scenarios with more than 50 examples of documents that students are likely to encounter in the workplace. To order the textbook packaged with *Document-Based Cases for Technical Communication* for free, use ISBN 978-1-4576-1577-1.

ix visual exercises for tech comm by Cheryl E. Ball, Illinois State University, and Kristin L. Arola, Washington State University, introduces the fundamentals of design for technical communication in a CD-ROM that extends beyond the printed page. Each of the nine exercises progresses through a three-part sequence, helping students develop a critical vocabulary and method to read and compose all kinds of technical communication. To order the textbook packaged with *ix visual exercises for tech comm* for free, use ISBN 978-1-4576-1580-1. To order the book packaged with both *ix visual exercises for tech comm* and *Document-Based Cases for Technical Communication*, use ISBN 978-1-4576-1582-5.

Team Writing by Joanna Wolfe, University of Louisville, is a print supplement with online videos that provides guidelines and examples of collaborating to manage written projects by documenting tasks, deadlines, and team goals. Two- to five-minute videos correspond with the chapters in *Team Writing* to give students the opportunity to analyze team interactions and learn about communication styles. Practical troubleshooting tips show students how best to handle various types of conflicts within peer groups. To order the textbook packaged with *Team Writing*, use ISBN 978-1-4576-1197-1.

Instructor Resources

You have a lot to do in your course. Bedford/St. Martin's wants to make it easy for you to find the support you need—and to get it quickly.

Instructor's Resource Manual for Technical Communication, Tenth Edition, is available as a PDF file that can be downloaded from the Bedford/St. Martin's online catalog <bedfordstmartins.com/techcomm/catalog> or from *TechComm Web*. In addition to sample syllabi, chapter summaries, and suggested teaching approaches, the *Instructor's Resource Manual* includes suggested responses to every Interactive Sample Document, exercise, and case in the book. The manual also includes a unique series of teaching topics: "Making the Transition from Comp to Tech Comm," "Addressing Plagiarism in the Tech-Comm Course," "Integrating Technology in the Tech-Comm Course," "Teaching Distance Education with *Technical Communication*," "Including Service Learning in

the Tech-Comm Course,” and “Introducing Green Writing in the Tech-Comm Classroom.”

Other resources for instructors include additional exercises and cases for every chapter, reading quizzes to download and distribute to students, and presentation slides that can be adapted for classroom use.

Bedford Coursepacks for the most common course management systems—Blackboard, WebCT, Angel, and Desire2Learn—allow you to easily download Bedford/St. Martin’s digital materials for your course.

ACKNOWLEDGMENTS

All of the examples in this book—from single sentences to complete documents—are real. Some were written by my students at Boise State University. Some were written by engineers, scientists, health-care providers, and businesspeople with whom I have worked as a consultant for more than 35 years. Because much of the information in these documents is proprietary, I have silently changed brand names and other identifying information. I thank the dozens of individuals—students and professionals alike—who have graciously allowed me to reprint their writing. They have been my best teachers.

The tenth edition of *Technical Communication* has benefited greatly from the perceptive observations and helpful suggestions of my fellow instructors throughout the country. I thank Julia Arnold, Fairleigh Dickinson University; Gabriella Bedetti, Eastern Kentucky University; Katherine Bode-Lang, Penn State University; Patricia Boyd, Arizona State University; Beverley Braud, Texas State University; Pat Cearley, South Plains College; Alexis Carroll Cline, Texas State University; Kelly Cresap, University of Maryland, College Park; Tracy L. Dalton, Missouri State University; Joshua Edwards, University of Maryland, College Park; Roger Friedmann, Kansas State University; Bob Haynes, Arizona State University; Nels P. Highberg, University of Hartford; Thomas Huminski, Portland Community College; Danielle Lawson, Georgia Institute of Technology; Nancy C. Martinez, University of New Mexico; Jane Moody, University of Central Florida; William C. Morton, University of Central Florida; Phillip Scott Moses, University of Maryland, College Park; Marcella Parry Reekie, Kansas State University; Mark Ristroph, Augusta Technical College; Laurie Rozakis, Farmingdale State College; Beverly Army Williams, Westfield State College; Kevin S. Wilson, Boise State University; and several anonymous reviewers.

I would like to extend a special thanks to Stuart Selber and his team at Pennsylvania State University for sharing their experiences with the use of *Technical Communication e-Book* on iPads.

I would like to acknowledge the contributions of one of my colleagues from Boise State University: Russell Willerton. Russell updated all of the Tech Tips and drafted all the revisions to the features on *TechComm Web*, including test questions, flashcards, and the *Instructor’s Resource Manual*. I greatly appreciate his expertise and hard work.

I have been fortunate, too, to work with a terrific team at Bedford/St. Martin's, led by Carrie Thompson, an editor of great intelligence, judgment, and energy. Carrie has helped me improve the text in many big and small ways. I also want to express my appreciation to Joan Feinberg, Denise Wydra, Karen Henry, and Leasa Burton for assembling the first-class team that has worked so hard on this edition, including Andrea Cava, Regina Tavani, Anna Palchik, Judith Riotto, Naomi Kornhauser, Judy Ladendorf and Lynn Tews of The Permissions Group, and Nancy Benjamin of Books By Design. For me, Bedford/St. Martin's continues to exemplify the highest standards of professionalism in publishing. The people there have been endlessly encouraging and helpful. I hope they realize the value of their contributions to this book.

My greatest debt is, as always, to my wife, Rita, who, over the course of many years and ten editions, has helped me say what I mean.

A FINAL WORD

I am more aware than ever before of how much I learn from my students, my fellow instructors, and my colleagues in industry and academia. If you have comments or suggestions for making this a better book, please get in touch with me at the Department of English, Boise State University, Boise, ID 83725. You can phone me at (208) 426-3088, or you can send me an e-mail from the companion Web site: <bedfordstmartins.com/techcomm>. I hope to hear from you.

Mike Markel

Introduction for Writers

The tenth edition of *Technical Communication* is organized into five parts, highlighting the importance of the writing process in technical communication and giving equal weight to the development of text and graphics in documents and Web sites.

<i>Part</i>	<i>Coverage</i>
Part 1: Understanding the Technical Communication Environment	Provides a basic understanding of important topics in technical communication, including ethical and legal considerations, the role of the writing process in planning and developing technical documents, and the practice of collaborating on documents.
Part 2: Planning the Document	Focuses on rhetorical concerns, such as considering audience and purpose, gathering information through primary and secondary research, and planning the organization of documents.
Part 3: Developing and Testing the Verbal and Visual Information	Describes communicating persuasively; writing coherent documents; writing effective sentences; designing documents and Web sites; creating graphics; and reviewing, evaluating, and testing documents and Web sites.
Part 4: Learning Important Applications	Covers a wide range of types of technical communication: letters, memos, e-mails, and microblogs; job-application materials, including print and electronic résumés; proposals; informational reports, such as progress and status reports, incident reports, and meeting minutes; lab reports; recommendation reports; definitions, descriptions, and instructions; oral presentations; and applications used in communicating with the public, including newsletters, brochures, white papers, podcasts, discussion boards, blogs, and wikis.
Appendix: Reference Handbook	Offers additional help with skimming sources and taking notes; documenting sources using the APA, IEEE, and MLA styles; and editing and proofreading documents. Also provides advice to multilingual writers on cultural, stylistic, and sentence-level communication issues.

Technical Communication offers a wealth of support to help you complete your technical communication projects:

Annotated Examples make it easier for you to learn from the many model documents, illustrations, and screen shots throughout the text.

PROGRESS

Our investments in delivering comprehensive prevention programs and promoting male circumcision are yielding a number of successes:

- Phase I (2001–2008) of **Botswana’s ACHAP** resulted in 90 percent prevention of mother-to-child transmission (PMCT) coverage rates, and more than 90 percent of people needing treatment received antiretroviral therapy. The partnership was also responsible for renovating and supporting 34 infectious-disease care clinics, training 7,000 health-service providers and lay personnel, providing equipment to support laboratory diagnostic and monitoring services, procuring and delivering antiretroviral therapy (ART), and embedding more than 100 staff in key national and district government positions. In addition, ACHAP was instrumental in helping the government of Botswana develop a national male circumcision plan, implementing routine HIV testing, and reducing the age of consent for testing from 21 to 16.
- Our **Avahan** initiative to support partners in India has shown significant reductions in HIV-prevalence rates among antenatal care attendees and increases in condom use. We are gradually transitioning key aspects of Avahan to the government of India and other partners.
- We supported a trial in Uganda demonstrating that male circumcision leads to reduced HIV incidence among men. This led to WHO’s endorsement of male circumcision and specific implementation guidelines for male circumcision for select countries. We are now working in partnership with the U.S. President’s Emergency Plan for AIDS Relief and others to encourage scale-up of male circumcision in high-HIV-prevalent countries with low coverage rates of male circumcision.

The first section presents the most-important set of results. It is reported in considerable detail, accompanied by specific data.

The second section presents less-important information. Note that this section lacks specific data.

The third section, the least important of the three, explains that the writer’s organization assisted another organization.

Figure 7.5 Information Organized from More Important to Less Important
 Source: Bill and Melinda Gates Foundation, 2009 <www.gatesfoundation.org/global-health/Documents/hiv-strategy.pdf>.

Guidelines boxes throughout the book summarize crucial information and provide strategies related to key topics.

Guidelines

Designing Easy-to-Read Text

Follow these three suggestions to make the text on your sites easy to read.

- ▶ **Keep the text short.** Poor screen resolution makes reading long stretches of text difficult. In general, pages should contain no more than two or three screens of information.
- ▶ **Chunk information.** When you write for the screen, chunk information to make it easier to understand. Use frequent headings, brief paragraphs, and lists.
- ▶ **Make the text as simple as possible.** Use common words and short sentences to make the information as simple as the subject allows.

Ethics Notes in every chapter remind you to think about the ethical considerations and implications of your writing and oral presentations.

ETHICS NOTE

Acknowledging Reviewers Responsibly

When you write on the job, take advantage of the expertise of others. It is completely ethical to ask subject-matter experts and people who are like the intended audience of your document to critique a draft of it. If your reviewer offers detailed comments and suggestions on the draft or sends you a multipage review—and you use some or many of the ideas—you are ethically bound to acknowledge that person’s contributions. This acknowledgment can take the form of a one- or two-sentence statement of appreciation in the introduction of the document or in a transmittal letter. Or you could write a letter or memo of appreciation to the reviewer; he or she can then file it and use it for a future performance evaluation.

Cases in every chapter present real-world writing scenarios built around common workplace documents that you can critique, download, and revise.

Case 6: Revising a Questionnaire

Background

You are the Director of Marketing for Yakima Properties, a real-estate company that employs 18 agents and advertises approximately one hundred residential properties at any one time. The company advertises in the Saturday real-estate supplement in the local newspaper and on its own Web site, presenting photographs and a description for each of the properties. In addition, for properties that are advertised at a price of \$750,000 and above, the company presents virtual-reality 360° tours on the Web site. When Yakima Properties began offering the virtual-reality tours we need to answer to know whether this idea would work, and how you'd answer them." Two days later, she sends you an e-mail (Document 6.1).

You leave her a phone message: "Thanks, Rachel. Good to know that the hardware is available and cheap. What I'd like you to think about now, however, is what our agents would think about being asked to take their own pictures. How many of the agents are experienced with taking digital photos? Do they have any preferences about the kind of camera to get? Would they consider it an imposition to have to take their own photos, or do they think the ability to shoot just what they want—and have the

tours on its Web site two years ago. It contracted with Edelson Custom Photography, a high-end photographic supplier, to provide both the virtual-reality tours and the traditional photographs of all the company's properties. Yakima's contract with Edelson is about to expire.

In an attempt to determine if it is possible to cut costs, you have asked one of your agents, Rachel Stevens, to research whether it would be possible to have the real-estate agents take their own photographs of the properties they list. You ask Rachel to sketch out how she would research the topic. "Write me an e-mail listing the questions available right away—outweighs the extra work we'd be asking them to do? And keep in mind that, with 18 agents, you're going to want to choose types of questions that let us quantify the responses effectively."

Rachel sends you a quick e-mail saying that she'll get on it, and the next day you receive her response (Document 6.2). After studying it, you realize that you are going to need to become more involved in carrying out this research. You know that Rachel is a good worker who has a bright future with Yakima Properties, but she has little experience writing questionnaires. You ask her if she would like you to critique her five questions. She says yes.

Document 6.1 Rachel's Response to the Request for a List of Questions That Need to Be Answered

To: [yourname]@yakimaproperties.com
From: rstevens@yakimaproperties.com
Subject: camera research

I've had a chance to speak with Jill in Production, who said that it would be pretty easy to have our agents do the stills. Almost any level of digital camera would work. We already have the image-editing software, so that wouldn't be a problem.

I checked online, and there's all kinds of cameras at less than \$200 that we could get. For instance, for about \$110, we could get a Nikon Coolpix 12-megapixel, with the following features:

- 12 megapixels, for pics up to 16 x 20 inches
- 5x optical/4x digital/20x total zoom
- 2.7-inch high-resolution LCD
- High ISO sensitivity (3200)
- Digital image stabilization
- 47MB internal memory and a digital media card slot

There's a good dozen companies offering similar products. And there's no shortage of sites that sell these packages.

Let me know if there's anything else you need. I think we're good to go.

Rachel

For quick reference, many of these features are indexed on the inside back cover of this book.

For an overview of the numerous resources available to you on *TechComm Web* <bedfordstmartins.com/techcomm>, see the inside front cover of this book.

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PART 1

Understanding the Technical Communication Environment

CHAPTER 1

Introduction to Technical Communication



Telris Telepresence.

The heart of technical communication is communicating with people.

Although high-tech tools such as this videoconferencing package from Teliris (2011) are becoming more important in the workplace, the heart of technical communication remains what it has always been: communicating with people. All technical-communication documents—whether e-mails, reports, Web sites, or any of a dozen other forms—are meant to help people learn, carry out tasks, and make decisions. This book is about the process of finding and creating technical information and communicating it to others.

Employers in every industry stress the importance of communication skills. A study of over 400 U.S. companies, which together employ 2 million people, found that almost all of them felt that the following skills are “very important” for new college graduates (Conference Board, 2006, p. 20):

<i>Skill</i>	<i>Percentage of employers who think the skill is “very important”</i>
Oral communication	95.4
Teamwork and collaboration	94.4
Professionalism and work ethic	93.8
Written communication	93.1

A study of more than 100 large American corporations, which together employ 8 million people, suggests that writing is a more important skill for today’s professionals than it ever has been (College Entrance Examination Board, 2004, pp. 3–4). Among the major findings of the survey are the following:

- For hiring and promotions, writing is a “threshold skill.” If your job-application materials are written poorly, 86 percent of companies surveyed would “frequently” or “almost always” hold it against you. If you somehow get the job, you won’t last long enough to be promoted.
- Two-thirds of professionals need strong writing skills in their daily work. Some 80 percent of companies in the service, finance, insurance, and real-estate industries assess applicants’ writing during the hiring process. Fifty percent of all companies in all industries consider writing skills in making promotion decisions.

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- Half of all companies “frequently” or “almost always” produce reports, memos, and correspondence. Almost 100 percent of companies use e-mail, and more than 80 percent use PowerPoint presentations.

The working world depends on written communication. Within most modern organizations, almost every action is documented in writing, whether on paper or online. Here are a few examples:

- a memo or an e-mail to request information or to identify a problem
- a wiki with instructions that explain how to carry out a new task
- a proposal to persuade management to authorize a project
- a report to document a completed project
- an oral presentation to explain a new policy to employees

Every organization also communicates with other organizations, customers, suppliers, and the public, using materials such as these:

- inquiry letters, sales letters, goodwill letters, and claim and adjustment letters to customers, clients, and suppliers
- Web sites to describe and sell products and to solicit job applications
- podcasts, videos, and posts on social-networking sites to introduce new products and services
- research reports for external organizations
- articles for trade and professional journals

WHAT IS TECHNICAL COMMUNICATION?

You can look at technical communication in two ways: as the process of making and sharing information and ideas in the workplace, and as a set of applications—the documents you write.

Technical communication is the process of finding and using information and sharing meaning. The brief conversations you have with your colleagues in the hallway, the text messages you exchange with vendors, the phone calls with your project team—all these are examples of technical communication.

In fact, every professional spends most of every workday using the four communication skills: reading, writing, speaking, and listening. Think of it this way: a professional is a person who communicates with others about a technical subject. An engineer is a person who communicates about engineering. An architect is a person who communicates about architecture. A biologist is a person who communicates about biology.

Professionals often use these four communication skills to create, design, and transmit technical information so that people can understand it easily

and use it safely, effectively, and efficiently. Much of what you read every day—textbooks, computer-based training videos, procedures manuals, Web sites, owner’s manuals—is technical communication.

The purpose of this book is to help you improve your skills in the *process* of technical communication (finding information and developing ideas on your own and with others) and in the *applications* of technical communication (the letters, reports, blogs, and other kinds of documents you will write). The focus of this book is on the techniques that skilled communicators use to analyze their audience and purpose, create and find the best information on their subject, arrange it skillfully to meet their audience’s needs and preferences, and deliver it effectively using the most appropriate application.

The principles you have studied in your earlier writing courses apply to technical communication. The biggest difference between technical communication and the other kinds of writing you have done is that technical communication has a somewhat different focus on *audience* and *purpose*.

In most of your previous academic writing, your *audience* has been your instructor, and your *purpose* has been to show your instructor that you have mastered some body of information or skill. Typically, you were not trying to create new knowledge or motivate the reader to take a particular action—except to give you an A for that assignment.

By contrast, in technical communication in the workplace, your *audience* will likely include peers and supervisors in your company, and perhaps people outside your company. Your *purpose* will likely be to reinforce or change their attitudes toward the subject you are writing about, motivate them to take particular actions, or help them carry out their own work-related tasks.

For example, suppose you are a public-health scientist working for a federal agency. You have just completed a study showing that, for most adults, moderate exercise provides as much health benefit as strenuous exercise. You might report your results in a journal article for other scientists, in a press release distributed to popular print and online publications, and in a blog and podcast on your agency’s Web site. In each case, you will present the key information in different ways to meet the needs of the various audiences.

WHAT ARE YOUR ROLES AS A COMMUNICATOR?

Regardless of whether you are a *technical professional* (such as an electrical engineer, a chemist, or an accountant) or a *technical communicator* (a person whose main job is to create applications such as manuals, reports, and Web sites), you are likely to have three major roles as a communicator:

- *The writer of a document.* You will be the main author of documents and oral presentations.
- *A member of a project team.* As a member of a team, you will likely participate in writing one or more documents for various audiences.

On TechComm Web

For a good introduction to technical communication, see the STC introduction to the subject. Also see Tom Johnson’s blog. Click on Links Library for Ch. 1 on <bedfordstmartins.com/techcomm>.

- *An information resource for people inside and outside your organization.* Modern organizations run on information, and it's everyone's responsibility to help provide it. You will communicate with your co-workers when they seek advice and information. In addition, you will communicate with vendors, suppliers, and customers to help them understand your industry and your organization's products and services.

This book focuses on the strategies, techniques, and tools that you will use in all three of these roles.

TECHNICAL COMMUNICATION AND YOUR CAREER

The College Entrance Examination Board study referred to earlier suggests that communication skills are a “threshold skill” required to get and keep a job (2004, pp. 3–4). A survey by the Plain English Network found that 96 percent of the nation's 1,000 largest employers say employees must have good communication skills to get ahead (2002).

Job ads reflect this reality. The following ad from an organization that manufactures medical instruments is typical:

Design Assurance Engineer. Duties include performing electronic/mechanical product, component, and material qualifications. Requires spreadsheet/word-processing abilities, excellent client-relationship skills, and excellent written/oral communication skills. BSEE or biology degree preferred.

According to one survey, almost half of the largest U.S. companies offer or require training for professionals who cannot write well (College Entrance Examination Board, 2004, p. 4). The companies spent about \$900 per employee for writing training. Would a company rather save that \$900? Of course. The facts of corporate life today are simple: if you cannot communicate well, you are less valuable; if you can, you are more valuable.

CHARACTERISTICS OF A TECHNICAL DOCUMENT

Almost every technical document has six major characteristics: it addresses particular readers, helps readers solve problems, reflects the organization's goals and culture, is produced collaboratively, uses design to increase readability, and consists of words or images or both.

Addresses Particular Readers

Technical documents address particular readers. For instance, if you are planning to write a proposal for your supervisor, you might think about that person's job responsibilities, the level of detail he or she would be interested in reading, and personal factors such as history with the organization and attitudes toward your ideas. These factors help you decide what kind of docu-

This typical job ad mentions not only computer skills but also communication skills.

In This Book

For more about job-application materials, see Ch. 15, p. 400.

In This Book

For more about addressing a particular audience, see Ch. 5, p. 87.

ment to write, how to structure it, how much detail to include, and what sentence style and vocabulary to use.

Even if you do not know your readers personally, you can try to create a profile of them. For example, if readers of your brochure are police officers responsible for purchases, you know that they share a police background and a common responsibility for approving expenditures.

Your writing might also be read by people you never intended as your audience: managers and executives in your organization, the public, or the press. Avoid writing anything that will embarrass you or your organization if other audiences read it.

Often, you will write for people from different cultures or whose native language is different from yours. These readers will react differently to the design, organization, and writing style of documents than people from your own culture will. Therefore, you should consider these cultural differences as you write.

A good first step is to read a full-length discussion of intercultural communication, such as one or more of the following respected resources:

Hofstede, G. H., Hofstede, G. J., & Minkow, M. (2010). *Cultures and organizations: Software for the mind* (3rd ed.). New York, NY: McGraw-Hill.

Jandt, F. E. (2009). *An introduction to intercultural communication: Identities in a global community* (6th ed.). Thousand Oaks, CA: Sage.

Lustig, M. W., & Koester, J. (2009). *Intercultural competence: Interpersonal communication across cultures* (6th ed.). Boston, MA: Pearson (Allyn & Bacon).

Neuliep, J. W. (2008). *Intercultural communication: A contextual approach* (4th ed.). Boston, MA: Houghton Mifflin.

Samovar, L. A., Porter, R. E., and McDaniel, E. R. (Eds.). (2008). *Intercultural communication: A reader* (12th ed.). Belmont, CA: Wadsworth.

Another valuable resource is the Intercultural Communication Institute (www.intercultural.org). The articles, training, and resource lists available through this nonprofit organization offer a helpful introduction to the subject.

Helps Readers Solve Problems

Technical documents help readers learn something or carry out a task. For instance, you might watch your company's video on employee benefits to help you select a benefits package. In other words, you watch it because you need information to analyze a situation and solve a problem.

Reflects the Organization's Goals and Culture

Technical documents further the organization's goals. For example, a state government department that oversees vocational-education programs submits an annual report to the state legislature, as well as a lot of technical information for the public: flyers, brochures, pamphlets, radio and television

ads, and course materials. These documents help the department secure its funding and reach its audience.

Technical documents also reflect the organization's culture. For example, many organizations encourage their employees to blog about their areas of expertise. Blogging can help an organization establish an identity based on producing high-quality products, using green energy and protecting the environment, helping the community, and many other values.

Is Produced Collaboratively

Although you will often work alone in writing short documents, you will probably work as part of a team in producing more-complicated documents. Collaboration is common in technical communication because no one person has all the information, skills, or time to create a large document. Writers, editors, designers, and production specialists work with subject-matter experts—the various technical professionals—to create a better document than any one of them could have made working alone.

Collaboration can range from having a colleague review your two-page memo to working with a team of a dozen technical professionals and technical communicators on a 200-page catalog. Social media such as wikis, blogs, and microblogs (such as Twitter) have made another kind of collaboration more convenient. People routinely post questions to networks of friends and associates—both inside and outside their own organization—to help them answer technical questions.

Uses Design to Increase Readability

Technical communicators use design features—typography, spacing, color, special paper, and so forth—to accomplish three basic goals:

- *To make the document look attractive and professional.* If it is attractive and creates a positive impression, you are more likely to accomplish your goal.
- *To help readers navigate the document.* Because a technical document can be long and complicated and most readers want to read only parts of it, design features such as headings, color, and highlighting help readers see where they are and get to where they want to be.
- *To help readers understand the document.* If all the safety warnings in a manual appear in a color and size different from the rest of the text, readers will be better able to recognize the importance of the information.

Consists of Words or Images or Both

Most technical documents include words and images—both static graphics and moving images. Images help the writer perform five main functions:

- make the document more interesting and appealing to readers
- communicate and reinforce difficult concepts

In This Book

For more about collaboration, see Ch. 4.

In This Book

For more about design, see Ch. 11.

In This Book

For more about graphics, see Ch. 12.


INTERACTIVE SAMPLE DOCUMENT

Studying How Technical Communication Combines Words, Graphics, and Design

This is a page from a brochure from Xerox describing two products. The questions in the margin ask you to consider how technical communication combines words and graphics.

print

Phaser 6180



Step up the pace

The Phaser 6180 laser printer gets your jobs out quickly. Very quickly.

- A print speed of up to 20 ppm in full color brings your work to colorful life without slowing you down.
- Print black-and-white—even complex or large jobs—at up to a speedy 26 ppm thanks to a powerful 400 MHz processor and 128 MB of memory (expandable to 1.152 MB).
- A first-page-out time as quick as 10 seconds means your job's out faster than your trip to the printer.
- The 60,000-page-per-month duty cycle easily handles a steady flow of office document demands.


print copy scan fax

Phaser 6180MFP

Go full speed


Robust multifunction performance that easily keeps up with the busy pace of your entire office.

- One space-saving device does the work of four standalone machines, combining powerful printing, copying, scanning and faxing.
- Fast color at up to 20 ppm lets your entire workgroup enjoy the benefits of color without slowing down.
- Black-and-white prints at up to a quick 31 ppm regardless of your job's size or complexity, thanks to a 400 MHz processor and 348 MB of memory (expandable to 1.408 MB).
- A scan speed of up to 7 color or 20 black-and-white scans per minute lets you quickly go from paper to digital.
- Walk-up fax and LAN fax (fax from the print PCL driver) delivers up to 400 x 400 dpi resolution, and includes JBIG compression technology for faster transmissions.



Intuitive control panel makes copy, fax and scan functions easy to use, and also displays job status and toner levels.

One-button copying makes walkup use quick and easy. No need navigating a menu just to make a copy.



Phaser 6180MFP control panel

1. How has the company used words and graphics to communicate different kinds of information?
2. How has the company used design to help readers understand that this page describes two different products?
3. How has the company used color to help readers understand the messages that it wishes to communicate?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 1 on <bedfordstmartins.com/techcomm>.

Source: Xerox, 2007 <www.office.xerox.com/latest/61CBR-01U.PDF>.

- communicate instructions and descriptions of objects and processes
- communicate large amounts of quantifiable data
- communicate with nonnative speakers

Technical professionals and technical communicators alike use high-tech tools to produce documents. Although you are unlikely to need to become an expert user of these tools, some of them, such as word processors and spreadsheets, are fundamentally important. Throughout this book, Tech Tips suggest ways to make the most of these tools.

A LOOK AT THREE SAMPLE DOCUMENTS

Characteristics of technical communication:

- **addresses particular readers:** This poster is addressed to Spanish-speaking children and their caregivers in the United States.
- **helps readers solve problems:** It provides information about the elements of a balanced diet.
- **reflects the organization's goals and culture:** It is intended to show that the organization (the U.S. Department of Agriculture) works to improve children's nutrition.
- **is produced collaboratively:** The poster was created by nutrition experts, technical communicators, graphic artists, Web authors, and others.
- **uses design to increase readability:** The width of each color-coded food group is intended to suggest how much of that food group a child requires. Elsewhere on the poster this concept is communicated in more detail.
- **consists of words or images or both:** The words, colors, and graphics are used to make the message clear and easy to understand.

Figures 1.1 (below), 1.2 (page 11), and 1.3 (page 12) illustrate a number of the characteristics of technical communication discussed in this chapter.

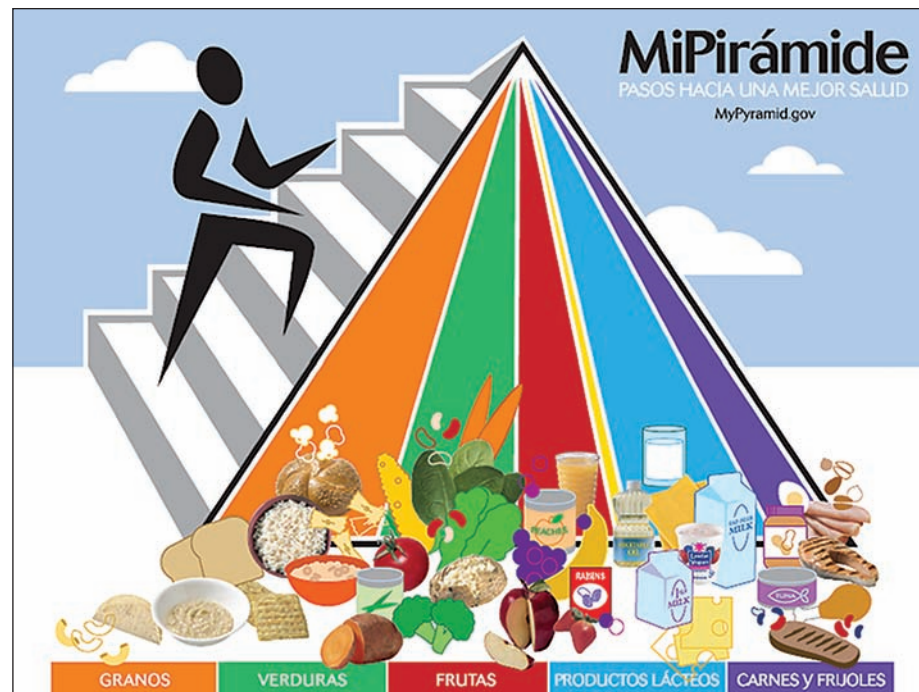


Figure 1.1 A Poster That Shows the Characteristics of Technical Communication

Source: U.S. Department of Agriculture, 2005 <www.mypyramid.gov/downloads/sp-MiniPoster.pdf>.

Proving Usability and Productivity

While creating ACT! 2010 we emphasized a number of usability and productivity related themes. Our first focus area was on navigation. Navigation is the act of finding your way around in a software product. Similar to navigating when traveling by car, there sometimes are easy paths and sometimes difficult paths depending on the route and the signs provided. Our goal was to make navigation as effortless as possible. We did this by creating simplified “context-driven” menus, by including a familiar “PC-style” navigation scheme to access views, and by augmenting the traditional top-of-screen toolbar with big “easy buttons” to allow instant recognition and access to the most frequently used functions. In addition, we added a persistent Lookup box, so you can search for information more quickly (Figure 1).

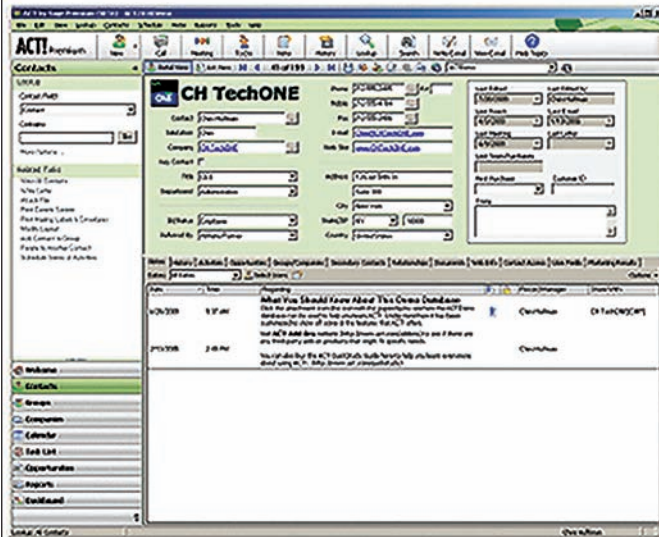


Figure 1: Contact Details Screen Showing New User Interface Elements

Second, we added a customizable Welcome page as a home base for users (Figure 2). This new screen is a navigational aid and a touchpoint for beginning ACT! users. It is also a place for all ACT! users to discover important features and how to use them. It exposes advanced features and provides assistance to experienced users who need to access infrequently used functionality. It also provides a view tailored specifically for Administrators.

ACT! by Sage

“Our goal was to make navigation as effortless as possible.”

Characteristics of technical communication:

- **addresses particular readers:** This page is from a white paper addressed to managers interested in learning about the company’s customer relationship management software.
- **helps readers solve problems:** The page explains how the software is easy to use and shows the user interface.
- **reflects the organization’s goals and culture:** This white paper focuses on usability: making the product easy to use for the customer. The explanations, the image, and the marginal quotation all focus on this goal.
- **is produced collaboratively:** It was created by the product experts, with the help of technical communicators.
- **uses design to increase readability:** The three elements—the textual explanation, the screen shot, and the marginal quotation—work together to make an argument.
- **consists of words or images or both:** The words explain the argument; the graphic shows what the words say.

On TechComm Web

To view Figs. 1.1–1.3 in context on the Web, click on Links Library for Ch. 1 on <bedfordstmartins.com/techcomm>.

Figure 1.2 A White Paper Page That Shows the Characteristics of Technical Communication

Source: Sage Software, 2009 <http://download.act.com/act2010/docs/act_2010_usability_and_productivity_whitepaper.pdf>.

Characteristics of technical communication:

- **addresses particular readers:** This Web page is addressed to prospective buyers of the company's software.
- **helps readers solve problems:** All the elements—the text, the links, and the video—are intended to answer readers' questions and show that the product is a good value. A set of links on the right is called "Solve Your Problem."
- **reflects the organization's goals and culture:** This page contains numerous elements—from the photo to the logos from social-media sites such as Facebook—that say that the company will be there to help readers solve their problems.
- **is produced collaboratively:** It was created by a writer, with the help of a photographer, a videographer, a designer, and a Web specialist.
- **uses design to increase readability:** Although this page contains a lot of information, it is well designed, with navigation information spanning the top and a balanced three-column design in the main content area of the screen.
- **consists of words or images or both:** Like much technical communication, this Web page consists of words, images (such as photographs and logos), and video.

The screenshot shows the Marathon Technologies website. At the top, there is a navigation bar with the Marathon logo and links for 'COMPANY', 'PRODUCTS', 'SOLUTIONS', 'SERVICES & SUPPORT', 'PARTNERS & ALLIANCES', 'NEWS & EVENTS', 'RESOURCE CENTER', and 'BLOG'. Below this is a search bar and social media icons. The main content area features a large green banner with the text 'See the "Why Marathon" Video'. To the left of the banner is a 'Live Help I'm Online' chat button. Below the banner is a section titled 'High Availability and Disaster Recovery Solutions Provider' with a paragraph of text. Below the text is a video player showing a man in a blue shirt speaking. To the right of the video player is a 'SOLVE YOUR PROBLEM' section with a list of bullet points. At the bottom of the page, there are social media sharing icons and a 'More' link.

Figure 1.3 A Q&A That Shows the Characteristics of Technical Communication

Source: Marathon Technologies, 2010 <www.marathon1.com/why_marathon_video.html>.

MEASURES OF EXCELLENCE IN TECHNICAL COMMUNICATION

Eight measures of excellence characterize all technical communication: honesty, clarity, accuracy, comprehensiveness, accessibility, conciseness, professional appearance, and correctness.

Honesty

The most important measure of excellence in technical communication is honesty. For three reasons, you have to tell the truth and not mislead the reader:

- *It is the right thing to do.* Technical communication is meant to help people make wise choices as they use the information available in a high-tech culture.
- *If you are dishonest, readers can get hurt.* Misinforming your readers or deliberately omitting important information can defraud, injure, or kill people.

In This Book

For more about the ethical and legal aspects of technical communication, see Ch. 2.

- If you are dishonest, you and your organization could face serious legal charges. If a court finds that your document's failure to provide honest, appropriate information caused a substantial injury or loss, your organization might have to pay millions of dollars.

ETHICS NOTE

You will find Ethics Notes throughout this book. These notes will describe typical ethical problems related to technical communication and suggest ways to think about them.

Clarity

Your goal is to produce a document that conveys a single meaning the reader can understand easily. The following directive, written by the British navy (*Technical Communication*, 1990), is an example of what to avoid:

It is necessary for technical reasons that these warheads should be stored upside down, that is, with the top at the bottom and the bottom at the top. In order that there may be no doubt as to which is the top and which is the bottom, for storage purposes, it will be seen that the bottom of each warhead has been labeled with the word TOP.

Technical communication must be clear for two reasons:

- *Unclear technical communication can be dangerous.* A carelessly drafted building code, for example, could tempt contractors to use inferior materials or techniques.
- *Unclear technical communication is expensive.* The average cost of a telephone call to a customer-support center is more than \$32 (About.com, 2008). Clear technical communication in the product's documentation—its instructions—can greatly reduce the number and length of such calls.

Accuracy

You need to get your facts straight. A slight inaccuracy can confuse and annoy your readers; a major inaccuracy can be dangerous and expensive. In another sense, accuracy is a question of ethics. Technical documents must be as objective and unbiased as you can make them. If readers suspect that you are slanting information—by overstating or omitting facts—they will doubt the validity of the entire document.

Comprehensiveness

A good technical document provides all the information readers need. It describes the background so that readers unfamiliar with the subject can understand it. It contains sufficient detail so that readers can follow the

discussion and carry out any required tasks. It refers to supporting materials clearly or includes them as attachments.

Comprehensiveness is crucial because readers need a complete, self-contained discussion in order to use the information safely, effectively, and efficiently. A document also often serves as the official company record of a project, from its inception to its completion.

Accessibility

Most technical documents—both in print and online—are made up of small, independent sections. Because few people will read a document from the beginning to the end, your job is to make its various parts accessible. That is, readers should not be forced to flip through the pages or click links unnecessarily to find the appropriate section.

Conciseness

A document must be concise enough to be useful to a busy reader. You can shorten most writing by 10 to 20 percent simply by eliminating unnecessary phrases, choosing shorter words, and using economical grammatical forms. Your job is to figure out how to convey a lot of information economically.

Professional Appearance

You start to communicate before anyone reads the first word of the document. If the document looks neat and professional, readers will form a positive impression of it and of you. Your document should adhere to the format standards of your organization or your professional field, and it should be well designed and neatly printed. For example, a letter should follow one of the traditional letter formats and have generous margins.

Correctness

A correct document is one that adheres to the conventions of grammar, punctuation, spelling, mechanics, and usage. Sometimes, incorrect writing can confuse readers or even make your writing inaccurate. The more typical problem, however, is that incorrect writing makes you look unprofessional. If your writing is full of errors, readers will wonder if you were also careless in gathering, analyzing, and presenting the technical information. If readers doubt your professionalism, they will be less likely to accept your conclusions or follow your recommendations.

A technical document is meant to convey information to a particular audience so that they understand something or carry out a task. To accomplish these goals, it must be honest, clear, accurate, comprehensive, accessible, concise, professional in appearance, and correct.


In This Book

For more about making documents accessible, see Chs. 9 and 11.

In This Book

For more about writing concisely, see Ch. 10.

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. INTERNET EXERCISE Form small groups and study the home page of your college or university's Web site. Focus on three characteristics of technical communication:

- It addresses particular readers.
- It helps readers solve problems.
- It reflects the organization's goals and culture.

Identify two or three examples of each characteristic on the home page of the site. For example, for the characteristic that technical communication addresses particular readers, you might point to the section of the site called "For Prospective Students" because it presents information addressed specifically to people who are considering enrolling. Be prepared to share your findings with the class.

2. Locate an owner's manual for a consumer product, such as a coffeemaker, bicycle, or hair dryer. In a memo to your instructor, describe and evaluate the manual. To what extent does it meet the measures of excellence discussed in this chapter? In what ways does it fall short? Submit a copy of the document (or a representative portion of it) with your memo.

3. INTERNET EXERCISE Locate a document on the Web that you think is an example of technical communication. Describe the aspects of the document that illustrate the characteristics of technical communication discussed in this chapter. Then evaluate the effectiveness of the document. Write your response in a memo to your instructor. Submit a copy of the document (or a representative portion of it) with your assignment.

Case 1: Using the Measures of Excellence in Evaluating a Résumé

Background

It is the first day of the semester, and the instructor in your technical-communication class, Robin Shaftsbury, has asked for your assistance. Prof. Shaftsbury is planning to invite five guest speakers to the classroom during the semester to discuss topics such as the role of graphics in business documents, ethics in the workplace, writing effective proposals, and delivering oral presentations.

"What I'd like your help with," Prof. Shaftsbury says to you after class, "is the presentation on résumés and job-application letters. The speaker is Matt Ito, the Director of the Career Center."

"How can I help?" you ask.

"I know that Matt has a standard presentation that he delivers in classes about the process of preparing job-application materials, strategies for looking for work, and so forth. But I spoke with him on the phone last week, asking him if he wouldn't mind tailoring the presentation to our course. He said he'd be happy to. So I'd like you to meet with him and help him see what we're doing in Chapter 1 of our text. Can you figure out some way he can key his remarks to the 'Measures of Excellence' section of the chapter?"

"How long do you want his presentation to be?" you ask.

"He said he could do 20 minutes, focusing on résumés, but if you've got ideas for some kind of class activity after he leaves to fill out the 50 minutes, that's fine."

You tell Prof. Shaftsbury that you'll get right on it. Later that day, you realize that if you had a representative résumé, you could show that to Mr. Ito before his presentation so that he could discuss it in some detail. You e-mail Prof. Shaftsbury, who sends you a job notice (Document 1.1) and a student's résumé that responds to that notice (Document 1.2).

Your Assignment

1. You decide that a useful activity for the class to carry out after Mr. Ito's remarks is to evaluate the résumé according to the measures of excellence discussed in Chapter 1. Using a word processor, create a form that you can distribute to the class members that prompts them to evaluate the résumé. Be sure the form is itself a model of effective technical communication and that it prompts students to evaluate the résumé according to each of the measures of excellence, that it gives class members space to write comments, and that it enables students to use a numerical score to measure the effectiveness of the résumé.
2. Using this form, evaluate the résumé.

Document 1.1 Job Notice for Technical-Support Positions in Boise

Corey S. Kendall

3929 Macmillan Str. #6
Garden City, Id. 837134

(208)555-1603
kendall.corey@gmail.com

OBJECTIVE: Support Technician.

A position using proven intrapersonal and technical skills.

PROFILE

A quick and willing learner of all things technical. Capable of hardware and software installation, systematic troubleshooting and providing technical research. Open to all new experiences and great at translating learning into real-life experience.

SUMMARY OF QUALIFICATIONS

- Expertise in troubleshooting and technical research.
- Excellent organization and communion skills.
- Great team player, and integrate well into new environments.
- High technical attitude that allows for ease of integration into new technical settings.

TECHNICAL EXPERIENCE / EXPERTISE

Languages	HTML, CSS, JavaScript
Software	Powerpoint, Word, Excel, OpenOffice.org, Marcomedia Flash
Operating Systems	Windows (9x, 2000, XP), Linux (RedHat, Mandrake, SuSE, Ubuntu)
Hardware	Peripherals, Routers, Switches, Network Cards, Building custom PC's

PROFESSIONAL EXPERIENCE

- Cymbal Software, Boise, ID** *Web Designer* 2090-2011
- Design, code and implement web pages using HTML, JavaScript and Css.
 - Performed tasks related to advertising

- Garden City School Systems,** *Custodian* Summer 2009
Garden City, ID
- Responsible for grounds maintenance.
 - Accomplished in gaining the trust of leaders and authorities over me.

EDUCATION

Courses included APCS, ICT A+, CAD, and Intro to Technology

- Boise State University, Boise, ID** 2009 - Present
Major: Computer Science, 4 year program

Courses included C, Java, math, english

Excellent references available upon request.

Tech Support Positions (Boise)

Date: 2012-03-23, 2:40PM
MDT

Hiring for Technical Support and Customer Service positions! VisionPerformance is now hiring for Technical Support Representatives! Full-time positions are available.

Requirements:

- BA or BS in Computer Science or appropriate experience.
- Excellent communication skills.
- Attention to detail.
- Working knowledge of TCP/IP, LAN/WAN, VPN, TCP IP, and Network environments.
- Basic PC and Mac knowledge.
- Type 55+ wpm.
- Customer service skills, call center experience a plus.

We offer medical, dental, and vision insurance just 30 days after employment, with competitive wages, referral bonuses, 401(k), and lots more!

Apply online at <www.visionperformance.com/USA/Careers/Default.aspx> and click on Apply Now!

*Location: Boise
Compensation: \$17.00 per hour*

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Document 1.2 Résumé for Corey S. Kendall

Understanding Ethical and Legal Considerations



Joseph McNally/Getty Images.

Does a bicycle company care about riders' safety?

A Brief Introduction to Ethics 18

Your Ethical Obligations 20

Obligations to Your Employer 21

Obligations to the Public 22

Obligations to the Environment 23

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The Role of Corporate Culture in Ethical and Legal Conduct 29

Communicating Ethically Across Cultures 33

Communicating with Cultures with Different Ethical Beliefs 33

Communicating with Cultures with Different Laws 34

Principles for Ethical Communication 34

Abide by Relevant Laws 34

Abide by the Appropriate Professional Code of Conduct 35

Abide by Your Organization's Policy on Social Media 35

Take Advantage of Your Employer's Ethics Resources 35

Tell the Truth 35

Don't Mislead Your Readers 35

Use Design to Highlight Important Ethical and Legal Information 36

Be Clear 36

Avoid Discriminatory Language 36

Acknowledge Assistance from Others 36

Ethical and legal issues are all around you in your work life. If you look at the Web site of any bike manufacturer, you will see that bicyclists are always shown wearing helmets. Is this because bike manufacturers care about safety? Certainly. But bike makers also care about product liability. If a company Web site showed cyclists without helmets, an injured cyclist could sue, claiming that the company was suggesting it is safe to ride without a helmet.

Ethical and legal pitfalls lurk in the words and graphics of many kinds of formal documents. In writing a proposal, you might be tempted to exaggerate or lie about your organization's past accomplishments, pad the résumés of the project personnel, list as project personnel some workers who will not be contributing to the project, or present an unrealistically short work schedule. In drafting product information, you might feel pressured to exaggerate the quality of the products shown in catalogs or manuals or to downplay the hazards of using those products. In creating graphics, you might be asked to hide an item's weaknesses by manipulating a product photo electronically.

One thing is certain: there are many serious ethical and legal issues related to technical communication, and all professionals need a basic understanding of them.

A BRIEF INTRODUCTION TO ETHICS

Ethics is the study of the principles of conduct that apply to an individual or a group. For some people, ethics is a matter of intuition—what their gut feelings tell them about the rightness or wrongness of an act. Others see ethics in terms of their own religion or the Golden Rule: treat others as you would like them to treat you. Ethicist Manuel G. Velasquez outlines four moral standards that are useful in thinking about ethical dilemmas (2006):

- **Rights.** This standard concerns individuals' basic needs and welfare. Everyone agrees, for example, that people have a right to a reasonably safe workplace. When we buy a product, we have a right to expect that the information that accompanies it is honest and clear. However, not everything that is desirable is necessarily a right. For example, in some countries high-quality health care is considered a right. That is, the government is required to provide it, regardless of whether a person can afford to pay for it. In other countries, health care is not considered a right.

- *Justice*. This standard concerns how the costs and benefits of an action or a policy are distributed among a group. For example, the cost of maintaining a highway should be borne, in part, by people who use that highway. However, because everyone benefits from the highway, it is just that general funds also be used. Another example: justice requires that people doing the same job receive the same pay, regardless of whether they are male or female, black or white.
- *Utility*. This standard concerns the positive and negative effects that an action or a policy has, will have, or might have on others. For example, if a company is considering closing a plant, the company's leaders should consider not only the money they would save but also the financial hardship of laid-off workers and the economic effects on the community. One tricky part in thinking about utility is figuring out the time frame to examine. An action such as laying off employees can have one effect in the short run—improving the company's quarterly balance sheet—and a very different effect in the long run—hurting the company's productivity or the quality of its products.
- *Care*. This standard concerns the relationships we have with other individuals. We owe care and consideration to all people, but we have greater responsibilities to people in our families, our workplaces, and our communities. The closer a person is to us, the greater care we owe that person. Therefore, we have greater obligations to members of our family than we do to others in our community.

Although these standards provide a vocabulary for thinking about how to resolve ethical conflicts, they are imprecise and often conflict with each other. Therefore, they cannot provide a systematic method of resolving ethical conflicts. Take the case of a job opportunity in your company. You are a member of the committee that will recommend which of six applicants to hire. One of the six is a friend of yours who has recently gone through a divorce and is currently unemployed. He needs the health benefits the job provides because he has a daughter with a chronic condition who requires expensive medications. Unfortunately, you have concluded that he is less qualified for the position than some of the other applicants.

How can the four standards help you think through the situation? According to the *rights* standard, lobbying for your friend or against the other applicants would be wrong because all applicants have a right to an evaluation process that considers only their qualifications to do the job. Looking at the situation from the perspective of *justice* yields the same conclusion: it would be wrong to favor your friend. From the perspective of *utility*, lobbying for your friend would probably not be in the best interests of the organization, although it might be in your friend's best interests. Only according to the *care* standard does lobbying for your friend seem reasonable.

As you think about this case, you have to consider another related question: should you tell the other people on the hiring committee that one of the applicants is your friend? Yes, because they have a right to know about your

personal relationship so that they can better evaluate your contributions to the discussion. You might also offer to recuse yourself (that is, not participate in the discussion of this position), leaving it to the other committee members to decide whether your friendship with a candidate represents a conflict of interest.

One more complication in thinking about this case: Let's say your friend is one of the top two candidates for the job. In your committee, which is made up of seven members, three vote for your friend, but four vote for the other candidate, who has a very good job with excellent benefits. She is a young, dynamic employee with degrees from prestigious universities. In other words, she is likely to be very successful in the working world, regardless of whether she is offered this particular job. Should the fact that your friend's career is in some real trouble affect your thinking about this problem? Some people would say no: the job should be offered to the most qualified applicant. Others would say yes: society does not adequately provide for its less-fortunate members, and because your friend needs the job more and is almost as qualified as the other top applicant, he should get the offer. In other words, some people would see this situation as a narrow, technical question of determining the best candidate for the job, whereas others would see it as a much broader social question involving human rights.

Most people do not explore the conflict among rights, justice, utility, and care when they confront a serious ethical dilemma; instead, they simply do what they think is right. Perhaps this is good news. However, the depth of ethical thinking varies dramatically from one person to another, and the consequences of superficial ethical thinking can be profound. For these reasons, ethicists have described a general set of principles that can help people organize their thinking about the role of ethics within an organizational context. These principles form a web of rights and obligations that connect an employee, an organization, and the world in which the organization is situated.

For example, in exchange for their labor, employees enjoy three basic rights: fair wages, safe and healthy working conditions, and due process in the handling of such matters as promotions, salary increases, and firing. Although there is still serious debate about the details of employee rights, such as the freedom from surreptitious surveillance and unreasonable searches in drug investigations, the question almost always concerns the extent of employees' rights, not the existence of the basic rights themselves. For instance, ethicists disagree about whether hiring undercover investigators to identify drug users at a job site is an unwarranted intrusion on the employees' rights, but there is no debate about the right of exemption from unwarranted intrusion.

YOUR ETHICAL OBLIGATIONS

In addition to enjoying rights, an employee assumes obligations, which can form a clear and reasonable framework for discussing the ethics of technical communication. The following discussion outlines three sets of obligations: to your employer, to the public, and to the environment.

Obligations to Your Employer

You will be hired to further your employer's legitimate aims and to refrain from any activities that run counter to those aims. Specifically, you have five obligations:

- *Competence and diligence.* *Competence* refers to your skills; you should have the training and experience to do the job adequately. *Diligence* simply means hard work.
- *Generosity.* Although *generosity* might sound like an unusual obligation, you are obligated to help your co-workers and stakeholders outside your organization by sharing your knowledge and expertise. What this means is that if you are asked to respond to questions or provide recommendations on some aspect of your organization's work, you should do so. If a customer or supplier contacts you, make the time to respond helpfully. Generosity shows professionalism and furthers your organization's goals.
- *Honesty and candor.* You should not steal from your employer. Stealing includes such practices as embezzlement, "borrowing" office supplies, and padding expense accounts. *Candor* means truthfulness; you should report problems to your employer that might threaten the quality or safety of the organization's product or service.

Issues of honesty and candor include what Sigma Xi, the Scientific Research Society, calls *trimming*, *cooking*, and *forging* (Sigma Xi, 1986, p. 11). *Trimming* is the smoothing of irregularities to make research data look extremely accurate and precise. *Cooking* is retaining only those results that fit the theory and discarding the others. And *forging* is inventing some or all of the data, and even reporting experiments that were never performed. In carrying out research, employees must resist any pressure to report only positive, statistically significant findings.

- *Confidentiality.* You should not divulge company business outside of the company. If a competitor finds out that your company is planning to introduce a new product, it might introduce its own version of that product, robbing you of your competitive advantage. Many other kinds of privileged information—such as quality-control problems, personnel matters, relocation or expansion plans, and financial restructuring—also could be used against the company. A well-known problem of confidentiality involves *insider information*: an employee who knows about a development that will increase the value of the company's stock, for example, buys the stock before the information is made public, thus reaping an unfair (and illegal) profit.
- *Loyalty.* You should act in the employer's interest, not in your own. Therefore, it is unethical to invest heavily in a competitor's stock because that could jeopardize your objectivity and judgment. For the same reason, it is unethical to accept bribes or kickbacks. It is unethical to devote considerable time to moonlighting (performing an outside

 **In This Book**

For more about whistle-blowing, see p. 33.

job, such as private consulting) because the outside job could lead to a conflict of interest and because the heavy workload could make you less productive in your primary position. However, you do not owe your employer absolute loyalty; if your employer is acting unethically, you have an obligation to try to change that behavior, even, if necessary, by blowing the whistle.

Obligations to the Public

Every organization that offers products or provides services is obligated to treat its customers fairly. As a representative of an organization, and especially as an employee communicating technical information, you will frequently confront ethical questions.

In general, an organization is acting ethically if its product or service is both *safe* and *effective*. The product or service must not injure or harm the consumer, and it must fulfill its promised function. However, these common-sense principles provide little guidance in dealing with the complicated ethical problems that arise routinely.

According to the U.S. Consumer Product Safety Commission (2009), more than 4,500 deaths and 14 million injuries occur each year in the United States because of consumer products—not counting automobiles and medications. Even more commonplace, of course, are product and service failures: products or services don't do what they are supposed to do, products are difficult to assemble or operate, they break down, or they require more expensive maintenance than indicated in the product information.

Who is responsible for injuries and product failures—the company that provides the product or service or the consumer who purchases it? In individual cases, blame is sometimes easy enough to determine. A person who operates a chainsaw without reading the safety warnings and without seeking any instruction in how to use it is to blame for any injuries caused by the normal operation of the saw. But a manufacturer that knows that the chain on the saw is liable to break under certain circumstances and fails to remedy this problem or warn the consumer is responsible for any resulting accidents.

Unfortunately, such ideas do not outline a rational theory that can help companies understand how to act ethically in fulfilling their obligations to the public. Today, most court rulings are based on the premise that the manufacturer knows more about its products than the consumer does and therefore has a greater responsibility to make sure the products comply with all of the manufacturer's claims and are safe. Therefore, in designing, manufacturing, testing, and communicating about a product, the manufacturer has to make sure the product will be safe and effective when used according to the instructions. However, the manufacturer is not liable when something goes wrong that it could not have foreseen or prevented.

Obligations to the Environment

One of the most important lessons we have learned in recent decades is that we are polluting and depleting our limited natural resources at an unacceptably high rate. Our excessive use of fossil fuels not only deprives future generations of their use but also causes possibly irreversible pollution problems, such as global warming. Everyone—government, businesses, and individuals—must work to preserve the environment to ensure the survival not only of our own species but also of the other species with which we share the planet.

But what does this have to do with you? In your daily work, you probably do not cause pollution or deplete the environment in any extraordinary way. Yet because of the nature of your work, you will often know how your organization's actions affect the environment. For example, if you work for a manufacturing company, you might be aware of the environmental effects of making or using your company's products. Or you might help write an environmental impact statement.

As communicators, we should treat every actual or potential occurrence of environmental damage seriously. We should alert our supervisors to the situation and work with them to try to reduce the damage. The difficulty, of course, is that protecting the environment can be expensive. Clean fuels cost more than dirty ones. Disposing of hazardous waste properly costs more (in the short run) than merely dumping it. Organizations that want to reduce costs may be tempted to cut corners on environmental protection.

YOUR LEGAL OBLIGATIONS

Although most people believe that ethical obligations are more comprehensive and more important than legal obligations, the two sets of obligations are closely related. Our ethical values have shaped many of our laws. For this reason, professionals should know the basics of four different bodies of law: copyright, trademark, contract, and liability.

Copyright Law

As a student, you are constantly reminded to avoid plagiarism. A student caught plagiarizing would likely fail the assignment or the course or even be expelled from school. A medical researcher or a reporter caught plagiarizing would likely be fired, or at least find it difficult to publish in the future. But plagiarism is an ethical, not a legal, issue. Although a plagiarist might be expelled from school or be fired, he or she will not be fined or sent to prison.

By contrast, copyright is a legal issue. *Copyright law* is the body of law that relates to the appropriate use of a person's intellectual property: written documents, pictures, musical compositions, and the like. Copyright literally refers to a person's *right to copy* the work that he or she has created.

On TechComm Web

For more about copyright law, see the U.S. Copyright Office Web site. Click on Links Library for Ch. 2 on <bedfordstmartins.com/techcomm>.

The most important concept in copyright law is that only the copyright holder—the person or organization that owns the work—can copy it. For instance, if you work for IBM, you can legally copy information from the IBM Web site and use it in other IBM documents. This reuse of information is routine in business, industry, and government because it helps ensure that the information a company distributes is both consistent and accurate.

However, if you work for IBM, you cannot simply copy information that you find on the Dell Web site and put it in IBM publications. Unless you obtained written permission from Dell to use its intellectual property, you would be infringing on Dell's copyright.

Why doesn't the Dell employee who wrote the information for Dell own the copyright to that information? The answer lies in a legal concept known as *work made for hire*. Anything written or revised by an employee on the job is the company's property, not the employee's.

Although copyright gives the owner of the intellectual property some rights, it doesn't give the owner all rights. You can place small portions of copyrighted text in your own document without getting formal permission from the copyright holder. When you quote a few lines from an article, for example, you are taking advantage of an aspect of copyright law called *fair use*. Under fair-use guidelines, you have the right to use material, without getting permission, for purposes such as criticism, commentary, news reporting, teaching, scholarship, or research. Unfortunately, *fair use* is based on a set of general guidelines that are meant to be interpreted on a case-by-case basis. Keep in mind that you should still cite the source accurately to avoid plagiarism.

▶ On TechComm Web

The U.S. Copyright Office Web site describes work made for hire. Click on Links Library for Ch. 2 on <bedfordstmartins.com/techcomm>.

Guidelines

Determining Fair Use

Courts consider four factors in disputes over fair use:

- ▶ **The purpose and character of the use, especially whether the use is for profit.** Profit-making organizations are scrutinized more carefully than nonprofits.
- ▶ **The nature and purpose of the copyrighted work.** When the information is essential to the public—for example, medical information—fair use is applied more liberally.
- ▶ **The amount and substantiality of the portion of the work used.** A 200-word passage would be a small portion of a book but a large portion of a 500-word brochure.
- ▶ **The effect of the use on the potential market for the copyrighted work.** Any use of the work that is likely to hurt the author's potential to profit from the original work will probably not be considered fair use.

A new trend in copyright is for copyright owners to stipulate which rights they wish to retain and which they wish to give up. You might see references to Creative Commons, a not-for-profit organization that provides symbols for copyright owners to use to communicate their preferences. Figure 2.1 shows three of the Creative Commons symbols.

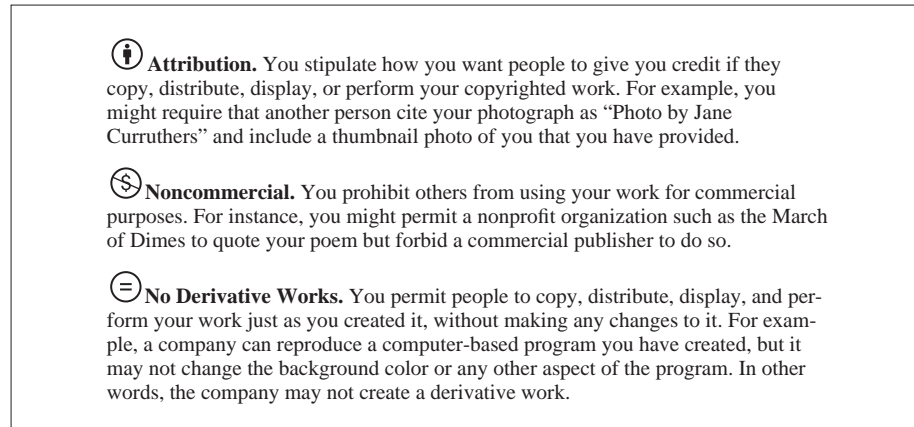



Figure 2.1 Selected Licensing Symbols from Creative Commons

The organization has created a number of symbols to represent rights that copyright owners can retain or surrender.

Source: Creative Commons, 2010 <<http://creativecommons.org/about/licenses>>.


 **On TechComm Web**
The U.S. Copyright Office Web site describes fair use. Click on Links Library for Ch. 2 on <bedfordstmartins.com/techcomm>.

Guidelines

Dealing with Copyright Questions

Consider the following advice when using material from another source.

- ▶ **Abide by the fair-use concept.** Do not rely on excessive amounts of another source's work (unless the information is your company's own boilerplate).
- ▶ **Seek permission.** Write to the source, stating what portion of the work you wish to use and the publication you wish to use it in. The source is likely to charge you for permission.
- ▶ **Cite your sources accurately.** Citing sources fulfills your ethical obligation and strengthens your writing by showing the reader the range of your research.
- ▶ **Consult legal counsel if you have questions.** Copyright law is complex. Don't rely on instinct or common sense.

 **In This Book**
For more about documenting your sources, see Appendix, Part B.

ETHICS NOTE**Distinguishing Plagiarism from Acceptable Reuse of Information**

Plagiarism is the act of using someone else's words or ideas without giving credit to the original author. It doesn't matter whether the writer intended to plagiarize. Obviously, it is plagiarism to borrow, buy, or steal graphics, video or audio media, written passages, or entire documents, and then use them without attribution. Web-based sources are particularly vulnerable to plagiarism, partly because people mistakenly think that if information is on the Web it is free to borrow and partly because it is so easy to copy, paste, and reformat Web-based material.

However, writers within a company often reuse one another's information without giving credit—and it is completely ethical. For instance, companies write press releases when they wish to publicize news. These press releases typically conclude with descriptions of the company and how to get in touch with an employee who can answer questions about the company's products or services. These descriptions, sometimes called *boilerplate*, are simply copied and pasted from previous press releases. Because these descriptions are legally the intellectual property of the company, reusing them in this way is completely honest. Similarly, companies often *repurpose* their writing. That is, they copy a description of the company from a press release and paste it into a proposal or an annual report. This reuse also is acceptable.


When you are writing a document and need a passage that you suspect someone in your organization might already have written, ask a more-experienced co-worker whether the culture of your organization permits reusing someone else's writing. If the answer is yes, check with your supervisor to see whether he or she approves what you plan to do.

Trademark Law

Companies use *trademarks* and *registered trademarks* to ensure that the public recognizes the name or logo of a product.

- A *trademark* is a word, phrase, name, or symbol that is identified with a company. The company uses the TM symbol after the product name to claim the design or device as a trademark. For instance, Google claims the multicolored design of the word GoogleTM as a trademark. Claiming a trademark permits a company to go to state court to try to prevent other companies from using the trademarked item for their own products.
- A *registered trademark* is a word, phrase, name, or symbol that the company has registered with the U.S. Patent and Trademark Office. The company can then use the ® symbol after the trademarked item. Registering a trademark, a process that can take years, ensures much more legal protection throughout the United States, as well as in other nations.

All employees are responsible for using the trademark and registered trademark symbols accurately when referring to a company's products.

 **On TechComm Web**
For more about trademarks, see the U.S. Patent and Trademark Office Web site. Click on Links Library for Ch. 2 on <bedfordsmartins.com/techcomm>.

Guidelines

Protecting Trademarks

Use the following techniques to protect your client's or employer's trademark.

- ▶ **Distinguish trademarks from other material.** Use boldface, italics, a different typeface or size, or a different color to distinguish the trademarked item.
- ▶ **Use the trademark symbol.** At least once in each document—preferably the first time the name or logo appears—use the appropriate symbol after the name or logo, followed by an asterisk. At the bottom of the page, include a statement such as the following: “*COKE is a registered trademark of the Coca-Cola Company.”
- ▶ **Use the trademarked item as an adjective, not as a noun or verb.** Trademarks can become confused with the generic term they refer to. Use the trademarked item along with the generic term, as in Xerox® photocopier or LaserJet® printer.
- ▶ **Do not use the plural form or the possessive form of the term.** Doing so reduces the uniqueness of the item and encourages the public to think of the term as generic.

DOES NOT PROTECT TRADEMARK	buy three LaserJets®
PROTECTS TRADEMARK	buy three LaserJet® printers
DOES NOT PROTECT TRADEMARK	LaserJet's® fine quality
PROTECTS TRADEMARK	the fine quality of LaserJet® printers

Contract Law

Contract law deals with agreements between two parties. In most cases, disputes concern whether a product lives up to the manufacturer's claims. These claims are communicated as express warranties or implied warranties.

An *express warranty* is a written or oral statement that the product has a particular feature or can perform a particular function. For example, a statement in a printer manual that the printer produces 17 pages per minute is an express warranty. An *implied warranty* is a warranty that is not written or spoken explicitly but inferred by the purchaser. Implied warranties also occur in more-casual communications, such as letters to customers or conversations between salespeople and customers. Figure 2.2 illustrates an implied warranty.

Liability Law

Under product-liability law, a manufacturer or seller of a product is liable for injuries or damages caused by the use of that product. Liability is an important concern for communicators because courts frequently rule that manufacturers are responsible for providing adequate operating instructions and for warning consumers about the risks of using their products. Figure 2.3 shows a warning label used to inform people how to avoid a safety risk.



Figure 2.2 An Implied Warranty

This photograph of a child operating a particular rock polisher is an implied warranty that children can operate it safely.

Source: Natural Science Industries, 2005 <http://images.amazon.com/images/P/B00000ISUU.01_SCLZZZZZZZ_.jpg>.

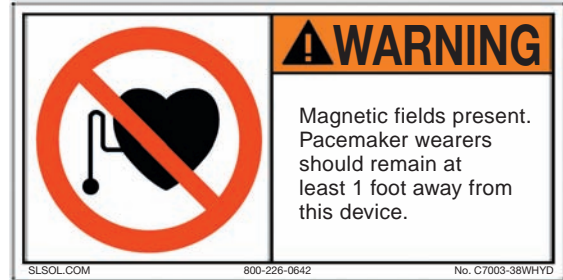


Figure 2.3 A Warning Label

This warning label uses symbols—such as the orange box, the red circle with the slash, and the image of the heart and pacemaker—and words to visually and verbally warn people with pacemakers to stay away from a device that can hurt them. The warning helps the company do the right thing—and avoid product-liability lawsuits.

Source: Safety Label Solutions, 2010 <<http://safetylabelsolutions.com/store/page8.html>>.

Guidelines

Abiding by Liability Laws

Pamela S. Helyar summarizes the communicator's obligations and offers ten guidelines for abiding by liability laws (1992):

- ▶ **Understand the product and its likely users.** Learn everything you can about the product and its users.
- ▶ **Describe the product's functions and limitations.** Help people determine whether it is the right product to buy. In one case, a manufacturer was found liable for not stating that its electric smoke alarm does not work during a power outage.
- ▶ **Instruct users on all aspects of ownership.** Include assembly, installation, use and storage, testing, maintenance, first aid and emergencies, and disposal.
- ▶ **Use appropriate words and graphics.** Use common terms, simple sentences, and brief paragraphs. Structure the document logically, and include specific directions. Make graphics clear and easy to understand; where necessary, show people performing tasks. Make the words and graphics appropriate to the education, mechanical ability, manual dexterity, and intelligence of intended users. For products that will be used by children or nonnative speakers of your language, include graphics illustrating important information.
- ▶ **Warn users about the risks of using or misusing the product.** Warn users about the dangers of using the product, such as chemical poisoning. Describe the cause, extent, and seriousness of the danger. A car manufacturer was found

In This Book

For a discussion of *danger*, *warning*, and *caution*, see Ch. 20, p. 587.

liable for not having warned consumers that parking a car on grass, leaves, or other combustible material could cause a fire. For particularly dangerous products, explain the danger and how to avoid it, and then describe how to use the product safely. Use *mandatory language*, such as *must* and *shall*, rather than *might*, *could*, or *should*. Use the words *warning* and *caution* appropriately.

- ▶ **Include warnings along with assertions of safety.** When product information says that a product is safe, readers tend to pay less attention to warnings. Therefore, include detailed warnings to balance the safety claims.
- ▶ **Make directions and warnings conspicuous.** Safety information must be in large type and easily visible, appear in an appropriate location, and be durable enough to withstand ordinary use of the product.
- ▶ **Make sure that the instructions comply with applicable company standards and local, state, or federal statutes.**
- ▶ **Perform usability testing on the product (to make sure it is safe and easy to use) and on the instructions (to make sure they are accurate and easy to understand).**
- ▶ **Make sure users receive the information.** If you discover a problem after the product has been shipped to retailers, tell users by direct mail or e-mail, if possible, or newspaper and online advertising if not. Automobile-recall notices are one example of how manufacturers contact their users.

 **In This Book**

For a discussion of usability testing, see Ch. 13, p. 357.

THE ROLE OF CORPORATE CULTURE IN ETHICAL AND LEGAL CONDUCT

Most employees work within organizations, such as corporations and government agencies. We know that organizations exert a powerful influence on their employees' actions. According to a study by the Ethics Resource Center of more than 2,000 employees in various businesses (2010), organizations with strong ethical cultures—organizations in which ethical values are promoted at all levels and employees see that everyone lives up to the organization's stated values—experience fewer ethical problems. Compared with organizations with weak ethical cultures, in organizations with strong ethical cultures, far fewer employees feel pressure to commit misconduct, far fewer employees observe misconduct, far more employees report the misconduct that they see, and there is far less retaliation against employees who report the misconduct.

Companies can take specific steps to improve their ethical culture:

- The organization's leaders can set the right tone by living up to their commitment to ethical conduct.
- Supervisors can set good examples and encourage ethical conduct.
- Peers can support those employees who act ethically.
- The organization can use informal communication to reinforce the formal policies, such as those presented in a company code of conduct.

In other words, it is not enough for an organization to issue a statement that ethical and legal behavior is important. The organization has to create a culture that values and rewards ethical and legal behavior. That culture starts at the top and extends to all employees, and it permeates the day-to-day operations of the organization.

One company that has earned praise for its commitment to ethical and legal conduct is Texas Instruments (TI). Its culture is communicated on its Web site, which contains a comprehensive set of materials that describes how TI employees and suppliers are required to act, and why (Texas Instruments, 2010). The materials begin with a statement from the President and Chief Executive Officer, Rich Templeton:

TI's products and markets have changed through the years, but our determination to maintain the values on which our company was founded remains true to this day. High ethical standards, a respect for individuals, a commitment to long-term relationships, a concern for the environment, and a sense of duty to our communities—these are the principles that bind us together and make TI a company of which we can all be proud.

Innovation lies at the center of all we do, but great products, alone, aren't enough to win in the long run. In our business, trust matters, and a reputation for integrity is our most effective marketing tool. Our customers choose TI, not only for our technology, but also because we treat them with respect, deal with them fairly, and deliver on our promises. We strive to be a company they can count on, and that focus has played a huge role in our success.

Throughout our company history, TI's commitment to high ethical standards has served our people, our customers and our communities. But it has also been good for business. Our determination to do the right thing demands that we look at problems from many perspectives and consider the full impact of our actions. As a result, we develop solutions that are more efficient, more creative, and more effective.

The TI site also includes a number of other statements:

- The “Values and Ethics Statement” concludes, “Know what’s right. Value what’s right. Do what’s right.”
- The “Integrity Statement” focuses on respect, dignity, courtesy, inoffensive behavior, a respect for privacy and cultural differences, and the employee’s right to ask tough questions about ethics.
- The “Innovation Statement” focuses on the benefits of collaboration, nondiscrimination, diversity, open communication, recognition for achievement, and a professional workplace.
- The “Commitment Statement” focuses on lifelong learning, accountability, integrity, and customer satisfaction.

In addition, the site includes numerous other ethics resources, including the company’s formal code of conduct for all employees, its code of ethics for company officers, information about the company’s Ethics Office, links to all

Notice that this statement outlines the company’s core values—respect for people and the environment, trust in business relationships—and links those values to the business success that the company enjoys. Many companies today have a statement of values, focusing on issues of character (such as respect, trust, honesty, and commitment).

its ethics publications, its statement of ethics for its suppliers, and detailed information on how to contact the TI Ethics Office confidentially.

Does the culture improve conduct? That question is difficult to answer, but the TI site describes some of the major awards the company has won for its ethics program, presents data from its own employee surveys showing they think the company's ethical culture is good, and describes the company's outreach to communities and other organizations that have established their own ethics programs.

One important element of a culture of ethical and legal conduct is a formal code of conduct. Of the 200 largest corporations in the world, more than half have codes of conduct (Kaptein, 2004). In the United States, most large corporations have them, as do almost all professional societies. Codes of conduct vary greatly from organization to organization, but most of them address such issues as the following:

- adhering to local laws and regulations, including those intended to protect the environment
- avoiding discrimination
- maintaining a safe and healthy workplace
- respecting privacy
- avoiding conflicts of interest
- protecting the company's intellectual property
- avoiding bribery and kickbacks in working with suppliers and customers

Many codes of conduct are only a few paragraphs long; others are lengthy and detailed, some consisting of several volumes.

An effective code has three major characteristics:

- *It protects the public rather than members of the organization or profession.* For instance, the code should condemn unsafe building practices but not advertising, which increases competition and thus lowers prices.
- *It is specific and comprehensive.* A code is ineffective if it merely states that people must not steal, or if it does not address typical ethical offenses such as bribery in companies that do business in other countries.
- *It is enforceable.* A code is ineffective if it does not stipulate penalties, including dismissal from the company or expulsion from the profession.

Although many codes are too vague to be useful in determining whether a person has violated one of their principles, writing and implementing a code can be valuable because it forces an organization to clarify its own values and can foster an increased awareness of ethical issues. Texas Instruments, like many organizations, encourages employees to report ethical problems to a committee or a person—sometimes called an *ethics officer* or an *ombudsperson*—who investigates and reaches an impartial decision.

A code of conduct focuses on behavior, including such topics as adhering to the law.

On TechComm Web

For links to codes of conduct from around the world, see Codes of Conduct/Practice/Ethics from Around the World. Click on Links Library for Ch. 2 on <bedfordstmartins.com/techcomm>.

INTERACTIVE SAMPLE DOCUMENT

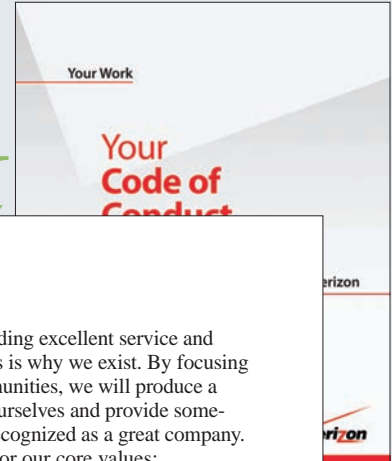
Linking Values and Conduct

The following statement of values, published by Verizon, introduces the company's 31-page code of conduct. The questions in the margin ask you to think about how a statement of values provides a basis for an organization's code of conduct (as discussed on page 31).

1. Where does this statement explain the reason Verizon exists? Is the explanation clear?
2. The "Performance Excellence" section is different from the other three sections in that it deals less with an aspect of character than with the business objectives of the company. How would you revise this section so that it is better integrated with the statement of values?
3. This statement of values uses idealistic statements (we never let the customer down) rather than more-realistic statements (we try never to let the customer down). Which sort of statement is more effective?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 2 on <bedfordstmartins.com/techcomm>.



VERIZON COMMITMENT AND VALUES

The Verizon commitment is to put our customers first by providing excellent service and great communications experiences. This is what we do and this is why we exist. By focusing on our customers and being responsible members of our communities, we will produce a solid return for our shareowners, create meaningful work for ourselves and provide something of lasting value for society. As a result, Verizon will be recognized as a great company.

In order to keep this commitment, we need to always honor our core values:

Integrity

Integrity is at the heart of everything we do. We are honest, ethical and upfront because trust is at the foundation of our relationships with our customers, our communities, our stakeholders and each other.

Respect

We know it is critical that we respect everyone at every level of our business. We champion diversity, embrace individuality and listen carefully when others speak.

Performance Excellence

We hold ourselves to a very high standard of performance. We prize innovative ideas and the teamwork it takes to make them realities. We never stop asking ourselves how we can make the customer experience better, and every day we find an answer.

Accountability

We take responsibility for our actions as individuals, as team members, and as an organization. We work together, support one another and never let the customer—or our coworkers—down.

Great companies are judged by what they do, not by what they say. To be the best, we're going to keep pushing ourselves in new and exciting directions. These values will guide our every action.

Source: Verizon, 2010 <<https://www22.verizon.com/about/careers/pdfs/CodeOfConduct.pdf>>.

If you think there is a serious ethical problem in your organization, find out what resources your organization offers to deal with it. If there are no resources, work with your supervisor to solve the problem.

What do you do if you have exhausted all the resources at your organization and, if appropriate, the professional organization in your field? The next step will likely involve *whistle-blowing*—the practice of going public with information about serious unethical conduct within an organization. For example, an engineer is blowing the whistle when she tells a regulatory agency or a newspaper that quality-control tests on a company product were faked.

Ethicists such as Velasquez (2006) argue that whistle-blowing is justified if you have tried to resolve the problem through internal channels, if you have strong evidence that the problem is hurting or will hurt other parties, and if the whistle-blowing is reasonably certain to prevent or stop the wrongdoing. But Velasquez also points out that whistle-blowing is likely to hurt the employee, his or her family, and other parties. Whistle-blowers can be penalized through negative performance appraisals, transfers to undesirable locations, or isolation within the company.

COMMUNICATING ETHICALLY ACROSS CULTURES

Every year, the United States exports more than \$1.8 trillion worth of goods and services to the rest of the world (U.S. Census Bureau, 2010, p. 1264). U.S. companies do not necessarily have the same ethical and legal obligations when they export as when they sell in the United States. For this reason, communicators should understand the basics of two aspects of writing for people in other countries: communicating with cultures with different ethical beliefs and communicating with countries with different laws.

Communicating with Cultures with Different Ethical Beliefs

Companies face special challenges when they market their products and services to people in other countries (and to people in their home countries who come from other cultures). Companies need to decide how to deal with situations in which the target culture's ethical beliefs clash with those of their own culture. For instance, in many countries, sexual discrimination makes it difficult for women to assume responsible positions in the workplace. If a U.S. company that sells computers, for example, wishes to present product information in such a country, should it reinforce this discrimination by excluding women from photographs of its products? Ethicist Thomas Donaldson argues that doing so is wrong (1991). Under the principle he calls the *moral minimum*, companies are ethically obligated not to reinforce patterns of discrimination in product information.

However, Donaldson argues, companies are not obligated to challenge the prevailing prejudice directly. A company is not obligated to include photographs that show women performing roles they do not normally perform within that culture, nor is it obligated to portray women wearing clothing, makeup, or jewelry that is likely to offend local standards. But there is nothing to prevent an organization from adopting a more activist stance. Organizations that actively oppose discrimination are acting admirably.

Communicating with Cultures with Different Laws

When U.S. companies export goods and services to other countries, they need to adhere to those countries' federal and regional laws. For instance, a company that wishes to export to Montreal must abide by the laws of Quebec Province and of Canada. A company that wishes to export to Germany must abide by the laws of Germany and of the European Union, of which it is a part. In many cases, the target region will not allow the importation of goods and services that do not meet local laws. The hazardous-product laws of the European Union, in particular, are typically more stringent than those of the United States.

Because exporting goods to countries with different laws is such a complex topic, companies that export devote considerable resources to finding out what they need to do, not only in designing and manufacturing products but also in writing the product information. For a good introduction to this topic, see Lipus (2006).

PRINCIPLES FOR ETHICAL COMMUNICATION

Although it is impossible to state principles for ethical communication that will guide you through all the challenges you will face communicating in the workplace, the following ten principles provide a starting point.

Abide by Relevant Laws

You must adhere to the laws governing intellectual property. Here are some examples:

- *Do not violate copyright.* When you want to publish someone else's copyrighted material, such as graphics you find on the Web, get written permission from the copyright owner.
- *Honor the laws regarding trademarks.* For instance, use the trademark symbol (™) and the registered trademark symbol (®) properly.
- *Live up to the express and implied warranties on your company's products.*
- *Abide by all laws governing product liability.* Helyar's (1992) guidelines, presented in this chapter on page 28, are a good introduction for products to be sold in the United States. Lipus's (2006) guidelines are useful for products to be sold outside the United States.

Abide by the Appropriate Professional Code of Conduct

Your field's professional organization, such as the American Society of Civil Engineers, is likely to have a code that goes beyond legal issues to express ethical principles, such as telling the truth, reporting information accurately, respecting the privacy of others, and avoiding conflicts of interest.

Abide by Your Organization's Policy on Social Media

Most organizations have written policies about how employees may use social media. These policies address such issues as what kinds of Web sites employees may visit while at work, how employees should represent themselves and the organization both at work and outside of work, and whether employees may set up a blog on the organization's servers. You should study your organization's policies related to social media. If you think that you will be unable to abide by those policies, you should not work there, or you should abide by them while you try to change them.

Take Advantage of Your Employer's Ethics Resources

Your employer is likely to have a code of conduct, as well as other resources, such as an ethics office or ombudsperson, that can help you find information to guide you in resolving ethical challenges you encounter. Your employer will likely have a mechanism for registering complaints about unethical conduct anonymously.

Tell the Truth

Sometimes, employees are asked to lie about their companies' products or about those of their competitors. Obviously, lying is unethical. Your responsibility is to resist this pressure, going over your supervisor's head if necessary.

Don't Mislead Your Readers

A misleading statement—one that invites or even encourages the reader to reach a false conclusion—is ethically no better than lying. Avoid these four common kinds of misleading technical communication:

- *False implications.* If you work for SuperBright and write, "Use only SuperBright batteries in your new flashlight," you imply that only that brand will work. If that is untrue, the statement is misleading. Communicators sometimes use clichés such as *user-friendly*, *ergonomic*, and *state-of-the-art* to make the product sound better than it is. Use specific, accurate information to back up your claims about a product.
- *Exaggerations.* If you say, "Our new Operating System 2500 makes system crashes a thing of the past," but the product only makes them less likely, you are exaggerating. Provide the specific technical information on the

In This Book

For a more detailed discussion of misleading writing, see Ch. 10. For a discussion of avoiding misleading graphics, see Ch. 12.

In This Book

For techniques for writing clearly, including avoiding discriminatory language, see Ch. 10.

reduction of crashes. Do not write, “We carried out extensive market research,” if all you did was make a few phone calls.

- *Legalistic constructions.* It is unethical to write, “The 3000X was designed to operate in extreme temperatures, from –40 degrees to 120 degrees Fahrenheit,” if the product cannot operate reliably in those temperatures. Although the statement might technically be accurate—the product was *designed* to operate in those temperatures—it is misleading.
- *Euphemisms.* If you refer to someone’s being fired, say *fired* or *released*, not *granted permanent leave* or *offered an alternative career opportunity*.

Use Design to Highlight Important Ethical and Legal Information

Courts have found that information that is buried in footnotes or printed in very small type violates the company’s obligation to inform consumers and warn them about hazards in using a product. If you want to communicate safety information or other facts that readers need to know, use design features to make it easy to see and understand. Figure 2.4 shows how design principles can be used to communicate nutritional information in food labels.



Figure 2.4 Using Design to Emphasize Important Information

This nutritional labeling system is called “traffic light labeling” because it uses red and green to indicate how healthy a food is.

Source: Alamy, 2011 <www.alamy.com>.

Be Clear

Clear writing helps your readers understand your message easily. Your responsibility is to write as clearly as you can to help your audience understand what you are saying. For instance, if you are writing a product warranty, make it as simple and straightforward as possible. Don’t hide behind big words and complicated sentences. Use tables of contents, indexes, and other accessing devices to help your readers find what they need.

Avoid Discriminatory Language

Don’t use language that discriminates against people because of their sex, religion, ethnicity, race, sexual orientation, or physical or mental abilities. Employees have been disciplined or fired for sending inappropriate jokes through the company e-mail system.


Acknowledge Assistance from Others

Don’t suggest that you did all the work yourself if you didn’t. Cite your sources and your collaborators accurately and graciously. For more about citing sources, see Chapter 6, page 125, and Appendix, Part B, page 667.

Writer's Checklist

- Did you abide by relevant laws? (p. 34)
 - Did you abide by the appropriate corporate or professional code of conduct? (p. 35)
 - Did you abide by your organization's policy on social media? (p. 35)
 - Did you take advantage of your company's ethics resources? (p. 35)
 - Did you tell the truth? (p. 35)
- Did you avoid using
- false implications? (p. 35)
 - exaggerations? (p. 35)
 - legalistic constructions? (p. 36)
 - euphemisms? (p. 36)
- Did you use design to highlight important ethical and legal information? (p. 36)
 - Did you write clearly? (p. 36)
 - Did you avoid discriminatory language? (p. 36)
 - Did you acknowledge any assistance you received from others? (p. 37)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. It is late April, and you need a summer job. In a local newspaper, you see an ad for a potential job. The only problem is that the ad specifically mentions that it is “a continuing, full-time position.” You know that you will be returning to college in the fall. Is it ethical for you to apply for the job without mentioning this fact? Why or why not? If you feel it is unethical to withhold the information that you plan to return to college in the fall, is there any way you can ethically apply? Be prepared to share your ideas with the class.
2. You serve on the Advisory Committee of your college's bookstore, which is a private business that leases space on campus and donates 10 percent of its profits to student scholarships. The head of the bookstore wishes to stock Simple Study Guides, a popular series of plot summaries and character analyses of classic literary works. In similar bookstores, the sale of Simple Study Guides yields annual profits of over \$10,000. Six academic departments have signed a statement condemning the idea. Should you support the bookstore head or the academic departments? Be prepared to discuss your answer with the class.
3. **INTERNET EXERCISE** Find an article or advertisement in a newspaper or magazine or on the Web that you feel contains untrue or misleading information. Write a memo to your instructor describing the ad and analyzing the unethical techniques. How might the information have been presented more honestly? Include a photocopy or a printout of the ad with your memo.
4. **GROUP EXERCISE** Form small groups. Study the Web site of a company or other organization that has a prominent role in your community or your academic field. Find the information about the organization's commitment to ethical and legal conduct. Often, organizations present this information in sections called “information for investors,” “about the company,” “values and principles of conduct,” or similar titles.
 - One group member could identify the section that states the organization's values. How effective is this section in presenting information that goes beyond general statements that ethical behavior is important?
 - A second group member could identify the section that describes the organization's code of conduct. Does the organization seem to take ethical and legal behavior seriously? Can you get a clear idea from the description whether the organization has a specific, well-defined set of policies, procedures, and resources available for employees who wish to discuss ethical and legal issues?

- A third group member could identify any information related to the organization's commitment to the environment. What does the organization do, in its normal operations, to limit its carbon footprint or in other ways encourage responsible use of natural resources and limit damage to the environment?
- As a team, write a memo to your instructor presenting your findings. Attach the organization's code to your memo.

Case 2: The Ethics of Requiring That Students Subsidize a Plagiarism-Detection Service

Background

You are the chair of your university's nine-member Student Council. The purpose of the Student Council is to give students a voice in university governance. The university's administration often presents to the Student Council its ideas on ways to improve the academic and social lives of students. The Student Council then discusses these ideas and sometimes solicits the views of the entire student body before responding to the administration.

The subject of this month's meeting is a letter from the Provost, Mary Lingram, to you as the chair of the Student Council. In the letter, Provost Lingram discusses an idea to reduce plagiarism by purchasing a site license to Turnitin.com, a plagiarism-detection service (see Document 2.1).

You distribute copies of the letter to the other members of the Student Council, and you can see that they don't look happy. After a minute, you say, "What do you think?"

Crystal Noack responds first. "Well, speaking as someone who's over twenty thousand dollars in debt," she says, pausing for effect, "I'm not wild about paying a for-profit company to check up on whether I'm plagiarizing."

"Yeah," agrees Adam Levanger, "I don't plagiarize. How is it fair that I have to pay?"

"How do we even know how big a problem plagiarism is in the first place?" Laura Kim asks. "The Provost didn't say anything about how pervasive it is here."

Sa'id Hamdi says, "What about my rights as a student? I don't get a say in whether my paper gets uploaded to Turnitin? Isn't there an intellectual-property issue here?"

"Okay, it seems that this is kind of complicated," you say. "How about we do this: Let's take a look at the site and see if we can understand how it works. By Monday I'll write a post to our discussion list, soliciting your arguments. I think the best strategy is to look at the ethics of how this would affect us, not the cost—"

"That's right," Adam interrupts. "Six bucks a year is three coffees."

"Okay," you continue. "If we don't like it, it has to be because it violates our rights, or something like that. So let's come at this from the ethics angle. But we need to think about what the Provost said about how it's in everyone's best interest if people realize we're not all a bunch of cheaters. If you all post to the list by the end of the week, I'll post a draft of a letter to the Provost by Monday. Then we'll take it from there."

Your Assignment

1. Write a draft of a letter to Provost Lingram that presents the Student Council's analysis of whether it is right for the university administration to require that all students subsidize a site license for Turnitin.com. Start by reviewing the company's Web site to better understand the service the company provides. Then analyze the ethical implications of the Provost's idea by considering it from the perspective of the four ethical standards (rights, justice, utility, and care). Do all of the standards pertain? Which standards enable you to make the persuasive case for your recommended course of action? Present your findings in a letter to Provost Lingram.

As you know, the chief responsibility of all educators at the university is to ensure that students receive the best education possible. Although a university education consists of many experiences that occur outside the classroom, the core element is to help students learn how to think critically, creatively, and responsibly about the world and their role in it. To this end, the ability to write clearly and originally is fundamentally important.

I write to you today to solicit the Student Council's views on an idea we are considering to confront an insidious threat to the success of our shared mission: plagiarism. Plagiarism—the use of another's words and ideas without proper attribution—has long been a threat to the integrity of writing by students and professionals alike. In the age of the Internet, however, with easy access to term-paper mills, plagiarism has become an epidemic on campuses all across the country.

At the suggestion of a number of department chairs representing all four of our academic colleges, I am investigating purchasing a site license to Turnitin.com, the leading plagiarism-detection service. With a site license, any instructor in any department on campus can upload some or all papers to Turnitin and quickly receive a report indicating whether the papers are original or contain plagiarized writing.

In these times of economic austerity, the university cannot afford to purchase this site license out of the existing operating budget. Therefore, we are considering proposing a \$3 increase in the student fee paid each semester by full-time students and a \$2 increase for part-time students.

The administration feels that Turnitin can be a highly effective tool in reducing the incidence of plagiarism on campus, thus helping us educate our students in the norms of academic conduct. In addition, reducing plagiarism will have the effect of protecting the students' investment in their education by ensuring that we maintain our well-earned reputation with graduate schools and employers for educating honest, skilled, and thoughtful leaders of tomorrow.

Would you please let me know the Student Council's views on this idea before the end of the month?

Sincerely,

Mary Lingram, Provost

Document 2.1 Body of Letter to Student Council from Provost Lingram

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

CHAPTER **3**

Writing Technical Documents



Bob Daemrich/The Image Works.

What process will enable you to write effective documents efficiently?

This police officer is using software for writing a field report. While still at the scene, she enters information about the crime—including data about the scene, witnesses, and suspects—and uses the software to help construct a time line of the crime. In short, the software helps the officer streamline the *planning* and *drafting* stages of the writing process that she uses on the job. This chapter presents a writing process that focuses on the techniques and tools that are most useful for technical writers.

Should you use the process described here? If you don't already have a process that works for you, yes. But your goal should be to devise a process that enables you to write *effective* documents (that is, documents that accomplish what you want them to) *efficiently* (without taking more time than necessary). At the end of this chapter you will find a Writer's Checklist. After you try implementing some of the techniques described in this chapter, you can start to revise the Writer's Checklist to reflect the techniques that you find most effective.

The writing process consists of five steps: planning, drafting, revising, editing, and proofreading. The frustrating part of writing, however, is that these five steps are not linear. That is, you don't plan the document, then check off a box and go on to drafting. At any step, you might double back to do more planning, drafting, or revising. Even when you think you're almost done—when you're proofreading—you still might think of something that would improve the planning. That means you'll need to go back and rethink all five steps.

As you backtrack, you will have one eye on the clock, because the deadline is sneaking up on you. That's the way it is for all writers. A technical writer stops working on a user manual because she has to get it off to the print shop. An engineer stops working on a set of slides for a conference presentation because it's time to head for the airport.

So, when you read about how to write, remember that you are reading about a messy process that goes backward as often as it goes forward and that, most likely, ends only when you run out of time.

PLANNING

Planning, which can take more than a third of the total time spent on a writing project, is critically important for every document, from an e-mail to a book-length manual. Start by thinking about your audience because you need to understand

Planning 41

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Selecting an Application, a Design, and a Delivery Method 45

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Drafting 46

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Using Styles 48

Revising 50

Studying the Draft by Yourself 51

Seeking Help from Others 51

Editing 52

Proofreading 52

whom you are writing to before you can figure out what you need to say about your subject.

Analyzing Your Audience

If you are lucky, you can talk with your audience before and during your work on the document. These conversations can help you learn what your readers already know, what they want to know, and how they would like the information presented. You can test out drafts, making changes as you go.

Even if you cannot consult your audience while writing the document, you still need to learn everything you can about your readers so that you can determine the best scope, organization, and style for your document. Then, for each of your most important readers, try to answer the following three questions:

- *Who is your reader?* Consider such factors as education, job experience and responsibilities, skill in reading English, cultural characteristics, and personal preferences.
- *What are your reader's attitudes and expectations?* Consider the reader's attitudes toward the topic and your message, as well as the reader's expectations about the kind of document you will be presenting.
- *Why and how will the reader use your document?* Think about what readers will do with the document. This includes the physical environment in which they will use it, the techniques they will use in reading it, and the tasks they will carry out after they finish reading it.

Analyzing Your Purpose

You cannot start to write until you can state the purpose (or purposes) of the document. Ask yourself these two questions:

- After your readers have read your document, what do you want them to know or do?
- What beliefs or attitudes do you want them to hold?

A statement of purpose might be as simple as this: "The purpose of this report is to recommend whether the company should adopt a health-promotion program." Although the statement of purpose might not appear in this form in the final document, you want to state it clearly now to help you stay on track as you carry out the remaining steps.

Generating Ideas About Your Subject

Generating ideas is a way to start mapping out the information you will need to include in the document, deciding where to put it, and identifying additional information that may be required.

First, find out what you already know about the topic by using any of the techniques shown in Table 3.1 on page 43.

In This Book

For more about analyzing your audience, see Ch. 5, p. 87.

On TechComm Web


For more about analyzing an audience, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 3 on <bedfordstmartins.com/techcomm>.

In This Book

For more about analyzing your purpose, see Ch. 5, p. 109.

Researching Additional Information

Once you have a good idea of what you already know about your topic, you need to obtain the rest of the information you will need. You can find and evaluate what other people have already written by reading reference books, scholarly books, articles, Web sites, and reputable blogs and discussion boards. In addition, you might compile new information by interviewing experts, distributing surveys and questionnaires, making observations, sending inquiries, and conducting experiments. Don't forget to ask questions and gather opinions from your own network of associates, both inside and outside your organization.

 **In This Book**
For more about conducting research, see Ch. 6.


 **In This Book**
For more about social media, see Chs. 4, 6, and 22.

TABLE 3.1 ► Techniques for Generating Ideas About Your Topic

Technique	Explanation	Example
Asking the six journalistic questions	Asking <i>who, what, when, where, why, and how</i> can help you figure out how much more research you need to do. Note that you can generate several questions from each of these six words.	<ul style="list-style-type: none"> • <i>Who</i> would be able to participate? • <i>Who</i> would administer it? • <i>What</i> would the program consist of?
Brainstorming	Spending 15 minutes listing short phrases and questions about your subject helps you think of related ideas. Later, when you construct an outline, you will rearrange your list, add new ideas, and toss out some old ones.	<ul style="list-style-type: none"> • Why we need a program • Lower insurance rates • On-site or at a club? • Who pays for it? • What is our liability? • Increase our productivity
Freewriting	Writing without plans or restrictions, without stopping, can help you determine what you do and do not understand. And one phrase or sentence might spark an important idea.	A big trend today in business is sponsored health-promotion programs. Why should we do it? Many reasons, including boosting productivity and lowering our insurance premiums. But it's complicated. One problem is that we can actually increase our risk if a person gets hurt. Another is the need to decide whether to have the program—what exactly is the program? . . .
Talking with someone	Discussing your topic can help you find out what you already know about it and generate new ideas. Simply have someone ask you questions as you speak. Soon you will find yourself in a conversation that will help you make new connections from one idea to another.	<p>You: One reason we might want to do this is to boost productivity.</p> <p>Bob: What exactly are the statistics on increased productivity? And who has done the studies? Are they reputable?</p> <p>You: Good point. I'm going to have to show that putting money into a program is going to pay off. I need to see whether there are unbiased recent sources that present hard data.</p>



TABLE 3.1 ► Techniques for Generating Ideas About Your Topic (continued)

Technique	Explanation	Example
Clustering	One way to expand on your topic is to write your main idea or main question in the middle of the page and then write second-level and third-level ideas around it.	
Branching	Another way to help you expand on your topic is to write your main idea or question at the top of the page and then write second-level and third-level ideas below it.	

Organizing and Outlining Your Document

Although each document has its own requirements, you can use or adapt existing organizational patterns to your own situation. For instance, the compare-and-contrast pattern might be an effective way to organize a discussion of different health-promotion programs. The cause-and-effect pattern might work well for a discussion of the effects of implementing such a program.

► On TechComm Web

For more about outlining, see Paradigm Online Writing Assistant. Click on Links Library for Ch. 3 on <bedfordsmartins.com/techcomm>.

At this point, your organization is only tentative. When you start to draft, you might find that the pattern you chose isn't working well or that you need additional information that doesn't fit into the pattern.

Once you have a tentative plan, write an outline to help you stay on track as you draft. To keep your purpose clearly in mind as you work, you may want to write it at the top of your page before you begin your outline.

Selecting an Application, a Design, and a Delivery Method

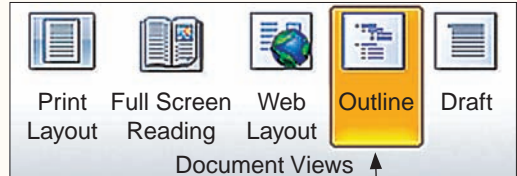
Once you have a sense of what you want to say, you need to select an application (the type of document), a design, and a delivery method. You have a number of decisions to make:

- *Is the application already chosen for me?* If you are writing a proposal to the Department of the Interior, for example, you must follow the department's specifications for what the proposal will look like and how it is to be delivered. For most kinds of communication, however, you will likely have to select the appropriate application, such as a set of instructions or a manual. Sometimes, you will deliver an oral presentation or participate in a phone conference or a video-conference.
- *What will my readers expect?* If your readers expect a written set of instructions, you should present a set of instructions unless some other application, such as a report or a manual, is more appropriate. If they expect to see the instructions presented in a simple black-and-white booklet—and there is no good reason to design something more elaborate than that—your choice is obvious. For instance, instructions for installing and operating a ceiling fan in a house are generally presented in a small, inexpensive booklet with the pages stapled together. However, for an expensive home-theater system, readers might expect a glossy, full-color manual.
- *What delivery method will work best?* Related to the question of reader expectations is the

TECH TIP

How to Use the Outline View

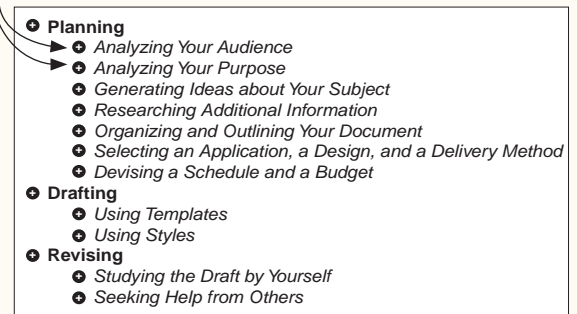
When organizing your document, you can use the **outline view** to examine and revise the structure of your document. To use this view, you must format your document with Word's built-in heading styles or outline levels.



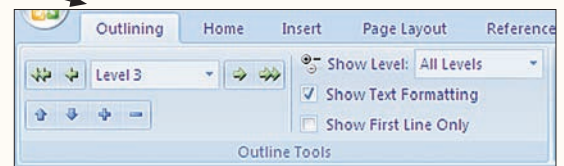
To view the structure of your document, select the **View** tab on the Ribbon and then select **Outline**.

A plus sign indicates that a heading has sub-headings or text associated with it. A minus sign indicates that it does not.

Headings are indented to show subordinate levels.



Use the **Outlining** tab to promote or demote headings or body text; to move, expand, or collapse sections; and to show levels.



KEYWORDS: outline view, create a document outline, outline levels

question of how you will deliver the document to your readers. For instance, you would likely mail an annual report to your readers and upload it to your company Web site. You might present routine information through e-mails and in a section of your Web site. You might present industry forecasts on a personal blog or on one sponsored by your employer.

It is important to think about these questions during the planning process because your answers will largely determine the scope, organization, style, and design of the information you will prepare. As early as the planning step, you need to imagine your readers using your information.

In This Book

For more about progress reports, see Ch. 17, p. 470.
For more about project management, see Ch. 4, p. 59.

Devising a Schedule and a Budget

During the planning stage, you also must decide when you will need to provide the information and how much you can spend on the project. For instance, for the project on health-promotion programs, your readers might need a report to help decide what to do before the new fiscal year begins in two months. In addition, your readers might want a progress report submitted halfway through the project. Making a schedule is often a collaborative process: you meet with your main readers, who tell you when they need the information, and you estimate how long the different tasks will take.

You also need to create a budget. In addition to the time you will need to do the project, you might incur additional expenses. For example, you might need to travel to visit companies with different kinds of health-promotion programs. You might need to conduct specialized database searches, create and distribute questionnaires to employees, or conduct interviews at remote locations. Some projects call for *usability testing*—evaluating prospective users as they try out a system or a document. This testing needs to be included in your budget.

In This Book

For more about usability testing, see Ch. 13, p. 357.

DRAFTING

When you have at least a preliminary outline, it is time to start drafting. Some writers like to draft within the outline created on their word-processing program. Others prefer to place a paper copy of their outline on the desk next to their keyboard.

Using Templates

When you draft, you might consider using an existing template or modifying one to meet your needs. Templates are preformatted designs for different types of documents, such as letters, memos, newsletters, and reports. Templates incorporate the design specifications for the document, including

On TechComm Web

Purdue University's Online Writing Lab has many instructional handouts covering all aspects of the writing process. Click on Links Library for Ch. 3 on <bedfordstmartins.com/techcomm>.

typeface, type size, margins, and spacing. Once you select a template, you just type in the information.

Using templates, however, can lead to three problems:

- *They do not always reflect the best design principles.* For instance, most letter and memo templates default to 10-point type, even though 12-point type is easier to read.
- *They bore readers.* Readers get tired of seeing the same designs.
- *They cannot help you answer the important questions about your document.* Although memo templates can help you format information, they cannot help you figure out how to organize and write a document. Sometimes, templates can even send you the wrong message. For example, résumé templates in word processors present a set of headings that might work better for some job applicants than for others.

In addition, the more you rely on existing templates, the less likely you are to learn how to use the software to make your documents look professional.



For more about design, see Ch. 11.

Guidelines

Drafting Effectively

Try the following techniques when you begin to draft or when you get stuck in the middle of drafting.

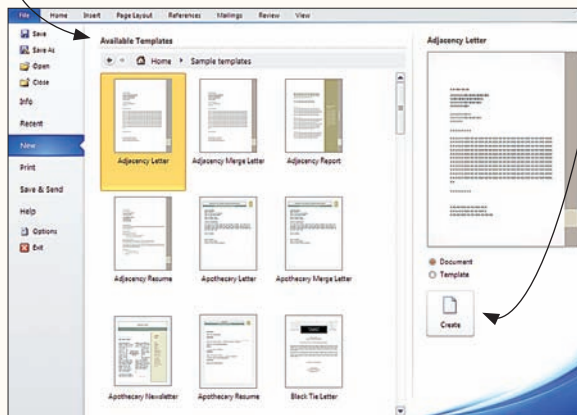
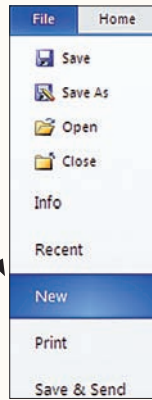
- ▶ **Get comfortable.** Choose a good chair set at the right height for the keyboard, and adjust the light so that it doesn't reflect off the screen.
- ▶ **Start with the easiest topics.** Instead of starting at the beginning of the document, begin with the section you most want to write.
- ▶ **Draft quickly.** Try to make your fingers keep up with your brain. Turn the phrases from your outline into paragraphs. You'll revise later.
- ▶ **Don't stop to get more information or to revise.** Set a timer, and draft for an hour or two without stopping. When you come to an item that requires more research, skip to the next item. Don't worry about sentence structure or spelling.
- ▶ **Try invisible writing.** Darken the screen or turn off the monitor so that you can look only at your hard-copy outline or the keyboard. That way, you won't be tempted to stop typing to revise what you have just written.
- ▶ **Stop in the middle of a section.** When you stop, do so in the middle of a paragraph or even in the middle of a sentence. You will find it easy to conclude the idea you were working on when you begin writing again. This technique will help you avoid writer's block, the mental paralysis that can set in when you stare at a blank page.

TECH TIP

How to Modify Templates

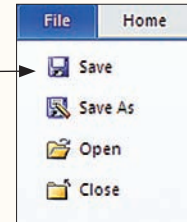
You can modify an existing document **template** to address your specific writing situation. You can then save this modified document as a template and use it again in similar writing situations.

1. Open an existing template on your computer by selecting **File** and then selecting **New**.
2. In the **Available Templates** window, find an appropriate template already installed on your computer or download one.



3. You can start with a Blank Document or with one of the many available templates. First, choose a template, and then select **Create**. If you click on a folder of templates, such as **Sample templates**, you can select a template and then save it as a document or a template. Select the format you want (**Document** or **Template**), then select **Create**.

4. After making changes to the design of the template, select **File** and then select **Save**.



Your saved template will now appear as an icon you can access by selecting **My Templates** in the **Available Templates** window.

KEYWORDS: templates, about templates, modify a template, installed templates, download templates

Using Styles

Styles are like small templates that apply to the design of smaller elements, such as headings. Like templates, styles save you time. For example, as you draft your document, you don't need to add all the formatting each time you want to designate an item as a first-level heading. You simply put your cursor in the text you want to be a first-level heading and use a pull-down menu or ribbon at the top of your screen to select that style. The text automatically incorporates all the specifications of that style.

If you decide to modify a style—by adding italics to a heading, for instance—you change it only once; the software automatically changes every instance of that style in the document. In collaborative documents, styles make it easier for collaborators to achieve a consistent look.

INTERACTIVE SAMPLE DOCUMENT

Identifying the Strengths and Weaknesses of a Commercial Template

The following template from Microsoft Word presents one style of writing a memo. The questions in the margin ask you to think about the assumptions underlying this template.

Memorandum

To: [Click **here** and type name]
CC: [Click **here** and type name]
From: [Click **here** and type name]
Date: 4/5/2011
Re: [Click **here** and type subject]

How to Use This Memo Template
 Select text you would like to replace, and type your memo. Use styles such as Heading 1-3 and Body Text in the Style control on the Formatting toolbar.

To delete the background elements—such as the circle, rectangles, or return address frames, click on the boundary border to highlight the “handles,” and press Delete. Some of the objects are part of a background watermark, so you have to choose Header and Footer from the View menu in order to select them. To replace the picture in this template with a different one, first click on the picture. Then, on the Insert menu, point to Picture, and click From File. Locate the folder that contains the picture you want to insert, then double-click the picture.

To save changes to this template for future use, choose Save As from the File menu. In the Save As Type box, choose Document Template. Next time you want to use it, choose New from the File menu, and then double-click your template.

1. How well does the explanation of how to use the template help you understand how to write an effective memo?
2. How well does the template help you understand how to reformat the elements, such as the date?
3. Are there any design elements in this template that do not appear to fulfill a useful purpose? If so, what are they?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 3 on <bedfordstmartins.com/techcomm>.

Source: Microsoft, 2011<<http://office.microsoft.com/en-us/templates/CT010117259.aspx#ai:TC001016238>>.

TECH TIP

How to Use the Styles Group

As you draft your document, you can use the **Styles** group to apply styles to elements such as headings, lists, and body text. Using styles helps to ensure consistency and makes it easy to automatically change every instance of a style in your document when you revise.

1. To apply a style, select the text you want to format, then select a style from the **Quick Styles** gallery in the **Styles** group on the **Home** tab.

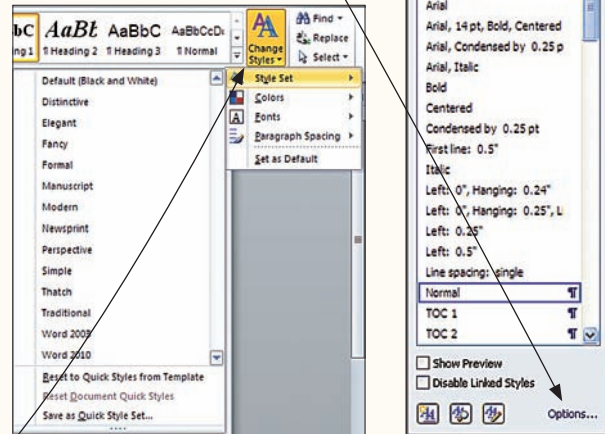


If you do not see the style you want in the gallery, you can access additional styles by using the up and down arrows.

You can also apply a **Quick Style Set** to your entire document by selecting the **Change Styles** icon.

2. Another way to apply a style is to select the **Styles** dialog box launcher and then select the style you wish to use.

If you do not see the style options you want, select **Options** to display the **Style Pane Options** dialog box.



KEYWORDS: styles, quick style, quick styles gallery, change styles, apply a style, apply a different style, styles dialog box launcher, style pane options

REVISING

Revising is the process of looking again at your draft to see whether it works. After you revise, you will carry out two more steps—editing and proofreading—but at this point you want to focus on three large topics:

- **Audience.** Has your understanding of your audience changed? Will you be addressing people you hadn't considered before? If so, how will that change what you should say and how you should say it?
- **Purpose.** Has your understanding of your purpose changed? If so, what changes should you make to the document?
- **Subject.** Has your understanding of the subject changed? Should you change the scope; that is, should you address more topics or fewer? Should you change the organization of the document? Should you present more evidence or different types of evidence?

On the basis of this revision, you might find that you need to make minor changes, such as adding one or two minor topics. Or you might find that you need to completely rethink the document.

There are two major ways to revise: by yourself and with the assistance of others. If possible, use both ways.

Studying the Draft by Yourself

The first step in revision is to read and reread the document, looking for different things each time. For instance, you might read it once just to see whether the information you have presented is appropriate for the various audiences you have identified. You might read it another time to see whether each of your claims is supported by appropriate and sufficient evidence.

In This Book

For more about revising your draft by yourself, see Ch. 13.

Seeking Help from Others

For technical documents, it is best to turn to two kinds of people for help. Subject-matter experts (SMEs) can help you determine whether your facts and explanations are accurate and appropriate. If, for instance, you are writing about fuel-cell automobiles, you could ask an automotive expert to review it. Important documents are routinely reviewed by technical experts before being released to the public.

The second category of reviewers includes both actual users of your existing document and prospective users of the next version of the document. These people can help you see problems you or other knowledgeable readers don't notice. For instance, a prospective user of a document on fuel-cell technologies might point out that she doesn't understand what a fuel cell is because you haven't defined it.

How do you learn from SMEs and from users and prospective users? Here are a few techniques:

- surveying, interviewing, or observing readers as they use the existing document
- interviewing SMEs about a draft of the document
- conducting focus groups to learn users' or prospective users' opinions about an existing or proposed document
- uploading the document to an online writing space, such as Microsoft SharePoint or Google Docs, and authorizing people to revise it

It is important to revise all drafts, but it is especially important to revise drafts of documents that will be read and used by people from other cultures. If your readers come from another culture, try to have your draft reviewed by someone from that culture. That reviewer can help you see whether you have made correct assumptions about how readers will react to your ideas and whether you have chosen appropriate kinds of evidence and design elements. As discussed in Chapters 11 and 12, people from other cultures might

In This Book

For more about having another person review your draft, see Ch. 4, p. 68.

In This Book

For more about these techniques, as well as usability testing, see Ch. 13, p. 355.

be surprised by some design elements used in reports, such as marginal comments.

ETHICS NOTE

Acknowledging Reviewers Responsibly

When you write on the job, take advantage of the expertise of others. It is completely ethical to ask subject-matter experts and people who are like the intended audience of your document to critique a draft of it. If your reviewer offers detailed comments and suggestions on the draft or sends you a multipage review—and you use some or many of the ideas—you are ethically bound to acknowledge that person’s contributions. This acknowledgment can take the form of a one- or two-sentence statement of appreciation in the introduction of the document or in a transmittal letter. Or you could write a letter or memo of appreciation to the reviewer; he or she can then file it and use it for a future performance evaluation.

EDITING

Having revised your draft and made changes to its content and organization, it’s time to edit. Editing is the process of checking the draft to improve its grammar, punctuation, style, usage, diction (word choice), and mechanics (such as use of numbers and abbreviations). You will do most of the editing by yourself, but you will also ask others for assistance, especially writers and editors in your organization. One technology that enables people at different locations to edit a document is a wiki, which lets authorized readers edit a document and archives all the previous versions of the document.

The resources devoted to editing will vary depending on the importance of the document. An annual report, which is perhaps the single most important document that people will read about your organization, will be edited rigorously because the company wants it to look perfect. A biweekly employee newsletter also will be edited, but not as rigorously as an annual report. What about the routine e-mails you write every day? Edit them, too. It’s rude not to.

PROOFREADING

Proofreading is the process of checking to make sure you have typed what you meant to type. The following sentence has three errors that you should catch in proofreading:

There are for major reasons we should implementing health-promotion program.

Here they are:

1. “For” is the wrong word. It should be the number “four.”
2. “Implementing” is the wrong verb form. It should be “implement.” This mistake is probably left over from an earlier version of the sentence.

In This Book

For more about editing for coherence and correctness, see Chs. 9 and 10. For more about correctness, see Appendix, Part C.

In This Book

For a discussion of using wikis to create collaborative documents, see Chs. 4 and 22.

3. The article “a” is missing before the phrase “health-promotion program.” This is probably just a result of carelessness.

By the way, a spell-checker and grammar-checker didn’t flag any of these errors.

Proofreading is no fun. You’re exhausted, you’re thoroughly sick of the document, and you will find that proofreading is not the most exciting thing you have ever done. But it is vital to producing a clear, well-written document that reflects your high standards and underscores your credibility as a professional. Don’t insult yourself and your readers by skipping this step. Reread your draft carefully and slowly, perhaps out loud, and get a friend to help. You’ll be surprised at how many errors you’ll find.

Writer’s Checklist

In planning the document, did you

- analyze your audience? (p. 42)
- analyze your purpose? (p. 42)
- generate ideas about your subject? (p. 42)
- research additional information? (p. 43)
- organize and outline your document? (p. 44)
- select an application, a design, and a delivery method? (p. 45)
- devise a schedule and a budget? (p. 46)


In drafting the document, did you

- use templates, if appropriate? (p. 46)
- use styles? (p. 48)

In revising the draft, did you

- study the draft by yourself? (p. 51)
- seek help from others? (p. 51)
- Did you edit the document carefully? (p. 52)
- Did you proofread the document carefully? (p. 52)

Exercises


 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Read your word processor’s online help about using the outline view. Make a file with five headings, each of which has a sentence of body text below it. Practice using the outline feature to do the following tasks:
 - a. change a first-level heading to a second-level heading
 - b. move the first heading in your outline to the end of the document
 - c. hide the body text that goes with one of the headings
2. Your word processor probably contains a number of templates for such documents as letters, memos, faxes, and résumés. Evaluate one of these templates. Is it clear and professional looking? Does it present an effective design for all users or only for some? What changes would you make to the template to improve it? Write a memo to your instructor presenting your findings, and attach a copy of the template.

3. Proofread the following paragraph. For information on writing effective sentences, see Chapter 10 and Appendix, Part C.

People who have a federal student loan can apply for program from the Department of Education that is intended too give relief to former students with moderate incomes by sketching the payments out over a longer period. The program calculates monthly payments on the basis of income. In addition, the program forgave balances after 25 years (10 years if the the person chooses employment in public service). The monthly-payment calculation, called income-based repayment (IBR), determined by the size of the loan and the persons income. For some 90 percent of the more than one million people who have already enrolled, the IRB works out to less then 10 percent if their income. The program also caps the payments at 15 percent of a peron’s income over \$16,000 a year (and eliminates payments for people who earn than \$16,000).

Case 3: Understanding Why Revision Software Cannot Revise and Edit Your Document

 **In This Book** For information on writing effective sentences, see Ch. 10. For information on writing effective introductions, see Ch. 19, p. 526.

Background

You are John Horsney, an engineer at Omni-Tech, a firm that manufactures and markets small electronic devices, primarily related to the sports and leisure industries. You are the leader of a project team that is working on a solution to a problem with the Omni-Tech 1000, a wireless heart-rate monitor for bicyclists. This device, which consists of a monitor attached to the rider's chest and a computer attached to the handlebar, enables riders to monitor their heart rates to ensure they are getting the desired level of aerobic workout. The problem with the Omni-Tech 1000 is that the signal fails unexpectedly, causing the computer to reset and thereby provide inaccurate information. Some devices fail only occasionally; others fail every two or three minutes, although never in a predictable pattern.

You are called to a meeting with Kevin Jonakin, the Director of Research and Development at Omni-Tech. Kevin oversees five or six project teams at any given time, each consisting of three or four engineers. Your project team has submitted to Kevin a draft of its project report, which analyzes the problem and recommends a solution. You don't like the look on Kevin's face.

"John, thanks for letting me have a look at the draft. I think you've identified the problem and come up with a good fix," Kevin says. "But here's the problem: this report has to go up to Caroline for her approval, and she reads everything. If she sees something she doesn't like or doesn't understand, she'll kick it back to me."

You are vaguely worried. "What's wrong with the report? We put a lot of time into it."

"Yes, I know you did," Kevin says, "and, as I said, I think you did good engineering, but the report is awfully hard to read."

"I don't know what you mean," you reply. "We spell-checked it, and even ran it through the grammar-checker. We fixed everything that was wrong with it."

"Let me explain what I'm talking about," Kevin says. "Let's take a look at the introduction." He hands you a

copy of the introduction (Document 3.1). "You're right, there are no spelling errors or grammar mistakes. But it's hard to follow. First, I'd like you to work on the writing. You need to break the intro into paragraphs and make sure each one has a clear topic sentence. And the writing is often choppy and sometimes awkward. But the most important thing to remember is that readers need to understand the context of what you're writing about."

"I assumed everyone signed off on the project," you say.

"Yes," Kevin replies. "I did, and Caroline did. But you need to remember that Caroline spends most of every day reading and writing and talking about new products and new versions of existing products. We've probably got thirty different projects at various stages of development. She simply doesn't remember what you guys are doing."

"So you want me to go back and make sure I explain the context better?"

"Yes, that's right, and try to make sure it is written as well as possible."

Your Assignment

1. Write a memo to the two other team members, describing your meeting with Kevin. Explain the two major categories of revisions that Kevin is requesting: changes to the content of the introduction and changes to the writing of the introduction. Provide specific examples of these two categories of revisions. In explaining the requested revisions to the content, invent any necessary details.
2. Download the Microsoft Word file of Document 3.1 from bedfordstmartins.com/techcomm, or type the passage in a word processor. Revise and edit Document 3.1 so that it reflects the two categories of revisions. Don't forget to spell-check and grammar-check your revision.

Introduction

This report is a description of the methods and results of the Omni-Tech 1000 wireless heart-rate monitor study and a presentation of our recommendation to the Omni-Tech Executive team. The members of this project are three Omni-Tech engineers: John Horsney, Tim Maloney, and Amanda Brownstein. The Omni-Tech 1000 consists of a belt worn around the chest of a cyclist, which transmits a wireless heart rate signal to a computer/receiver on the handlebars. This currently uses DSRC. DSRC is also known by the name Wi-Fi 802.11b. John Horsney was approached by the Sales and Marketing leads of Omni-Tech sometime in early April in regard to a technical problem with this. The wireless signal between the chest belt and the receiver goes out during use, with the resulting effect that inaccurate data for the user is presented. The sales team is of the impression that this is a persistent problem with this specific model. Out of a total of 1620 monitors sold at \$140 each, Omni-Tech have had to refund or replace 980 units, which is a loss of \$13,720, not to mention the damage to Omni-Tech's credibility and reputation for quality. After four days spent examining and testing the model, it was determined that simply correcting the problem with the device would not be feasible. We decided to consider alternative wireless technologies and establish a set of criteria for a new wireless system. Two key criteria were the requirement that the new wireless system fit into the existing housing and to maintain our current cost. Our research included online resources, interviews, field research, and product testing. The conclusion of our test was reached on April 24, 2012 and determined that using Bluetooth 4.0 Wi-Fi is Omni-Tech's optimal option for correction of the problem with this product. During our field testing using Bluetooth no wireless failures were observed. As an additional feature, Bluetooth will allow multiple devices to be connected, which would permit a team leader to receive someone's data on an additional device. In addition, Bluetooth is \$2 less than our current Wi-Fi system. This upgrade will correct the product's failures, provide additional features, and restore Omni-Tech's reputation for quality and high performance. The following sections of this report will include the details of our methodology, the results, our conclusions, and our recommendations for the ETW-2000.

Document 3.1 Introduction After Spell-Check and Grammar-Check

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

CHAPTER 4

Writing Collaboratively



REUTERS/Thomas Peter/Landov.

Every document calls for a unique kind of collaboration.

The two people shown in this photo are using a touch table to work with digital images. A touch table is typical of new technologies that streamline the process of collaborating in technical communication. The explosive growth of social media over the last decade has greatly expanded the scope of workplace collaboration, reducing earlier barriers of time and space. Today, people routinely collaborate not only with members of their project teams but also with others within and outside their organization, as shown in Figure 4.1.

But how exactly does this sort of collaboration work? In every possible way. For example, you and your project team might use social media primarily to gather information that you will use in your research. You bring this information back to your team, and then you work exclusively with your team in drafting, revising, and proofreading your document. In a more complex collaboration pattern, you and your team might use social media to gather information from sources around the globe and then reach out to others in your organization to see what they think of your new ideas. Later in the process, you create the outline of your document, in the form of a wiki, and authorize everyone in your own organization to draft sections, pose questions and comments, and even edit what others have written. In short, you can collaborate with any number of people at one or several stages of the writing process.

Every document is unique and will therefore call for a unique kind of collaboration. Your challenge is to think creatively about how you can work effectively with others to make your document as good as it can be. Being aware of the strengths and limitations of collaborative tools can prompt you to consider people in your building and around the world who can help you think about your subject and write about it compellingly and persuasively.

ADVANTAGES AND DISADVANTAGES OF COLLABORATION

As a student, you might have already worked collaboratively on course projects. As a professional, you will work on many more. In the workplace, the stakes might be higher. Effective collaboration can make you look like a star, but ineffective collaboration can ruin an important project—and hurt your reputation. The best way to start thinking about collaboration is to understand its main advantages and disadvantages.

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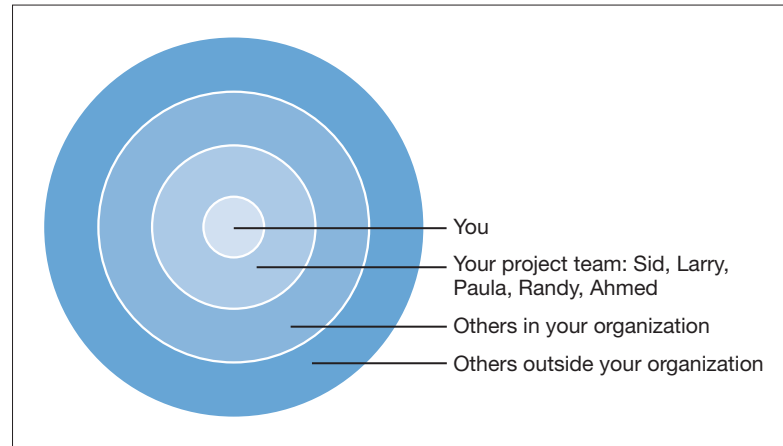


Figure 4.1 Collaboration Beyond the Project Team

Using social media such as messaging technologies, videoconferencing, shared document workspaces, and wikis, you can tap into the world's knowledge for ideas and information.

In This Book

For more about the writing process, see Ch. 3.

Advantages of Collaboration

According to a recent survey conducted by Cisco Systems (2010), more than 75 percent of employees said that collaboration is critical to their success on the job. Some 90 percent said that collaboration makes them more productive. Writers who collaborate can create a better document and improve the way an organization functions:

- *Collaboration draws on a greater knowledge base.* Therefore, a collaborative document can be more comprehensive and more accurate than a single-author document.
- *Collaboration draws on a greater skills base.* No one person can be an expert manager, writer, editor, graphic artist, and production person.
- *Collaboration provides a better idea of how the audience will read the document.* Each collaborator acts as an audience, offering more questions and suggestions than one person could while writing alone.
- *Collaboration improves communication among employees.* Because many of your collaborators share a goal, they learn about each other's jobs, responsibilities, and frustrations.
- *Collaboration helps acclimate new employees to an organization.* New employees learn how things work—which people to see, which forms to fill out, and so forth—as well as what the organization values, such as the importance of ethical conduct and the willingness to work hard and sacrifice for an important initiative.

- *Collaboration motivates employees to help an organization grow.* New employees bring new skills, knowledge, and attitudes that can help the organization develop. More experienced employees mentor the new employees as they learn from them. Everyone teaches and learns from everyone else, and the organization benefits.

Disadvantages of Collaboration

Collaboration can also have important disadvantages:

- *Collaboration takes more time than individual writing.* It takes longer because of the time needed for the collaborators to communicate. In addition, meetings—whether they are live or remote—can be difficult to schedule.
- *Collaboration can lead to groupthink.* When collaborators value getting along more than thinking critically about the project, they are prone to *groupthink*. Groupthink, which promotes conformity, can result in an inferior document, because no one wants to cause a scene by asking tough questions.
- *Collaboration can yield a disjointed document.* Sections can contradict or repeat each other or be written in different styles. To prevent these problems, writers need to plan and edit the document carefully.
- *Collaboration can lead to inequitable workloads.* Despite the project leader's best efforts, some people will end up doing more work than others.
- *Collaboration can reduce a person's motivation to work hard on the document.* A collaborator who feels alienated from the team can lose motivation to make the extra effort.
- *Collaboration can lead to interpersonal conflict.* People can disagree about the best way to create the document or about the document itself. Such disagreements can hurt working relationships during the project and long after.

MANAGING PROJECTS

At some point in your academic career, you will likely collaborate on a course project that is just too big, too technical, and too difficult for your team to complete successfully without some advance planning and careful oversight. Often, collaborative projects are complex, lasting several weeks or months and involving the efforts of several people at scheduled times so that the project can proceed. For this reason, collaborators need to spend time managing the project to ensure that it not only meets the needs of the audience but also is completed on time and, if appropriate, within budget.

Guidelines

Managing Your Project

These seven suggestions can help you keep your project on track.

- ▶ **Break down a large project into several smaller tasks.** Working backward from what you must deliver to your client or manager, partition your project into its component parts, making a list of what steps your team must take to complete the project. This task is not only the foundation of project management but also a good strategy for determining the resources you will need to successfully complete the project on time. After you have a list of tasks to complete, you can begin to plan your project, assign responsibilities, and set deadlines.
- ▶ **Plan your project.** Planning allows collaborators to develop an effective approach and reach agreement before investing a lot of time and resources. Planning prevents small problems from becoming big problems with a deadline looming. Effective project managers use planning documents such as *needs analyses*, *information plans*, *specifications*, and *project plans*.
- ▶ **Create and maintain an accurate schedule.** An accurate schedule helps collaborators plan ahead, allocate their time, and meet deadlines. Update your schedule when changes are made, and place the up-to-date schedule in an easily accessible location (for example, on a project Web site) or send the schedule to each team member. If the team misses a deadline, immediately create a new deadline. Team members should always know when tasks must be completed.
- ▶ **Put your decisions in writing.** Writing down your decisions, and communicating them to all collaborators, helps the team remember what happened. In addition, if questions arise, the team can refer easily to the document and, if necessary, update it.
- ▶ **Monitor the project.** By regularly tracking the progress of the project, the team can learn what it has accomplished, whether the project is on schedule, and if any unexpected challenges exist.
- ▶ **Distribute and act on information quickly.** Acting fast to get collaborators the information they need helps ensure that the team makes effective decisions and steady progress toward completing the project.
- ▶ **Be flexible regarding schedule and responsibilities.** Adjust your plan and methods when new information becomes available or problems arise. When tasks depend on earlier tasks that are delayed or need reworking, the team should consider revising responsibilities to keep the project moving forward.

CONDUCTING MEETINGS

Collaboration involves meetings. Whether you are meeting live in a room on campus or using videoconferencing tools, the five aspects of meetings discussed in this section can help you use your time productively and produce the best possible document.

Listening Effectively

Participating in a meeting involves listening and speaking. If you listen carefully to other people, you will understand what they are thinking and you will be able to speak knowledgeably and constructively. Unlike hearing, which involves receiving and processing sound waves, listening involves understanding what the speaker is saying and interpreting the information.

Guidelines

Listening Effectively

Follow these five steps to improve your effectiveness as a listener.

- ▶ **Pay attention to the speaker.** Look at the speaker, and don't let your mind wander.
- ▶ **Listen for main ideas.** Pay attention to phrases that signal important information, such as "What I'm saying is . . ." or "The point I'm trying to make is. . ."
- ▶ **Don't get emotionally involved with the speaker's ideas.** Even if you disagree, keep listening. Keep an open mind. Don't stop listening so that you can plan what you are going to say next.
- ▶ **Ask questions to clarify what the speaker said.** After the speaker finishes, ask questions to make sure you understand. For instance, "When you said that each journal recommends different printers, did you mean that each journal recommends several printers or that each journal recommends a different printer?"
- ▶ **Provide appropriate feedback.** The most important feedback is to look into the speaker's eyes. You can nod your approval to signal that you understand what he or she is saying. Appropriate feedback helps assure the speaker that he or she is communicating effectively.

Setting Your Team's Agenda

It's important to get your team off to a smooth start. In the first meeting, start to define your team's agenda.

Guidelines

Setting Your Team's Agenda

Carrying out these eight tasks will help your team work effectively and efficiently.

- ▶ **Define the team's task.** Every team member has to agree on the task, the deadline, and the approximate length of the document. You also need to agree on more-conceptual points, including the document's audience, purpose, and scope.
- ▶ **Choose a team leader.** This person serves as the link between the team and management. (In an academic setting, the team leader represents the team in communicating with the instructor.) The team leader also keeps the team on track, leads the meetings, and coordinates communication among team members.
- ▶ **Define tasks for each team member.** There are three main ways to divide the tasks: according to technical expertise (for example, one team member, an engineer, is responsible for the information about engineering), according to stages of the writing process (one team member contributes to all stages, whereas another participates only during the planning stage), or according to sections of the document (several team members work on the whole document but others work only on, say, the appendixes). People will likely assume informal roles, too. One person might be good at clarifying what others have said, another at preventing unnecessary arguments, and another at asking questions that force the team to reevaluate its decisions.
- ▶ **Establish working procedures.** Before starting to work, collaborators need answers—in writing, if possible—to the following questions:
 - When and where will we meet?
 - What procedures will we follow in the meetings?
 - What tools will we use to communicate with other team members, including the leader, and how often will we communicate?
- ▶ **Establish a procedure for resolving conflict productively.** Disagreements about the project can lead to a better product. Give collaborators a chance to express ideas fully and find areas of agreement, and then resolve the conflict with a vote.
- ▶ **Create a style sheet.** A style sheet defines the characteristics of writing style that the document will have. For instance, a style sheet states how many levels of headings the document will have, whether it will have lists, whether it will have an informal tone (using “you” and contractions), and so forth. If all collaborators draft using a similar writing style, the document will need less revision. And be sure to use styles, as discussed in Chapter 3, to ensure a consistent design for headings and other textual features.
- ▶ **Establish a work schedule.** For example, to submit a proposal on February 10, you must complete the outline by January 25, the draft by February 1, and the revision by February 8. These dates are called *milestones*.
- ▶ **Create evaluation materials.** Team members have a right to know how their work will be evaluated. In college, students often evaluate themselves and other team members. But in the working world, managers are more likely to do the evaluations.

In This Book

Figure 4.2 on p. 63 shows a work-schedule form. Figure 4.3 on p. 64 shows a team-member evaluation form. Figure 4.4 on p. 65 shows a self-evaluation form.

WORK-SCHEDULE FORM

Name of Project: *VoIP feasibility study*

Principal Reader: *Joan*

Other Readers: *Carlton, Wendy*

Group Members: *Saada, Larry, Randy, Ahmed*

Type of Document Required: *recommendation report*

Milestones	Responsible Member	Status	Date
Deliver Document	<i>Saada</i>		<i>May 19</i>
Proofread Document	<i>all</i>		<i>May 18</i>
Send Document to Print Shop	<i>n/a</i>		<i>n/a</i>
Complete Revision	<i>Randy</i>		<i>May 17</i>
Review Draft Elements	<i>all</i>	<i>Done</i>	<i>May 16</i>
Assemble Draft	<i>Ahmed</i>	<i>Done</i>	<i>May 13</i>
Establish Tasks	<i>Larry</i>	<i>Done</i>	<i>May 9</i>

Progress Reports	Responsible Member	Status	Date
Progress Report 3	<i>n/a</i>		
Progress Report 2	<i>n/a</i>		
Progress Report 1	<i>Randy</i>	<i>Done</i>	<i>May 15</i>

Meetings	Agenda	Location	Date	Time
Meeting 3	<i>Review final draft</i>	<i>Room C</i>	<i>May 18</i>	<i>3:30</i>
Meeting 2	<i>Review draft elements</i>	<i>Room B</i>	<i>May 16</i>	<i>2:00</i>
Meeting 1	<i>Kickoff meeting</i>	<i>Room C</i>	<i>May 9</i>	<i>3:00</i>

Notes

Figure 4.2 Work-Schedule Form

Notice that milestones sometimes are presented in reverse chronological order; the delivery-date milestone, for instance, comes first. On other forms, items are presented in normal chronological order.

The form includes spaces for listing the person responsible for each milestone and progress report and for stating the progress toward each milestone and progress report.

 **On TechComm Web**

For printable versions of Figs. 4.2, 4.3, and 4.4, click on Forms for Technical Communication on <bedfordstmartins.com/techcomm>.

Figure 4.3
Team-Member
Evaluation Form

TEAM-MEMBER EVALUATION FORM

Your name: Mackenzie Hopkins

Title of the project: 4-wheel-drive feasibility report

Date: October 14, 2011

Instructions

Use this form to evaluate the other members of your group. Write the name of each group member other than yourself in one of the columns, then assign a score of 0 to 10 (0 being the lowest grade, 10 the highest) to each group member for each criterion. Then total the scores for each member. Because each group member has different strengths and weaknesses, the scores you assign will differ. On the back of this sheet, write any comments you wish to make.

Criteria	Team Members			
	Kurt	Amber	Bob	
1. Regularly attends meetings	1. <u>10</u>	1. <u>9</u>	1. <u>6</u>	1. _____
2. Is prepared at meetings	2. <u>9</u>	2. <u>8</u>	2. <u>5</u>	2. _____
3. Meets deadlines	3. <u>9</u>	3. <u>9</u>	3. <u>2</u>	3. _____
4. Contributes good ideas in meetings	4. <u>9</u>	4. <u>10</u>	4. <u>9</u>	4. _____
5. Contributes ideas diplomatically	5. <u>8</u>	5. <u>9</u>	5. <u>9</u>	5. _____
6. Submits high-quality work	6. <u>9</u>	6. <u>9</u>	6. <u>7</u>	6. _____
7. Listens to other members	7. <u>8</u>	7. <u>10</u>	7. <u>6</u>	7. _____
8. Shows respect for other members	8. <u>9</u>	8. <u>10</u>	8. <u>6</u>	8. _____
9. Helps to reduce conflict	9. <u>9</u>	9. <u>10</u>	9. <u>5</u>	9. _____
10. Your overall assessment of this person's contribution	10. <u>9</u>	10. <u>9</u>	10. <u>7</u>	10. _____
Total Points	<u>89</u>	<u>93</u>	<u>62</u>	_____

Mackenzie gives high grades to Kurt and Amber but low grades to Bob. If Kurt and Amber agree with Mackenzie's assessment of Bob's participation, the three of them should meet with Bob to discuss why his participation has been weak and to consider ways for him to improve.

SELF-EVALUATION FORM

Your name: Lucas Barnes Date: April 12, 2011
 Title of the project: digital-camera study progress report

Instructions

On this form, record and evaluate your own involvement in this project. In the Log section, record the activities you performed as an individual and those you performed as part of the team. For all activities, record the date and the number of hours you spent. In the Evaluation section, write two brief statements, one about aspects of your contribution you think were successful and one about aspects you want to improve.

Log	Date	Number of Hours
Individual Activities		
<i>Reviewed proposal and analyzed the Simmons article</i>	<i>April 9</i>	<i>1.5</i>
<i>Wrote a draft of the progress report</i>	<i>April 10</i>	<i>2.5</i>
<i>Revised a draft of the progress report</i>	<i>April 11</i>	<i>1</i>
Activities as Part of Team		
<i>Met to discuss test research</i>	<i>April 10</i>	<i>1</i>
<i>E-mailed group and replied to questions about draft</i>	<i>April 11</i>	<i>2.5</i>
<i>Met to discuss revision of progress report</i>	<i>April 11</i>	<i>1.5</i>

Evaluation ←

Aspects of My Participation That Were Successful
I think I did a good job in reviewing the proposal and critiquing the research. I had the draft ready on time, although there were some rough parts in it. I participated effectively in the group meeting about the revision. I think I'm getting a little better about being less sensitive when the team suggests revisions.

Aspects of My Participation That I Want to Improve in the Future
I still need to get better at completing my work early enough so I can set it aside before getting it out to the other group members. I get embarrassed when they point out superficial mistakes that I should have caught. I need to practice using styles so that my drafts are easier to incorporate into the group's draft. The other members remembered to use them. I didn't.

Figure 4.4 Self-Evaluation Form

The evaluation section of the form is difficult to fill out, but it can be the most valuable section for you in assessing your skills in collaborating. When you get to the second question, be thoughtful and constructive. Don't merely say that you want to improve your skills in using the software. And don't just write "None."

ETHICS NOTE**Pulling Your Weight on Collaborative Projects**

Collaboration involves an ethical dimension. If you work hard and well, you help the other members of the team. If you don't, you hurt them.

You can't be held responsible for knowing and doing everything, and sometimes unexpected problems arise in other courses or in your private life that prevent you from participating as actively and effectively as you otherwise could. When problems occur, inform the other team members as soon as possible. For instance, call the team leader as soon as you realize you will have to miss a meeting. Be honest about what happened. Suggest ways you might make up for missing a task. If you communicate clearly, the other team members are likely to cooperate with you.

If you are a member of a team that includes someone who is not participating fully, keep records of your attempts to get in touch with that person. When you do make contact, you owe it to that person to try to find out what the problem is and suggest ways to resolve it. Your goal is to treat that person fairly and to help him or her do better work, so that the team will function more smoothly and more effectively.

Conducting Efficient Meetings

Human communication is largely nonverbal. That is, although people communicate through words and through the tone, rate, and volume of their speech, they also communicate through body language. For this reason, meetings provide the most information about what a person is thinking and feeling—and the best opportunity for team members to understand one another.

To help make meetings effective and efficient, team members should arrive on time and stick to the agenda. One team member should serve as secretary by recording the important decisions made at the meeting. At the end of the meeting, the team leader should summarize the team's accomplishments and state the tasks each team member is to perform before the next meeting. If possible, the secretary should give each team member this informal set of meeting minutes.

Communicating Diplomatically

Because collaborating can be stressful, it can lead to interpersonal conflict. People can become frustrated and angry with one another because of personality clashes or because of disputes about the project. If the project is to succeed, however, team members have to work together productively. When you speak in a team meeting, you want to appear helpful, not critical or overbearing.

Critiquing a Team Member's Work

In collaborating, team members often critique notes and drafts written by other team members. Knowing how to do it without offending the writer is a valuable skill.

 **On TechComm Web**

For an excellent discussion of how to conduct meetings, see Matson (1996). Click on Links Library for Ch. 4 on <bedfordstmartins.com/techcomm>.

 **In This Book**

For a discussion of meeting minutes, see Ch. 17, p. 490.

Guidelines

Communicating Diplomatically

These seven suggestions for communicating diplomatically help you communicate effectively.

- ▶ **Listen carefully, without interrupting.** See the Guidelines box on page 61.
- ▶ **Give everyone a chance to speak.** Don't dominate the discussion.
- ▶ **Avoid personal remarks and insults.** Be tolerant and respectful of other people's views and working methods. Doing so is right—and smart: if you anger people, they will go out of their way to oppose you.
- ▶ **Don't overstate your position.** A modest qualifier such as “I think” or “it seems to me” is an effective signal to your listeners that you realize that everyone may not share your views.

OVERBEARING My plan is a sure thing; there's no way we're not going to kill Allied next quarter.

DIPLOMATIC I think this plan has a good chance of success: we're playing off our strengths and Allied's weaknesses.

Note that in the diplomatic version, the speaker calls it “this plan,” not “my plan.”

- ▶ **Don't get emotionally attached to your own ideas.** When people oppose you, try to understand why. Digging in is usually unwise—unless it's a matter of principle—because, although you may be right and everyone else wrong, it's not likely.
- ▶ **Ask pertinent questions.** Bright people ask questions to understand what they hear and to connect it to other ideas. Asking questions also encourages other team members to examine what they hear.
- ▶ **Pay attention to nonverbal communication.** Bob might say that he understands a point, but his facial expression might show that he doesn't. If a team member looks confused, ask him or her about it. A direct question is likely to elicit a statement that will help the team clarify its discussion.

Guidelines

Critiquing a Colleague's Work

Most people are very sensitive about their writing. Following these three suggestions for critiquing writing increases the chances that your colleague considers your ideas positively.

- ▶ **Start with a positive comment.** Even if the work is weak, say, “You've obviously put a lot of work into this, Joanne. Thanks.” Or, “This is a really good start. Thanks, Joanne.”
- ▶ **Discuss the larger issues first.** Begin with the big issues, such as organization, development, logic, design, and graphics. Then work on smaller issues, such as paragraph development, sentence-level matters, and word choice. Leave editing and proofreading until the end of the process.



► **Talk about the document, not the writer.**

RUDE You don't explain clearly why this criterion is relevant.
BETTER I'm having trouble understanding how this criterion relates to the topic.

Your goal is to improve the quality of the document you will submit, not to evaluate the writer or the draft. Offer constructive suggestions.

RUDE Why didn't you include the price comparisons here, like you said you would?
BETTER I wonder if the report would be stronger if we include the price comparisons here.

In the better version, the speaker focuses on the goal—to create an effective report—rather than on the writer's draft. Also, the speaker qualifies his recommendation by saying, "I wonder if. . ." This approach sounds constructive rather than boastful or annoyed.

USING SOCIAL MEDIA AND OTHER ELECTRONIC TOOLS IN COLLABORATION

The tremendous growth of social media such as Facebook, YouTube, and Twitter in the general population is reflected in the working world. Although few of the social media sites were created to be used in the working world, most of them are used by professionals as business tools. Today, entrepreneurs are creating business-specific versions of some of the popular social media, such as Twitter-like microblogs that can be integrated with the rest of the organization's digital infrastructure and protected behind the organization's firewall to reduce security threats.

With each passing year, people are discovering new ways to use social media productively in the working world. Swensrud's table, "Imagine Facebook and Twitter-Style Collaboration in the Workplace" (2010), provides some examples of this relationship:

<i>Social media in your personal life</i>	<i>Social tools in your work life</i>
Post photos from the barbeque last Saturday, and they will show up in the feeds of your friends and family.	Post the new sales presentation you've updated, and it will show up in the feeds of your colleagues.
Collaborate with friends to plan a camping trip for next month.	Collaborate with colleagues to prepare for the big customer meeting next week.

<i>Social media in your personal life</i>	<i>Social tools in your work life</i>
You follow @tylerflorencia or @gdelaurentiis on Twitter for cooking tips.	You follow experts in your company for tips on how to best close deals or find industry expertise.
You follow @Starbucks on Twitter for the latest deals and news.	You follow important customer accounts to be sure issues and open items are resolved.
You post questions to your Facebook wall or Twitter feed to get recommendations and insight from friends and industry experts.	You post questions to your company network to receive advice and relevant documents from your colleagues across all departments.

Managers in business, industry, and government around the world encourage employees to use social media to find information, create and sustain relationships with stakeholders (such as other organizations, customers, suppliers, and the general public), recruit and retain workers, and keep employees informed about the organization's new products, services, and initiatives.

Because social media make it convenient for people to participate in the work of their organizations, they are having a profound effect on the ways that information is created and distributed in the working world. In a traditional organization that relies primarily on face-to-face meetings, only those who are invited to the meeting get to participate fully—and the organization benefits from the knowledge and ideas of only those people. However, an organization that relies on social media can tap into the knowledge and ideas of everyone in the organization—and many others outside the organization.

Different types of electronic tools facilitate the kind of broad, two-way interchange of information and ideas that is fundamental to effective collaboration. The following discussion highlights the major technologies that enable collaboration, including word processing tools, messaging technologies, videoconferencing, shared document workspaces, and virtual worlds.

Word Processing Tools

Word processors offer three powerful features you will find useful in collaborative work:

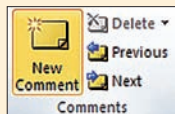
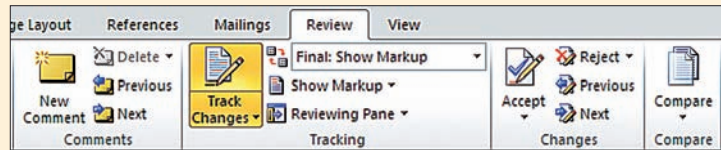
- The *comment feature* lets readers add electronic comments to a file.
- The *revision feature* lets readers mark up a text by deleting, revising, and adding words and indicates who made which suggested changes.
- The *highlighting feature* lets readers use one of about a dozen “highlighting pens” to call the writer’s attention to a particular passage.

TECH TIP

How to Use the Review Tab

When collaborating with others, you can distribute your document to readers electronically so that they can add comments, revise text, and highlight text. You can then review their comments, keep track of who made which changes, compare two versions, and decide whether to accept or decline changes without ever having to print your document. You can use the **Review** tab to electronically review a document or to revise a document that has already been commented on by readers.

1. Select the **Review** tab to access the **Comments**, **Tracking**, **Changes**, and **Compare** groups.
2. To **electronically review** a document, highlight the relevant text and do the following:



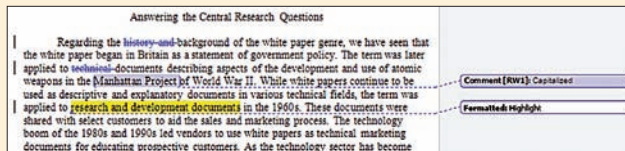
Select the **New Comment** button in the **Comments** group to write comments in a bubble in the margin.



Select the **Track Changes** button to distinguish between revised text and original text.

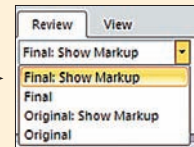


On the **Home** tab in the **Font** group, select the **Text Highlight** button to emphasize a particular passage.

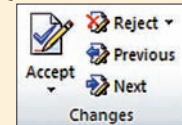


3. To **revise a document** that has already been commented on by reviewers, you can do the following:

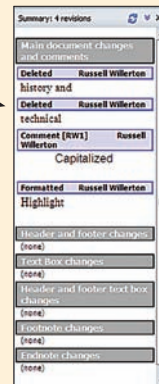
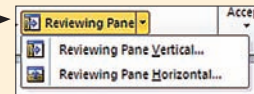
Use the **Tracking** group to change how the document is displayed.



Select buttons in the **Changes** group to see the **previous** or **next** comment and to **accept** or **reject** a change.



Select the **Reviewing Pane** button to review all comments and changes.



To change the color or design of comment bubbles or markup, select the **Track Changes** button in the **Tracking** group, and select **Change Tracking Options**. The **Track Changes Options** dialog box will appear.

KEYWORDS: review tab, comments group, tracking group, changes group, compare group

INTERACTIVE SAMPLE DOCUMENT

Critiquing a Draft Clearly and Diplomatically

This is an excerpt from the methods section of a report about computer servers. In this section, the writer is explaining the tasks he performed in analyzing different servers. In a later section, he explains what he learned from the analysis. The comments in the balloons were inserted into the document by the author's colleague.

The questions in the margin ask you to think about techniques for critiquing (as outlined on page 67).

<p>The first task of the on-site evaluations was to set up and configure each server. We noted the relative complexity of setting up each system to our network.</p>	<p>Comment: Huh? What exactly does this mean?</p>
<p>After we had the system configured, we performed a set of routine maintenance tasks: add a new memory module, swap a hard drive, swap a power supply, and perform system diagnostics.</p>	<p>Comment: Okay, good. Maybe we should explain why we chose these tests.</p>
<p>We recorded the time and relative difficulty of each task. Also, we tried to gather a qualitative feeling for how much effort would be involved in the day-to-day maintenance of the systems.</p>	<p>Comment: What kind of scale are you using? If we don't explain it, it's basically useless.</p>
<p>After each system was set up, we completed the maintenance evaluations and began the benchmark testing. We ran the complete WinBench and NetBench test suites on each system. We chose several of the key factors from these tests for comparison.</p>	<p>Comment: Same question as above.</p>
	<p>Comment: Will readers know these are the right tests? Should we explain?</p>

1. What is the tone of the comments? How can they be improved?
2. How well does the collaborator address the larger issues?
3. How well does the collaborator address the writing, not the writer?
4. How well do the collaborator's comments focus on the goal of the document, rather than judge the quality of the writing?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 4 on <bedfordstmartins.com/techcomm>.

Messaging Technologies

Two messaging technologies have been around for decades: instant messaging and e-mail. *Instant messaging (IM)* is real-time, text-based communication between two or more people. In the working world, people use IM as a way to enable several people to communicate textual information at the same time from different locations. *E-mail* is an asynchronous medium for sending brief textual messages and for transferring files such as documents, spreadsheets, images, and videos.

In the last decade, several new technologies have been introduced that are made to function on mobile devices such as phones. Of these, the two most popular are text messaging and microblogging.

Text messaging is a technology for sending messages that can include text, audio, images, and video. Texting is the fastest-growing technology for exchanging messages electronically because most people keep their phones nearby. Organizations use text messaging for such tasks as sending a quick update or alerting people that an item has been delivered or a task

In This Book

For more about writing e-mail, see Ch. 14, p. 387.

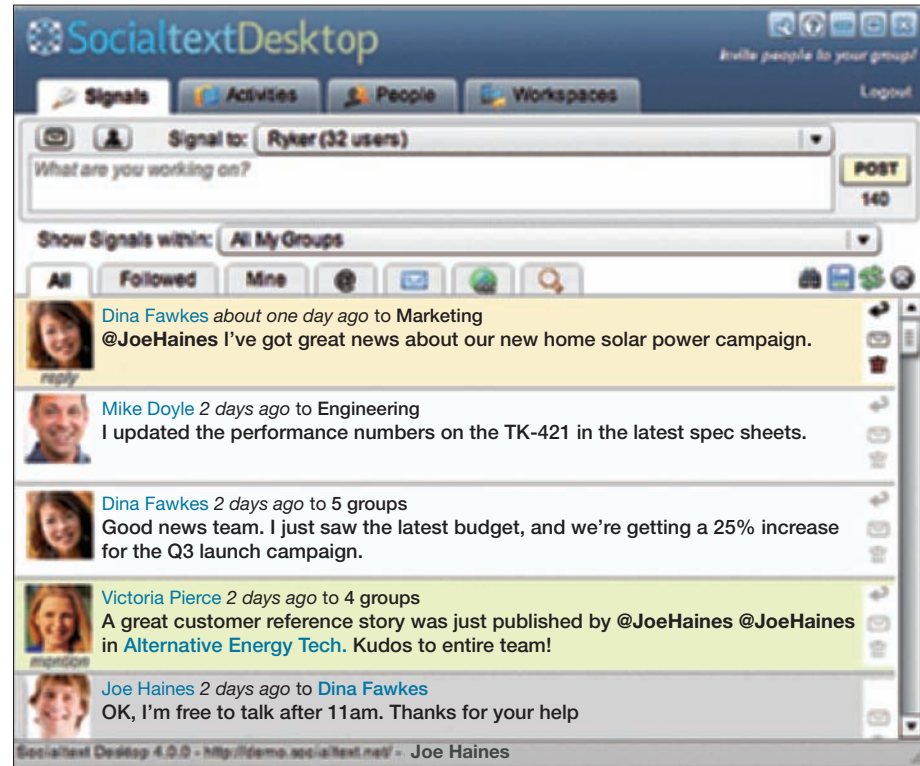


Figure 4.5 A Microblog

Source: Socialtext, 2010 <www.socialtext.com/products/desktop.php>.

completed. On your campus, the administration might use a texting system to alert people about a campus emergency.

Microblogging is a technology for sending very brief textual messages to your personal network. You're familiar with the world's most popular microblog, Twitter, which now has more than half a billion users. Although some organizations use Twitter, many use Twitter-like microblogs such as Yammer, which includes a search function and other features. Figure 4.5 shows a screen from Socialtext, another microblog.

Videoconferencing

Videoconferencing technology allows two or more people at different locations to simultaneously see and hear one another as well as exchange documents, share data on computer displays, and use electronic whiteboards. Systems such as Skype are simple and inexpensive, requiring only a Webcam and some free software. However, there are also large, dedicated systems that require extensive electronics, including cameras, servers, and a fiber-optic network or high-speed telephone lines. Figure 4.6 shows a videoconferencing system.



Figure 4.6 A Videoconference

Videoconferencing systems range from sophisticated ones like this to inexpensive cameras attached to individual workstations to systems that work on smartphones. Most videoconferencing systems can display more than one window to accommodate several sets of participants.

Source: Cisco, 2011 <www.cisco.com/en/US/products/ps10340/prod_view_selector.html>.

Guidelines

Participating in a Videoconference

Follow these six suggestions for participating effectively in a videoconference.

- ▶ **Practice using the technology.** For many people, being on camera is uncomfortable, especially the first time. Before participating in a high-stakes videoconference, become accustomed to the camera by participating in a few informal videoconferences.
- ▶ **Arrange for tech support at each site.** Participants can quickly become impatient or lose interest when someone is fumbling to make the technology work. Each site should have a person who can set up the equipment and troubleshoot if problems arise.
- ▶ **Organize the room to encourage participation.** If there is more than one person at the site, arrange the chairs so that they face the monitor and camera. Each person should be near a microphone. Before beginning the conference, check that each location has adequate audio and video as well as access to other relevant technology such as computer monitors. Finally, remember to introduce everyone in the room, even those off camera, to everyone participating in the conference.



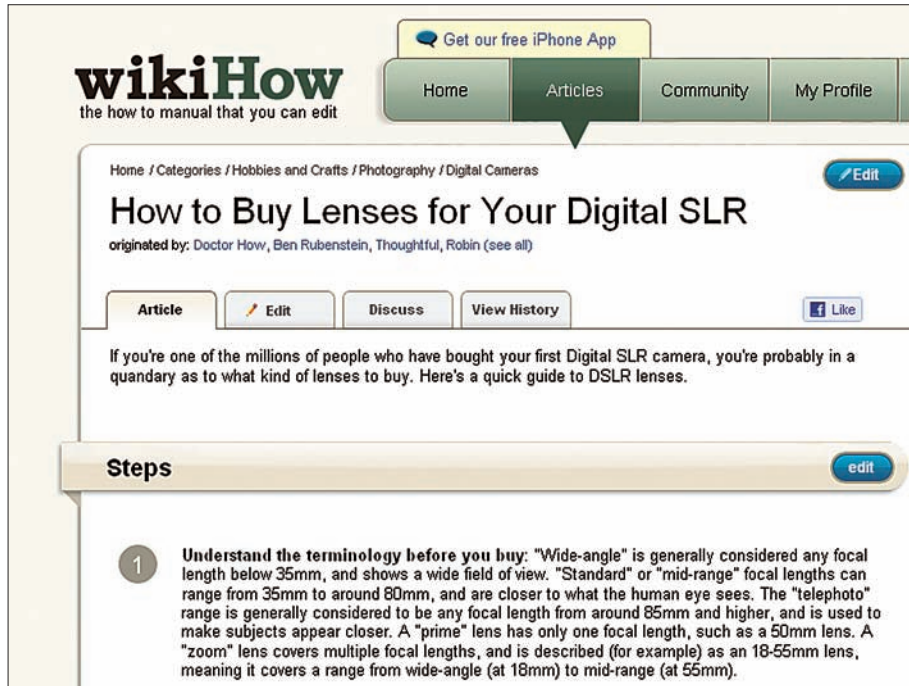
- ▶ **Make eye contact with the camera.** Eye contact is an important element of establishing your professional persona. The physical setup of some videoconferencing systems means you will likely spend most of your time looking at your monitor and not directly into the camera. However, this might give your viewers the impression that you are avoiding eye contact. Make a conscious effort periodically to look directly into the camera when speaking.
- ▶ **Dress as you would for a face-to-face meeting.** Wearing inappropriate clothing can distract participants and damage your credibility.
- ▶ **Minimize distracting noises and movements.** Sensitive microphones can magnify the sound of shuffling papers, fingers tapping on tables, and whispering. Likewise, depending on your position in the picture frame, excessive movements can be distracting.

Wikis and Shared Document Workspaces

Twenty years ago, people would collaborate on a document by using e-mail to send it from one person to another. One person would write or assemble the document, then send it to another person, who would revise it and send it along to the next person, and so forth. Although the process was effective, it was inefficient: only one person could work on the document at any given moment. Today, two new technologies—wikis and shared document workspaces—make it much simpler and more convenient to collaborate on a document.

A *wiki* is a Web-based document that authorized users can write and edit. The best-known example of a wiki is Wikipedia, an online encyclopedia that contains millions of articles written and edited by people around the world. In the working world, wikis are used for creating many kinds of documents, such as instructions, manuals, and policy documents. For instance, many organizations create their policies on using social media by setting up wikis and inviting employees to write and edit what others have written. The concept is that a wiki draws upon the expertise and insights of people throughout the organization and, sometimes, outside the organization. Figure 4.7 shows a portion of a wiki.

A *shared document workspace* is a technology that makes it convenient for a team of users to edit a file, such as a PowerPoint slide set or a Word document. A shared document workspace such as Microsoft SharePoint or Google Docs archives all the revisions made by each of the team members, so that the team can create a single document that incorporates selected revisions. Some shared document workspaces enable a user to download the document, revise it on his or her own computer, and then upload it again. This feature makes it extremely convenient because the user does not need to be connected to the Internet to work on the document.



This portion of a screen from wikiHow shows an excerpt from an article about how to buy lenses for a digital SLR camera. Users can click on the *Edit* tab or *Edit* buttons to edit the article; on the *Discuss* tab to post questions and answers; and on the *View History* tab to see any of the previous versions of the article.

Figure 4.7 A Wiki

Source: wikiHow, 2010 <www.wikihow.com/Buy-Lenses-for-Your-Digital-SLR>.

Virtual Worlds

Organizations are using virtual worlds, such as Second Life, to conduct meetings and conferences. Participants create avatars and visit different locations in the virtual world to view displays, watch product demonstrations, and talk with others. Many people think that entering a three-dimensional virtual world, in which you can talk with others through a headset connected to a computer, creates a more-realistic experience than merely visiting a Web site, watching a video, or talking on the phone. At IBM, where over 20,000 people use Second Life at work, employees attend virtual planning sessions, then vote for their favorite ideas (Gronstedt, 2009). Figure 4.8 shows how one company uses a virtual world to display a product.

Although this section has discussed various collaboration tools as separate technologies, the trend today is to bundle them in commercial products, such as Lotus Sametime, a suite of voice, data, and video services. These services usually share four characteristics:

- *They are cloud based.* That is, organizations lease the services and access them over the Internet. They do not have to acquire and maintain special hardware. This model is sometimes called *software as a service*.

Avatars of prospective customers are examining a model created by a design firm. The avatars can walk around and view the model from any perspective. The design firm even has full-scale models of houses. Avatars can enter a house, examine the interior, and then sit down in a virtual room with the firm's representatives to discuss the design. The firm can change the design in real time in response to customers' questions and suggestions.

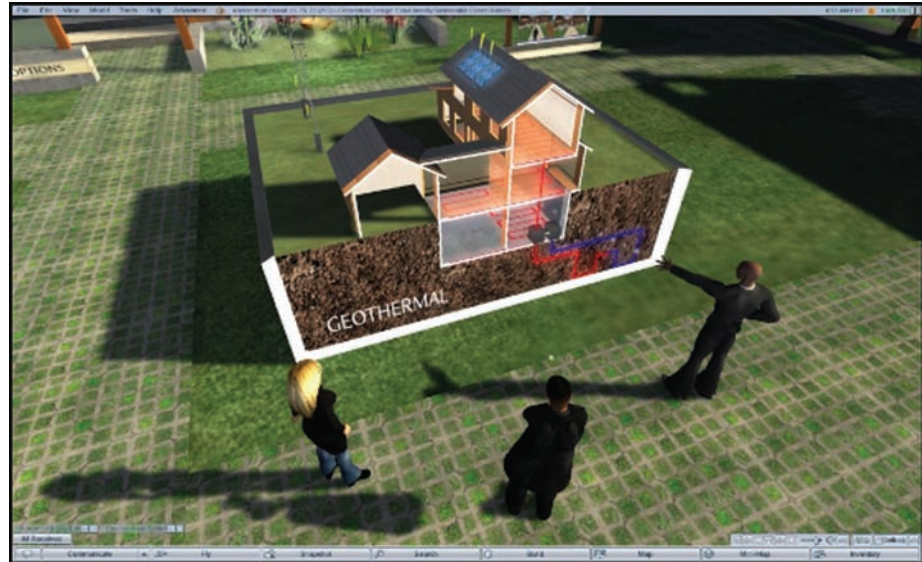


Figure 4.8 A Virtual World

Source: Crescendo Design, 2011 <http://crescendodesign.com/?page_id=1227>.

- *They are integrated across desktop and mobile devices.* Employees can access these services from their desktops or mobile devices, thus freeing them to collaborate in real time even if they are not at their desks. Some service providers provide *presence awareness*, the ability to determine a person's online status, availability, and geographic location.
- *They are customizable.* Organizations can choose whichever services they wish, and then customize them to work effectively with the rest of the organization's electronic infrastructure, such as computer software and telephone systems.
- *They are secure.* Organizations store the software behind a firewall, providing security: only authorized employees have access to the services.

ETHICS NOTE

Maintaining a Professional Presence Online

According to a reputable report from Cisco Systems (2010), half of the surveyed employees claim to routinely ignore company guidelines that prohibit the use of social media for non-work-related uses during company time. When you use your organization's social media at work, be sure to act professionally so that your actions reflect positively on you and your organization. Be aware of several important legal and ethical issues related to social media.

Although the law has not always kept pace with recent technological innovations, a few things are clear. You and your organization can be held liable if you make defamatory

statements (statements that are untrue and damaging) about people or organizations, publish private information (such as trade secrets) or something that publicly places an individual “in a false light,” publish personnel information, harass others, or participate in criminal activity.

In addition, follow these guidelines to avoid important ethical pitfalls:

- Don't waste company time using social media for nonbusiness purposes. You owe your employer a duty of diligence (hard work).
- Don't divulge secure information, such as a login and password that exposes your organization to unauthorized access, and don't reveal information about products that have not yet been released.
- Don't divulge private information about anyone. Private information relates to such issues as religion, politics, and sexual orientation.
- Don't make racist or sexist comments or post pictures of people drinking.

If your organization has a written policy on the use of social media, study it carefully. Ask questions if anything in it is unclear. If the policy is incomplete, work to make it complete. If there is no policy, work to create one.

For an excellent discussion of legal and ethical aspects of using your organization's social media, see Kaupins and Park (2010).

 **In This Book**

For more about your obligations to your employer, see Ch. 2, p. 21.

GENDER AND COLLABORATION

Effective collaboration involves two related challenges: maintaining the team as a productive, friendly working unit and accomplishing the task. Scholars of gender and collaboration see these two challenges as representing the feminine and the masculine perspectives.

This discussion should begin with a qualifier: in discussing gender, we are generalizing. The differences in behavior between two men or between two women are likely to be greater than the difference between men and women in general.

The differences in how the sexes communicate and work in teams have been traced to every culture's traditional family structure. As the primary caregivers, women have learned to value nurturing, connection, growth, and cooperation; as the primary breadwinners, men have learned to value separateness, competition, debate, and even conflict (Karten, 2002). In collaborative teams, women appear to value consensus and relationships more, to show more empathy, and to demonstrate superior listening skills compared to men. Women talk more about topics unrelated to the task (Duin, Jorn, & DeBower, 1991), but this talk is central to maintaining team coherence. Men appear to be more competitive than women and more likely to assume leadership roles. Scholars of gender recommend that all professionals strive to achieve an androgynous mix of the skills and aptitudes commonly associated with both women and men.

CULTURE AND COLLABORATION

Most collaborative teams in industry and in the classroom include people from other cultures. The challenge for all team members is to understand the ways in which cultural differences can affect team behavior. People from other cultures

- might find it difficult to assert themselves in collaborative teams
- might be unwilling to respond with a definite “no”
- might be reluctant to admit when they are confused or to ask for clarification
- might avoid criticizing others
- might avoid initiating new tasks or performing creatively

Even the most benign gesture of friendship on the part of a U.S. student can cause confusion. If a U.S. student casually asks a Japanese student about her major and the courses she is taking, she might find the question too personal but consider it perfectly appropriate to talk about her family and her religious beliefs (Lustig & Koester, 2009). Therefore, you should remain open to encounters with people from other cultures without jumping to conclusions about what their actions might or might not mean.

In This Book

For more about multicultural issues, see Ch. 5, p. 94.

Writer's Checklist

In managing your project, did you

- break down a large project into several smaller tasks? (p. 60)
- plan your project? (p. 60)
- create and maintain an accurate schedule? (p. 60)
- put your decisions in writing? (p. 60)
- monitor the project? (p. 60)
- distribute and act on information quickly? (p. 60)
- act flexibly regarding schedule and responsibilities? (p. 60)

In your first team meeting, did you

- define the team's task? (p. 62)
- choose a team leader? (p. 62)
- define tasks for each team member? (p. 62)
- establish working procedures? (p. 62)
- establish a procedure for resolving conflict productively? (p. 62)
- create a style sheet? (p. 62)
- establish a work schedule? (p. 62)
- create evaluation materials? (p. 62)

To conduct efficient meetings, do you

- arrive on time? (p. 66)
- stick to the agenda? (p. 66)
- make sure that a team member records important decisions made at the meeting? (p. 66)
- make sure that the leader summarizes the team's accomplishments and that every member understands what his or her tasks are? (p. 66)

To communicate diplomatically, do you

- listen carefully, without interrupting? (p. 67)
- give everyone a chance to speak? (p. 67)
- avoid personal remarks and insults? (p. 67)
- avoid overstating your position? (p. 67)
- avoid getting emotionally attached to your own ideas? (p. 67)
- ask pertinent questions? (p. 67)
- pay attention to nonverbal communication? (p. 67)


In critiquing a team member's work, do you

- start with a positive comment? (p. 68)
 - discuss the larger issues first? (p. 68)
 - talk about the document, not the writer? (p. 68)
- If appropriate, do you use the comment, revision, and highlighting features of your word processor? (p. 69)

In participating in a videoconference, did you

- practice using videoconferencing technology? (p. 73)
- arrange for tech support at each site? (p. 73)
- organize the room to encourage participation? (p. 73)
- make eye contact with the camera? (p. 74)
- dress as you would for a face-to-face meeting? (p. 74)
- minimize distracting noises and movements? (p. 74)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Experiment with the comment, revision, and highlighting features of your word processor. Using online help if necessary, learn how to make, revise, and delete comments; make, undo, and accept revisions; and add and delete highlights.
2. **INTERNET EXERCISE** Using a search engine, find free videoconferencing software on the Internet. Download the software, and install it on your computer at home. Learn how to use the feature that lets you send attached files.
3. **INTERNET EXERCISE** Using a wiki site such as wikiHow.com, find a set of instructions on a technical process that interests you. Study one of the revisions to the instructions, noting the types of changes made. Do the changes relate to the content of the instructions, to the use of graphics, or to the correctness of the writing? Be prepared to share your findings with the class.
4. If you are now enrolled in a technical-communication course that calls for you to do a large collaborative project, such as a recommendation report or an oral presentation, meet with your team members. Study the assignment for the project, and then fill out the work-schedule form. (You can download the form from <bedfordstmartins.com/techcomm>.) Be prepared to share your form with the class.
5. You have probably had a lot of experience working in collaborative teams in previous courses or on the job. Brainstorm for five minutes, listing some of your best and worst experiences participating in collaborative teams. Choose one positive experience and one negative experience. Think about why the positive experience went well. Was there a technique that a team

member used that accounted for the positive experience? Think about why the negative experience went wrong. Was there a technique or action that accounted for the negative experience? How might the negative experience have been prevented—or fixed? Be prepared to share your responses with the class.

6. **INTERNET EXERCISE** Your college or university wishes to update its Web site to include a section called “For Prospective International Students.” Along with members of your team, first determine whether your school already has information of particular interest to prospective international students. If it does, write a memo to your instructor describing and evaluating the information. Is it accurate? Comprehensive? Clear? Useful? What kind of information should be added to the site to make it more effective?

If the school's site does not have this information, perform the following two tasks:

- *Plan.* What kind of information should this new section include? Does some of this information already exist elsewhere on the Web, or does it all have to be created from scratch? For example, can you create a link to an external site with information on how to obtain a student visa? Write an outline of the main topics that should be covered.
- *Draft.* Write the following sections: “Where to Live on or Near Campus,” “Social Activities on or Near Campus,” and “If English Is Not Your Native Language.” What graphics could you include? Are they already available? What other sites should you link to for these three sections?

In a memo, present your suggestions to your instructor.

Case 4: Accommodating a Team Member's Scheduling Problems

Background

In your technical-communication course, you have been assigned to a team with two other students: DeAnna Omanovic and Jason Stokes. Your instructor, Dr. Robert Jenkins, likes to create teams of students from different majors. You have never met DeAnna or Jason.

Forty percent of your final course grade will be determined by your grade on three collaborative assignments: a research proposal, a recommendation report, and an oral presentation. The instructor believes that collaboration is an essential skill for college students and professionals alike, and he emphasizes the importance of learning to work effectively with others. In his syllabus, Dr. Jenkins describes his approach to grading collaborative assignments: each member of the team is to submit a self-evaluation form and a team-member evaluation form for each assignment. On the team-member evaluation form, each member assigns grades to every other member of the team for ten criteria, including such factors as attendance at team meetings, quality of the work contributed to the team, and quality of communication with other team members.

It is two weeks before the first collaborative assignment: the research proposal. You e-mail DeAnna and Jason and propose a meeting Thursday at four o'clock in the library to discuss procedures and possible subjects for your research proposal and the subsequent collaborative assignments. Both DeAnna and Jason agree to attend, but Jason does not show up. DeAnna tells you she received no communication from Jason that he would be late or unable to attend. At 4:30, you and DeAnna agree that you will try to get in touch with Jason to see if the three of you can reschedule the meeting.

You e-mail Jason, asking if there was some confusion about the time or place of the meeting but receive no reply. After dinner, you receive an e-mail from DeAnna (Document 4.1).

You respond to DeAnna (Document 4.2), presenting a plan to give Jason a little time to work through whatever

his problem is, while enabling you and DeAnna to do some productive work. She agrees with your idea.

Two days pass. You and DeAnna have not seen Jason in class, and he has not contacted either of you. Later that day you decide to phone Jason to see if you can get a better idea of what is going on. Jason's wife, Andrea, answers the phone. She sounds distraught. Jason is at the hospital, where they took their son three days ago with a fever of 104 degrees. The doctors have managed to bring the fever down to 102 degrees, but they still don't have a diagnosis. Andrea says Jason is very upset. He has missed a big assignment in his economics course and a midterm in his civil-engineering course. Andrea herself has not been to her job in three days; she and Jason have been at the hospital almost around the clock since their son was admitted. As Andrea is apologizing to you for Jason's missing the meeting, she starts to break down.

Your cell rings. It's DeAnna, who tells you she went to Dr. Jenkins's office after class today to complain about Jason because he didn't even have the courtesy to respond to e-mails after missing the meeting. She told Dr. Jenkins that she has had to work with jerks like Jason at the office and she's not going to get a lousy grade in this course because Jason has decided to blow it off.

Your Assignment

1. Draft an e-mail to send to DeAnna and Jason proposing a policy for communicating with other team members when problems arise.
2. Draft an e-mail for you and DeAnna to send to Jason and Dr. Jenkins proposing an approach to dealing with the fact that Jason is not able to participate in the collaborative assignments—at least not for a while. This approach should address the fact that although Jason did not communicate effectively with you and DeAnna, the situation with his sick son is causing him and his wife great distress. The proposal is due in one week, the recommendation report in four weeks, and the oral presentation in five weeks.

Hi.

Below is an e-mail I just got from Jason:

Hey DeAnna-

Some things come up and I had to miss the team meeting. I'll get back to you as soon as I know what's going on.

(I'm writing to you cause I forgot the other woman's name; tell her I'm sorry)

Uncool.

DeAnna

Document 4.1
E-mail from DeAnna

Hi, DeAnna-

I agree: uncool. But let's give Jason a couple of days to get back to us.

In the meantime, why don't you and I each try to think of three topics that we'd be comfortable working on for the three collaborative assignments? According to Dr. Jenkins' comments (see the syllabus, p. 3), the subject should be kind of technical (GPS systems, computer gear, etc.) and something that all team members are willing to work on. It would help if the subject were some sort of consumer product so that there is enough technical information about it on the Web.

We can exchange ideas in two days and, if you want, get together. Then, when we find out what's going on with Jason, we'll have something to present to him and we won't have lost too much time.

Sound like a plan?

(Your name)

Document 4.2
Your Follow-up E-mail
to DeAnna

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

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PART 2

Planning the Document

CHAPTER **5**

Analyzing Your Audience and Purpose



ColorBlind Images/Photolibrary

Audience and purpose determine everything about how you communicate on the job.

In the workplace you will communicate with many people with different backgrounds and needs. Your challenge is to select the information each person needs and present it so that it helps each person do his or her job.

The key concept in technical communication is that audience and purpose determine everything about how you communicate on the job. As a nurse, for example, you would need to communicate information to both doctors and patients. You'd likely use different language with these two audiences and have different goals in relaying the information to each party. As a sales manager, you would communicate information about your products to potential clients; you'd communicate that same information differently to other sales representatives that you're training to work with you.

What can go wrong when you don't analyze your audience? McDonald's Corporation found out when it printed takeout bags decorated with flags from around the world. Among them was the flag of Saudi Arabia, which contains scripture from the Koran. This was extremely offensive to Muslims, who considered it sacrilegious to throw out the bags. The chain's sales went way down as a consequence.

Throughout this chapter, the text will refer to your *reader* and your *document*. But all of the information refers as well to oral presentations, which are the subject of Chapter 21, as well as to nonprint documents, such as podcasts or video.

USING AN AUDIENCE PROFILE SHEET

As you read the discussions in this chapter about audience characteristics and techniques for learning about your audience, you might think about using an audience profile sheet. This sheet is a form that prompts you to consider various audience characteristics as you plan your document. For example, the sheet can help you realize that you do not know much about your primary reader's work history and what that history can tell you about how to shape your document. Figure 5.1 shows an audience profile sheet that provides important information for one of a writer's most important readers.

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Figure 5.1 An Audience Profile Sheet

Assume that you work in the drafting department of an architectural engineering firm. You know that the company's computer-assisted design (CAD) software is out-of-date and that recent CAD technology would make it easier and faster for the draftspeople to do their work. You want to persuade your company to authorize buying a CAD workstation that costs about \$4,000. To do so, you fill out an audience profile sheet for your primary reader, Harry Becker, the manager of your company's Drafting and Design Department.

AUDIENCE PROFILE SHEET

Reader's Name: Harry Becker

Reader's Job Title: Manager, Drafting and Design Department

Kind of Reader: Primary Secondary

Education: BS, Architectural Engineering, Northwestern, 1992. CAD/CAM Short Course, 1992; Motivating Your Employees Seminar, 1997; Writing on the Job Short Course, 2002

Professional Experience: Worked for two years in a small architecture firm. Started here 16 years ago as a draftsman. Worked his way up to Assistant Manager, then Manager. Instrumental in the Wilson project, particularly in coordinating personnel and equipment.

Job Responsibilities: Supervises a staff of 12 draftspeople. Approves or denies all requests for capital expenditures over \$2,000 coming from his department. Works with employees to help them make the best case for the purchase. After approving or denying the request, forwards it to Tina Buterbaugh, Manager, Finance Dept., who maintains all capital expenditure records.

Personal Characteristics: N/A

Personal Preferences: Likes straightforward documents, lots of evidence, clear structure. Dislikes complicated documents full of jargon.

Cultural Characteristics: Nothing of note.

Attitude Toward the Writer: No problems.

Attitude Toward the Subject: He understands and approves of my argument.

Expectations About the Subject: Expects to see a clear argument with financial data and detailed comparisons of available systems.

Expectations About the Document: Expects to see a report, with an executive summary, of about 10 pages.

Reasons for Reading the Document: To offer suggestions and eventually approve or deny the request.

Way of Reading the Document:

Skim it Study it Read a portion of it Which portion?

Modify it and submit it to another reader

Attempt to implement recommendations

Use it to perform a task or carry out a procedure

Use it to create another document

Other Explain.

Reading Skill: Excellent

Reader's Physical Environment: N/A

On TechComm Web

You should modify this form to meet your own needs and those of your organization. For a downloadable version of Fig. 5.1, click on Forms for Technical Communication on <bedfordstmartins.com/techcomm>.

If your document has several readers, you must decide whether to fill out only one sheet (for your most important reader) or several sheets. One technique is to fill out one or two sheets for important readers and one for each major category of other readers. For instance, you could fill out one sheet for your primary reader, Harry Becker, one for managers in other areas of your company, and one for readers from outside your company.

When do you fill out an audience profile sheet? Although some writers like to do so at the start of the process as a way to prompt them to consider audience characteristics, others prefer to do so at the end of the process as a way to help them summarize what they have learned about their audience. Of course, you can fill out the sheet before you begin, and then complete it or revise it at the end.

DETERMINING THE IMPORTANT CHARACTERISTICS OF YOUR AUDIENCE

When you analyze the members of your audience, you are trying to learn what you can about their technical background and knowledge, their reasons for reading or listening to you, their attitudes and expectations, and how they will use the information you provide.

Who Are Your Readers?

For each of your most important readers, consider six factors:

- *The reader's education.* Think not only about the person's degree but also about when the person earned the degree. A civil engineer who earned a BS in 1990 has a much different background from a person who earned the same degree in 2010. Also consider any formal education or training the person completed while on the job.

Knowing your reader's educational background helps you determine how much supporting material to provide, what level of vocabulary to use, what kind of sentence structure and length to use, what types of graphics to include, and whether to provide such elements as a glossary or an executive summary.

- *The reader's professional experience.* A nurse with a decade of experience might have represented her hospital on a community committee to encourage citizens to give blood and might have contributed to the planning for the hospital's new delivery room. These experiences would have provided several areas of competence or expertise that you should consider as you plan the document.
- *The reader's job responsibility.* Consider the major job responsibility of your reader and how your document will help that person accomplish it. For example, if you are writing a feasibility study on ways to cool the air for a new office building and you know that your reader, an upper-level manager, oversees operating expenses, you should explain how you are estimating future utility costs.
- *The reader's personal characteristics.* The reader's age might suggest how he or she will read and interpret your document. A senior manager at age 60 is probably less interested in tomorrow's technology than a 30-year-old manager is. Does your reader have any other personal characteristics,

such as impaired vision, that would affect the way you write and design your document?

- *The reader's personal preferences.* One person might hate to see the first-person pronoun *I* in technical documents. Another might find the word *interface* distracting when the writer isn't discussing computers. Does your reader prefer one type of application (such as blogs or memos) over another? Try to accommodate as many of your reader's preferences as you can.
- *The reader's cultural characteristics.* Understanding cultural characteristics can help you appeal to your reader's interests and avoid confusing or offending him or her. As discussed later in this chapter (p. 94), cultural characteristics can affect virtually every aspect of a reader's comprehension of a document and perception of the writer.

Why Is Your Audience Reading Your Document?

For each of your most important readers, consider why he or she is reading your document. Some writers find it helpful to classify readers into categories—such as primary, secondary, and tertiary—each of which identifies a reader's distance from the writer. Here are some common descriptions of three categories of readers:

- A *primary audience* consists of people close to the writer who use the document in carrying out their jobs. For example, they might include the writer's team members, who assisted in carrying out an analysis of a new server configuration for the IT department; the writer's supervisor, who reads it to decide whether to authorize its main recommendation to adopt the new configuration; an executive, who reads it to determine how high a rank the server project should have on a list of projects to fund; and a business analyst, who reads it to determine how the organization can pay for it.
- A *secondary audience* consists of people more distant from the writer who need to stay aware of developments in the organization but who will not directly act on or respond to the document. Examples include managers of other departments, who are not directly involved in the project but who need to be aware of its broad outlines; and representatives from the marketing and legal departments, who need to check that the document conforms to the company's standards and practices and with relevant legal standards, such as antidiscrimination or intellectual-property laws.
- A *tertiary audience* consists of people even farther removed from the writer who might take an interest in the subject of the report. Examples include interest groups (such as environmental groups or other advocacy organizations); local, state, and federal government officials;

On TechComm Web

For more about audience analysis, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 5 on <bedfordstmartins.com/techcomm>.

and, if the report is made public, the general public. Even if the report is not intended to be distributed outside the organization, given today's climate of information access and the ease with which documents can be distributed, chances are good that it will be made available to outsiders.

Regardless of whether you classify your readers using a scheme such as this, think hard about why the most important audience members will be reading your document. Don't be content to list only one purpose. Your direct supervisor, for example, might have several purposes that you want to keep in mind:

- to learn what you have accomplished in the project
- to determine whether to approve any recommendations you present
- to determine whether to assign you to a follow-up team that will work on the next stage of the project
- to determine how to evaluate your job performance next month

You will use all of this information about your audience as you determine the ways it affects how you will write your document or plan your presentation. In the meantime, write it down so you can refer to it later.

What Are Your Readers' Attitudes and Expectations?

In thinking about the attitudes and expectations of each of your most important readers, consider these three factors:

- *Your reader's attitude toward you.* Most people will like you because you are hardworking, intelligent, and cooperative. Some won't. If a reader's animosity toward you is irrational or unrelated to the current project, try to earn that person's respect and trust by meeting him or her on some neutral ground, perhaps by discussing other, less volatile projects or some shared interest, such as gardening, skiing, or science-fiction novels.
- *Your reader's attitude toward the subject.* If possible, discuss the subject thoroughly with your primary readers to determine whether they are positive, neutral, or negative toward it. Here are some basic strategies for responding to different attitudes.

<i>If . . .</i>	<i>Try this . . .</i>
Your reader is neutral or positively inclined toward your subject	Write the document so that it responds to the reader's needs; make sure that vocabulary, level of detail, organization, and style are appropriate.



<i>If . . .</i>	<i>Try this . . .</i>
Your reader is hostile to the subject or to your approach to it	<ul style="list-style-type: none"> • Find out what the objections are, and then answer them directly. Explain why the objections are not valid or are less important than the benefits. • Organize the document so that your recommendation follows your explanation of the benefits. This strategy encourages the hostile reader to understand your argument rather than to reject it out of hand. • Avoid describing the subject as a dispute. Seek areas of agreement and concede points. Avoid trying to persuade readers overtly; people don't like to be persuaded, because it threatens their ego. Instead, suggest that there are new facts that need to be considered. People are more likely to change their minds when they realize this.
Your reader was instrumental in creating the policy or procedure that you are arguing is ineffective	In discussing the present system's shortcomings, be especially careful if you risk offending one of your readers. When you address such an audience, don't write, "The present system for logging customer orders is completely ineffective." Instead, write, "While the present system has worked well for many years, new developments in electronic processing of orders might enable us to improve logging speed and reduce errors substantially."

- *Your reader's expectations about the document.* Think about how your readers expect to see the information treated in terms of scope, organizational pattern, and amount of detail. Consider, too, the application. If your reader expects to see the information presented as a memo, use a memo unless some other format would clearly work better.

How Will Your Readers Use Your Document?

In thinking about how your reader will use your document, consider the following three factors:

- *The way your reader will read your document.* Will he or she
 - file it?
 - skim it?
 - read only a portion of it?
 - study it carefully?
 - modify it and submit it to another reader?
 - try to implement recommendations?
 - use it to perform a test or carry out a procedure?
 - use it as a source document for another document?

If only 1 of your 15 readers will study the document for detailed information, you don't want the other 14 people to have to wade through it.

Therefore, put this information in an appendix. If you know that your reader wants to use your status report as raw material for a report to a higher-level reader, try to write it so that it requires little rewriting. Use the reader's own writing style and make sure the reader has access to the electronic file so that your report can be merged with the new document without needing to be retyped.

- *Your reader's reading skill.* Consider whether you should be writing at all, or whether it would be better to do an oral presentation or use computer-based training. If you decide to write, consider whether your reader can understand how to use the type of document you have selected, handle the level of detail you will present, and understand your graphics, sentence structure, and vocabulary.
- *The physical environment in which your reader will read your document.* Often, technical documents are formatted in a special way or constructed of special materials to improve their effectiveness. Documents used in poorly lit places might be printed in larger-than-normal type. Some documents might be used on ships, on aircraft, or in garages, where they might be exposed to wind, water, and grease. You might have to use special waterproof bindings, oil-resistant or laminated paper, coded colors, and unusual-sized paper.

 **In This Book**

For more about designing a document for use in different environments, see Ch. 11, p. 265.

TECHNIQUES FOR LEARNING ABOUT YOUR AUDIENCE

To learn about your audience, you figure out what you do and do not already know, interview people, read about them, and read documents they have written. Of course, you cannot perform extensive research about every possible reader of every document you write, but you should learn what you can about your most important readers of your most important documents.

Determining What You Already Know About Your Audience

Start by asking yourself what you already know about your most important readers: their demographics (such as age, education, and job responsibilities); their expectations and attitudes toward you and the subject; and the ways they will use your document. Then list the important factors you *don't* know. That is where you will concentrate your energies. The audience profile sheet shown in Figure 5.1 (p. 86) can help you identify gaps in your knowledge about your readers.

Interviewing People

For each of your most important readers, make a list of people who you think have known them and their work the longest or who are closest to them on the job. These people might include those who joined the organization at

 **In This Book**

For a discussion of interviewing, see Ch. 6, p. 140.

about the same time your reader did; people who work in the same department as your reader; and people at other organizations who have collaborated with your reader.

Prepare a few interview questions that are likely to elicit information about your reader and his or her preferences and needs. Then, conduct these informal interviews in person, on the phone, or by e-mail.

Reading About Your Audience Online

If you are writing for people in your own organization, start your research there. If the person is a high-level manager or executive, search the organization's Web site. Sections such as "About Us," "About the Company," and "Information for Investors" often contain a wealth of biographical information, as well as links to other sources.

In addition, use a search engine to look for information on the Internet. You are likely to find newspaper and magazine articles, industry directories, Web sites, and blog posts about your audience.

Searching Social Media for Documents Your Audience Has Written

Documents your readers have written can tell you a lot about what they like to see, including design, level of detail, organization and development, style, and vocabulary. Again, start in your own organization, searching for documents the person has written. Then broaden the search to the Internet.

Although some of your readers might have written books and articles, many or even most of them might be active participants in social media, such as Facebook. Pay particular attention to LinkedIn, which specializes in professional people. LinkedIn profiles are particularly useful because they include a person's current and former positions, education, and recommendations from other professionals. Figure 5.2 is an excerpt from the LinkedIn entry written by Mike Markley, a technical communicator at Aquent.

Markley begins his LinkedIn biography with these paragraphs:

Mike Markley joined Aquent Studios in 2003. While at Aquent Studios, he has held the positions of Information Developer, Senior Project Manager, and Resource Manager. In 2007 he became the Managing Director for Aquent Studios, overseeing a team of 100 people across studios located in Idaho, Oregon, Colorado, and India. His home office is located in Boise, Idaho.

Mike has worked in professional and technical communication for over 15 years, with a focus on managing projects and directing teams in the development of creative and technical content for commercial and consumer products. His background includes consulting work for several Fortune 500 companies as an author, an editor, a graphics and training developer, and a project manager. With five years' experience in the director role with Aquent and a prior company, he has experience building cli-

Mike Markley 1st

Director, Aquent Studios; content development consultant; and technical communication professional
Boise, Idaho Area | Writing and Editing



Current	<ul style="list-style-type: none"> • Director, Aquent Studios at Aquent • Adjunct Instructor at Boise State University
Past	<ul style="list-style-type: none"> • Resource Manager / Sr. Project Manager at Sakson & Taylor, Inc. • Director of Content Design & Development at Lionbridge Technologies, Inc. • Assembly Documentation Supervisor at Micron Technology, Inc.
Education	<ul style="list-style-type: none"> • Boise State University • University of Idaho
Recommendations	3 people have recommended Mike
Connections	206 connections
Public Profile	http://www.linkedin.com/pub/mike-markley/0/244/64b

This summary is followed by a much more detailed description of Mike Markley's professional history and education. Even this brief summary suggests that Markley has extensive experience (note the words director, senior project manager, and supervisor).

Figure 5.2 A LinkedIn Bio

Source: Markley, 2010a <www.linkedin.com/pub/mike-markley/0/244/64b>.

ent relationships, recruiting and managing creative and technical resources, as well as setting up and directing managed-service groups for clients throughout the western United States and India.

These two paragraphs suggest a couple of points about Markley's credentials:

- He has an extensive background, not only in writing and editing but also in various levels of management. You can expect that he knows project management, budgeting, and human resources. He understands both how to make documents and how to lead teams that make documents.
- He has experience overseeing project teams in India. This experience gives him a broad perspective not only on how two very different cultures see the world but also on how to supervise people from those cultures so that they work effectively and efficiently.

In short, when you read Markley's comments on LinkedIn, you get the clear impression that he is an experienced, versatile, and highly respected technical communicator.

A typical LinkedIn entry also directs you to the person's Web sites and blogs and to the LinkedIn groups to which the person belongs. You can also

The tweet welcoming Amit shows appropriate professional courtesy. The little bio to the right suggests a well-grounded individual with whom you would likely feel comfortable working.

mmboise

Name Mike Markley
Location Boise, Idaho
Web <http://www.aquent...>
Bio Managing Director at Aquent Studios, tech comm professional, adjunct instructor, writer, runner, Idaho and CLE sports fan, Beth's husband, and very proud dad

216 following 132 followers 6 listed

Tweets 95

Favorites

Following

excited that we have a new #aquentstudios project manager in #houston as of Tuesday. Welcome to Amit!
 9:37 AM Jul 9th via web

what's the longest #MSWord doc you ever had? we're looking down the barrel of 2400-pgs with auto TOC/indexing-storm on the horizon. Ugh.
 8:17 AM Jun 7th via web

Figure 5.3 A Twitter Page

Source: Markley, 2010b <<http://twitter.com/mmboise>>.

see the person's *connections* (the list of people whom the person is connected to through work or personal relationships). And if you are a LinkedIn member, you can also see whether you and the person share any connections.

In addition, the person you are researching might have a Twitter account. Reading a person's recent tweets gives you a good idea of his or her job responsibilities and professionalism, as shown in Figure 5.3.

COMMUNICATING ACROSS CULTURES

Our society and our workforce are becoming increasingly diverse, both culturally and linguistically, and businesses are exporting more and more goods and services. As a result, technical communicators and technical professionals often communicate with nonnative speakers of English in the United States and abroad and with speakers of other languages who read texts translated from English into their own languages.

The economy of the United States depends on international trade. In 2008, according to the U.S. Census Bureau, the United States exported over \$1.8 trillion of goods and services (U.S. Census Bureau, 2010, p. 1264). In that year, direct investment abroad by U.S. companies totaled more than \$3.2 trillion (p. 1259). In addition, the population of the United States itself is truly multicultural. Each year, the United States admits more than a million immigrants (p. 45). In 2007, 12.6 percent of the U.S. population was foreign born; of those foreign born, more than a quarter had entered the country since the year 2000 (p. 40).

Effective communication requires an understanding of culture: the beliefs, attitudes, and values that motivate people's behavior.

Understanding the Cultural Variables “on the Surface”

Communicating effectively with people from another culture requires understanding a number of cultural variables that lie on the surface. You need to know, first, what language or languages to use. You also need to be aware of political, social, religious, and economic factors that can affect how readers will interpret your documents. Understanding these factors is not an exact science, but it does require that you learn as much as you can about the culture of those you are addressing.

A brief example: an American manufacturer of deodorant launched an advertising campaign in Japan in which a cute octopus applied the firm’s product under each of its eight arms. But the campaign failed because in Japan, an octopus is viewed as having eight *legs*, not eight arms (Bathon, 1999).

In *International Technical Communication*, Nancy L. Hoft (1995) describes seven major categories of cultural variables that lie on the surface:

- **Political.** This category includes trade issues and legal issues (for example, some countries forbid imports of certain foods or chemicals) and laws about intellectual property, product safety, and liability.
- **Economic.** In many developing countries, most people cannot afford personal computers.
- **Social.** This category covers many issues, including gender and business customs. In most Western cultures, women play a much greater role in the workplace than they do in many Middle Eastern and Asian cultures. Business customs—including forms of greeting, business dress, and gift giving—vary from culture to culture.
- **Religious.** Religious differences can affect diet, attitudes toward individual colors, styles of dress, holidays, and hours of business.
- **Educational.** In the United States, 40 million people are only marginally literate. In other cultures, that rate can be much higher or much lower. In some cultures, classroom learning with a teacher is considered the most acceptable way to study; in others, people tend to study on their own.
- **Technological.** If you sell high-tech products, you need to know whether your readers have the hardware, the software, and the technological infrastructure to use them.
- **Linguistic.** In some countries, English is taught to all children starting in grade school; in other countries, English is seen as a threat to the national language. In many cultures, the orientation of text on a page and in a book is not from left to right.

In addition to these basic differences, you need to understand dozens of other factors. For instance, the United States is the only major country that has not adopted the metric system. Americans also use periods to separate whole numbers from decimals, and commas to separate thousands from hundreds. Much of the rest of the world reverses this usage.

UNITED STATES	3,425.6
EUROPE	3.425,6

In the United States, the format for writing out and abbreviating dates is different from that of most other cultures:

UNITED STATES	March 2, 2012	3/2/12
EUROPE	2 March 2012	2/3/12
JAPAN	2012 March 2	12/3/2

These cultural variables are important in an obvious way: you can't send a fax to a person who doesn't have a fax machine. However, there is another set of cultural characteristics—those beneath the surface—that you also need to understand.

Understanding the Cultural Variables “Beneath the Surface”

Scholars of multicultural communication have identified cultural variables that are less obvious than those discussed in the previous section but just as important. Writing scholars Elizabeth Tebeaux and Linda Driskill (1999) explain six key variables and how they are reflected in technical communication.

- *Focus on individuals or groups.* Some cultures, especially in the West, value individuals more than groups. The typical employee doesn't see his or her identity as being defined by the organization. Other cultures, particularly in Asia, value groups more than individuals. The typical employee sees himself or herself more as a member of the organization than as an individual who works there.

Communication in individualistic cultures focuses on the writer's and reader's needs rather than on those of the two organizations. Writers use the pronoun *I* rather than *we*. Letters are addressed to the principal reader and signed by the writer.

Communication in group-oriented cultures focuses on the organization's needs by emphasizing the benefits to be gained by the two organizations through a cooperative relationship. Writers emphasize the relationship between the writer and reader rather than the specific technical details of the message. Writers use *we* rather than *I*. They might address letters to “Dear Sir” and use their organization's name, not their own, in the complimentary close.

- *Distance between business life and private life.* In some cultures, especially in the West, people separate their business lives from their private lives. When the workday ends, they are free to go home and spend their time as they wish. In other cultures, particularly in Asia, people see a much smaller

distance between their business lives and their private lives. Even after the day ends, they still see themselves as employees of the organization.

Cultures that value individualism tend to see a great distance between business and personal lives. In these cultures, communication focuses on technical details, with relatively little reference to personal information about the writer or the reader.

Cultures that are group oriented tend to see a smaller distance between business life and private life. In these cultures, communication contains much more personal information—about the reader’s family and health—and more information about general topics, for example, the weather and the seasons. The goal is to build a formal relationship between the two organizations. Both the writer and the reader are, in effect, on call after business hours and are likely to transact business during long social activities such as elaborate dinners or golf games.

- *Distance between ranks.* In some cultures, the distance in power and authority between workers within an organization is small. This small distance is reflected in a close working relationship between supervisors and their subordinates. In other cultures, the distance in power and authority between workers within an organization is great. Supervisors do not consult with their subordinates. Subordinates use formal names and titles—“Mr. Smith,” “Dr. Jones”—when addressing higher-ranking people.

Individualistic cultures that separate business and private lives tend to have a smaller distance between ranks. In these cultures, communication is generally less formal. Informal documents (e-mails and memos) are appropriate, and writers often sign their documents with their first names only. Keep in mind, however, that many people in these cultures resent inappropriate informality, such as letters or e-mails addressed “Dear Jim” if they have never met the writer.

In cultures with a great distance between ranks, communication is generally formal. Writers tend to use their full professional titles and to prefer formal documents (such as letters) to informal ones (such as memos and e-mails). Writers make sure their documents are addressed to the appropriate person and contain the formal design elements (such as title pages and letters of transmittal) that signal their respect for their readers.

- *Nature of truth.* Some cultures feel that truth is a universal concept. An action is either wrong or right. There are no exceptions. If facts are presented clearly and comprehensively, all reasonable readers will understand them in the same way. People in other cultures think that truth is a more complex and relative concept and believe that reasonable people can have different perspectives on complex ethical issues.

In cultures that take a universal approach to truth, such as the United States, documents tend to be comprehensive and detailed. They

spell out the details of the communication, leaving nothing to interpretation. In cultures that take a relative view of truth, documents tend to be less detailed and less conclusive. Discussions might seem vague, as if the writer is unwilling to reach a clear conclusion.

- *Need to spell out details.* Some cultures value full, complete communication. The written text must be comprehensive, containing all the information a reader needs to understand it. These cultures are called *low context*. Other cultures value documents in which some of the details are merely implied. This implicit information is communicated through other forms of communication that draw upon the personal relationship between the reader and the writer, as well as social and business norms of the culture. These cultures are called *high context*.

Low-context cultures tend to be individualistic; high-context cultures tend to be group oriented. In low-context cultures, writers spell out all the details. Documents are like contracts in that they explain procedures in great detail and provide specific information that indicates the rights and responsibilities of both the writer and the readers. In high-context cultures, writers tend to omit information that they consider obvious because they don't want to insult the reader. For example, a manual written for people in a high-context culture might not mention that a remote control for a television set requires batteries, because everyone knows that a remote control needs a power source.

- *Attitudes toward uncertainty.* In some cultures, people are comfortable with uncertainty. They communicate less formally and rely less on written policies. In many cases, they rely more on a clear set of guiding principles, as communicated in a code of conduct or a mission statement. In other cultures, people are uncomfortable with uncertainty. Businesses are structured formally, and they use written procedures for communicating.

In cultures that tolerate uncertainty, written communication tends to be less detailed. Oral communication is used to convey more of the information that is vital to the relationship between the writer and the readers. In cultures that value certainty, communication tends to be detailed. Policies are lengthy and specific, and forms are used extensively. Everyone knows what he or she is supposed to do, and there is a wide distance between ranks.

As you consider this set of cultural variables, keep four points in mind:

- *Each variable represents a spectrum of attitudes.* Terms such as *high-context* and *low-context*, for instance, represent the two end points on a scale. Most cultures occupy a middle ground.
- *The six variables do not line up in a clear pattern.* Although the variables sometimes correlate—for example, low-context cultures tend to be individualistic—in any one culture, the six variables do not form a consistent

pattern. For example, the dominant culture in the United States is highly individualistic rather than group oriented but only about midway along the scale of attitudes toward accepting uncertainty.

- *Different organizations within the same culture can vary greatly.* For example, one software company in Germany might have a management style that does not tolerate uncertainty, whereas another software company in that country might tolerate a lot of uncertainty.
- *An organization's cultural attitudes are fluid, not static.* How organizations operate is determined not only by the dominant culture but also by its own people. As new people join an organization, its culture changes. The IBM of 1992 is not the IBM of 2012.

For you as a communicator, this set of variables therefore offers no answers. Instead, it offers a set of questions. You cannot know in advance the attitudes of the people in an organization. You have to interact with them for a long time before you can reach even tentative conclusions. The value of being aware of the variables is that they can help you study the communications from people in that organization and become more aware of underlying values that affect how they will interpret your documents.

Considering Cultural Variables as You Write

The challenge of communicating effectively with a person from another culture is that you are communicating with a person, not a culture. You cannot be sure which cultures have influenced that person (Lovitt, 1999). For example, a 50-year-old Japanese-born manager for the computer-manufacturer Fujitsu in Japan has been shaped by the Japanese culture, but he also has been influenced by the culture of his company and of the Japanese computer industry in general. It is also likely that he has worked outside of Japan for several years and has absorbed influences from another culture.

A further complication is that when you communicate with a person from another culture, to that person *you* are from another culture, and you cannot know how much that person is trying to accommodate your cultural patterns. As writing scholar Arthur H. Bell (1992) points out, the communication between the two of you is carried out in a third, hybrid culture. When you write to a large audience, the complications increase. A group of managers for Fujitsu represents a far more complex mix of cultural influences than one manager for Fujitsu.

No brief discussion of cultural variables can answer questions about how to write for a particular multicultural audience. You need to study your readers' culture and, as you plan the document, seek assistance from someone native to the culture who can help you avoid blunders that might confuse or offend your readers.

Start by reading some of the basic guides to communicating with people from other cultures, and study guides to the particular culture you are inves-

tigating. In addition, numerous sites on the Internet provide useful guidelines that can help you write to people from another culture. Here, for instance, is an excerpt from a guide to writing letters to the Japanese (Anderson School, 2002):

A Japanese letter is the reverse of one in the West, in the sense that you proceed first from the general to the specific. You need to begin with the social niceties, with small talk about the weather, the holidays, or some seasonal reference. Include at least a paragraph of such material before getting to the heart of the correspondence. You may begin the business section with a phrase such as: “We are so happy that your business is becoming even more prosperous,” and then state your business in a “soft” manner. Even then, do not be overly direct or assertive. Use phrases like: “I am not sure . . .”; “I wonder if . . .”; “I hope this is not too bold a request but. . .” Also include some sort of reference to the personal, trusting relationship you have both put so much effort into, and how you desire its continuance. Your letter should end with a closing general phrase at the bottom, followed by the date. The date is given in the reverse order of dates in the West: the year, the month, and then the day.

If possible, study documents written by people in your audience. If you don’t have access to these, try to locate documents written in English by people from that culture. Figures 5.4 and 5.5 show two excerpts from documents that provide useful glimpses into cultural variables. Figure 5.4 is an excerpt from a statement by the president of a Japanese electronics company.

Figure 5.5 is from a training manual used by Indian Railways. The paragraph describes a training course that new employees are required to take.

Notice how the writer describes his company in terms of its long history and its cutting-edge technology. In Japan, a long history suggests trustworthiness.

He emphasizes the concept of fulfilling customers’ needs through high performance, safety, and environmental awareness.

Here he describes his company’s commitment to realizing a prosperous and sustainable society. This focus emphasizes the Japanese concept of living in harmony with the physical environment.

This year, FDK marks the 60th anniversary of the founding of the company. Keeping our customers in mind, we supply high performance batteries and electronic devices based on material technology which FDK has cultivated over many years and which increases the value and function of our customers’ products.

While the business environment in our product markets has been changing dramatically on a global scale as a result of progress from globalization and network technology, we strive for stable management from a global viewpoint. In response to our customers’ needs, we offer products and services created in pursuit of the highest possible performance, accompanied by safety and environmental friendliness.

To contribute to society through manufacturing, we aim to realize the affluent society by pursuing the realization of the 3 Es (Energy Security, Environmental Protection, and Economic Efficiency) to build a sustainable society.

Figure 5.4 Statement by a Japanese Electronics Company President

Source: Ono, 2010 <www.fdk.co.jp/company_e/message-e.html>.

There is no denying the fact that the Combined Civil Services Foundation Course, held for different Services at the Lal Bahadur Shastri National Academy of Administration (LBSNAA), Mussoorie, provides a great and unique opportunity for developing ‘*esprit de corps*’ [sic] and fostering appropriate attitudes and values in the young minds of the Probationers belonging to different Services. The importance of imbibing these values right in the beginning of the career of the officers can hardly be overemphasized.

This paragraph from a report by managers of Indian Railways describes a training course that new employees are required to take.

The reference to “esprit de corps” (group spirit) and “fostering appropriate attitudes and values in the young minds of the Probationers” suggests a culture in which age and seniority are considered to be the most important characteristics of a successful employee and in which it is the duty of elders to teach young people proper values.

Figure 5.5 Statement from an Indian Training Manual

Source: Indian Railways, 2010 <www.indianrailways.gov.in/indianrailways/directorate/mgt_ser/training_circulars/report_iras.pdf>.

Guidelines

Writing for Readers from Other Cultures

The following eight suggestions will help you communicate more effectively with multicultural readers.

- ▶ **Limit your vocabulary.** Every word should have only one meaning, as called for in Simplified English and in other basic-English languages.
- ▶ **Keep sentences short.** There is no magic number, but try for an average length of no more than 20 words.
- ▶ **Define abbreviations and acronyms in a glossary.** Don’t assume that your readers know what a GFI (ground fault interrupter) is, because the abbreviation is derived from English vocabulary and word order.
- ▶ **Avoid jargon unless you know your readers are familiar with it.** For instance, your readers might not know what a graphical user interface is.
- ▶ **Avoid idioms and slang.** These terms are culture specific. If you tell your Japanese readers that your company plans to put on a “full-court press,” most likely they will be confused.
- ▶ **Use the active voice whenever possible.** The active voice is easier for nonnative speakers of English to understand than the passive voice.
- ▶ **Be careful with graphics.** The garbage-can icon on the Macintosh computer does not translate well, because garbage cans have different shapes and can be made of different materials in other countries.
- ▶ **Be sure someone from the culture reviews your document.** Even if you have had help in planning the document, have it reviewed before you publish and distribute it.

In This Book

For a discussion of Simplified English, see Ch. 10, p. 252.

In This Book

For more about voice, see Ch. 10, p. 241.

In This Book

For more about graphics, see Ch. 12, p. 342.

INTERACTIVE SAMPLE DOCUMENT

Examining Cultural Variables in a Business Letter

These two versions of the same business letter were written by a sales manager for an American computer company. The first letter was addressed to a potential customer in the United States; the second version was addressed to a potential customer in Japan. The questions in the margin ask you to think about how the cultural variables affect the nature of the evidence, the structure of the letters, and their tone (see pp. 96–99).

July 3, 2012

Mr. Philip Henryson, Director of Purchasing
Allied Manufacturing
1321 Industrial Boulevard
Boise, ID 83756

Server Solutions
Cincinnati, OH 46539
Nadine Meyer
Director of Marketing

Dear Mr. Henryson:

Thank you for your inquiry about our PowerServer servers. I'm happy to answer your questions.

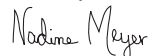
The most popular configuration is our PowerServer 3000. This model is based on the Intel® Xeon processor, ServerSure High-End UltraLite chipset with quad-processor PCI architecture, and embedded RAID. The system comes with our InstallIt system-management CD, which lets you install the server and monitor and manage your network with a simple graphical interface. With six PCI slots, the PowerServer 3000 is equipped with redundant cooling as well as redundant power, and storage expandability to 950 GB. I'm taking the liberty of enclosing the brochure for this system to fill you in on the technical details.

The PowerServer 3000 has performed extremely well on a number of industry benchmark tests. I'm including with this letter copies of feature articles on the system from *PC World*, *InternetWeek*, and *Windows Vista Magazine*.

It would be a pleasure for me to arrange for an on-site demo at your convenience. I'll give you a call on Monday to see what dates would be best for you. In the meantime, please do not hesitate to get in touch with me directly if you have any questions about the PowerServer line.

I look forward to talking with you next week.

Sincerely,



Nadine Meyer
Director of Marketing

Attachments:

- “PowerServer 3000 Facts at a Glance”
- “Another Winner from Server Solutions”
- “Mid-Range Servers for 2012”
- “Four New Dual-Processor Workhorses”

Mr. Kato Kirisawa, Director of Purchasing
Allied Manufacturing
3-7-32 Kita Urawa
Saitama City, Saitama Pref. 336-0002
Japan

Server Solutions
Cincinnati, OH 46539
Nadine Meyer
Director of Marketing

Dear Sir:

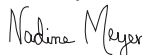
It is my sincere hope that you and your loved ones are healthy and enjoying the pleasures of summer. Here in the American Midwest, the warm rays of the summer sun are accompanied by the sounds of happy children playing in the neighborhood swimming pools. I trust that the same pleasant sounds greet you in Saitama City.

Your inquiry about our PowerServer 3000 suggests that your company is growing. Allied Manufacturing has earned a reputation in Japan and all of Asia for a wide range of products manufactured to the most demanding standards of quality. We are not surprised that your company requires new servers that can be expanded to provide fast service for more and more clients.

For more than 15 years, Server Solutions has had the great honor of manufacturing the finest computer servers to meet the needs of our valued customers all over the world. We use only the finest materials and most innovative techniques to ensure that our customers receive the highest-quality, uninterrupted service that they have come to expect from us.

One of my great pleasures is to talk with esteemed representatives such as yourself about how Server Solutions can help them meet their needs for the most advanced servers. I would be most gratified if our two companies could enter into an agreement that would be of mutual benefit.

Sincerely,



Nadine Meyer
Director of Marketing

Attachments:

- “PowerServer 3000 Facts at a Glance”
- “Another Winner from Server Solutions”
- “Mid-Range Servers for 2012”
- “Four New Dual-Processor Workhorses”

2012 July 3

1. How does the difference in the salutation (the “Dear . . .” part of the letter) reflect a cultural difference?
2. Does the first paragraph of the second letter have any function beyond delaying the discussion of business?
3. What is the function of telling Mr. Kirisawa about his own company? How does this paragraph help the writer introduce her own company’s products?
4. To a reader from the United States, the third paragraph would probably seem thin. What aspect of Japanese culture makes it effective in the context of this letter?
5. Why doesn’t the writer make a more explicit sales pitch at the end of the letter?

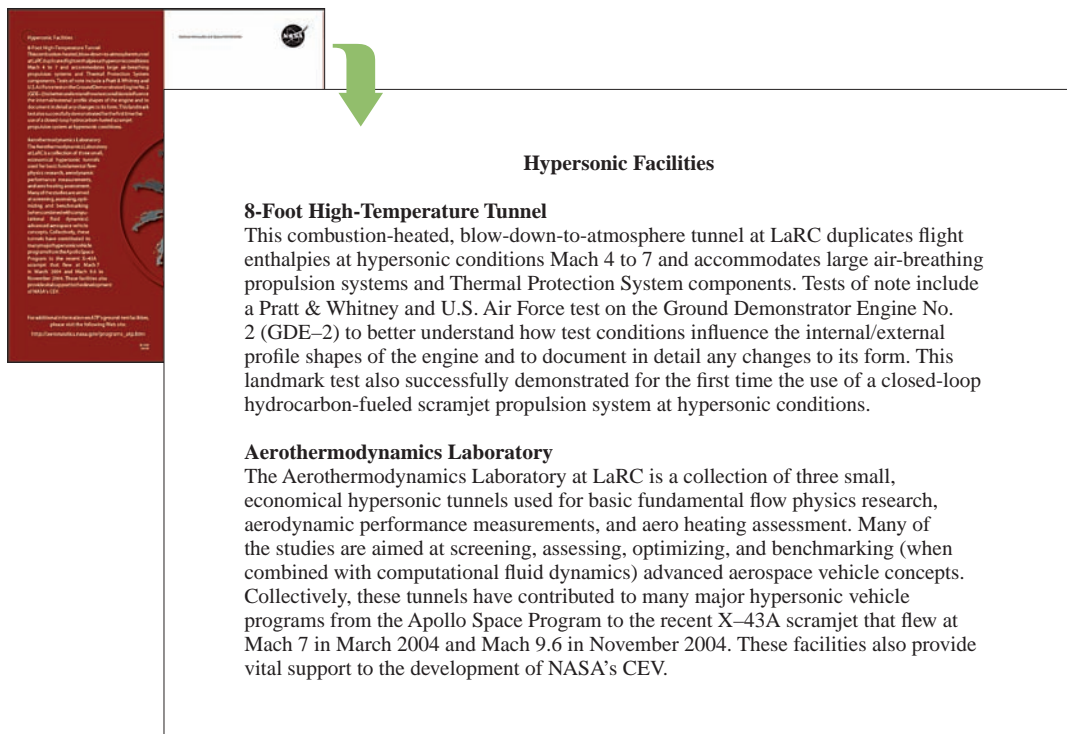
On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 5 on <bedfordstmartins.com/techcomm>.

APPLYING WHAT YOU HAVE LEARNED ABOUT YOUR AUDIENCE

You want to use what you know about your audience to tailor your communication to their needs and preferences. Obviously, if your most important reader does not understand the details of DRAM technology, you cannot use the concepts, vocabulary, and types of graphics used in that field. If she uses one-page summaries at the beginning of her documents, decide whether they will work for your document. If your primary reader's paragraphs always start with clear topic sentences, yours should, too.

The following figures show some of the ways writers have applied what they know about their audiences in text and graphics. Figure 5.6 shows samples of text that demonstrate the writer's knowledge of a specific audience. In Figure 5.6a, a brief description of hypersonic facilities overseen by NASA, the writer uses highly technical vocabulary and concepts. A reader who would need this level of technical information would understand this passage.



Hypersonic Facilities

8-Foot High-Temperature Tunnel

This combustion-heated, blow-down-to-atmosphere tunnel at LaRC duplicates flight enthalpies at hypersonic conditions Mach 4 to 7 and accommodates large air-breathing propulsion systems and Thermal Protection System components. Tests of note include a Pratt & Whitney and U.S. Air Force test on the Ground Demonstrator Engine No. 2 (GDE-2) to better understand how test conditions influence the internal/external profile shapes of the engine and to document in detail any changes to its form. This landmark test also successfully demonstrated for the first time the use of a closed-loop hydrocarbon-fueled scramjet propulsion system at hypersonic conditions.

Aerothermodynamics Laboratory

The Aerothermodynamics Laboratory at LaRC is a collection of three small, economical hypersonic tunnels used for basic fundamental flow physics research, aerodynamic performance measurements, and aero heating assessment. Many of the studies are aimed at screening, assessing, optimizing, and benchmarking (when combined with computational fluid dynamics) advanced aerospace vehicle concepts. Collectively, these tunnels have contributed to many major hypersonic vehicle programs from the Apollo Space Program to the recent X-43A scramjet that flew at Mach 7 in March 2004 and Mach 9.6 in November 2004. These facilities also provide vital support to the development of NASA's CEV.

Figure 5.6 Using Text to Appeal to Readers' Needs, Interests, and Attitudes

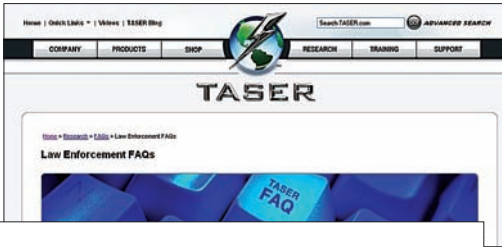
a. Text addressed to a technical audience

Source: National Aeronautics and Space Administration, 2011 <www.aeronautics.nasa.gov/atp/documents/B-1240.pdf>.

In Figure 5.6b, an excerpt from an FAQ from Taser, the maker of stun guns, the writer is addressing high-level police officers who are responsible for ordering police equipment. Here the writer is explaining how the product provides a documentary record of its use by officers, thus removing one question that readers might have about the controversial product.

The item in Figure 5.6c, appearing in the newsletter of the Michael J. Fox Foundation for Parkinson's Research, is addressed to donors and potential donors to the organization, as well as to anyone else interested in the foundation's activities. The purpose of this article is to provide a brief summary of one set of research studies that the foundation supports. Note that the final sentence of the statement links to more detailed descriptions of the supported research.

The writing throughout is addressed to a nonexpert audience. The writer assumes that the audience understands such terms as "REM" and "cognitive activity." Notice that at the beginning and end of the passage, the writer addresses the interests of donors and potential donors by emphasizing the goal of the research: to learn more about an important aspect of Parkinson's disease that is not yet fully understood.



Home | Quick Links | Video | TASER Blog | Search TASER.com | ADVANCED SEARCH

COMPANY | PRODUCTS | SHOP | RESEARCH | TRAINING | SUPPORT

TASER

Home » Research » LEOs » Law Enforcement FAQs

Law Enforcement FAQs

TASER FAQ

There are three recording modes: Video only, audio only, and event (audio & video). The available modes are configurable by the department administrator. For example, in states where audio recording is illegal, the department can configure the AXON unit to always record video only.

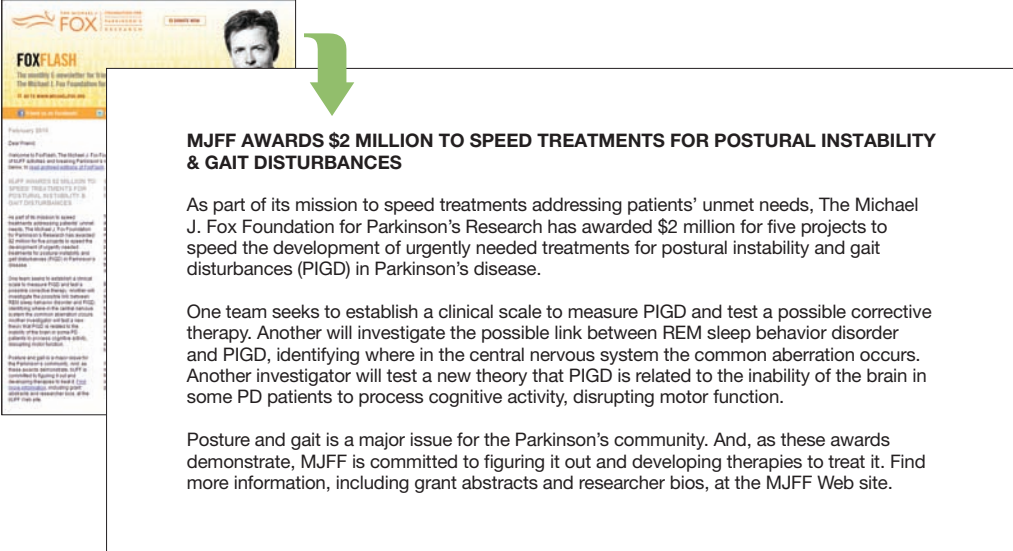
These three modes can be selected depending on the circumstances. Video only is the default mode during non-event times. This prevents recording of general conversations when the officer is not involved in an actual event.

The event mode is activated manually by the officer and records both audio and video in addition to increasing the video frame rate for higher quality resolution.

Figure 5.6 (continued)

b. Text addressed to decision makers

Source: TASER International, 2010 <www.taser.com/research/Pages/LawEnforcementFAQs.aspx>.



FOXFLASH

The Michael J. Fox Foundation for Parkinson's Research

MJFF AWARDS \$2 MILLION TO SPEED TREATMENTS FOR POSTURAL INSTABILITY & GAIT DISTURBANCES

As part of its mission to speed treatments addressing patients' unmet needs, The Michael J. Fox Foundation for Parkinson's Research has awarded \$2 million for five projects to speed the development of urgently needed treatments for postural instability and gait disturbances (PIGD) in Parkinson's disease.

One team seeks to establish a clinical scale to measure PIGD and test a possible corrective therapy. Another will investigate the possible link between REM sleep behavior disorder and PIGD, identifying where in the central nervous system the common aberration occurs. Another investigator will test a new theory that PIGD is related to the inability of the brain in some PD patients to process cognitive activity, disrupting motor function.

Posture and gait is a major issue for the Parkinson's community. And, as these awards demonstrate, MJFF is committed to figuring it out and developing therapies to treat it. Find more information, including grant abstracts and researcher bios, at the MJFF Web site.

Figure 5.6 (continued)

c. Text addressed to donors and the public

Source: Michael J. Fox Foundation for Parkinson's Research, 2010 <www.michaeljfox.org/about_publications_foxFlashEmail.cfm?FileID=43>.

Figure 5.7 shows examples that combine text and graphics to meet various audiences' needs.

Figure 5.7 Using Verbal and Visual Techniques to Appeal to Readers' Needs, Interests, and Attitudes

Source: Climate Savers Computing, 2010 <www.climatesaverscomputing.org/component/option.com_surveys/act.view_survey/lang,en/survey,3%20Steps%20to%20Go%20Green/>.

This screen shows a good understanding of general readers who are interested in learning some simple ways to reduce their carbon footprint. The screen presents clear, basic information, followed by a brief interactive feature that prompts the reader to take action.



climate savers computing

English search... search

home about learn act share tools login

3 steps to go green

In mere minutes, you can learn how to slow climate change with your computer.

*** 1 of 3: turn on power management**

Did you know? The average desktop PC wastes nearly half of the energy it consumes as heat. This wasted electricity translates to higher electricity bills and increased greenhouse gas emissions.

Fun Fact: Using power management features on your computer can save nearly half a ton of CO2 and more than \$60 a year in energy costs.

What you can do: Making some simple changes to your computer's power management settings is an easy and inexpensive way to make a difference in your environmental impact. With a few mouse clicks, your computer can be set to automatically go to "sleep" when it's not in use.

Power Management: What are you doing?

I'm already using Power Management, thanks!

Now that I know about Power Management, I will turn it on.

I probably won't use Power Management. Why?

Next >>

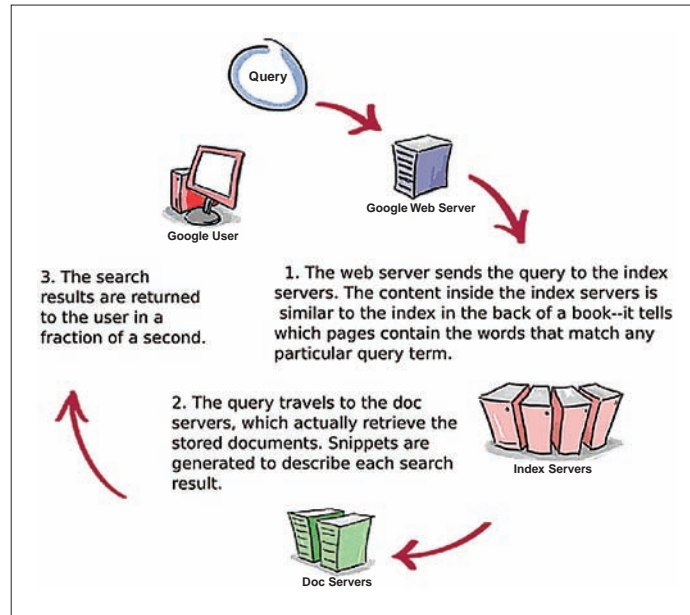


Figure 5.7 (continued)

This image, from Google, is addressed to the general reader. Although almost everyone who uses the Internet has done a search using Google, most people do not understand the technology behind a search. Although the process is highly technical, the cartoon drawings, the simple flowchart, and the clear explanations of such terms as "index server" and "doc server" make it a very accessible description.

Source: Google, 2010 <www.google.com/corporate/tech.html>.

ubuntu
documentation

Search

★ Official Documentation

Official Ubuntu Documentation

This site is where you can find the official documentation developed and maintained by the Ubuntu Documentation Project.

Choose your version of Ubuntu below to access the documentation for that version ([find out which version of Ubuntu you are running](#)).

If you don't find what you are looking for, visit the [community contributed documentation](#) for even more material!

- [Ubuntu 10.04 LTS](#) - the current long term support version, released in April 2010, codenamed *Lucid Lynx*.
- [Ubuntu 9.10](#) - previous stable version, released in October 2009, codenamed *Karmic Koala*.
- [Ubuntu 9.04](#) - previous stable version, released in April 2009, codenamed *Jaunty Jackalope*.
- [Ubuntu 8.04 LTS](#) - previous long term support version, released in April 2008, codenamed *Hardy Heron*.
- [Ubuntu 6.06 LTS](#) - previous long term support version, released in June 2006, codenamed *Dapper Drake*.

If your version of Ubuntu is not listed above, it is no longer supported and does not receive security or critical fixes. Documentation for these releases of Ubuntu is no longer supplied, but information on how to upgrade to supported versions of Ubuntu can be found at the [Upgrade Notes](#) page.

The material in this document is available under a free license, see [Legal](#) for details
For information on contributing see the [Ubuntu Documentation Team wiki page](#). To report a problem, visit the [bug page for Ubuntu Documentation](#)

This portion of a screen, from the wiki written and edited by people who use the open-source operating system called Ubuntu, appeals to the interests and attitudes of its readers. Because readers of this wiki are likely to be highly skilled computer users who are interested in finding documentation for the version of the software they are using, they are fully comfortable with the simple bullet lists and links, and they do not want content-free graphics. Notice that the footer links to other pages that explain how to do tasks these readers might want to do, including finding additional documentation, contributing to the wiki, and reporting bugs.

Source: Ubuntu Documentation Team, 2010 <<https://help.ubuntu.com/>>.

ETHICS NOTE**Meeting Your Readers' Needs Responsibly**

A major theme of this chapter is that effective technical communication meets your readers' needs. What this theme means is that as you plan, draft, revise, and edit, you should always be thinking of who your readers are, why they are reading your document, and how they will read the document. For example, if your readers include many nonnative speakers of English, you will adjust your vocabulary, sentence structure, and other textual elements so that they can understand your document easily. If your readers will be seated at computer terminals as they use your document, you will choose a page size that lets your readers place the document next to their terminals.

Meeting your readers' needs does *not* mean writing a misleading or inaccurate document. If your readers want you to slant the information, omit crucial data, or downplay bad news, they are asking you to act unethically. You are under no obligation to do so. For more information on ethics, see Chapter 2.

USING GRAPHICS AND DESIGN FOR MULTICULTURAL READERS

One of the challenges of writing to people from another culture is that they are likely to be nonnative speakers of English. One way to overcome the language barrier is to use effective graphics and appropriate document design.

However, the use of graphics and design can differ from culture to culture. A business letter written in Australia uses a different size paper and a different format than in the United States. An icon for a file folder in a software program made in the United States could confuse European readers, who use a different size and shape for file folders (Bosley, 1999). A series of graphics arranged left to right could confuse readers from the Middle East, who read from right to left. For this reason, you should study samples of documents written by people from the culture you are addressing to learn the important differences.

WRITING FOR MULTIPLE AUDIENCES

Many documents of more than a few pages are addressed to more than one reader. Often, multiple audiences consist of people with widely different backgrounds, needs, and attitudes.

If you think your document will have a number of readers, consider making it *modular*: break it up into components addressed to different readers. A modular report might contain an executive summary for managers who don't have the time, knowledge, or desire to read the whole report. It might also contain a full technical discussion for expert readers, an implementa-

 **In This Book**

For more about design for multicultural readers, see Ch. 11, p. 296. For more about graphics for international readers, see Ch. 12, p. 342.

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This table of contents shows the organization of a modular document.

Few readers will want to read the whole document—it's almost 1,000 pages long.

Most readers will want to read the 18-page summary for policymakers.

Some readers will want to read selected sections of the technical summary or "annexes" (appendixes).

Figure 5.8 Table of Contents for a Modular Report

Source: Solomon et al., 2007, p. xix.

tion schedule for technicians, and a financial plan in an appendix for budget officers. Figure 5.8 shows the table of contents for a modular report.

DETERMINING YOUR PURPOSE

Once you have identified and analyzed your audience, it is time to examine your purpose. Ask yourself this: "What do I want this document to accomplish?" When your readers have finished reading what you have written, what do you want them to *know* or *believe*? What do you want them to *do*? Your writing should help your readers understand a concept, hold a particular belief, or carry out a task.

In defining your purpose, think of a verb that represents it. (Sometimes, of course, you have several purposes.) The following list presents verbs in two categories: those used to communicate information to your readers and those used to convince them to accept a particular point of view.

Communicating verbs	Convincing verbs
authorize	assess
define	evaluate
describe	forecast
explain	propose
illustrate	recommend
inform	request
outline	
present	
review	
summarize	

This classification is not absolute. For example, *review* could in some cases be a *convincing verb* rather than a *communicating verb*: one writer's review of a complicated situation might be very different from another's.

Here are a few examples of how you can use these verbs to clarify the purpose of your document (the verbs are italicized).

- This wiki *presents* the draft of our policies on professional use of social media within the organization.
- This letter *authorizes* the purchase of six new laptops for the Jenkintown facility.
- This memo *recommends* that we revise the Web site as soon as possible.

Sometimes your real purpose differs from your expressed purpose. For instance, if you want to persuade your reader to lease a new computer system rather than purchase it, you might phrase the purpose this way: *to explain the advantages of leasing over purchasing*. As mentioned earlier, many readers don't want to be *persuaded* but are willing to learn new facts or ideas.

GAINING MANAGEMENT'S APPROVAL

After you have analyzed your audience and purpose, consider gaining the approval of management before you proceed. The larger and more complex the project and the document, the more sense it makes to be sure that you are on the right track before you invest too much time and effort.

For example, suppose you are planning a CAD equipment project. You already know your audience and purpose, and you are drafting a general outline in your mind. But before you actually start to write an outline or gather the information you will need, spend another 10 or 15 minutes making sure your primary reader agrees with your thinking by submitting to your supervi-

sor a brief description of your plans. You don't want to waste days or even weeks working on a document that won't fulfill its purpose. If you have misunderstood what your supervisor wants, it is far easier to fix the problem at this early stage.

Your description can also serve another purpose: if you want your reader's views on which of two strategies to pursue, you can describe each one and ask your reader to state a preference.

What application should you use? It doesn't matter. Just be sure you clearly and briefly state what you are trying to do. Here is an example of the description you might submit to your boss about the CAD equipment. In composing this description of her plan, the writer drew on audience profile sheets for her two principal readers. She describes a logical, rational strategy for proposing the equipment purchase.

Juan:

Please tell me if you think this is a good approach for the proposal on CAD equipment.

Outright purchase of the complete system will cost more than \$1,000, so you would have to approve it and send it on for Tina's approval. (I'll provide leasing costs as well.) I want to show that our CAD hardware and software are badly out-of-date and need to be replaced. I'll be thorough in recommending new equipment, with independent evaluations in the literature, as well as product demonstrations. The proposal should specify what the current equipment is costing us and show how much we can save by buying the recommended system.

I'll call you later today to get your reaction before I begin researching what's available.

Renu

Once you have received your primary reader's approval, you can feel confident about starting to gather information.

The purpose of the memo

A statement of the audience for the proposal

A statement of the purpose, followed by early statements of the scope of the document

A statement of how the writer intends to follow up on this memo

REVISING INFORMATION FOR A NEW AUDIENCE AND PURPOSE

Chapter 2 introduced the concept of boilerplate information: standard text or graphics that are plugged into various documents published by your organization (see p. 23). Often, however, when you write to a new audience or have a new purpose, you need to revise the information.

Figure 5.9 on page 112 shows an excerpt from a press release from Chevrolet (2011) about its decision to substitute a tire-inflator kit for a spare tire on one of its models. Figure 5.10 on page 113 is an excerpt from an online article based on the press release.

A press release is a statement distributed by a company to the news media to promote a new development at the company. The company hopes the news media will print the news release, thereby publicizing the development. Notice the marketing spin in the title of the press release. The writer is trying to attract potential customers.

Press releases often include quotations from company officers that highlight the features or benefits of the new product. In addition, press releases often provide flattering information about the company itself.

Getting Rid of Spare Tire Helps Boost Chevy Cruze MPG

MILFORD, Mich. – Changing a flat tire on the side of a busy freeway can be a dirty and dangerous job. The 2011 Chevrolet Cruze offers a safer option: an on-board tire inflator kit that also helps improve fuel efficiency by shedding 26 pounds of spare tire and jacking hardware.

The inflator kit is among 42 changes to the Cruze Eco that help it to an EPA-estimated 42 mpg on the highway, the best highway mileage of any non-hybrid, gasoline-fueled, compact available in the U.S. market.

“Getting rid of something as important as the spare tire wasn’t a decision we made lightly,” said Terry Connolly, GM director of Tire and Wheel Systems. “The universal implementation of tire pressure monitoring systems over the past five years has significantly reduced the likelihood that a flat tire will leave you stranded by the side of the road.”

A Tire Pressure Monitoring System provides a warning on the instrument cluster allowing a driver to act before tire damage occurs. The trunk-mounted inflator can be plugged into the 12-volt accessory socket inside the car and be used to re-pressurize the tire with no additional equipment. If the tire has been punctured by a screw, nail or other object, the inflator can inject a sealant capable of plugging holes of up to one-quarter-inch in diameter in the tread area.

The process takes just minutes with much less risk than a tire change. Re-inflated tires should always be inspected at a repair facility as soon as possible after the car gets back on the road.

If a tire is too severely damaged to be repaired with the inflator kit, drivers can press the blue OnStar button on the rearview mirror to request emergency roadside assistance. Cruze and all new Chevrolet, Buick, GMC and Cadillac models are equipped with the embedded OnStar telematics system that can provide roadside assistance, automatic crash response, turn-by-turn directions and other safety and security features.

Figure 5.9 Press Release

Source: General Motors, 2011 <http://media.gm.com/content/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2011/May/0520_cruze>.

GM ditches spare tires on the Chevy Cruze Eco

DETROIT—As automakers try to produce cars consumers want to buy in light of higher gas prices, the 2011 Chevrolet Cruze Eco was built purposefully without a spare tire to make the vehicles lighter and more fuel efficient.

Instead of a spare tire, the Cruze features a tire-inflator kit that makes the vehicle 26 pounds lighter, and more fuel efficient, than if it had a traditional spare tire and jack, Chevrolet said in a statement today. . . .

The Cruze averages 42 mpg on the highway and 28 mpg in the city, according to Environmental Protection Agency estimates.

Terry Connolly, the director of GM's Tire and Wheel Systems, said in the statement that GM decided to remove spare tires from the Cruze because, as technology has improved, flat tires have become less common.

"Getting rid of something as important as the spare tire wasn't a decision we made lightly," Connolly said. "The universal implementation of tire pressure monitoring systems over the past five years has significantly reduced the likelihood that a flat tire will leave you stranded by the side of the road."

The OnStar system, equipped in all GM vehicles, also made the decision to ditch the spare tire easier, GM spokesman Sam Abuelsamid said. OnStar provides its subscribers with access to immediate roadside assistance.

So, instead of changing the flat tire, Cruze drivers will have to take the tire-inflator kit out of their trunk, plug it into the 12-volt socket inside the car and then re-inflate the tire. If the tire was punctured, the inflator can plug up holes in the tread of up to .25 inches in diameter by injecting sealant into the tire.

Gene Peterson, a senior engineer at *Consumer Reports* who oversees the publication's tire testing, said in a telephone interview that he wasn't enamored with tire-inflator kits. Peterson said the sealant that comes with the kits can only fix small punctures in the tread of the tire—not the tire's sidewall.

Peterson added that unlike spare tires, drivers need to replace the sealant-fixed tires soon after making the repairs, something that some drivers may not be inclined to do.

The tires could re-puncture and damage the wheel of the car if not replaced quickly, which could result in what Peterson called "a muddy situation."

The title of this analysis of the corporate decision is almost identical to the title of the press release. The writer begins by presenting factual information from the press release.

The writer then begins to analyze the information from the press release. He consults an expert who offers a different perspective on the automaker's decision to give up spare tires on this model.

Figure 5.10 Article Based on a Press Release

Source: Lichterman, 2011 <www.autonews.com/apps/pbcs.dll/article?AID=/20110520/OEM04/110529987/1147>.

Writer's Checklist

Following is a checklist for analyzing your audience and purpose. Remember that your document might be read by one person, several people, a large group, or several groups with various needs.

- Did you fill out an audience profile sheet for your primary and secondary audiences? (p. 85)

In analyzing your audience, did you consider the following questions about each of your most important readers? (p. 87)

- What is your reader's educational background? (p. 87)
- What is your reader's professional experience? (p. 87)
- What is your reader's job responsibility? (p. 87)
- What are your reader's personal characteristics? (p. 87)
- What are your reader's personal preferences? (p. 88)
- What are your reader's cultural characteristics? (p. 88)
- Why is the reader reading your document? (p. 88)
- What is your reader's attitude toward you? (p. 89)
- What is your reader's attitude toward the subject? (p. 89)
- What are your reader's expectations about the subject? (p. 89)
- What are your reader's expectations about the document? (p. 90)
- How will your reader read your document? (p. 90)
- What is your reader's reading skill? (p. 91)
- What is the physical environment in which your reader will read your document? (p. 91)

In learning about your readers, did you

- determine what you already know about them? (p. 91)
- interview people? (p. 91)
- read about your audience online? (p. 92)
- search social media for documents your audience has written? (p. 92)

In planning to write for an audience from another culture, did you consider the following cultural variables:

- political? (p. 95)
- economic? (p. 95)
- social? (p. 95)
- religious? (p. 95)
- educational? (p. 95)
- technological? (p. 95)
- linguistic? (p. 95)

In planning to write for an audience from another culture, did you consider the other set of cultural variables:


- focus on individuals or groups? (p. 96)
- distance between business life and private life? (p. 96)
- distance between ranks? (p. 97)
- nature of truth? (p. 97)
- need to spell out details? (p. 98)
- attitudes toward uncertainty? (p. 98)

In writing for a multicultural audience, did you

- limit your vocabulary? (p. 101)
- keep sentences short? (p. 101)
- define abbreviations and acronyms in a glossary? (p. 101)
- avoid jargon unless you know that your readers are familiar with it? (p. 101)
- avoid idioms and slang? (p. 101)
- use the active voice whenever possible? (p. 101)
- use graphics carefully? (p. 101)
- have the document reviewed by someone from the reader's culture? (p. 101)

- In writing for multiple audiences, did you consider creating a modular document? (p. 108)
- Did you state your purpose in writing and express it in the form of a verb or verbs? (p. 109)
- Did you get management's approval of your analysis of audience and purpose? (p. 110)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1. INTERNET EXERCISE** Choose a 200-word passage from a technical article addressed to an expert audience, one related to your major course of study. (You can find a technical article on the Web by using a directory search engine, such as Yahoo! Directory, selecting a subject area such as “science,” then selecting “scientific journals.” In addition, many federal government agencies publish technical articles and reports on the Web.) Rewrite the passage so that it is clear and interesting to the general reader. Submit the original passage to your instructor along with your revision.
- 2.** The following passage is an advertisement from a translation service. Revise the passage to make it more appropriate for a multicultural audience. Submit the revision to your instructor.

If your technical documents have to meet the needs of a global market but you find that most translation houses are swamped by the huge volume, fail to accommodate the various languages you require, or fail to make your deadlines, where do you turn?

Well, your search is over. Translations, Inc. provides comprehensive translations in addition to full-service documentation publishing.

We utilize ultrasophisticated translation programs that can translate a page in a blink of an eye. Then our crack linguists comb each document to give it that personalized touch.

No job too large! No schedule too tight! Give us a call today!

- 3. INTERNET EXERCISE** Study the Web site of a large manufacturer of computer products, such as Hewlett-Packard, Acer, Dell, or Lenovo. Identify three different pages that address different audiences and fulfill different purposes. Here is an example:

Name of the page: Lenovo Group Fact Page

Audience: prospective investors

Purpose: persuade the prospective investor to invest in the company

Be prepared to share your findings with the class.

- 4. GROUP/INTERNET EXERCISE** Form small groups and study two Web sites that advertise competing products. For instance, you might choose the Web sites of two carmakers, two television shows, or two music publishers. Have each person in the group, working *alone*, compare and contrast the two sites according to these three criteria:
 - a. the kind of information they provide: hard, technical information or more emotional information
 - b. the use of multimedia such as animation, sound, or video
 - c. the amount of interactivity they invite, that is, the extent to which you can participate in activities while you visit the site

After each person has separately studied the sites and taken notes about the three points, come together as a group. After each person shares his or her findings, discuss the differences as a group. Which aspects of these sites caused the most difference in group members' reactions? Which aspects seemed to elicit the most consistent reactions? In a brief memo to your instructor, describe and analyze how the two sites were perceived by the different members of the group.

Case 5: Reaching Out to a New Audience

Background

You are a student intern working in the marketing department at Jitterbug, a company that sells cell-phone service, primarily to older Americans. Your supervisor, Jackie Hartung, has called a meeting with you and three other student interns to discuss a project that she thinks would be right for you.

“As you know,” Jackie says, “Jitterbug has carved out a sizable niche in the cell-phone market by selling phones and phone service to baby boomers and beyond, based on two principles: phones that are simple and easy to use, and no-contract plans that meet our customers' needs at reasonable prices. That's why we've been written up in major papers and magazines, appeared on

network magazine shows, and won a number of prestigious awards from design organizations, business groups, and advocates for the elderly.

“Here’s how I’d like you all to help. We’re doing a marketing study that calls for your expertise. Bobby,” she says to one of the interns, “how long have you been using cell phones?”

“Since I was about 14,” Bobby says. “My parents wanted to be able to track me down.”

Jackie laughs. “Yeah, I’ve got two teenage girls. Sharon, when you leave your apartment in the morning, what’s the likelihood you’ve got your cell with you?”

“I’m not leaving the apartment without my cell. Simple as that.”

“Okay,” Jackie says, “bottom line is each of you lives with your phone, and you’ve probably had a phone for eight or ten years. So you’ve had, probably, two or three different phones and at least a couple of different service plans. You’re my experts. The marketing study we’re planning is this: what is the feasibility of broadening our marketing to appeal to a different demographic?”

“We’ve gotten a number of comments from our customers that make us think that our simple phones and cell service might appeal to a younger base: maybe people your age, but certainly people the age of your parents. A lot of parents of teens want their kids to have access to a phone but they really don’t want their kids texting and sending photos and surfing. They want their kids to receive their calls and make a few calls—that’s all.” She pauses.

“Okay,” you say, “how can we help?”

“I want you to take a close look at our site and think about how much we’d have to change it to pull in a

younger demographic. Look at this page, for instance.” (See Document 5.1.) “It’s great for our current market: simple, large text, easy navigation. By contrast,” Jackie says, look at this page, from Verizon.” (See Document 5.2.)

“I’m not asking you to simply copy what you see companies like Verizon doing. But I want your opinion on whether it’s possible to change our approach to make it a little more appealing to a younger demographic, such as the parents of teens and college students.”

Your Assignment

1. Write a 1,000-word memo to Jackie Hartung responding to her request for your thinking about whether it would be difficult or simple to broaden the appeal of the Jitterbug site. What are the main features of the Jitterbug site that would need to be changed? Is it the graphics? The design of the pages? The textual information? Would you recommend changing all the major pages or simply adding a few new pages to appeal to the new target demographic? How could you appeal to the new target demographic without alienating your current demographic?
2. Using a word-processing program, a graphics program, or pencil and paper, draw two or three new or revised pages for the site that might appeal to the new target demographic. Either in the drawings or separately, include new text that would explain how Jitterbug would be an attractive and useful product for the new target demographic. Describe the graphics or photographs that would be most effective.

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Jitterbug Community

Want to hear the real story? Just ask our customers: How do you jitterbug?
 People all across America are sharing their Jitterbug stories with us. We'd love to hear from you too!
[Send Us Your Story](#)

Featured Stories
Maggie S., Denver, Colorado "Finally, a phone for those who want their cell phone to just be a phone. My Jitterbug cell phone is easy, beautiful and convenient. There are no roaming fees and no contracts. It's perfect! Thank you, Jitterbug. I'm in love with you!"

Susan L., Santa Rosa, California "If you think the new Jitterbug J is only for older people, think again. I've had two different cell phones and found them both to be too complicated. I didn't need my phone to take photos, turn on my TV or play music. I just wanted to talk, one call at a time. We are very satisfied. Simplicity in a complicated world. What could be better? We are jazzed to be doing the Jitterbug."



Press Releases
 Click here to browse through several press releases and stories about Jitterbug.
[Press Releases Home](#)

Tell a Friend
 Spread the word and earn a \$25 credit.
[Tell a Friend Home](#)

Jitterbug in the News
 Click [here](#) to read the articles about our award winning phones.
 Click [here](#) to visit our Awards page.

FAQ's | compare jitterbug | about us | contact us | careers | privacy policy | resources | terms of use | site map
 Created with worldwide leader Samsung.

Document 5.1 The Jitterbug Community Page


Source: Jitterbug, 2010 <www.jitterbug.com/Community/>.

Welcome. What can we help you with today? [Español >](#)

Wireless >
 Wireless service, devices, and accessories.

Residential >
 TV, Internet and landline phone for your home.

Business >
 Services and tools for all your business needs.



Corporate: [Verizon](#) | [Verizon Wireless](#)

[About Us](#) | [Contact Us](#) | [Store Locator](#) | [Careers](#) | [Verizon ThirdParty](#) | [Site Map](#) | [Privacy Policy](#) | [Terms and Conditions](#) | [Site Feedback](#) | © 2010 Verizon

Document 5.2 The Verizon Home Page

Source: Verizon, 2010 <www22.verizon.com/content/verizonglobalhome/ghp_landing.aspx>.

CHAPTER 6

Researching Your Subject



Rhoda Sidney/The Image Works.

In the workplace, you will conduct research all the time.

In the workplace, you will conduct research all the time. As a buyer for a clothing retailer, for example, you might need to determine whether a new line of products would be successful in your store. As a civil engineer, you might need to decide whether to replace your company's traditional surveying equipment with GPS-based gear. And as a pharmacist, you might need to determine what medication a patient is taking and find information on potentially harmful drug interactions.

Although you will conduct some of this research by consulting traditional printed sources, most of your research will involve online sources. You will consult Web sites, blogs, and discussion boards, and you might listen to podcasts or watch videos. Like the U.S. Census worker pictured in the photograph, sometimes you will interview people. Regardless of which technique you use, your challenge will be to sort the relevant information from the irrelevant, and the accurate from the bogus.

This chapter focuses on conducting primary research and secondary research. *Primary research* involves creating technical information yourself. *Secondary research* involves collecting information that other people have already discovered or created. This chapter presents secondary research first. Why? Because you will probably do secondary research first. To design the experiments or the field research that goes into primary research, you need a thorough understanding of the information that already exists about your subject.

UNDERSTANDING THE DIFFERENCES BETWEEN ACADEMIC AND WORKPLACE RESEARCH

Although *academic research* and *workplace research* can overlap, in most cases they differ in their goals and their methods.

In *academic research*, your goal is to find information that will help answer a scholarly question: “What would be the effect on the balance of trade between the United States and China if China lowered the value of its currency by 10 percent?” or “At what age do babies learn to focus on people’s eyes?” Academic research questions are often more abstract than applied. That is, they get at the underlying principles of a phenomenon. Academic research usually requires extensive secondary re-

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search: reading scholarly literature in academic journals and books. If you do primary research, as scientists do in labs, you do so only after extensive secondary research.

In *workplace research*, your goal is to find information to help you answer a practical question, usually one that involves the organization for which you work: “Should we replace our sales staff’s notebook computers with tablet computers?” or “What would be the advantages and disadvantages if our company adopted a European-style privacy policy for customer information?” Because workplace research questions are often focused on improving a situation at a particular organization, they call for much more primary research. You need to learn about your own organization’s processes and how the people in your organization would respond to your ideas.

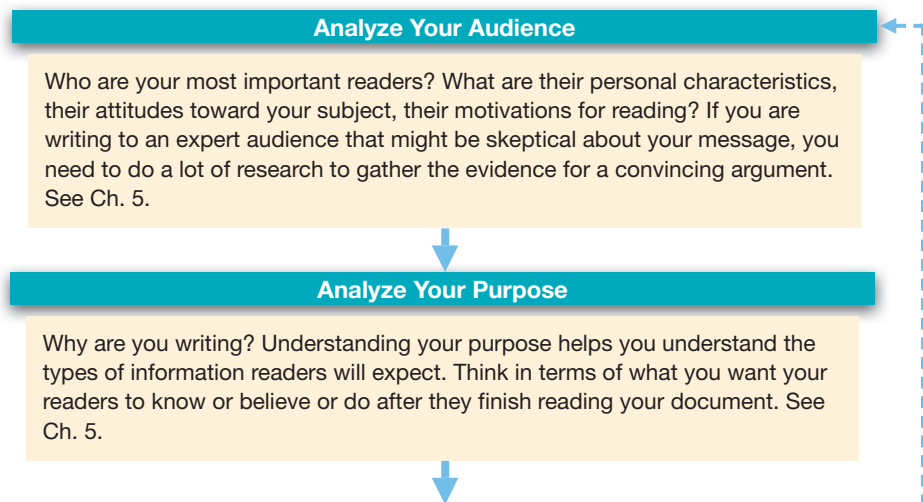
Regardless of whether you are conducting academic or workplace research, the basic research methods—primary and secondary research—are fundamentally the same, as is the goal: to answer questions.

UNDERSTANDING THE RESEARCH PROCESS

When you need to perform research, you want the process to be effective and efficient. That is, you want the information that you find to answer the questions you need to answer. And you don’t want to spend any more time than necessary getting that information. To meet these goals, you have to think about how the research relates to the other aspects of the overall project. Figure 6.1 provides an overview of the research process.

Figure 6.1 An Overview of the Research Process

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your subject, audience, and purpose.



Analyze Your Subject

What do you already know about your subject? What do you still need to find out? Using techniques such as freewriting and brainstorming, you can determine those aspects of the subject you need to investigate. See Ch. 3.

**Visualize the Deliverable**

What application will you need to deliver: a proposal, a report, a Web site? What kind of oral presentation will you need to deliver? See Ch. 3.

**Work Out a Schedule and a Budget for the Project**

When is the deliverable—the document or the presentation—due? Do you have a budget for phone calls, database searches, or travel to libraries or other sites? See Ch. 3.

**Determine What Information Will Need to Be Part of That Deliverable**

Draft an outline of the contents, focusing on the kinds of information that readers will expect to see in each part. See Ch. 3.

**Determine What Information You Still Need to Acquire**

Make a list of the pieces of information you don't yet have.

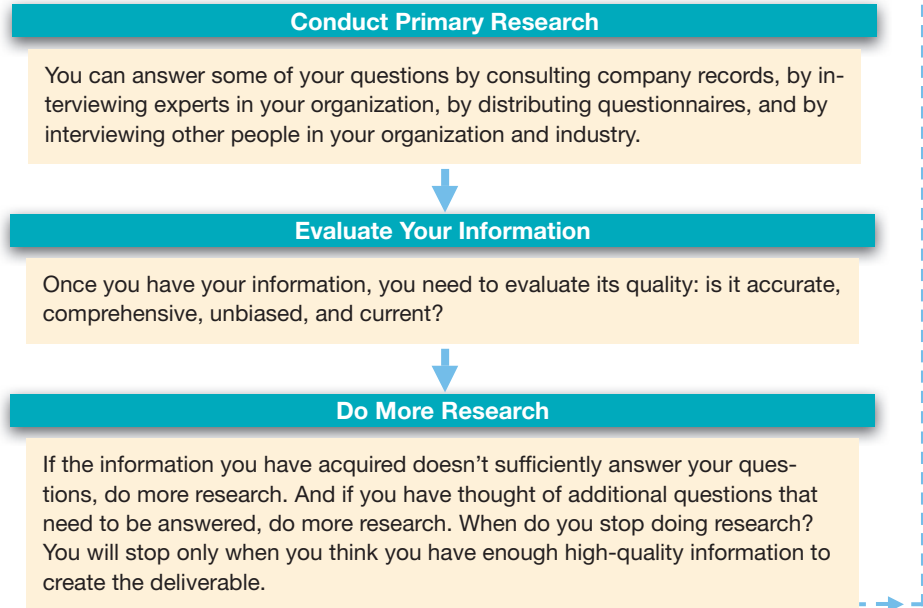
**Create Questions You Need to Answer in Your Deliverable**

Writing the questions in a list forces you to think carefully about your topic. One question suggests another, and soon you have a lengthy list that you need to answer.

**Conduct Secondary Research**

Study journal articles and Web-based sources such as online journals, discussion boards, blogs, and podcasts.





CHOOSING APPROPRIATE RESEARCH METHODS

Once you have determined the questions you need to answer, think about the various research techniques you can use to answer them. Different research questions require different research methods.

For example, your research methods for finding out how a current situation is expected to change would be different than your research methods for finding out how well a product might work for your organization. That is, if you want to know how outsourcing will change the computer-support industry over the next 10 to 20 years, you might search for long-range predictions in journal and magazine articles and on reputable Web sites and blogs. By contrast, if you want to figure out whether a specific scanner will produce the quality of scan that you need and will function reliably, you might do the same kind of secondary research and then observe the use of the product at a vendor's site; schedule product demos at your site; follow up by interviewing others in your company; and perform an experiment in which you try two different scanners and then analyze the results.

Choosing research methods means choosing the ways in which you'll conduct your research. Start by thinking about the questions you need to answer:

- *What types of research media might you use?* Should you look for information in books, journals, and reports, or online in Web sites, discussion boards, and blogs?

- *What types of research tools might you use?* Are these media best accessed via online catalogs, reference works, indexes, or abstract services?
- *What types of primary research might you conduct?* Should you conduct observations, demonstrations, inspections, experiments, interviews, questionnaires, or other field research?

You are likely to find that your research plan changes as you conduct your research. You might find, for instance, that you need more than one method to get the information you need, or that the one method that you thought would work doesn't. Still, having a plan can help you discover the most appropriate methods more quickly and efficiently. The advice in Table 6.1 provides a good starting point.

If you are doing research for a document that will be read by people from other cultures, think about what kinds of evidence your readers will consider appropriate. In many non-Western cultures, tradition or the authority of the person making the claim can be extremely important, more important than the kind of scientific evidence that is favored in Western cultures.

And don't forget that all people pay particular attention to information that comes from their own culture. If you are writing to European readers about telemedicine, for instance, try to find information from European authorities and about European telemedicine. This information will interest your readers and will likely reflect their cultural values and expectations.

Guidelines

Researching a Topic

Follow these three guidelines as you gather information to use in your document.

- ▶ **Be persistent.** Don't be discouraged if a research method doesn't yield useful information. Even experienced researchers fail at least as often as they succeed. Be prepared to rethink how you might find the information. Don't hesitate to ask reference librarians for help or to post questions on discussion boards.
- ▶ **Record your data carefully.** Prepare the materials you will need. Write information down, on paper or online. Record interviews (with the respondents' permission). Paste the URLs of the sites you visit into your notes. Bookmark sites so you can return to them easily.
- ▶ **Triangulate your research methods.** *Triangulating* your research methods means using more than one or two methods. If a manufacturer's Web site says the printer produces 17 pages per minute, an independent review in a reputable journal also says 17, and you get 17 in a demo at your office with your documents, the printer probably will produce 17 pages per minute. When you need to answer important questions, don't settle for only one or two sources.

TABLE 6.1 ► Research Questions and Methods

Type of question	Example of question	Appropriate research technique
What is the theory behind this process or technique?	How do greenhouse gases contribute to global warming?	Encyclopedias, handbooks, and journal articles present theory. Also, you can find theoretical information on Web sites from reputable professional organizations and universities. Search using keywords such as “greenhouse gases” and “global warming.”
What is the history of this phenomenon?	When and how did engineers first try to extract shale oil?	Encyclopedias and handbooks present history. Also, you can find historical information on Web sites from reputable professional organizations and universities. Search using keywords such as “shale oil” and “petroleum history.”
What techniques are being used now to solve this problem?	How are companies responding to the federal government’s new laws on health-insurance portability?	If the topic is recent, you will have better luck using digital resources such as Web sites and social media than using traditional print media. Search using keywords and tags such as “health-insurance portability.” Your search will be most effective if you use standard terminology in your search, such as “HIPAA” for the health-insurance law.
How is a current situation expected to change?	What changes will outsourcing cause in the computer-support industry over the next 10 to 20 years?	For long-range predictions, you can find information in journal articles and magazine articles and on reputable Web sites . Experts might write forecasts on discussion boards and blogs .
What products are available to perform a task or provide a service?	Which vendors are available to upgrade and maintain our company’s Web site?	For current products and services, search Web sites, discussion boards, and blogs . Reputable vendors—manufacturers and service providers—have sites describing their offerings. But be careful not to assume vendors’ claims are accurate. Even the specifications they provide might be exaggerated.
What are the strengths and weaknesses of competing products and services?	Which portable GPS system is the lightest?	Search for benchmarking articles from experts in the field, such as a journal article —either in print or on the Web—about camping and outfitting that compares the available GPS systems according to reasonable criteria. Also check discussion boards for reviews and blogs for opinions. If appropriate, do field research to answer your questions.
Which product or service do experts recommend?	Which four-wheel-drive SUV offers the best combination of features and quality for our needs?	Experts write journal articles, magazine articles, and sometimes blogs . Often, they participate in discussion boards . Sometimes, you can interview them, in person or on the phone, or write inquiries .
What are the facts about how we do our jobs at this company?	Do our chemists use gas chromatography in their analyses?	Sometimes, you can interview someone, in person or on the phone, to answer a simple question. To determine whether your chemists use a particular technique, start by asking someone in that department.

TABLE 6.1 ▶ Research Questions and Methods (*continued*)

Type of question	Example of question	Appropriate research technique
What can we learn about what caused a problem in our organization?	What caused the contamination in the clean room?	You can interview personnel who were closest to the problem and inspect the scene to determine the cause of the problem.
What do our personnel think we should do about a situation?	Do our quality-control analysts think we need to revise our sampling quotient?	If there are only a few personnel, interview them. If there are many, use questionnaires to get the information more quickly.
How well would this product or service work in our organization?	Would this scanner produce the quality of scan that we need and interface well with our computer equipment?	Read product reviews on reputable Web sites . Study discussion boards . Observe the use of the product or service at a vendor's site. Schedule product demos at your site. Follow up by interviewing others in your company to get their thinking. Do an experiment in which you try two different solutions to a problem, then analyze the results.

CONDUCTING SECONDARY RESEARCH

Even though workplace research often focuses on primary research, you will almost always need to do secondary research as well. Some topics call for research in a library. You might need specialized handbooks or access to online subscription services that are not freely available on the Internet. More and more, however, you will do your research on the Web. As a working professional, you might find most of the information in your organization's information center. An *information center* is the organization's library, a resource that collects different kinds of information critical to the organization's operations. Many large organizations have specialists who can answer research questions or who can get articles or other kinds of data for you.

Understanding the Research Media

Today, most technical information is distributed not only in print but also through digital media accessible on the Internet. You will probably use information published in four major media:

- **Print.** Books, journals, reports, and other documents will continue to be produced in print because printed information is portable and you can write on it. For documents that do not need to be updated periodically, print remains a useful and popular medium. To find printed documents, you will use online catalogs.
- **Online databases.** Most libraries—even many public libraries—subscribe to services, such as LexisNexis, ProQuest, InfoTrac, and EBSCOhost, that provide access to large databases of journal articles, conference proceedings, newspapers, and other documents.

▶ On TechComm Web

ipl2 (the successor to the Internet Public Library) is an excellent source on all aspects of Internet research. Click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

▶ On TechComm Web

For sites that list discussion boards, click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

- *Web sites.* The good news is that there are billions of pages of information on the Web. The bad news is that there are billions of pages of information on the Web. Still, if you search effectively and efficiently, you can find reference materials such as dictionaries and encyclopedias that don't exist in print, online versions of magazines and journals with extra features not present in the print versions, conversion calculators and other statistical software, current survey data, animations and videos, audio and video podcasts, and many other kinds of information.
- *Social media.* This is a broad term encompassing several kinds of media, all of which include user-generated information. A *discussion board* is an online discussion that readers contribute to by posting messages. Most discussion boards are organized by threads (sometimes called *topics*). All of the posts on a thread are presented together, usually in reverse-chronological order. A *blog* is a Web log, a Web-based periodical published by a person or group, to which readers can contribute comments. A *wiki* is a document or Web site that users write and edit online.

Using Traditional Research Tools

There is a tremendous amount of information in the different media. The trick is to learn how to find what you want. This section discusses six basic research tools.

Online Catalogs An online catalog is a database of books, microform materials, films, compact discs, phonograph records, tapes, and other materials. In most cases, an online catalog lists and describes the holdings at one particular library or a group of libraries. Your college library has an online catalog of its holdings. To search for an item, consult the instructions for searching, which explain how to limit your search by characteristics such as the type of media, date of publication, and language. The instructions also explain how to use punctuation and words such as *and*, *or*, and *not* to focus your search effectively.

Reference Works Reference works include general dictionaries and encyclopedias, biographical dictionaries, almanacs, atlases, and dozens of other research tools. These print and online works are especially useful when you begin a research project because they provide an overview of the subject and often list the major works in the field.

How do you know if there is a dictionary of the terms used in a given field? The following reference books—the guides-to-the-guides—list the many resources available:

Hacker, D. *Research and documentation online*. <http://dianahacker.com/resdoc>
 Kennedy, X. J., Kennedy, D. M., & Muth, M. F. (2010). *The Bedford guide for college writers with reader, research manual, and handbook with 2009 MLA and 2010 APA updates*. Boston: Bedford/St. Martin's.

Lester, R. (Ed.). (2005–2008). *The new Walford guide to reference resources* (Vol. 1: Science, Technology and Medicine; Vol. 2: Social Sciences). London: Neal-Schuman.

Palmquist, M. *The Bedford researcher*. <http://bedfordresearcher.com/links/disciplines>

To find information on the Web, use a library Web site or search engine and go to its “reference” section. There you will find numerous sites that contain links to excellent collections of reference works online, such as Best Information on the Net and ipl2.

Periodical Indexes Periodicals are excellent sources of information because they offer recent, authoritative discussions of limited subjects. The biggest challenge in using periodicals is identifying and locating the dozens of relevant articles that are published each month. Although only half a dozen major journals might concentrate on your field, a useful article could appear in one of hundreds of other publications. A periodical index, which is a list of articles classified according to title, subject, and author, can help you determine which journals you want to locate.

There are periodical indexes in all fields. The following brief list gives you a sense of the diversity of titles:

- *Applied Science & Technology Index*
- *Business Periodicals Index*
- *Readers' Guide to Periodical Literature*
- *Engineering Index*

You can also use a directory search engine. Many directory categories include a subcategory called “journals” or “periodicals” listing online and printed sources.

Once you have created a bibliography of printed articles you want to study, you have to find them. Check your library’s online catalog, which includes all the journals your library receives. If your library does not have an article you want, you can use one of two techniques for securing it:

- *Interlibrary loan*. Your library finds a library that has the article. That library photocopies the article and sends it or faxes it to your library. This service can take more than a week.
- *Document-delivery service*. If you are in a hurry, you can log on to a document-delivery service, such as IngentaConnect, a free database of 4.5 million articles in 13,500 periodicals. There are also fee-based document-delivery services.

On TechComm Web

For links to these and other reference sources, click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

Newspaper Indexes Many major newspapers around the world are indexed by subject. The three most important indexed U.S. newspapers are the following:

- The *New York Times* is perhaps the most reputable U.S. newspaper for national and international news.
- The *Christian Science Monitor* is another highly regarded general newspaper.
- The *Wall Street Journal* is the most authoritative news source on business, finance, and the economy.

Many newspapers available on the Web can be searched electronically, although sometimes they charge for archived articles. Keep in mind that the print version and the electronic version of a newspaper can vary greatly. If you wish to cite a quotation from an article in a newspaper, the print version is the preferred one.

Abstract Services Abstract services are like indexes but also provide abstracts: brief technical summaries of the articles. In most cases, reading the abstract will enable you to decide whether to seek out the full article. The title of an article alone is often a misleading indicator of its contents.

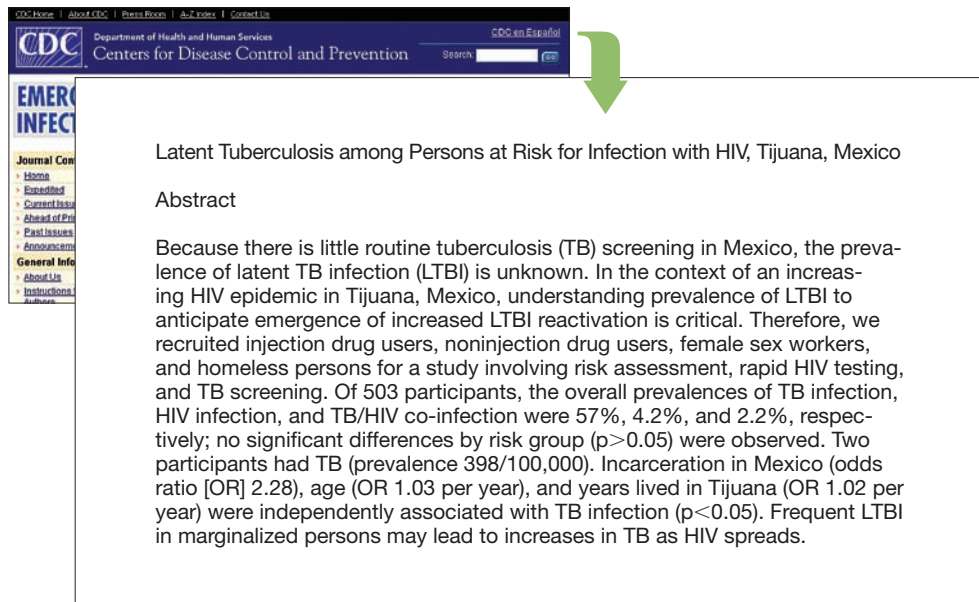
Some abstract services, such as *Chemical Abstracts*, cover a broad field, but many are specialized rather than general. *Adverse Reaction Titles*, for instance, covers research on the subject of adverse reactions to drugs. Figure 6.2 shows an abstract from *Emerging Infectious Diseases*.

On TechComm Web

For links to online newspapers, click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

In This Book

For more about abstracts, see Ch. 18, p. 494.



Latent Tuberculosis among Persons at Risk for Infection with HIV, Tijuana, Mexico

Abstract

Because there is little routine tuberculosis (TB) screening in Mexico, the prevalence of latent TB infection (LTBI) is unknown. In the context of an increasing HIV epidemic in Tijuana, Mexico, understanding prevalence of LTBI to anticipate emergence of increased LTBI reactivation is critical. Therefore, we recruited injection drug users, noninjection drug users, female sex workers, and homeless persons for a study involving risk assessment, rapid HIV testing, and TB screening. Of 503 participants, the overall prevalences of TB infection, HIV infection, and TB/HIV co-infection were 57%, 4.2%, and 2.2%, respectively; no significant differences by risk group ($p > 0.05$) were observed. Two participants had TB (prevalence 398/100,000). Incarceration in Mexico (odds ratio [OR] 2.28), age (OR 1.03 per year), and years lived in Tijuana (OR 1.02 per year) were independently associated with TB infection ($p < 0.05$). Frequent LTBI in marginalized persons may lead to increases in TB as HIV spreads.

Figure 6.2 An Abstract from *Emerging Infectious Diseases*

Source: Garfein et al., 2010 <www.cdc.gov/eid/content/16/5/757.htm>.

Government Information The U.S. government is the world's biggest publisher. In researching any field of science, engineering, or business, you are likely to find that a federal agency or department has produced a relevant brochure, report, or book.

Government publications are not usually listed in the indexes and abstract journals. The *Monthly Catalog of United States Government Publications*, available on paper, on CD, and on the Web, provides extensive access to these materials.

Printed government publications are usually cataloged and shelved separately from other kinds of materials. They are classified according to the Superintendent of Documents system, not the Library of Congress system. A reference librarian or a government documents specialist at your library can help you use government publications.

You can also access most government sites and databases on the Internet. For example, if your company wishes to respond to a request for proposals (RFP) published by a federal government agency, you will find that RFP on a government site. The major entry point for federal government sites is USA.gov (www.usa.gov), which links to hundreds of millions of pages of government information and services. It also features tutorials, a topical index, online transactions, and links to state and local government sites.

Using Social Media and Other Interactive Resources

Social media and other interactive resources enable people to collaborate, share, link, and generate content in ways that traditional Web sites offering static content cannot. The result is an Internet that can harness the collective intelligence of people around the globe—and do so quickly. As a result, researchers today have access to far more information than they had in the past, and they have access to it almost instantaneously. However, the ease and speed of posting new content, as well as the lack of formal review of the content, creates challenges for people who do research on the Internet. Everyone using social-media resources must be extra cautious in evaluating and documenting their sources.

This discussion covers three categories of social media and Web-based resources used by researchers—discussion boards, wikis, and blogs—as well as two techniques for streamlining the process of using these resources: tagged content and RSS.

Discussion Boards Discussion boards, online discussion forums sponsored by professional organizations, private companies, and others, enable researchers to tap a community's information. Discussion boards are especially useful in providing quick, practical advice. However, the advice might or might not be authoritative. Figure 6.3 shows one interchange on a thread related to civil engineering.

On TechComm Web

For an excellent guide to using government information, see Patricia Cruse and Sherry DeDecker's "How to Effectively Locate Federal Government Information on the Web." Click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

In This Book

For more about RFPs, see Ch. 16, p. 442.

On TechComm Web

For links to USA.gov and to other government information, click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

Here, someone with the username *DirtPusher* asked a question about how to calculate the shrinkage factor for sand.

Seven minutes after he posted the question, the first responder, *fattedad*, replied. Within a few hours, a half dozen people had contributed their ideas.

DirtPusher (Civil/Environme)	21 Jun 10 9:38
Does anybody have a good rule of thumb for shrinkage factors for sand. The material is described as coarse to fine with "some" clay. Moisture content is unknown. Previous development is unknown but, thought to be original ground. What I am looking for is the difference between the volume of naturally occurring materials vs compacted material.	
Thanks	
Check Out Our Whitepaper Library. Click Here.	
fattedad (Geotechnical)	21 Jun 10 9:45
Do a Proctor. Take a nuke test of the native soil. Determine the in-situ relative compaction. Contrast that value to what you've specified. Determine the "shrinkage factor."	
You will likely find that the in-situ density is close to what you want to specify. Let's say it's 93 percent and you want 95 to 100. So, that's an increase of about 5 percent.	
Usually, shrinkage factors are a more relevant concern when you are trucking in dirt. What's end-dumped in the back of a truck has very low relative compaction. Your shrinkage factor could easily be 15 percent.	
Hope this helps.	
f-d	

Figure 6.3 A Discussion Board Exchange

Source: Eng-Tips Forums, 2010 <www.eng-tips.com/viewthread.cfm?qid=274942&page=1>.

Wikis A wiki is a Web site that makes it easy for members of a community, company, or organization to create and edit content collaboratively. Often, a wiki contains articles, information about student and professional conferences, reading lists, annotated sets of links, book reviews, and documents used by members of the community. You might have participated in creating and maintaining a wiki in one of your courses or as a member of a community group outside of your college.

Wikis are popular with researchers because they contain information about topics that can change day to day, such as medicine or business. In addition, because wikis rely on information contributed voluntarily by members of a community, they represent a much broader spectrum of viewpoints than media that publish only information that has been approved by editors. For this reason, however, you should be especially careful when you use wikis because the information they contain might not be trustworthy. It's a good idea to corroborate any information you find on a wiki by consulting other sources.

An excellent example of how researchers are using wikis is the Texas Digital Library (TDL), which allows researchers at any Texas college or university to create a wiki (2010). Included in the TDL are a number of wikis, such as the Texas Water Digital Library, which includes research data, journal articles, links to water-resource journals, and minutes of the regular meetings attended by water researchers from the Texas universities. Another example is the Molecular Biology Wiki, which contains user-generated information

about such subjects as general biology, cell biology, DNA, RNA, biochemistry, peptides, proteins, histology, and the mathematics of biology. In addition, the Molecular Biology Wiki links to a discussion board on the subject.

How do you search wikis? You can use any search engine and add the word “wiki” to the search. Or you can use a specialized search engine such as Wiki.com.

Blogs Many technical and scientific organizations, universities, and private companies sponsor blogs that can offer useful information for researchers. Bloggers almost always invite their readers to post comments.

Keep in mind that bloggers are not always independent voices. A Hewlett-Packard employee blogging on an HP-sponsored blog will likely be presenting the company’s viewpoint on the topic. Don’t count on that blogger to offer objective views about products.

Figure 6.4, a screenshot of a portion of the blog.AIDS.gov site, offers information that is likely to be credible, accurate, and timely.

In This Book
 For more about blogs, see Ch. 22, p. 650.



← Blog.AIDS.gov is really five blogs in one, covering the U.S. federal government’s efforts to combat AIDS in the United States and abroad.

← This image shows an excerpt from one blog post, titled “What games are you playing?” from the New Media section of the blog. Each blog post is followed by a comment box, which enables a reader to publish a response to the post.

Figure 6.4 A Blog

Source: U.S. Department of Health and Human Services, 2011 <http://blog.aids.gov/>.

The screenshot shows the Technorati website interface. At the top, there's a search bar with 'tracking technology' entered. Below the search bar, there are navigation tabs for 'Technology', 'Business', 'Entertainment', 'Lifestyle', 'Sports', 'Politics', 'Videos', 'Blogging', and 'Twitter'. A secondary navigation bar includes 'Blog Directory', 'Top 100', 'Tags', 'Technorati List', 'People', 'Write for Technorati', and 'State of t...'. Below this, there are links for 'Ads by Google', 'Youtube Video', 'Video Erotici', 'Video 8', and 'Podcasts'. The main content area displays 'Blogs relating to "tracking technology" (95 blogs found out of ...)' with an RSS icon. A green bar below the search results says 'Click to refine this search'. Below that, there's a pagination bar for 'Page: 1 2 3 4 5 6 7 ... 10' and a link to 'Look up "tracking", "technology" at The Free Dictionary'. The search results are listed in a table-like format with three entries visible:

Rank	Blog Name	URL	Recent Post	Auth	Change
1228.	Next Big Future	http://nextbigfuture.com/	Recent: Gallium at senide signal processing at terahertz speeds Ad Support: Nano Technology Netbook Technology News Computer Software Devices made from ...	Auth: 600	
5197.	Greenbang	http://www.greenbang.com	Recent: UKs low-carbon spending cuts: Penny wise but If the new coalition government in the UK is serious about building a green economy for the nation, why on ...	Auth: 485	Change +1
6382.	The Psy-Fi Blog	http://www.psyfitec.com/	Recent: Behavioral Law and Disorder Mutual Fund Perfection Its may come as a surprise to you that the mutual fund industry, at least in th...	Auth: 469	Change +2

This search returned 95 blogs that relate to the topic. Readers could also search for individual posts about the topic on other social media and get even more responses. The Technorati Authority figure, which is abbreviated as "Auth" on the right, measures how many other sites refer to the blog, reflecting its popularity.

Figure 6.5 Search Results for Blogs Tagged with "Tracking Technology"

Source: Technorati, 2010 <http://technorati.com/search?return=sites&authority=all&q=tracking+technology&x=0&y=0>.

Tagged Content Tags are descriptive keywords people use to categorize and describe content such as blog entries, videos, podcasts, and images they post to the Internet or bookmarks they post to social-bookmarking sites. Tags can be one-word descriptors without spaces or punctuation (such as "sandiegozoo") or multiword descriptors (such as "San Diego Zoo").

Tags help researchers search for content based on the tags associated with the content. Figure 6.5 shows search results for blogs tagged with "tracking technology" on Technorati, a site that currently tracks more than a hundred million blogs and a quarter billion pieces of tagged social media.

RSS Feeds Repeatedly checking for new content on many different Web sites can be a time-consuming and haphazard way to research a topic. RSS technology (short for *rich site summary* or *really simple syndication*) allows readers to check just one place (such as a software program running on their computer or an e-mail program) for alerts to new content posted on selected Web sites. Figure 6.6 shows a Web site that offers RSS feeds. Readers use a

This page shows how to use RSS feeds on the Library of Congress Web site.

Figure 6.6 A Web Site Offering RSS Feeds

Source: Library of Congress, 2010 <www.loc.gov/rss/>.

special type of software program called an RSS *aggregator* to be alerted by RSS *feeds* (notifications of new or changed content from sites of interest to them).

Evaluating the Information

You've taken notes, paraphrased, and quoted material from your secondary research. Now, with more information than you can possibly use, you try to figure out what it all means. You realize that you still have some questions, that some of the information is incomplete, some contradictory, and some unclear. There is no shortage of information; the challenge is to find information that is accurate, unbiased, comprehensive, appropriately technical, current, and clear.

- *Accurate.* If you are researching whether your company should consider flextime scheduling, you might begin by determining the number of employees who would be interested in flextime. If you estimate that number to be 500 but it is in fact closer to 50, you will waste time doing an unnecessary study.
- *Unbiased.* You want sources that have no financial stake in your project. If employees cannot carpool easily because they start work at different times, a private company that transports workers in vans is likely to be a biased source because it could profit from flextime.
- *Comprehensive.* You want information from different kinds of people—in terms of gender, cultural characteristics, and age—and from people representing all viewpoints on the topic.

In This Book

For more about taking notes, paraphrasing, and quoting, see Appendix, Part A, p. 660.

- *Appropriately technical.* Good information is sufficiently detailed to respond to the needs of your readers, but not so detailed that they cannot understand it. For the flextime study, you need to find out whether opening your building an hour earlier and closing it an hour later will significantly affect your utility costs. You can get this information by interviewing people in the Operations Department; you will not need to do a detailed inspection of all the utility records of the company.
- *Current.* If your information is 10 years old, it might not accurately reflect today's situation.
- *Clear.* You want information that is easy to understand. Otherwise, you'll waste time figuring it out, and you might misinterpret it.

The most difficult kind of material to evaluate is information from the Internet, because it rarely undergoes the formal review procedure used for books and professional journals. A general principle for using any information you found on the Internet, especially on social media, is to be extremely careful. Because content is unlikely to have been reviewed before being published on a social-media site, use one or more trusted sources to confirm the information you locate. Some instructors do not allow their students to use blogs or wikis, including *Wikipedia*, for their research. Check with your instructor to learn his or her policies.

On TechComm Web

For links to sources on finding and evaluating Internet information, click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

Guidelines

Evaluating Print and Online Sources

Criteria	For printed sources	For online sources
Authorship	Do you recognize the name of the author? Does the source describe the author's credentials and current position? If not, can you find this information in a who's who or by searching for other books or other journal articles by the author?	If you do not recognize the author's name, is the site mentioned on another reputable site? Does the site contain links to other reputable sites? Does it contain biographical information—the author's current position and credentials? Can you use a search engine to find other references to the author's credentials? Be especially careful with unedited sources such as <i>Wikipedia</i> ; some articles in it are authoritative, others are not. Be careful, too, with blogs, some of which are written by disgruntled former employees with a score to settle.

Criteria	For printed sources	For online sources
Publisher	<p>What is the publisher's reputation? A reliable book is published by a reputable trade, academic, or scholarly publisher; a reliable journal is sponsored by a professional association or university. Are the editorial board members well known?</p> <p>Trade publications—magazines about a particular industry or group—often promote the interests of that industry or group. For example, information in trade publications for loggers or environmentalists might be biased. If you doubt the authority of a book or journal, ask a reference librarian or a professor.</p>	<p>Can you determine the publisher's identity from headers or footers? Is the publisher reputable?</p> <p>If the site comes from a personal account on an Internet service provider, the author might be writing outside his or her field of expertise. Many Internet sites exist largely for public relations or advertising. For instance, Web sites of corporations and other organizations are unlikely to contain self-critical information. For blogs, examine the <i>blogroll</i>, a list of links to other blogs and Web sites. Credible blogs are likely to link to blogs already known to be credible. If a blog links only to friends, blogs hosted by the same corporation, or blogs that share the same beliefs, be very cautious.</p>
Knowledge of the literature	<p>Does the author appear to be knowledgeable about the major literature? Is there a bibliography? Are there notes throughout the document?</p>	<p>Analyze the Internet source as you would any other source. Often, references to other sources will take the form of links.</p>
Accuracy and verifiability of the information	<p>Is the information based on reasonable assumptions? Does the author clearly describe the methods and theories used in producing the information, and are they appropriate to the subject? Has the author used sound reasoning? Has the author explained the limitations of the information?</p>	<p>Is the site well constructed? Is the information well written? Is it based on reasonable assumptions? Are the claims supported by appropriate evidence? Has the author used sound reasoning? Has the author explained the limitations of the information? Are sources cited? Online services such as BlogPulse help you evaluate how active a blog is, how the blog ranks compared to other blogs, and who is citing the blog. Active, influential blogs that are frequently linked to and cited by others might be more likely to contain accurate, verifiable information.</p>
Timeliness	<p>Does the document rely on recent data? Was the document published recently?</p>	<p>Was the document created recently? Was it updated recently? If a site is not yet complete, be wary.</p>

 On TechComm Web

Evaluating sources is easier if you start searching from a reputable list of links, such as that of the WWW Virtual Library, sponsored by the World Wide Web Consortium. Click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

 On TechComm Web

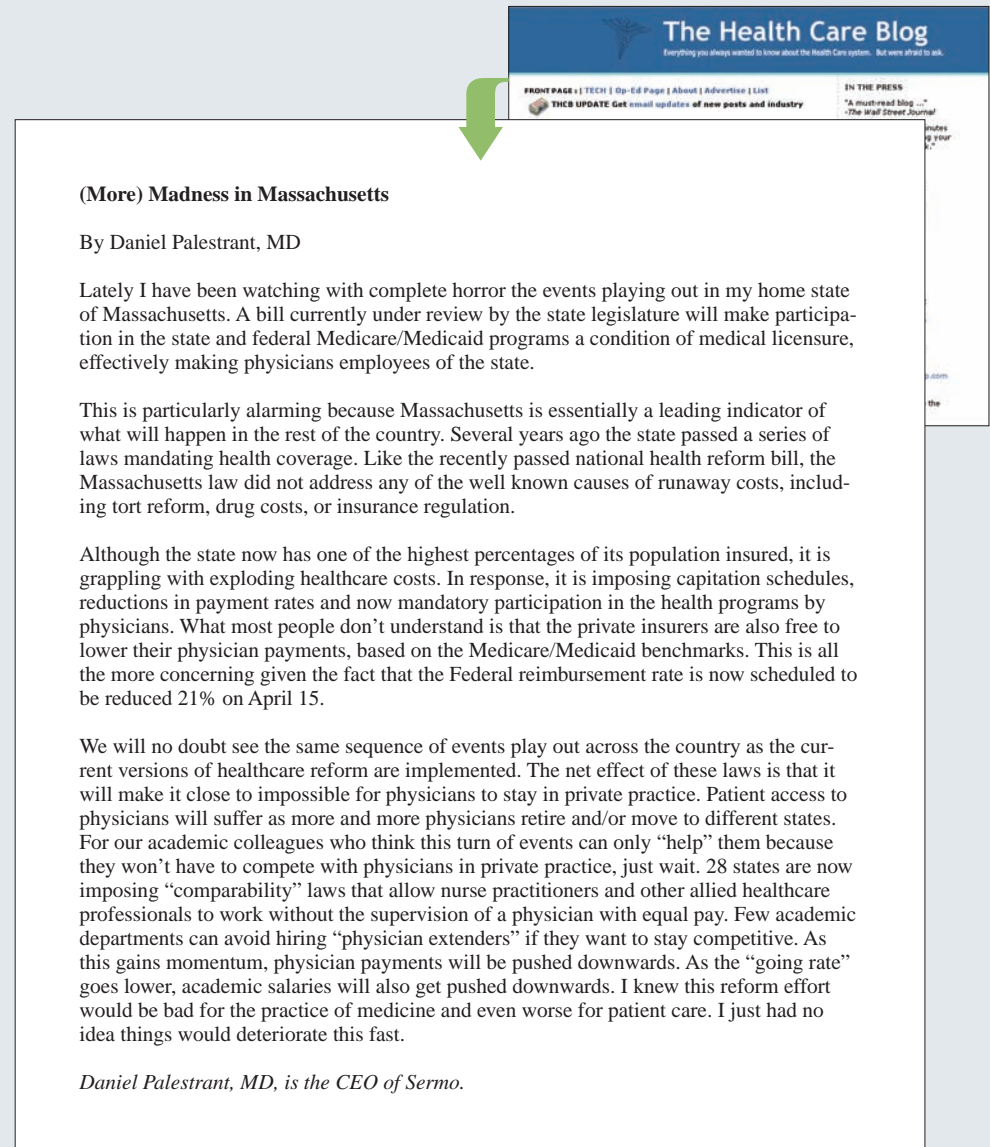
To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 6 on <bedfordstmartins.com/techcomm>.

1. The author of this blog post, Dr. Daniel Palestrant, is a guest blogger. If you considered using Dr. Palestrant as a source in a document you were writing, what information would you want to discover about him, and how would you discover it?
2. If you considered using this post as a source in a document you were writing, what information would you want to discover about the blog? How would you discover it?
3. Study the Guidelines box (pp. 134–35). Evaluate this passage about health-care reform on the basis of the “accuracy and verifiability of the information” criterion. Identify a claim in the post that might be strengthened by the addition of more evidence.

INTERACTIVE SAMPLE DOCUMENT

Evaluating Information from Internet Sources

The following blog post appears in the Health Care Blog, which uses the subtitle “Everything you always wanted to know about the Health Care system. But were afraid to ask.” The questions in the margin ask you to consider the guidelines for evaluating Internet sources (pp. 134–35).



(More) Madness in Massachusetts

By Daniel Palestrant, MD

Lately I have been watching with complete horror the events playing out in my home state of Massachusetts. A bill currently under review by the state legislature will make participation in the state and federal Medicare/Medicaid programs a condition of medical licensure, effectively making physicians employees of the state.

This is particularly alarming because Massachusetts is essentially a leading indicator of what will happen in the rest of the country. Several years ago the state passed a series of laws mandating health coverage. Like the recently passed national health reform bill, the Massachusetts law did not address any of the well known causes of runaway costs, including tort reform, drug costs, or insurance regulation.

Although the state now has one of the highest percentages of its population insured, it is grappling with exploding healthcare costs. In response, it is imposing capitation schedules, reductions in payment rates and now mandatory participation in the health programs by physicians. What most people don't understand is that the private insurers are also free to lower their physician payments, based on the Medicare/Medicaid benchmarks. This is all the more concerning given the fact that the Federal reimbursement rate is now scheduled to be reduced 21% on April 15.

We will no doubt see the same sequence of events play out across the country as the current versions of healthcare reform are implemented. The net effect of these laws is that it will make it close to impossible for physicians to stay in private practice. Patient access to physicians will suffer as more and more physicians retire and/or move to different states. For our academic colleagues who think this turn of events can only “help” them because they won't have to compete with physicians in private practice, just wait. 28 states are now imposing “comparability” laws that allow nurse practitioners and other allied healthcare professionals to work without the supervision of a physician with equal pay. Few academic departments can avoid hiring “physician extenders” if they want to stay competitive. As this gains momentum, physician payments will be pushed downwards. As the “going rate” goes lower, academic salaries will also get pushed downwards. I knew this reform effort would be bad for the practice of medicine and even worse for patient care. I just had no idea things would deteriorate this fast.

Daniel Palestrant, MD, is the CEO of Sermo.

Source: Palestrant, 2010 <<http://thehealthcareblog.com/blog/2010/04/22/more-madness-in-massachusetts>>.

CONDUCTING PRIMARY RESEARCH

Although the library and the Internet offer a wealth of secondary sources, in the workplace you will often need to conduct primary research to acquire new information. There are seven major categories of primary research: observations and demonstrations, inspections, experiments, field research, interviews, inquiries, and questionnaires.

Observations and Demonstrations

Observations and demonstrations are two common forms of primary research. When you *observe*, you simply watch some activity to understand some aspect of it. For instance, if you are trying to determine whether the location of the break room is interfering with work on the factory floor, you could observe the situation, preferably at different times of the day and on different days of the week. If you saw workers distracted by people moving in and out of the room or by sounds made in the room, you would record your observations by taking notes, taking still pictures, or videotaping events. An observation might lead to other forms of primary research. You might, for example, follow up by interviewing some employees who might help you understand what you observed.

When you witness a *demonstration* (or *demo*), you are watching someone carry out a process. For instance, if your company is considering buying a mail-sorting machine, you could arrange to visit a manufacturer's facility, where technicians would show how the machine works. If your company is considering a portable machine, such as a laptop computer, manufacturers or dealers could demo their products at your facility.

When you plan to observe a situation or witness a demo, prepare beforehand. Write down the questions you need answered or the factors you want to investigate. Prepare interview questions in case you have a chance to speak with someone. Think about how you are going to incorporate the information you acquire into the document you will write. Finally, bring whatever equipment you will need (pen and paper, computer, camera, etc.) to the site of the observation or demo.

Inspections

Inspections are like observations, but you participate more actively. For example, a civil engineer can determine what caused a crack in a foundation by inspecting the site: walking around, looking at the crack, photographing it and the surrounding scene, picking up the soil. An accountant can determine the financial health of an organization by inspecting its financial records, perhaps performing calculations and comparing the data she finds with other data.

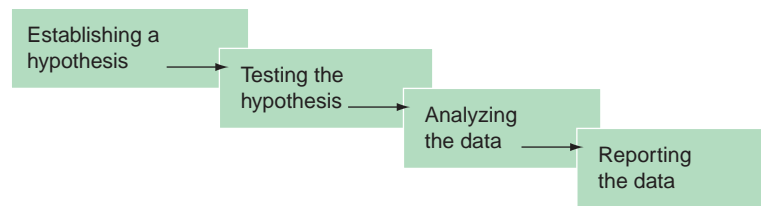
These professionals are applying their knowledge and professional judgment as they inspect a site, an object, or a document. Sometimes inspection

techniques are more complicated. A civil engineer inspecting foundation cracking might want to test his hunches by bringing soil samples back to the lab for analysis.

When you carry out an inspection, do your homework beforehand. Think about how you will use the data in your document: will you need photographs or video files or computer data? Then prepare the materials and equipment you'll need to capture the data.

Experiments

Learning to conduct the many kinds of experiments used in a particular field can take months or even years. This discussion is a brief introduction. In many cases, conducting an experiment involves four phases.



- *Establishing a hypothesis.* A hypothesis is an informed guess about the relationship between two factors. In a study relating gasoline octane and miles per gallon, a hypothesis might be that a car will get 10 percent better mileage with 89 octane gas than with 87 octane.
- *Testing the hypothesis.* Usually, you need an experimental group and a control group. These two groups would be identical except for the condition you are studying: in the above example, the gasoline. The control group would be a car running on 87 octane. The experimental group would be an identical car running on 89 octane. The experiment would consist of driving the two cars over an identical course at the same speed—preferably in some sort of controlled environment—over a given distance, such as 1,000 miles. Then, you would calculate the miles per gallon. The results would either support or refute your original hypothesis.
- *Analyzing the data.* Do your data show a correlation—one factor changing along with another—or a causal relationship? For example, we know that sports cars are involved in more fatal accidents than sedans (there is a stronger correlation for sports cars), but we don't know whether the car or the way it is driven is the important factor (causal relationship).
- *Reporting the data.* When researchers report their findings, they explain what they did, why they did it, what they saw, what it means, and what ought to be done next.

In This Book

For more about reports, see
Chs. 17–19.

Field Research

Whereas an experiment yields quantitative data that typically can be measured precisely, most field research is qualitative; that is, it yields data that typically cannot be measured as precisely. Often in field research, you seek to understand the quality of an experience. For instance, you might want to understand how a new seating arrangement affects group dynamics in a classroom. You could design a study in which you observed and recorded the classes and interviewed the students and the instructor about their reactions to the new arrangement. Then you could do the same in a traditional classroom and compare the results.

Some kinds of studies have both quantitative and qualitative elements. In the case of classroom seating arrangements, you could include some quantitative measures, such as the number of times students talked with one another. You could also distribute questionnaires to elicit the opinions of the students and the instructor. If you used these same quantitative measures on enough classrooms, you could gather valid quantitative information.

When you are doing quantitative or qualitative studies on the behavior of animals—from rats to monkeys to people—try to minimize two common problems:

- *The effect of the experiment on the behavior you are studying.* In studying the effects of the classroom seating arrangement, minimize the effects of your own presence. For instance, make sure that the camera is placed unobtrusively and that it is set up before the students arrive, so they don't see the process. Still, any time you bring in a camera, you can never be sure that what you witness is typical.
- *Bias in the recording and analysis of the data.* Bias can occur because researchers want to confirm their hypotheses. In an experiment to determine whether word processors help students write better, the researcher might see improvement where other people don't. For this reason, the experiment should be designed so that it is *double blind*. That is, the students doing the writing shouldn't know what the experiment is about so they won't change their behavior to support or negate the hypothesis. And the data being analyzed should be disguised so that researchers don't know whether they are examining the results from the control group or the experimental group. If the control group wrote in ink and the experimental group used word processors, for example, the control group's papers should be formatted on a word processor, so that all the papers look identical.

Conducting an experiment or field research is relatively simple; the hard part is designing your study so that it accurately measures what you want it to measure.

Interviews

Interviews are extremely useful when you need information on subjects that are too new to have been discussed in the professional literature or are inappropriate for widespread publication (such as local political questions).

In choosing a respondent—a person to interview—answer three questions:

- *What questions do you want to answer?* Only then can you begin to search for a person who can provide the information.
- *Who could provide this information?* The ideal respondent is an expert willing to talk. Unless the respondent is an obvious choice, such as the professor carrying out the research you are studying, use directories, such as local industrial guides, to locate potential respondents.
- *Is the person willing to be interviewed?* On the phone or in writing, state what you want to ask about. The person might not be able to help you but might be willing to refer you to someone who can. Explain why you have decided to ask him or her. (A compliment works better than admitting that the person you really wanted to interview is out of town.) Explain what you plan to do with the information, such as write a report or give a talk. Then, if the person is willing to be interviewed, set up an appointment at his or her convenience.

Guidelines

Conducting an Interview

Preparing for the interview

- ▶ **Do your homework.** If you ask questions that are already answered in the professional literature, the respondent might become annoyed and uncooperative.
- ▶ **Prepare good questions.** Good questions are clear, focused, and open.
 - Be clear. The respondent should be able to understand what you are asking.

UNCLEAR Why do you sell Trane products?

CLEAR What are the characteristics of Trane products that led you to include them in your product line?

The unclear question can be answered in a number of unhelpful ways: “Because they’re too expensive to give away” or “Because I’m a Trane dealer.”

- Be focused. The question must be narrow enough to be answered briefly. If you want more information, you can ask a follow-up question.

▶ On TechComm Web

For an excellent discussion of interview questions, see Joel Bowman’s *Business Communication: Managing Information and Relationships*. Click on Links Library for Ch. 6 on <bedfordstmartins.com/techcomm>.

UNFOCUSED What is the future of the computer industry?

FOCUSED What will the American chip industry look like in 10 years?

- Ask open questions. Your purpose is to get the respondent to talk. Don't ask a lot of questions that have yes or no answers.

CLOSED Do you think the federal government should create industrial partnerships?

OPEN What are the advantages and disadvantages of the federal government's creating industrial partnerships?

- ▶ **Check your equipment.** If you will be taping the interview, test your voice recorder or video camera to make sure it is operating properly.

Beginning the interview

- ▶ **Arrive on time.**
- ▶ **Thank the respondent for taking the time to talk with you.**
- ▶ **State the subject and purpose of the interview and what you plan to do with the information.**
- ▶ **If you wish to tape the interview, ask permission.**

Conducting the interview

- ▶ **Take notes.** Write down important concepts, facts, and numbers, but don't take such copious notes that you are still writing when the respondent finishes an answer.
- ▶ **Start with prepared questions.** Because you are likely to be nervous at the start, you might forget important questions. Have your first few questions ready.
- ▶ **Be prepared to ask follow-up questions.** Listen carefully to the respondent's answer and be ready to ask a follow-up question or request a clarification. Have your other prepared questions ready, but be willing to deviate from them if the respondent leads you in unexpected directions.
- ▶ **Be prepared to get the interview back on track.** Gently return to the point if the respondent begins straying unproductively, but don't interrupt rudely or show annoyance. Do not say, "Whoa! I asked about layoffs in this company, not in the whole industry." Rather, say, "On the question of layoffs at this company, do you anticipate . . . ?"

Concluding the interview

- ▶ **Thank the respondent.**
- ▶ **Ask for a follow-up interview.** If a second meeting would be useful, ask to arrange it.



- ▶ **Ask for permission to quote the respondent.** If you think you might want to quote the respondent by name, ask for permission now.

After the interview

- ▶ **Write down the important information while the interview is fresh in your mind.** (This step is unnecessary, of course, if you have recorded the interview.) If you will be printing a transcript of the interview, make the transcript now.
- ▶ **Send a brief thank-you note.** Within a day or two, send a note that shows you appreciate the respondent's courtesy and that you value what you have learned. In the note, confirm any previous offers you have made, such as sending the respondent a copy of your final document.

When you wish to present the data from an interview in a document you are preparing, include a transcript of the interview (or an excerpt from the interview). You will probably present the transcript as an appendix so that readers can refer to it but are not slowed down when reading the body of the document. You might decide to present brief excerpts from the transcript in the body of the document as evidence for points you make.

Figure 6.7 is from a transcript of an interview with an attorney specializing in information technology. The interviewer is a student who is writing about legal aspects of software ownership.

Inquiries

A useful alternative to a personal interview is to send an inquiry. This inquiry can take the form of a letter, an e-mail, or a message sent through an organization's Web site. Although digital inquiries are more convenient for both the sender and the recipient, a physical letter is more formal and therefore might be more appropriate if the topic is important (concerning personnel layoffs, for instance) or related to safety.

If you are lucky, your respondent will provide detailed and helpful answers. However, the respondent might not clearly understand what you want to know or might choose not to help you. Although the strategy of the inquiry is essentially that of a personal interview, inquiries can be less successful because the recipient has not already agreed to provide information and might not respond. Also, an inquiry, unlike an interview, gives you little opportunity to follow up by asking for clarification.

Questionnaires

Questionnaires enable you to solicit information from a large group of people. You can send questionnaires through the mail, e-mail them, present them as forms on a Web site, or use survey software (such as SurveyMonkey).

In This Book

For more about inquiry letters, see Ch. 14, p. 379.

To find software for conducting surveys, search for "survey software."

Interview Transcript, Page 1

Q. Why is copyright ownership important in marketing software?

A. If you own the copyright, you can license and market the product and keep other people from doing so. It could be a matter of millions of dollars if the software is popular.

Q. Shouldn't the programmer automatically own the copyright?

A. If the programmer wrote the program on personal time, he or she should and does own the copyright.

Q. So "personal time" is the critical concept?

A. That's right. We're talking about the "work-made-for-hire" doctrine of copyright law. If I am working for you, anything I make under the terms of my employment is owned by you.

Q. What is the complication, then? If I make the software on my machine at home, I own it; if I'm working for someone, my employer owns it.

A. Well, the devil is in the details. Often the terms of employment are casual, or there is no written job description or contract for the particular piece of software.

Q. Can you give me an example of that?

A. Sure. There was a 1992 case, *Aymes v. Bonelli*. Bonelli owned a swimming pool and hired Aymes to write software to handle record keeping on the pool. This was not part of Bonelli's regular business; he just wanted a piece of software written. The terms of the employment were casual. Bonelli paid no health benefits, Aymes worked irregular hours, usually unsupervised—Bonelli wasn't a programmer. When the case was heard, the court ruled that even though Bonelli was paying Aymes, Aymes owned the copyright because of the lack of involvement and participation by Bonelli. The court found that the degree of skill required by Aymes to do the job was so great that, in effect, he was creating the software by himself, even though he was receiving compensation for it.

Q. How can such disagreements be prevented? By working out the details ahead of time?

A. Exactly. The employer should have the employee sign a statement that the project is being carried out as work made for hire and should register the copyright with the U.S. Copyright Office in Washington. Conversely, employees should try to have the employer sign a statement that the project is not work made for hire and should try to register the copyright themselves.

Q. And if agreement can't be reached ahead of time?

A. Then stop right there. Don't do any work.

Figure 6.7 Excerpt from an Interview

Notice how the student prompts the attorney to expand her answers.

Notice how the student responds to the attorney's answers, making the interview more of a discussion.

Unfortunately, questionnaires rarely yield completely satisfactory results, for three reasons:

- *Some of the questions will misfire.* Respondents will misinterpret some of your questions or supply useless answers.
- *You won't obtain as many responses as you want.* The response rate will almost never exceed 50 percent. In most cases, it will be closer to 10 to 20 percent.

- *You cannot be sure the respondents are representative.* People who feel strongly about an issue are much more likely to respond to questionnaires than are those who do not. For this reason, you need to be careful in drawing conclusions based on a small number of responses to a questionnaire.

When you send a questionnaire, you are asking the recipient to do you a favor. Your goal should be to construct questions that will elicit the information you need as simply and efficiently as possible.

Asking Effective Questions To ask effective questions, follow two suggestions:

- *Use unbiased language.* Don't ask, "Should U.S. clothing manufacturers protect themselves from unfair foreign competition?" Instead, ask, "Are you in favor of imposing tariffs on men's clothing?"
- *Be specific.* If you ask, "Do you favor improving the safety of automobiles?" only an eccentric would answer no. Instead, ask, "Do you favor requiring automobile manufacturers to equip new cars with electronic stability control, which would raise the price by an average of \$300 per car?"

Table 6.2 explains common types of questions used in questionnaires.

Include an introductory explanation with the questionnaire. This explanation should clearly indicate who you are, why you are writing, what you plan to do with the information from the questionnaire, and when you will need it.

TABLE 6.2 ▶ Common Types of Questions Used in Questionnaires

Type of question	Example	Comments
Multiple choice	Would you consider joining a company-sponsored sports team? Yes ___ No ___	The respondent selects one of the alternatives.
Likert scale	The flextime program has been a success in its first year. strongly disagree _____ strongly agree	The respondent ranks the degree to which he or she agrees or disagrees with the statement. Using an even number of possible responses (six, in this case) increases your chances of obtaining useful data. With an odd number, many respondents will choose the middle response.
Semantic differentials	simple _____ difficult interesting _____ boring	The respondent registers a response along a continuum between a pair of opposing adjectives. Usually, these questions measure a person's feelings about a task, an experience, or an object. As with Likert scales, an even number of possible responses yields better data.
Ranking	Please rank the following work schedules in order of preference. Put a 1 next to the schedule you would most like to have, a 2 next to your second choice, and so on. 8:00–4:30 _____ 9:00–5:30 _____ 8:30–5:00 _____ flexible _____	The respondent indicates a priority among a number of alternatives.

TABLE 6.2 ▶ **Common Types of Questions Used in Questionnaires** (*continued*)

Type of question	Example	Comments
Short answer	What do you feel are the major advantages of the new parts-requisitioning policy? 1. _____ 2. _____ 3. _____	The respondent writes a brief answer using phrases or sentences.
Short essay	The new parts-requisitioning policy has been in effect for a year. How well do you think it is working? _____ _____ _____ _____ _____ _____	Although essay questions can yield information you never would have found using closed-ended questions, you will receive fewer responses because they require more effort. Also, essays cannot be quantified precisely, as data from other types of questions can.

Testing the Questionnaire Before you send out *any* questionnaire, show it and its accompanying explanation to a few people who can help you identify any problems. After you have revised the materials, test them on people whose backgrounds are similar to those of your real respondents. Revise the materials a second time, and, if possible, test them again. Once you have sent the questionnaire, you cannot revise it and resend it to the same people.

Administering the Questionnaire Determining who should receive the questionnaire can be simple or difficult. If you want to know what the residents of a particular street think about a proposed construction project, your job is easy. But if you want to know what mechanical-engineering students in colleges across the country think about their curricula, you will need a background in sampling techniques to identify a representative sample.

Make it easy for respondents to present their information. For mailed questionnaires, include a self-addressed, stamped envelope.

Figure 6.8 on page 146 shows a sample questionnaire.

Presenting Questionnaire Data in Your Document To decide where and how to present the data that you acquire from your questionnaire, think about your audience and purpose. Start with this principle: important information is presented and analyzed in the body of a document, whereas less-important information is presented in an appendix (a section at the end that only some of your audience will read). Most often, some version of the information appears in both places, but in different ways.

 **In This Book**

For more about testing documents, see Ch. 13, p. 357.

Figure 6.8 Questionnaire

September 6, 2012

To: All employees
 From: William Bonoff, Vice President of Operations
 Subject: Evaluation of the Lunches Unlimited food service

As you may know, every two years we evaluate the quality and cost of the food service that caters our lunchroom. We would like you to help in our evaluation by sharing your opinions about the food service. Please note that your responses will remain anonymous. Please drop the completed questionnaires in the marked boxes near the main entrance to the lunchroom.

1. Approximately how many days per week do you eat lunch in the lunchroom?
 0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5 _____
2. At approximately what time do you eat in the lunchroom?
 11:30–12:30 _____ 12:00–1:00 _____ 12:30–1:30 _____ varies _____
3. A clean table is usually available.
 strongly disagree _____ strongly agree
4. The Lunches Unlimited personnel are polite and helpful.
 strongly disagree _____ strongly agree
5. Please comment on the quality of the different kinds of food you have eaten in the lunchroom.
 - a. Daily specials
 excellent _____ good _____ satisfactory _____ poor _____
 - b. Hot dogs and hamburgers
 excellent _____ good _____ satisfactory _____ poor _____
 - c. Other entrées
 excellent _____ good _____ satisfactory _____ poor _____
6. What *foods* would you like to see served that are not served now?

7. What *beverages* would you like to see served that are not served now?

8. Please comment on the prices of the foods and beverages served.
 - a. Hot meals (daily specials)
 too high _____ fair _____ a bargain _____
 - b. Hot dogs and hamburgers
 too high _____ fair _____ a bargain _____
 - c. Other entrées
 too high _____ fair _____ a bargain _____
9. Would you be willing to spend more money for a better-quality lunch if you thought the price was reasonable?
 yes, often _____ sometimes _____ not likely _____
10. On the other side of this sheet, please provide whatever comments you think will help us evaluate the catering service.

Likert-scale questions 3 and 4 make it easy for the writer to quantify data about subjective impressions.

Short-answer questions 6 and 7 are best for soliciting ideas from respondents.

Thank you for your assistance.

If you think your questionnaire data are relatively unimportant, present the questionnaire in an appendix. If you can, present the respondents' data—the answers they provided—in the questionnaire itself, as shown here:

1. Approximately how many days per week do you eat lunch in the lunchroom?

0 12 1 16 2 18 3 12 4 9 5 4

2. At approximately what time do you eat in the lunchroom?

11:30–12:30 3 12:00–1:00 26 12:30–1:30 7 varies 23

If you think your questionnaire data are relatively important, present the full data in an appendix and interpret selected data in the body of the document. For instance, you might want to devote a few sentences or paragraphs to the data for one of the questions. The following example shows how one writer might discuss the data from question 2.

Question 2 shows that 26 people say that they use the cafeteria between noon and 1:00. Only 10 people selected the two other times: 11:30–12:30 or 12:30–1:30. Of the 23 people who said they use the cafeteria at various times, we can conclude that at least a third—8 people—use it between noon and 1:00. If this assumption is correct, at least 34 people (26 + 8) use the cafeteria between noon and 1:00. This would explain why people routinely cannot find a table in the noon hour, especially between 12:15 and 12:30. To alleviate this problem, we might consider asking department heads not to schedule meetings between 11:30 and 1:30, to make it easier for their people to choose one of the less-popular times.

The body of a document is also a good place to discuss important nonquantitative data. For example, you might wish to discuss and interpret several representative textual answers to open-ended questions.

ETHICS NOTE

Reporting and Analyzing Data Honestly

When you put a lot of time and effort into a research project, it's frustrating when you can't find the information you need or when the information you find doesn't help you say what you want to say. As discussed in Chapter 2, your challenge as a professional is to tell the truth.

If the evidence suggests that the course of action you propose won't work, don't omit that evidence or change it. Rather, try to figure out the discrepancy between the evidence and your proposal. Present your explanation honestly.

If you can't find reputable evidence to support your claim that one device works better than another, don't just keep silent and hope your readers won't notice. Explain why you think the evidence is missing and how you propose to follow up by continuing your research.

If you make an honest mistake, you are a person. If you cover up a mistake, you're a dishonest person. If you get caught fudging the data, you could be an unemployed dishonest person. If you don't get caught, you're still a smaller person.

If you think your reader will benefit from analyses of the data, present such analyses. For instance, you could calculate the percentage for each response: for question 1, "12 people—17 percent—say they do not eat in the cafeteria at all." Or you could present the percentage in parentheses after each number: "12 (17%)."

Writer's Checklist

- Did you determine the questions you need to answer for your document? (p. 119)

Did you choose appropriate secondary-research methods to answer those questions, including, if appropriate,

- online catalogs? (p. 126)
- reference works? (p. 126)
- periodical indexes? (p. 127)
- newspaper indexes? (p. 128)
- abstract services? (p. 128)
- government information? (p. 129)
- social media and other interactive resources? (p. 129)

In evaluating information, did you carefully assess

- the author's credentials? (p. 134)
- the publisher? (p. 135)


- the author's knowledge of literature in the field? (p. 135)
- the accuracy and verifiability of the information? (p. 135)
- the timeliness of the information? (p. 135)

Did you choose appropriate primary-research methods to answer your questions, including, if appropriate,

- observations and demonstrations? (p. 137)
- inspections? (p. 137)
- experiments? (p. 138)
- field research? (p. 139)
- interviews? (p. 140)
- inquiries? (p. 142)
- questionnaires? (p. 142)

- Did you report and analyze the data honestly? (p. 147)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Imagine that you are an executive working for a company that distributes books to bookstores in the Seattle, Washington, area. Your company, with a 20,000-square-foot warehouse and a fleet of 15 small delivery vans, employs 75 people. The following are three questions that an academic researcher specializing in energy issues might focus her research on. Translate each of these academic questions into workplace questions that your company might need to answer.
 - a. What are the principal problems that need to be resolved before biomass (such as switchgrass) can become a viable energy source for cars and trucks?
 - b. How much money will need to be invested in the transmission grid before windmills can become a major part of the energy solution for business and residential customers in the western United States?
 - c. Would a federal program that enables companies to buy and sell carbon offsets help or hurt industry in the United States?
2. For each of the following questions, select a research technique that is likely to yield a useful answer. For

instance, if the question is “Which companies within a 20-mile radius of our company headquarters sell recycled paper?” a search of the Web is likely to provide a useful answer.

- a. Does the Honda CR-V include traction control as a standard feature?
 - b. How much money has our company's philanthropic foundation donated to colleges and universities in each of the last three years?
 - c. How does a tankless water heater work?
 - d. Could our Building 3 support a rooftop green space?
 - e. How can we determine whether we would save more money by switching to fluorescent or LED lighting in our corporate offices?
3. **INTERNET EXERCISE** Using a search engine, answer the following questions. Provide the URL of each site you mention. If your instructor requests it, submit your answers in an e-mail to him or her.
 - a. What are the three largest or most important professional organizations in your field? (For example, if you are a construction management major, your

- field is construction management, civil engineering, or industrial engineering.)
- b. What are three important journals read by people in your field?
 - c. What are three important online discussion lists or bulletin boards read by people in your field?
 - d. What are the date and location of an upcoming national or international professional meeting for people in your field?
 - e. Name and describe, in one paragraph for each, three major issues being discussed by practitioners or academics in your field. For instance, nurses might be discussing the effect of managed care on the quality of medical care delivered to patients.
- 4.** Revise the following interview questions to make them more effective. In a brief paragraph for each, explain why you have revised it as you have.
- a. What is the role of communication in your daily job?
 - b. Do you think it is better to relocate your warehouse or go to just-in-time manufacturing?
 - c. Isn't it true that it's almost impossible to train an engineer to write well?
 - d. Where are your company's headquarters?
 - e. Is there anything else you think I should know?
- 5.** Revise the following questions from questionnaires to make them more effective. In a brief paragraph for each, explain why you have revised the question as you have.
- a. Does your company provide tuition reimbursement for its employees? Yes _____ No _____
 - b. What do you see as the future of bioengineering?
 - c. How satisfied are you with the computer support you receive?
 - d. How many employees work at your company? 5–10 _____ 10–15 _____ 15 or more _____
 - e. What kinds of documents do you write most often? memos _____ letters _____ reports _____
- 6. GROUP/INTERNET EXERCISE** Form small groups, and describe and evaluate your college or university's Web site. A different member of the group might carry out each of the following tasks:
- In an e-mail to the site's webmaster, ask questions about the process of creating the site. For example, how involved was the webmaster with the content and design of the site? What is the webmaster's role in maintaining the site?
 - Analyze the kinds of information the site contains, and determine whether the site is intended primarily for faculty, students, alumni, legislators, or prospective students.
 - Determine the overlap between information on the site and information in printed documents published by the school. In those cases in which they overlap, is the information on the site merely a duplication of the printed information, or has it been revised to take advantage of the unique capabilities of the Web?
- In a memo to your instructor, present your findings and recommend ways to improve the site.

Case 6: Revising a Questionnaire

Background

You are the Director of Marketing for Yakima Properties, a real-estate company that employs 18 agents and advertises approximately one hundred residential properties at any one time. The company advertises in the Saturday real-estate supplement in the local newspaper and on its own Web site, presenting photographs and a description for each of the properties. In addition, for properties that are advertised at a price of \$750,000 and above, the company presents virtual-reality 360° tours on the Web site. When Yakima Properties began offering the virtual-reality

tours on its Web site two years ago, it contracted with Edelson Custom Photography, a high-end photographic supplier, to provide both the virtual-reality tours and the traditional photographs of all the company's properties. Yakima's contract with Edelson is about to expire.

In an attempt to determine if it is possible to cut costs, you have asked one of your agents, Rachel Stevens, to research whether it would be possible to have the real-estate agents take their own photographs of the properties they list. You ask Rachel to sketch out how she would research the topic. "Write me an e-mail listing the ques-

tions we need to answer to know whether this idea would work, and how you'd answer them." Two days later, she sends you an e-mail (Document 6.1).

You leave her a phone message: "Thanks, Rachel. Good to know that the hardware is available and cheap. What I'd like you to think about now, however, is what our agents would think about being asked to take their own pictures. How many of the agents are experienced with taking digital photos? Do they have any preferences about the kind of camera to get? Would they consider it an imposition to have to take their own photos, or do they think the ability to shoot just what they want—and have the

photos available right away—outweighs the extra work we'd be asking them to do? And keep in mind that, with 18 agents, you're going to want to choose types of questions that let us quantify the responses effectively."

Rachel sends you a quick e-mail saying that she'll get on it, and the next day you receive her response (Document 6.2). After studying it, you realize that you are going to need to become more involved in carrying out this research. You know that Rachel is a good worker who has a bright future with Yakima Properties, but she has little experience writing questionnaires. You ask her if she would like you to critique her five questions. She says yes.

Document 6.1 Rachel's Response to the Request for a List of Questions That Need to Be Answered

To: [yourname]@yakimaproperties.com
From: rstevens@yakimaproperties.com
Subject: camera research

I've had a chance to speak with Jill in Production, who said that it would be pretty easy to have our agents do the stills. Almost any level of digital camera would work. We already have the image-editing software, so that wouldn't be a problem.

I checked online, and there's all kinds of cameras at less than \$200 that we could get. For instance, for about \$110, we could get a Nikon Coolpix 12-megapixel, with the following features:

- 12 megapixels, for pics up to 16 x 20 inches
- 5x optical/4x digital/20x total zoom
- 2.7-inch high-resolution LCD
- High ISO sensitivity (3200)
- Digital image stabilization
- 47MB internal memory and a digital media card slot

There's a good dozen companies offering similar products. And there's no shortage of sites that sell these packages.

Let me know if there's anything else you need. I think we're good to go.

Rachel

1. Do you feel comfortable using a digital camera? Why or why not?
2. Do you feel that it would be productive to send out the agents with digital cameras to take pictures of the featured property?
A.) Strongly Agree B.) Agree C.) Neutral D.) Disagree
E.) Strongly Disagree
3. What direction should the company go in terms of use of the digital camera for agents?
A.) The company should equip the agents to take pictures of real estate.
B.) The company should do more research on the cost effectiveness of every agent having a digital camera.
C.) It would be a waste of resources to have the agents take pictures.
4. Do you feel that we should be having the agents take the pictures for our clients? Do you feel that it would make the selling process more or less professional?
5. Please explain in a few paragraphs your usage and understanding of digital cameras.

**Document 6.2 Rachel's
E-mail Proposing
Questions About Agents'
Skills and Attitudes**



On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Your Assignment

1. Write an e-mail response to Rachel in which you thank her for her work but explain the major flaw in each of the five questions.
2. Rachel receives your critique of her questions and asks if you wouldn't mind showing her how you would frame the questions. Write her an e-mail in which you present five questions meant to gather easy-to-quantify infor-

mation about the agents' experience and expertise using digital cameras and their attitudes toward your idea of having agents take their own photos of their properties. For each of the five questions, include a one-paragraph statement explaining why the information the question is intended to elicit is important, and why the question is likely to gather the necessary information and be easy to quantify.

CHAPTER **7**

Organizing Your Information



James P. Blair/National Geographic Stock.

When you plan and draft, how do you know which organizational patterns will work best?

A Gore's book and documentary *An Inconvenient Truth* is an argument arranged according to causal analysis: human activities have caused potentially catastrophic climate change. Gore uses many other organizational patterns to present his case. This photograph of the border between Haiti and the Dominican Republic contrasts the forest-conservation policies of the two countries.

During the planning phase of your writing process, you need to organize the information that will go into a document. But how do you know which organizational patterns will work best? Is it a question of the information you want to communicate? The audience you are addressing? The purpose you are trying to achieve? The culture in your own company? Short answer: yes. To get some ideas, talk with an experienced co-worker, read other similar documents, and read this chapter.

At this point, you should know for whom you are writing and why, and you should have completed most of your research. Now it is time to start organizing the information that will make up the body of your document.

UNDERSTANDING THREE PRINCIPLES FOR ORGANIZING TECHNICAL INFORMATION

Follow these three principles in organizing your information:

- Analyze your audience and purpose.
- Use conventional patterns of organization.
- Display your organizational pattern prominently.

Analyzing Your Audience and Purpose

Although you thought about your audience and purpose as you planned and researched your subject, your initial analyses of audience and purpose are likely to change as you continue. Therefore, it is useful to review your assessment of audience and purpose before you proceed.

Will your audience like the message you will present? If so, announce your main point early in the document. If not, consider a pattern that presents your important evidence before your main message. Is your audience used to seeing a particular pattern in the kind of document you will be writing? If they are, you will probably want to use that pattern, unless you have a good reason to use a different one.

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Cause and Effect 172

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For more about audience and purpose, see Ch. 5.

What is your purpose in writing the document? Do you want your audience to understand a body of information or to accept a point of view and perhaps act on it? One purpose might call for a brief report without any appendixes; the other might require a detailed report, complete with appendixes.

If you are addressing people from other cultures, remember that organizational patterns can vary from culture to culture. If you can, study documents written by people from the culture you are addressing to see whether they favor an organizational pattern different from the one you are considering.

- *Does the text follow expected organizational patterns?* For example, this chapter discusses the general-to-specific pattern. Does the text you are studying present the specific information first?
- *Do the introductions and conclusions present the kind of information you would expect?* In the United States, main findings are often presented in the introduction; in other cultures, the main findings are not presented until late in the document.
- *Does the text appear to be organized linearly?* Is the main idea presented first in a topic sentence or thesis statement? Does supporting information follow? In some cultures, main ideas are withheld until the end of the paragraph or document.
- *Does the text use headings?* If so, does it use more than one level?

If documents from the culture you plan to address are organized very differently from those you're used to seeing, take extra steps to ensure that you don't distract readers by using an unfamiliar organizational pattern.

Using Conventional Patterns of Organization

This chapter presents a number of conventional patterns of organization, such as the chronological pattern and the spatial pattern. You should begin by asking yourself whether a conventional pattern for presenting your information already exists. Using a conventional pattern makes things easier for you as a writer and for your audience.

For you, a conventional pattern serves as a template or checklist, helping you remember which information to include and where to put it. In a proposal, for example, you include a budget, which you put near the end or in an appendix. For your audience, a conventional pattern makes your document easier to read and understand. Readers who are familiar with proposals can find the information they want because you have put it where others have put similar information.

Does this mean that technical communication is merely the process of filling in the blanks? No. You need to assess the writing situation continuously as you work. If you think you can communicate your ideas better by modifying a conventional pattern or by devising a new pattern, do so. However, you gain nothing if an existing pattern would work just as well.

Displaying Your Organizational Pattern Prominently

Make it easy for your readers to understand your organizational pattern. Displaying your pattern prominently involves three main steps:

- *Create a detailed table of contents.* If your document has a table of contents, including at least two levels of headings helps readers find the information they seek.
- *Use headings liberally.* Headings break up the text, making your page more interesting visually. They also communicate the subject of the section and improve readers' understanding.
- *Use topic sentences at the beginnings of your paragraphs.* The topic sentence announces the main point of a paragraph and helps the reader understand the details that follow.

In This Book

For more about tables of contents, see Ch. 19, p. 525. For more about headings and topic sentences, see Ch. 9, pp. 206 and 212.

USING BASIC ORGANIZATIONAL PATTERNS

Every argument calls for its own organizational pattern. Table 7.1 explains the relationship between organizational patterns and the kinds of information you want to present.

On TechComm Web

For a discussion of organizing information, see Paradigm Online Writing Assistant. Click on Links Library for Ch. 7 on <bedfordstmartins.com/techcomm>.

TABLE 7.1 ► Organizational Patterns and the Kinds of Information You Want to Present

If you want to . . .	Consider using this organizational pattern	For example . . .
Explain events that occurred or might occur or tasks the reader is to carry out	Chronological (p. 156). Most of the time, you present information in chronological order. Sometimes, however, you use reverse chronology.	You describe the process used to diagnose the problem with the accounting software. Or, in a résumé, you describe your more-recent jobs before your less-recent ones.
Describe a physical object or scene, such as a device or a location	Spatial (p. 158). You choose an organizing principle such as top-to-bottom, east-to-west, or inside-to-outside.	You describe the three buildings that will make up the new production facility.
Explain a complex situation, such as the factors that led to a problem or the theory that underlies a process	General to specific (p. 158). You present general information first, then specific information. Understanding the big picture helps readers understand the details.	You explain the major changes and details of a law mandating the use of a new refrigerant in cooling systems.
Present a set of factors	More important to less important (p. 161). You discuss the most-important issue first, then the next most-important issue, and so forth. In technical communication, you don't want to create suspense. You want to present the most-important information first.	When you launch a new product, you discuss market niche, competition, and then pricing.



TABLE 7.1 ► **Organizational Patterns and the Kinds of Information You Want to Present** (*continued*)

If you want to . . .	Consider using this organizational pattern	For example . . .
Present similarities and differences between two or more items	Comparison and contrast (p. 162). You choose from one of two patterns: (1) discuss all the factors related to one item, then all the factors related to the next item, and so forth; (2) discuss one factor as it relates to all the items, then another factor as it relates to all the items, and so forth.	You discuss the strengths and weaknesses of three companies bidding on a contract your company is offering.
Assign items to logical categories or discuss the elements that make up a single item	Classification and partition (p. 168). Classification involves placing items into categories according to some basis. Partition involves breaking a single item into its major elements.	You group the motors your company manufactures according to the fuel they burn: gasoline or diesel. Or you explain the operation of each major component of one of your motors.
Discuss a problem you encountered, the steps you took to address the problem, and the outcome or solution	Problem-methods-solution (p. 170). You can use this pattern in discussing the past, the present, or the future. Readers understand this organizational pattern because they use it in their everyday lives.	In describing how your company is responding to a new competitor, you discuss the problem (the recent loss in sales), the methods (how you plan to examine your product line and business practices), and the solution (which changes will help your company remain competitive).
Discuss the factors that led to (or will lead to) a given situation, or the effects that a situation led to or will lead to	Cause and effect (p. 173). You can start from causes and speculate about effects, or start with the effect and work backward to determine the causes.	You discuss factors that you think contributed to a recent sales dip for one of your products. Or you explain how you think changes to an existing product will affect its sales.

Long, complex arguments often require several organizational patterns. For instance, one part of a document might be a causal analysis of the problem you are writing about, and another might be a comparison and contrast of two options for solving that problem. Figure 7.1, an excerpt from a user's manual, shows how different patterns might be used in a single document.

Chronological

The chronological—or time-line—pattern commonly describes events. In an *accident report*, you describe the events in the order in which they occurred. In the background section of a *report*, you describe the events that led to the present situation. In a *reference manual*, you explain how to carry out a task by describing the steps in sequence.

Figure 7.2 on page 158, a description of the process of reopening waters to fishing after an oil spill, is arranged chronologically.

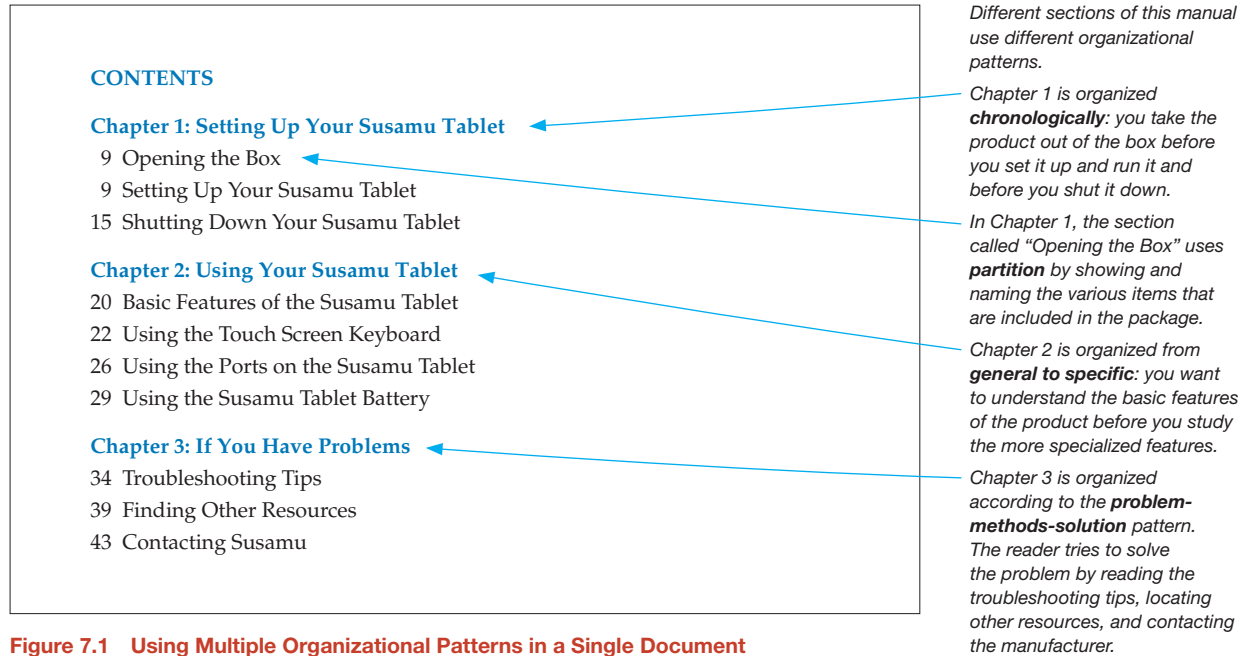


Figure 7.1 Using Multiple Organizational Patterns in a Single Document

Guidelines

Organizing Information Chronologically

These three suggestions can help you write an effective chronological passage.

- ▶ **Provide signposts.** If the passage is more than a few hundred words long, use headings. Choose words such as *step*, *phase*, *stage*, and *part*, and consider numbering them. Add descriptive phrases to focus readers' attention on the topic of the section:

Phase One: Determining Our Objectives

Step 3: Installing the Lateral Supports

At the paragraph and sentence levels, transitional words such as *then*, *next*, *first*, and *finally* help your reader follow your discussion.

- ▶ **Consider using graphics to complement the text.** Flowcharts, in particular, help you emphasize chronological passages for all kinds of readers, from the most expert to the general reader.
- ▶ **Analyze events where appropriate.** When you use chronology, you are explaining what happened in what sequence, but you are not necessarily explaining why or how an event occurred or what it means. For instance, the largest section of an accident report is usually devoted to the chronological discussion, but the report is of little value unless it explains what caused the accident, who bears responsibility, and how such accidents can be prevented.

In This Book

For more about transitions, see Ch. 9, p. 217.

In This Book

For more about graphics, see Ch. 12.

The National Oceanic and Atmospheric Administration (NOAA), in consultation with the U.S. Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and state health and fisheries agencies in the Gulf region, has established a protocol for use in re-opening oil-impacted areas closed to seafood harvesting. The state agency or agencies responsible for the fishery and for the safety of the seafood for consumption shall initiate the following protocol:

1. **The State Agency Proposes the Re-opening of an Area.** Once the oil spill has been contained and/or the oil has receded from state waters for a sufficient period of time, the applicable state agency proposes that a specific area be re-opened for seafood harvesting. The state agency specifies that the opening will be for all seafood harvested from a particular area or for specific species. The state agency collects samples from the area using the state-created sampling plan.
2. **The State Agency Sends Samples to the National Seafood Inspection Laboratory (NSIL).** Upon receipt, NSIL personnel prepare the samples for sensory evaluation and possible chemical analyses.
3. **NSIL Performs Sensory Analyses.** Sensory analyses are performed on the edible portion of the species of seafood being tested. A panel consisting of a minimum of 10 expert sensory assessors shall evaluate each sample in both a raw and cooked state. If at least 70 percent of the assessors find NO detectable petroleum or dispersant odor or flavor from each sample, samples are considered to have passed the sensory analyses.
4. **NSIL Performs Chemical Analyses.** If the samples pass sensory analyses, NSIL performs chemical analyses on additional samples to determine if harmful levels of polycyclic aromatic hydrocarbons (PAHs) are present.

If harmful levels of PAHs are found, the site from which the sample was collected fails and remains closed. If the levels of PAHs do not pose a health concern—and the results are confirmed by the FDA—the site will be considered eligible for re-opening.

Figure 7.2 Information Organized Chronologically

Source: Based on U.S. Food and Drug Administration, 2010 <www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/ucm233720.htm>.

Spatial

The spatial pattern is commonly used to describe objects and physical sites. In an *accident report*, you describe the physical scene of the accident. In a *feasibility study* about building a facility, you describe the property on which it would be built. In a *proposal* to design a new microchip, you describe the layout of the new chip.

Figure 7.3 shows the use of spatial organization.

General to Specific

The general-to-specific pattern is used when readers need a general understanding of a subject before they can understand and remember the details. For example, in a *report*, you include an executive summary—an overview for

 **On TechComm Web**
To view Fig. 7.3 in context on the Web, click on Links Library for Ch. 7 on <bedfordstmartins.com/techcomm>.

Guidelines

Organizing Information Spatially

These three suggestions can help you write an effective spatial passage.

- ▶ **Provide signposts.** Help your readers follow the argument by using words and phrases that indicate location (*to the left, above, in the center*) in headings, topic sentences, and support sentences.
- ▶ **Consider using graphics to complement the text.** Diagrams, drawings, photographs, and maps clarify spatial relationships.
- ▶ **Analyze events where appropriate.** A spatial arrangement doesn't explain itself; you have to do the analysis. A diagram of a floor plan cannot explain why the floor plan is effective or ineffective.



This screen, from the Metropolitan Museum of Art's "Heilbrunn Timeline of Art History" Web feature, uses spatial organization to show the different styles of art that originated in various regions from 1600 to 1800 c.e.

Figure 7.3 Information Organized Spatially

Source: Metropolitan Museum of Art, 2010 <www.metmuseum.org/toah/world-regions/#/09/World-Map>.

managers—before the body of the report. In a set of *instructions*, you provide general information about the necessary tools and materials and about safety measures before providing the step-by-step instructions. In a *blog*, you describe the topic of the blog before presenting the individual blog posts.

Figure 7.4 on page 160, from the U.S. Department of Transportation site on distracted driving, is an example of information organized from general to specific.

Guidelines

Organizing Information from General to Specific

These two suggestions can help you use the general-to-specific pattern effectively.

- ▶ **Provide signposts.** Explain that you will address general issues first and then move on to specific concerns. If appropriate, incorporate the words *general* and *specific* or other relevant terms in the major headings or at the start of the text for each item you describe.
- ▶ **Consider using graphics to complement the text.** Diagrams, drawings, photographs, and maps help your reader understand the general or fine points of the information.

Use of Electronic Devices While Driving

A 2008 survey by the National Highway Traffic Safety Administration (NHTSA) reveals an increase in the use of electronic devices while driving and some regional differences in this practice.

Overview

The percentage of young drivers texting or using other hand-held electronic devices has increased from 2007, according to the National Highway Traffic Safety Administration's 2008 nationwide survey, which provides the only nationwide probability-based observed data on driver electronic device use in the United States. The survey shows that the hand-held cell phone use rate in 2008 translates into 812,000 vehicles being driven by someone using a hand-held cell phone at any given moment during daylight hours. It also translates into an estimated 11 percent of all vehicles that had drivers who were using some type of phone (hand-held or hands-free).

Highlights

- Nationwide, those drivers observed visibly manipulating hand-held electronic devices increased from 0.7 percent to 1.0 percent.
- Some 1.7 percent of drivers 16 to 24 years old were observed visibly manipulating hand-held electronic devices, up from 1.0 percent the previous year.
- More drivers in Western States were observed manipulating hand-held electronic devices (2.1%) than in the other regions of the country (from 0.4% in the Northeast to 0.8% in the Midwest).
- The use of hand-held devices increased the most in the West, from 0.6 percent in 2007 to 2.1 percent in 2008.
- The observed use rate of hand-held electronic devices was higher among females (1.2%) than among males (0.8%).

The first sentence presents the most general statement of the research results.

The Overview section presents a somewhat more specific version of the information.

The Highlights section presents the most specific information.

Figure 7.4 Information Organized from General to Specific

Source: Distraction.gov, 2010 <www.distraction.gov/stats-and-facts>.

More Important to Less Important

This organizational pattern, more important to less important, recognizes that readers often want the bottom line—the most-important information—first. For example, in an *accident report*, you describe the three most important factors that led to the accident before describing the less-important factors. In a *feasibility study* about building a facility, you present the major reasons that the proposed site is appropriate, then the minor reasons. In a *proposal* to design a new microchip, you describe the major applications for the new chip, then the minor applications.

For most documents, this pattern works well because readers want to get to the bottom line as soon as possible. For some documents, however, other patterns work better. People who write for readers outside their own company often reverse the more-important-to-less-important pattern because they want to make sure their audience reads the whole discussion. This pattern is also popular with writers who are delivering bad news. For instance, if you want to justify recommending that your organization *not* go ahead with a popular plan, the reverse sequence lets you explain the problems with the popular plan before you present the plan you recommend. Otherwise, readers might start to formulate objections before you have had a chance to explain your position.

Figure 7.5 on page 162, from a foundation’s annual report, shows the more-important-to-less-important organizational structure.

Guidelines

Organizing Information from More Important to Less Important

These three suggestions can help you write a passage organized from more important to less important.

- ▶ **Provide signposts.** Tell your readers how you are organizing the passage. For instance, in the introduction of a proposal to design a new microchip, you might write, “The three applications for the new chip, each of which is discussed below, are arranged from most important to least important.”

In assigning signposts, be straightforward. If you have two very important points and three less-important points, present them that way: group the two important points and label them, as in “Major Reasons to Retain Our Current Management Structure.” Then present the less-important factors as “Other Reasons to Retain Our Current Management Structure.” Being straightforward makes the material easier to follow and enhances your credibility.

- ▶ **Explain why one point is more important than another.** Don’t just say that you will be arranging the items from more important to less important. Explain why the more-important point is more important.
- ▶ **Consider using graphics to complement the text.** Diagrams and numbered lists often help to suggest levels of importance.

HIV
STRATEGY OVERVIEW (2005-2009)

OUR MISSION

Our mission is to ensure that all those living with HIV, the Bill & Melinda Gates Foundation works to help all people lead healthy, productive lives. Our Global Health Program supports...
 Progress made in preventing HIV are available and affordable, but quality of these interventions will determine prevention strategies are accessible to those that need them most. For example, globally, only 10 percent of HIV-infected pregnant women have access to...

PROGRESS

Our investments in delivering comprehensive prevention programs and promoting male circumcision are yielding a number of successes:

- Phase I (2001–2008) of **Botswana’s ACHAP** resulted in 90 percent prevention of mother-to-child transmission (PMTCT) coverage rates, and more than 90 percent of people needing treatment received antiretroviral therapy. The partnership was also responsible for renovating and supporting 34 infectious-disease care clinics, training 7,000 health-service providers and lay personnel, providing equipment to support laboratory diagnostic and monitoring services, procuring and delivering antiretroviral therapy (ART), and embedding more than 100 staff in key national and district government positions. In addition, ACHAP was instrumental in helping the government of Botswana develop a national male circumcision plan, implementing routine HIV testing, and reducing the age of consent for testing from 21 to 16.
- Our **Avahan** initiative to support partners in India has shown significant reductions in HIV-prevalence rates among antenatal care attendees and increases in condom use. We are gradually transitioning key aspects of Avahan to the government of India and other partners.
- We supported a trial in Uganda demonstrating that male circumcision leads to reduced HIV incidence among men. This led to WHO’s endorsement of male circumcision and specific implementation guidelines for male circumcision for select countries. We are now working in partnership with the U.S. President’s Emergency Plan for AIDS Relief and others to encourage scale-up of male circumcision in high-HIV-prevalent countries with low coverage rates of male circumcision.

The first section presents the most-important set of results. It is reported in considerable detail, accompanied by specific data.

The second section presents less-important information. Note that this section lacks specific data.

The third section, the least important of the three, explains that the writer’s organization assisted another organization.

Figure 7.5 Information Organized from More Important to Less Important

Source: Bill and Melinda Gates Foundation, 2009 <www.gatesfoundation.org/global-health/Documents/hiv-strategy.pdf>.

Comparison and Contrast

Typically, the comparison-and-contrast pattern is used to describe and evaluate two or more items or options. For example, in a *memo*, you compare and contrast the credentials of three finalists for a job. In a *proposal* to design a new microchip, you compare and contrast two different strategies for designing the chip. In a *feasibility report* describing a legal challenge that your company faces, you compare and contrast several options for responding.

The first step in comparing and contrasting two or more items is to determine the *criteria*: the standards or needs you will use in studying the

In This Book

For more about feasibility reports, see Ch. 19, p. 514.

items. For example, a professional musician who plays a piano in restaurants might be looking to buy a new portable keyboard. She might compare and contrast available instruments using the number of keys as one criterion. For this person, 88 keys would be better than 64. Another criterion might be weight: lighter is better than heavier.

Almost always, you will need to consider several or even many criteria. Start by deciding whether each criterion represents a necessary quality or merely a desirable one. In studying keyboards, for instance, the number of keys might be a necessary quality. If you need an 88-key instrument to play your music, you won't consider any instruments without 88 keys. The same thing might be true of touch-sensitive keys. But a MIDI interface might be less important, a merely desirable quality; you would like MIDI capability, but you would not eliminate an instrument from consideration just because it doesn't have MIDI.

Two typical patterns for organizing a comparison-and-contrast discussion are *whole-by-whole* and *part-by-part*. The following table illustrates the difference between them. In this table, two printers—Model 5L and Model 6L—are being compared and contrasted according to three criteria: price, resolution, and print speed.

The whole-by-whole pattern provides a coherent picture of each option: Model 5L and Model 6L. This pattern works best if your readers need an overall assessment of each option or if each option is roughly equivalent according to the criteria.

<i>Whole-by-whole</i>	<i>Part-by-part</i>
Model 5L	Price
<ul style="list-style-type: none"> • price • resolution • print speed 	<ul style="list-style-type: none"> • Model 5L • Model 6L
Model 6L	Resolution
<ul style="list-style-type: none"> • price • resolution • print speed 	<ul style="list-style-type: none"> • Model 5L • Model 6L
	Print Speed
	<ul style="list-style-type: none"> • Model 5L • Model 6L

The part-by-part pattern lets you focus your attention on the criteria. If, for instance, Model 5L produces much better resolution than Model 6L, the part-by-part pattern reveals this difference more effectively than the whole-by-whole pattern does. The part-by-part pattern is best for detailed comparisons and contrasts.

You can have it both ways. If you want to use a part-by-part pattern to emphasize particular aspects, you can begin the discussion with a general description of the various items. Once you have chosen the overall pattern—whole-by-whole or part-by-part—you can decide how to organize the second-level items. That is, in a whole-by-whole passage, you have to sequence the “aspects”; in a part-by-part passage, you have to sequence the “options.”

Figure 7.6 on page 164, a comparison of Facebook Groups and LinkedIn Groups for marketing, shows a comparison-and-contrast passage organized according to the part-by-part pattern.

Guidelines

Organizing Information by Comparison and Contrast

These four suggestions can help you compare and contrast items effectively.

- ▶ **Establish criteria for the comparison and contrast.** Choose criteria that are consistent with the needs of your audience.
- ▶ **Evaluate each item according to the criteria you have established.** Draw your conclusions.
- ▶ **Organize the discussion.** Choose either the *whole-by-whole* or *part-by-part* pattern or some combination of the two. Then organize the second-level items.
- ▶ **Consider using graphics to complement the text.** Graphics can clarify and emphasize comparison-and-contrast passages. Diagrams, drawings, and tables are common ways to provide such clarification and emphasis.

LinkedIn Group versus Facebook Group

I have already reviewed how Facebook Group is different from Facebook Fan Page: a group is better to use for (two-way) discussion, while a page is easier to brand and promote. A LinkedIn group is definitely closer to a Facebook Group in this respect, so comparing it to a Facebook page (a wider-used tool nowadays) would be like comparing apples to oranges.

Why do we need to compare, you might ask. Why not use both?

The purpose of this post is NOT to tell which one of the two (or the three) should be used. I myself use all the three tools (to take advantage of all social media properties I can build). **The purpose is to help you make sure you don't miss any important features.**

So, here you go: a LinkedIn Group versus a Facebook Group—for social media marketers.

1. Basic Differences

The main difference I should start with is tightly connected to how the two networks are different in styles and purposes. LinkedIn connects experts and businesses, while Facebook is for personal connections.

This takes us to a few basic differences you will notice:

- LinkedIn discussions are generally more focused and, well, business-like.
- LinkedIn members are more thorough and willing to discuss business opportunities.

Besides that (and here's where LinkedIn wins), there is *only one* networking feature of this type within LinkedIn and plenty of them at Facebook (community pages, business pages, groups, etc.). This makes LinkedIn much **clearer and clutter-free**.

This passage uses the part-by-part pattern: the writer selects four criteria by which to compare and contrast the two tools. Note that she begins with the most-general criterion before discussing the more-specific criteria.

Figure 7.6 Information Organized by Comparison and Contrast

Source: Based on Smarty, 2010 <www.searchenginejournal.com/linkedin-group-versus-facebook-group/22683/#ixzz0vqx2tm37>.

2. Privacy Options, Moderation and Managing Settings

Winner: LinkedIn

Both the networks have varied privacy settings for their group functionality. Facebook group can be set to be

- Public (any Facebook member can join)
- Private (any Facebook member can join after one of the administrators approves him)
- Secret (the administrators should invite people to join and only members can view photos and discussion boards)

Additionally, being a group administrator at Facebook will let you set who can share what at the group wall.

A LinkedIn Group administrator can set if the group can be joined by anyone or by those who get approved. In addition, you can set whether you want the group to be included into the LinkedIn group search engine.

Like on Facebook, you can set whether you want only admins and moderators to share anything within the group but those settings are less flexible.

Why I think LinkedIn is still a winner here is the variety of its moderation options. The newly-added LinkedIn feature set also allows for some cool, handy moderation and management tools (some of them are still being developed, though):

- Managers and moderators can delete inappropriate posts right from their email box using the new option “Send me an email for each new discussion” in More > My Settings.
- Managers and moderators can delete inappropriate comments right from their email box by clicking “Delete” within any followed-discussion email alert.
- Members can flag items as inappropriate.
- The moderation queue allows group managers to decide how many member flags can delete a thread or a comment.
- Very-low-connection users can be flagged as such in groups’ request-to-join queues.

3. Promotion Tools

Winner: Both

Sadly, none of the group types is public (though with a Facebook group at least discussions are public and can be crawled). On the plus side, both tools allow you to invite all (or any) of your friends:

- Facebook allows you to select all your friends (one by one) to invite as well as import your contacts from Gtalk or Outlook.
- LinkedIn allows you to add friends to invite in bunches (per 10 or 20), but you can only invite up to 50 friends per day. What’s nice is that you can select friends to invite by industry and/or by location, so you can target your invitations more precisely.



Figure 7.6 (continued)

4. Networking and Communication Tools

Winner: LinkedIn

Both the services allow you to host discussions, but LinkedIn Groups have more cool features here (**especially in terms of driving members back to the group and thus engaging them**):

- Members (by default) receive email digest of updated discussions.
- Members receive instant updates of new replies to the threads they are subscribed to (they previously commented on).
- You can see which of the group members are connected personally to you (and who you may want to add). Besides that, the common group gives another way to add the member to your network.
- Members can follow the most influential people in your groups by checking the Top Influencers board or clicking their profile image to see all their group activity.

On the big plus side (for both the services) is that any member's sharing on the group wall includes the update into his personal feed, which encourages more people to check the group and accounts for the viral effect.

What's your take? Which of the two is a more powerful networking tool?

Figure 7.6 (continued)

ETHICS NOTE

Comparing and Contrasting Fairly

Because the comparison-and-contrast organizational pattern is used frequently in evaluating items, it appears often in product descriptions as part of the argument that one company's products are better than a competitor's. There is nothing unethical in this. But it is unethical to misrepresent items, such as when writers portray their own product as better than it is or portray their competitor's as worse than it is. Obviously, lying about a product is unethical.

But some practices are not so easy to characterize. For example, your company makes laptop computers, but your chief competitor's model has a longer battery life than yours. In comparing and contrasting the two laptops, are you ethically obligated to mention battery life? No, you are not. If readers are interested in battery life, they will have to figure out what your failure to mention battery life means and seek further information from other sources. If you do mention battery life, however, you must do so honestly, using industry-standard techniques for measuring it. You cannot measure your laptop's battery life under one set of conditions and your competitor's under another set.

INTERACTIVE SAMPLE DOCUMENT

Comparing and Contrasting Honestly

In this comparison-and-contrast table, Microsoft is comparing and contrasting its browser, Internet Explorer, with two other browsers. The questions in the margin ask you to think about the ethics of the information.

	Internet Explorer 8	Firefox 3.6	Google Chrome 4.0	Comments
Security	✓			With the SmartScreen filter , Internet Explorer 8 is the #1 browser in malware and phishing protection . Internet Explorer 8 is: <ul style="list-style-type: none"> • 2.9 times better than Firefox in protecting against malicious malware • 5 times better than Chrome in protecting against malicious malware • 3 times better than Chrome in protecting users against phishing attacks
Privacy	✓			By default, Internet Explorer 8 separates the address bar and search bar functions to help ensure that what you type in your address bar stays private and isn't shared with anyone.
Ease of use	✓			Internet Explorer 8 is the only browser that offers tab grouping and color coding, Accelerators , Web Slices , and visual search suggestions that help make your daily online tasks easier.
Web standards	✓	✓	✓	Firefox and Chrome have more support for emerging standards like HTML5 and CSS3, but Internet Explorer 8 supports standards commonly used by the websites you visit today. That includes supporting more of the CSS 2.1 specification than any other browser.
Developer tools	✓	✓		Internet Explorer 8 has the most comprehensive developer tools—including HTML, CSS and JavaScript editing, and JavaScript profiling—built in. The developer tools available with other browsers either need to be downloaded separately or aren't as complete.
Reliability	✓			Only Internet Explorer 8 has both tab isolation and crash recovery features .

Source: Microsoft, 2010 <www.microsoft.com/windows/internet-explorer/compare/default.aspx>.

1. Identify one claim from the Comments column that is not precise enough for you to understand whether the claim is valid. Explain why.
2. The row titled “Web standards” is the only one in which the writers appear to admit that Firefox and Chrome are better than Internet Explorer. How do the writers argue that Internet Explorer is superior in its approach to Web standards? Is the argument convincing?
3. This table presents a lot of technical information but no source statements. For instance, there are three claims in the bullet list in the Security row, but no citations attributing the information to a trusted source. Why did the writers choose not to present source statements? Was that a good idea?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 7 on <bedfordstmartins.com/techcomm>.

Classification and Partition

Classification is the process of assigning items to categories. For instance, all the students at a university could be classified by sex, age, major, and many other characteristics. You can also create subcategories within categories, such as males and females majoring in business.

Classification is common in technical communication. In a *feasibility study* about building a facility, you classify sites into two categories: domestic and foreign. In a *journal article* about ways to treat a medical condition, you classify the treatments as surgical and nonsurgical. In a description of a major in a *college catalog*, you classify courses as required or elective.

Partition is the process of breaking a unit into its components. For example, a home-theater system could be partitioned into the following components: TV, amplifier, peripheral devices such as DVD players, and speakers. Each component is separate, but together they form a whole system. Each component can, of course, be partitioned further.

Partition is used in descriptions of objects, mechanisms, and processes. In an *equipment catalog*, you use partition to describe the major components of one of your products. In a *proposal*, you use partition to present a detailed description of an instrument being proposed for development. In a *brochure*, you describe how to operate a product by describing each of its features.

Guidelines

Organizing Information by Classification or Partition


These six suggestions can help you write an effective classification or partition passage.

- ▶ **Choose a basis of classification or partition that fits your audience and purpose.** If you are writing a warning about snakes for hikers in a particular state park, your basis of classification will probably be whether the snakes are poisonous. You will describe all the poisonous snakes, then all the nonpoisonous ones.
- ▶ **Use only one basis of classification or partition at a time.** If you are classifying graphics programs according to their technology—paint programs and draw programs—do not include another basis of classification, such as cost.
- ▶ **Avoid overlap.** In classifying, make sure that no single item could logically be placed in more than one category. In partitioning, make sure that no listed component includes another listed component. Overlapping generally occurs when you change the basis of classification or the level at which you are partitioning a unit. In the following classification of bicycles, for instance, the writer introduces a new basis of classification that results in overlapping categories:
 - mountain bikes
 - racing bikes
 - comfort bikes
 - ten-speed bikes

The first three items share a basis of classification: the general category of bicycle. The fourth item has a different basis of classification: number of speeds. Adding the fourth item is illogical because a particular ten-speed bike could be a mountain bike, a racing bike, or a comfort bike.

- ▶ **Be inclusive.** Include all the categories necessary to complete your basis of classification. For example, a partition of an automobile by major systems would be incomplete if it included the electrical, fuel, and drive systems but not the cooling system. If you decide to omit a category, explain why.
- ▶ **Arrange the categories in a logical sequence.** Use a reasonable plan: chronology (first to last), spatial development (top to bottom), importance (most important to least important), and so on.
- ▶ **Consider using graphics to complement the text.** Organization charts are commonly used in classification passages; drawings and diagrams are often used in partition passages.

In Figure 7.7, the writer uses classification effectively in introducing categories of hurricanes to a general audience.



What Is a Hurricane?

A hurricane is a type of tropical cyclone, the generic term for a low pressure system that generally forms in the tropics. A typical cyclone is accompanied by thunderstorms, and in the Northern Hemisphere, a counterclockwise circulation of winds near the earth's surface.

All Atlantic and Gulf of Mexico coastal areas are subject to hurricanes or tropical storms. Parts of the Southwest United States and the Pacific Coast experience heavy rains and floods each year from hurricanes spawned off Mexico. The Atlantic hurricane season lasts from June to November, with the peak season from mid-August to late October.

Hurricanes can cause catastrophic damage to coastlines and several hundred miles inland. Winds can exceed 155 miles per hour. Hurricanes and tropical storms can also spawn tornadoes and microbursts, create storm surges along the coast, and cause extensive damage from heavy rainfall.

Hurricanes are classified into five categories based on their wind speed, central pressure, and damage potential (see chart). Category Three and higher hurricanes are considered major hurricanes, though Categories One and Two are still extremely dangerous and warrant your full attention.

This classification system, from the Federal Emergency Management Agency, begins with a few basic facts about hurricanes.

Figure 7.7 Information Organized by Classification

Source: Federal Emergency Management Agency, 2009 <www.fema.gov/hazard/hurricane/hu_about.shtm>.

The writers have chosen a table as a way to present the information that distinguishes each category of hurricane.

How Are the Hurricane Categories Determined?

Saffir-Simpson Hurricane Scale			
Scale Number (Category)	Sustained Winds (MPH)	Damage	Storm Surge
1	74–95	Minimal: Unanchored mobile homes, vegetation and signs.	4–5 feet
2	96–110	Moderate: All mobile homes, roofs, small crafts, flooding.	6–8 feet
3	111–130	Extensive: Small buildings, low-lying roads cut off.	9–12 feet
4	131–155	Extreme: Roofs destroyed, trees down, roads cut off, mobile homes destroyed. Beach homes flooded.	13–18 feet
5	More than 155	Catastrophic: Most buildings destroyed. Vegetation destroyed. Major roads cut off. Homes flooded.	Greater than 18 feet

Hurricanes can produce widespread torrential rains. Floods are the deadly and destructive result. Slow moving storms and tropical storms moving into mountainous regions tend to produce especially heavy rain. Excessive rain can trigger landslides or mud slides, especially in mountainous regions. Flash flooding can occur due to intense rainfall. Flooding on rivers and streams may persist for several days or more after the storm.

Figure 7.7 (continued)

Figure 7.8 is an example of partition. For more examples of partition, see Chapter 20, which includes descriptions of objects, mechanisms, and processes (page 573).

Problem-Methods-Solution

The problem-methods-solution pattern reflects the logic used in carrying out a project. The three components of this pattern are simple to identify:

- **Problem.** A description of what was not working (or not working effectively) or what opportunity exists for improving current processes.
- **Methods.** The procedures performed to confirm the analysis of the problem, solve the problem, or exploit the opportunity.

Consumer Products Home :: Camera :: Digital Cameras :: PowerShot SX210 IS

PowerShot SX210 IS

Average Rating ★★★★★ 4.1 [Read all Reviews \(22\)](#) [Write a Review](#)


Digital Camera

Item Code: 4246B001 [Email this Page](#) [Product Tour](#) [Find a Retail Store](#)
 Suggested Retail Price: \$349.99†

Overview Features Specifications **What's in the Box** Supplies & Accessories Support & Service Drivers & Downloads

What's in the Box

- PowerShot SX210 IS Body
- Lithium-ion Battery Pack NB-5L
- Battery Charger CB-2LX
- Wrist Strap WS-DC9
- Digital Camera Solution CD-ROM
- USB Interface Cable IFC-400PCU
- AV Cable AVC-DC400ST



▲ Back to top

This “What’s in the Box” page from a user manual partitions the camera kit into its components. The manual then discusses each of the components.

Figure 7.8 Information Organized by Partition

Source: Canon, 2010 <www.usa.canon.com/cusa/consumer/products/cameras/digital_cameras/powershot_sx210_is#BoxContent>.

- **Solution.** The statement of whether the analysis of the problem was correct or of what was discovered or devised to solve the problem or capitalize on the opportunity.

The problem-methods-solution pattern is common in technical communication. In a *proposal*, you describe a problem in your business, how you plan to carry out your research, and how your deliverable (an item or a report) can help solve the problem. In a *completion report* about a project to improve a

Guidelines

Organizing Information by Problem-Methods-Solution

These five suggestions can help you write an effective problem-methods-solution passage.

- ▶ **In describing the problem, be clear and specific.** Don’t write, “Our energy expenditures are getting out of hand.” Instead, write, “Our energy usage has increased 7 percent in the last year, while utility rates have risen 11 percent.” Then calculate the total increase in energy costs.



- ▶ **In describing your methods, help your readers understand what you did and why you did it that way.** You might need to justify your choices. Why, for example, did you use a *t*-test in calculating the statistics in an experiment? If you can't defend your choice, you lose credibility.
- ▶ **In describing the solution, don't overstate.** Avoid overly optimistic claims, such as, "This project will increase our market share from 7 percent to 10 percent within 12 months." Instead, be cautious: "This project could increase our market share from 7 percent to 10 percent." This way, you won't be embarrassed if things don't turn out as well as you had hoped.
- ▶ **Choose a logical sequence.** The most common sequence is to start with the problem and conclude with the solution. However, different sequences work equally well as long as you provide a preliminary summary to give readers an overview and provide headings or some other design elements to help readers find the information they want (see Chapter 11). For instance, you might want to put the methods last if you think your readers already know them or are more interested in the solution.
- ▶ **Consider using graphics to complement the text.** Graphics, such as flowcharts, diagrams, and drawings, can clarify problem-methods-solution passages.

manufacturing process, you describe the problem that motivated the project, the methods you used to carry out the project, and the findings: the results, conclusions, and recommendations.

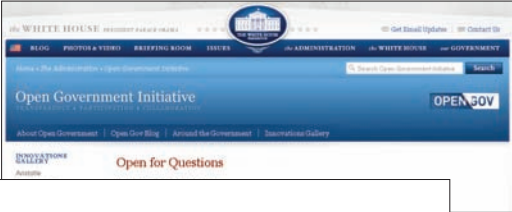
Figure 7.9, from the White House Office of New Media, shows the problem-methods-solution pattern. The passage describes a program called Open for Questions.

Cause and Effect

Technical communication often involves cause-and-effect discussions. Sometimes you will reason forward, from cause to effect: if we raise the price of a particular product we manufacture (cause), what will happen to our sales (effect)? Sometimes you will reason backward, from effect to cause: productivity went down by 6 percent in the last quarter (effect); what factors led to this decrease (causes)? Cause-and-effect reasoning, therefore, provides a way to answer the following two questions:

- What will be the effect(s) of X?
- What caused X?

Arguments organized by cause and effect are common in technical communication. In an *environmental impact statement*, you argue that a proposed construction project would have three important effects on the ecosystem. In the recommendation section of a *report*, you argue that a recommended solution would improve operations in two major ways. In a *memo*, you describe a new policy, then explain the effects you anticipate the policy will have.



The image shows a screenshot of the White House website's 'Open Government Initiative' page. A green arrow points from the 'Open for Questions' link on the website to the corresponding section in the text below. The text is organized into four sections: 'The Challenge', 'The Solution', 'The Benefit', and 'Additional Details'. Blue arrows point from each section header to a corresponding explanatory note on the right side of the page.

The Challenge ← “The Challenge” presents the problem.

The economy affects American households across the country, but it is hard to bring all of these concerns, hopes, and fears directly to the President in Washington. Open for Questions made a new type of town hall possible: one that leveraged the internet to bring American voices directly to the President in the East Room of the White House.

The Solution ← “The Solution” describes the methods the Office of New Media used to solve the problem.

The White House Office of New Media launched Open for Questions on Whitehouse.gov on March 24, 2009. The public was encouraged to submit questions via text or video, and rate questions submitted by others. After getting more than 100,000 questions and 3.6 million ratings in less than 48 hours, President Obama responded to several of the top questions via an online town hall held at the White House and streamed live on Whitehouse.gov.

The Benefit ← The final two sections of this discussion present some details of the solution. Note that writers do not necessarily use the words problem, methods, and solution in this method of organization. For instance, the word solution often refers to products or services that a company is trying to sell. And the word benefit often refers to advantages you can expect to derive from implementing the solution. Don’t worry about the terminology; the important point is to recognize that this organizational pattern is based on identifying a problem, doing something to respond to it, and solving it.

The American people received direct answers to some of their most pressing questions. The President and policy makers got a better sense of what’s on people’s minds during these tough economic times. In addition, both the public and the government experienced firsthand the potential of new media in connecting voices around the country with the White House.

Additional Details

Open for Questions greatly expanded the range of people who could participate in a dialogue on the economy. Over a period of less than 48 hours, 92,927 people representing all 50 states submitted 104,127 questions and cast 3,606,825 ratings (average of 38 ratings per participant). In addition there were 1 million visits and 1.4 million views of the Open for Questions page. All questions can be viewed online.

Other members of the Administration addressed more of the questions after the event, through products such as this video Q&A about employment and health options for people with disabilities by Kareem Dale, Special Assistant to the President for Disability Policy, and additional answers by Jared Bernstein, the Vice President’s Chief Economist and Economic Policy Advisor.

Figure 7.9 Information Organized by the Problem-Methods-Solution Pattern

Source: Whitehouse.gov, 2010 <www.whitehouse.gov/open/innovations/OpenforQuestions>.

Cause-and-effect relationships are difficult to describe because there is no scientific way to determine causes or effects. You draw on your common sense and your knowledge of your subject. When you try to determine, for example, why the product your company introduced last year sold poorly, you start with the obvious possibilities: the market was saturated, the product was of low quality, the product was poorly marketed, and so forth. The more you know about your subject, the more precise and insightful your analysis will be.

But a causal discussion can never be certain. You cannot *prove* why a product failed in the marketplace. But you can explain why the causes or effects you are identifying are the most plausible ones. For instance, to make a plausible case that the main reason is that it was poorly marketed, you can show that, in the past, your company's other unsuccessful products were marketed in similar ways and that your company's successful products were marketed in other ways.

Guidelines

Organizing Information by Cause and Effect

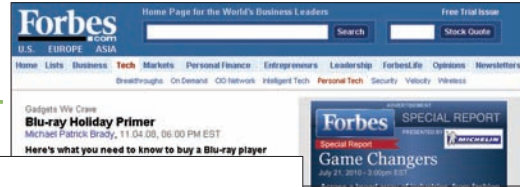
These four suggestions can help you write an effective cause-and-effect passage.

- ▶ **Explain your reasoning.** To support your claim that the product was marketed poorly, use specific facts and figures: the low marketing budget, delays in beginning the marketing campaign, and so forth.
- ▶ **Avoid overstating your argument.** For instance, if you write that Bill Gates, the co-founder of Microsoft, “created the computer revolution,” you are claiming too much. It is better to write that Gates “was one of the central players in creating the computer revolution.”
- ▶ **Avoid logical fallacies.** Logical fallacies, such as hasty generalizations or post hoc reasoning, can also undermine your discussion.
- ▶ **Consider using graphics to complement the text.** Graphics, such as flowcharts, organization charts, diagrams, and drawings, can clarify and emphasize cause-and-effect passages.

In This Book

For more about logical fallacies, see Ch. 8, p. 192.

Figure 7.10 illustrates an effective cause-and-effect argument.



First, let's explore what makes Blu-ray discs superior to traditional DVDs. Although Blu-ray discs and DVDs are the same size (120 mm in diameter), Blu-ray discs are capable of holding more data. Data—like movies, music and other files—are burned onto DVDs and Blu-ray discs using a laser that etches tiny pits onto the surface of the disc. A blue laser, with a wavelength of 405 nanometers, etches tiny pits onto the surface of a Blu-ray disc. The wavelength of a red laser, used to burn DVDs, is 650 nanometers. The smaller wavelength of a Blu-ray laser makes smaller pits, leaving room for more pits—and thus more data.

This minute difference accounts for Blu-ray's substantial advantage in capacity over DVDs. A single-layer Blu-ray disc can hold 25 GB of data and dual-layer discs can hold up to 50 GB, while single- and dual-layer DVDs are limited to 4.7 GB and 8.5 GB, respectively. This makes Blu-ray discs well-suited to hold the vast amounts of data required to properly display a movie in high-definition. While you could burn HD content to a DVD, it would be impossible to hold more than a few minutes on a single disc, making it less than ideal for HD feature films or television shows.

The first paragraph presents the claim: Blu-ray discs hold more data than DVDs (effect) because the pits on its surface are smaller (cause).

The second paragraph presents more-specific information about how this difference in pit size translates into a big difference in picture quality.

Figure 7.10 A Discussion Organized by the Cause-and-Effect Pattern

Source: Brady, 2008 <www.forbes.com/2008/11/04/blu-ray-players-tech-personal-cx_mpb_1104bluray.html>.

Writer's Checklist

- Did you analyze your audience and purpose? (p. 153)
- Did you consider using a conventional pattern of organization? (p. 154)

Did you display your organizational pattern prominently by

- creating a detailed table of contents? (p. 155)
- using headings liberally? (p. 155)
- using topic sentences at the beginnings of your paragraphs? (p. 155)

The following checklists cover the eight organizational patterns discussed in this chapter.

Chronological and Spatial

Did you

- provide signposts, such as headings and transitional words or phrases? (p. 157)
- consider using graphics to complement the text? (p. 157)
- analyze events where appropriate? (p. 157)

General to Specific

Did you

- provide signposts, such as headings and transitional words or phrases? (p. 160)
- consider using graphics to complement the text? (p. 160)

More Important to Less Important

Did you

- provide signposts, explaining clearly that you are using this organizational pattern? (p. 161)
- explain why the first point is the most important, the second is the second most important, and so forth? (p. 161)
- consider using graphics to complement the text? (p. 161)

Comparison and Contrast

Did you

- establish criteria for the comparison and contrast? (p. 164)
- evaluate each item according to the criteria you have established? (p. 164)
- organize the discussion by choosing the pattern—whole-by-whole or part-by-part—that is most appropriate for your audience and purpose? (p. 164)
- consider using graphics to complement the text? (p. 164)

Classification and Partition

Did you

- choose a basis of classification or partition that fits your audience and purpose? (p. 168)
- use only one basis of classification or partition at a time? (p. 168)
- avoid overlap? (p. 168)
- include all the appropriate categories? (p. 168)

- arrange the categories in a logical sequence? (p. 168)
- consider using graphics to complement the text? (p. 168)

Problem-Methods-Solution

Did you

- describe the problem clearly and specifically? (p. 171)
- if appropriate, justify your methods? (p. 173)
- avoid overstating your solution? (p. 173)
- arrange the discussion in a logical sequence? (p. 173)
- consider using graphics to complement the text? (p. 173)

Cause and Effect

Did you

- explain your reasoning? (p. 174)
- avoid overstating your argument? (p. 174)
- avoid logical fallacies? (p. 174)
- consider using graphics to complement the text? (p. 174)

Exercises

- 1. INTERNET EXERCISE** Using a search engine, find the Web site of a company that makes a product used by professionals in your field. (Personal computers are a safe choice.) Locate three discussions on the site that use different organizational patterns. For example, there will probably be the following: a passage devoted to ordering a product from the site (using a chronological pattern), a description of a product (using a partition pattern), and a passage describing why the company's products are superior to those of its competitors (using a comparison-and-contrast argument). Print a copy of the passages you've identified.
- 2.** For each of the lettered topics that follow, identify the best organizational pattern for a discussion of the subject. For example, a discussion of distance education and on-campus courses could be organized using the comparison-and-contrast pattern. Write a brief explanation about why this would be the best organizational pattern to use. (Use each of the organizational patterns discussed in this chapter at least once.)
 - a. how to register for courses at your college or university
 - b. how you propose to reduce the time required to register for classes or to change your schedule
 - c. your car's dashboard
 - d. the current price of gasoline
 - e. advances in manufacturing technology
 - f. the reasons you chose your college or major
 - g. a student organization on your campus
 - h. two music-streaming services
 - i. MP3 players
 - j. how you propose to increase the ties between your college or university and local business and industry
 - k. college courses
 - l. increased security in airports

- m. the room in which you are sitting
 - n. the three most important changes you would like to see at your school
 - o. a guitar
 - p. cooperative education and internships for college students
 - q. how to prepare for a job interview
3. You are researching portable GPS systems for use in your company’s existing fleet of 35 delivery vans. You are considering such factors as ease of use, size of

screen, number of points of interest, and Bluetooth compatibility. You conclude that the three leading models are quite similar to each other except in one way: price. One model costs about 30 percent less than the other two models. In organizing your discussion of the three models, should you use the whole-by-whole pattern or the part-by-part pattern? Why?

4. Write a 500-word discussion of one of the lettered topics in Exercise 2. If appropriate, include graphics. Preface your discussion with a sentence explaining the audience and purpose of the discussion.

Case 7: Organizing a Document for Clarity—and Diplomacy

Background

As the president of the Civil Engineering Student Association on campus, you work closely with the Department of Civil Engineering. One of the department’s initiatives this year is to focus on teaching quality. The department chair, Dr. Elizabeth Carstens, has asked you if you would like to participate in the initiative.

“What I’d like you to help with,” she tells you, “is collating the information from last year’s student evaluations for CE 100.” CE 100 is Introduction to Civil Engineering, the first course taken by new CE majors. Approximately a hundred students took CE 100 last year; five instructors taught a section of the course.

Last year, the university adopted an online system for students to evaluate their professors and courses. The form, which is identical for all courses across all departments, consists of 10 short-answer questions and one essay question: “Please provide any additional comments you would like us to read about the course or the professor.” Because the evaluations are filled out online, all the information they contain is digital and easy to capture.

Dr. Carstens explains that she would like you to write a brief report—no more than a thousand words—that summarizes the responses to the essay question in the CE 100 classes.

“I’m happy to help,” you say. “Can you give me an idea of the audience and purpose?”

“Sure,” Dr. Carstens says. “This report will go to the nine members of the department and the Civil Engineering Student Association. With all the emphasis on publishing and grants, it’s easy for us to lose sight of our mission as teachers. I want to get a clearer idea of what we’re doing well—and what we’re not doing so well.”

“Could I send you a brief outline of the report before I get too far into it, just to see if I’m on the right track?” you ask.

“Absolutely,” Dr. Carstens says. “That’s a great idea.”

Three days later, after you have had a chance to study the responses to the essay question from the CE 100 evaluations, you e-mail Dr. Carstens (Document 7.1). Two days later, you receive a reply from her (Document 7.2).

**Document 7.1 Your
E-mail to Dr. Carstens
Proposing an Outline for
Your Report**

Dr. Carstens,

I'm attaching here a group of responses (it's about 20% of the total number of responses). As you can see, the responses are all over the place. I think the clearest organization for my report would be the following:

Dr. Greenberg

- strengths
- weaknesses
- recommendations

Dr. Matthews

- strengths
- weaknesses
- recommendations

Etc. for the other three instructors.

Please let me know what you think.

Sincerely,

[your name]

- I think Dr. Greenberg did a great job—she really knows what she's talking about, and I thought it was a great intro to CE. . . .
- I've always hated tests, and having 60% of the grade made up of tests was too much. . . .
- I really liked having the class at night. I've got a 2-year-old, and I don't think I would be able to take it (and therefore be a CE major) if the course met during the day. . . .
- I know Dr. Matthews gets a lot of grants and all, but he kept talking down to us. He could lighten up—it's the first course in the major. . . .
- I really appreciated Mr. Warren's Saturday workshops before the two tests. It really says something about him that he's willing to come in on his own time and work with us. . . .
- The teacher said that he wanted us to participate in class, but it seemed like nobody's answer was as good as his. . . .
- Dr. Patel obviously knows the subject, but I have to be honest—sometimes I couldn't understand her through that accent. She could at least speak slower. . . .
- I would have liked a little heads up about the calculus—had I known there were going to be some calc problems I would have dusted off my calc text over Christmas. . . .
- Dr. Greenberg's PowerPoints were kind of boring. If all he's going to do is repeat what the slides say, why not just put the slides online so we don't have to come to his lectures. . . .
- The one quirk about Dr. Matthews was the way he'd just sit there after he asked a question and nobody answered. It got kind of annoying. . . .
- I took CE 100 because I'm not sure EE is what I want to do. I'm convinced that CE is a lot closer to what I want to do. . . .
- Can someone do something about the temperature in the lecture hall? It was either 60 or 80. 70 would be a nice compromise. . . .
- I busted my hump studying for the tests and still did lousy. This other guy I know put in half the work and got an A. Fair? . . .
- I thought my instructor was going to be a total nerd (lose the bow tie, dude), but he really turned out to be a cool guy. . . .
- The best part of the course was Dr. Patel—it's refreshing to see a woman with all that industrial experience. Her real-life stories were the highlight of the course, for me as a woman, anyway. . . .
- Just a thought—how come Mr. Warren gets to come to class 5 minutes late most of the time but I don't. . . .
- My recommendation is to do this evaluation earlier in the semester so the teacher can learn what he's doing wrong and fix it. . . .

Hi [your name],

Thanks for sending me this outline. I'm glad to see you're getting into this project.

Let me say a little about the outline. I'm hesitant to use the instructor's names as the first-level headings. My goal is not to publicly praise or embarrass anyone, which is, I think, a danger if we link any student comments to particular instructors. (That goes for comments that explicitly name a professor or implicitly name a professor—such as the comment about a professor's accent.)

I guess what I'd prefer to see is more of a collection of best practices—what do the students like and dislike. For instance, they like instructors who show up on time, treat students respectfully, present a good balance of theory and practice, and so forth.

Plus, there is a lot of good information about the course itself, from logistical details to content and evaluation methods, that I think the faculty would like to see.

As I look at all this information, I think it might be useful if you begin each section with a brief statement of the importance of the subject you're discussing. Then maybe figure out a way to summarize the data for that section. (I'm thinking maybe if you present the excerpts from the student comments with your own comments, the report will seem choppy and hard to use. What do you think about assembling samples of the student comments in some kind of appendix?)

So, please keep in mind that we're not interested in praising or blaming instructors. We want to create a constructive, cooperative environment. We want students to know that we are sincerely interested in their learning, that we value the trust they are placing in us.

Could you give me a new outline?

Thanks so much.

Elizabeth Carstens

Document 7.2
Dr. Carstens's Response
to Your E-mail



On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Your Assignment

1. Write an e-mail to Dr. Carstens, thanking her for her advice and describing a revised approach to the report. Explain how your new approach to the audience and purpose of the report will guide your thinking about its content and organization.
2. Using or adapting one or more of the organizational patterns presented in this chapter, revise your outline for Dr. Carstens. To help her understand your approach to writing the report, include samples of text that you would write. For instance, you might include text (or excerpts of text) for one complete section of the report, a section that consists of first-level and second-level headings.

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PART 3

**Developing
and Testing
the Verbal
and Visual
Information**

CHAPTER 8

Communicating Persuasively



Shalmor Avnon Amichay/Y & R Interactive/Tel Aviv. Photo from Gettyimages/imagebankisreal.

Technical communication calls for making and supporting persuasive claims.

Technical communication, like any other kind of writing, calls for making persuasive claims and supporting them effectively. Some forms of evidence are so clear and obvious that you immediately understand the claim the writer is making, as in this ad for a publishing company.

It is a mistake to think that technical communication is only about facts. Certainly, facts are important. But communication is about determining which facts are appropriate, describing the context that helps people understand what those facts mean, and presenting a well-reasoned argument about those facts. Your job as a communicator is to convince a reader of a viewpoint—about what factors caused a situation, for example, or what a company ought to do to solve a problem. If you are lucky, you will be reinforcing a viewpoint the reader already holds. Sometimes, however, you will want to change the reader's mind. Regardless, you are presenting an *argument*: an arrangement of facts and judgments about some aspect of the world.

This chapter explains how to craft a persuasive argument, avoid logical fallacies, present yourself effectively, and use graphics in your arguments.

CONSIDERING THE CONTEXT OF YOUR ARGUMENT

An argument can be as short as a sentence or as long as a multivolume report. It can take many forms, including oral communication. And it can discuss almost any kind of issue. Here are some examples:

- *From a description of a construction site:*
Features A, B, and C characterize the site.
- *From a study of why a competitor is outselling your company:*
Company X's dominance can be attributed to four major factors: A, B, C, and D.
- *From a feasibility study considering four courses of action:*
Alternative A is better than alternatives B, C, and D.
- *From a set of instructions for performing a task:*
The safest way to perform the task is to complete task A, then task B, and so on.

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Using Graphics as Persuasive Elements 195

A Look at Several Persuasive Arguments 197

Before you can develop an effective argument, you must understand your audience's broader goals and work within constraints.

Understanding Your Audience's Broader Goals

When you analyze your audience, consider the values that motivate them. Certainly, most people want the company they work for to prosper, but they are also concerned about their own welfare and interests within the company. Your argument is most likely to be effective if it responds to four goals that most people share: security, recognition, professional growth, and connectedness.

Security People resist controversial actions that might hurt their own interests. Those who might lose their jobs will likely oppose an argument that their division be eliminated, even if there are many valid reasons to support the argument. Another aspect of security is workload; most people resist an argument that calls for them to work more.

Recognition People like to be praised for their hard work and their successes. Where appropriate, be generous in your praise. Similarly, people hate being humiliated in public. Therefore, allow people to save face. Avoid criticizing their actions or positions and speculating about their motivations. Instead, present your argument as a response to the company's present and future needs. Look ahead, not back, and be diplomatic.

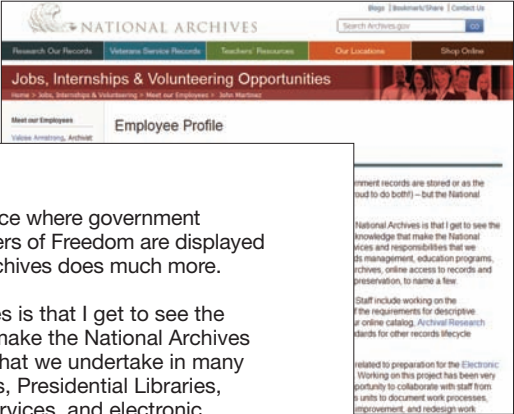
Professional Growth People want to develop and grow on the job. They want to learn new skills and assume new duties. And they want to work for an organization that is developing and growing. Your argument will be more persuasive if you can show how the recommended action will help the organization improve the quality of its products or services, branch out into new areas, or serve new customers and stakeholders.

Connectedness People like to be part of communities, whether at work or at home. In the workplace, connectedness can take many forms, from working with others in the organization on project teams to joining company sports leagues to helping improve the community. Organizations that encourage employees to connect with their peers through social media such as wikis, blogs, and discussion boards help satisfy this human need for community. A new trend in the working world is to encourage employees to spend weeks or even months of company time working on community educational or environmental projects. These projects not only improve the organization's image but also help employees feel connected to the community.

Figure 8.1, from the National Archives site, profiles an employee the agency believes reflects the personality and character of those who work there.

On TechComm Web

For an excellent discussion of persuasion, see Business Communication: Managing Information and Relationships. Click on Links Library for Ch. 8 on <bedfordsmartins.com/techcomm>.



Most people think of the National Archives as a place where government records are stored or as the place where the Charters of Freedom are displayed (and we're proud to do both!)—but the National Archives does much more.

My favorite part of working at the National Archives is that I get to see the wide range of people, skills, and knowledge that make the National Archives work, as well as the services and responsibilities that we undertake in many areas—records management, education programs, Presidential Libraries, regional archives, online access to records and services, and electronic records preservation, to name a few.

My duties on the Lifecycle Policy Staff include working on the development and maintenance of the requirements for descriptive elements and authority files for our online catalog, [Archival Research Catalog \(ARC\)](#), and on data standards for other records lifecycle systems.

Much of my work lately has been related to preparation for the [Electronic Records Archives \(ERA\)](#) system. Working on this project has been very exciting and has given me the opportunity to collaborate with staff from almost all of the National Archives units to document work processes, analyze and determine areas for improvement, and redesign work processes for the ERA environment.

My work allows me to appreciate the many parts of the National Archives system and the variety of work that staff does for the Federal government and the public. The common trait that the different National Archives staff members all have is their dedication to their work and to carry out our mission—to safeguard and preserve the records of our government and to ensure that the people can access, use, and learn from our holdings.

On TechComm Web

To view Fig. 8.1 in context on the Web, click on Links Library for Ch. 8 on <[bedfordstmartins.com/techcomm](#)>.

This profile of employee John Martinez shows his broader goals: personal and professional growth and connecting with a community of like-minded employees to improve the services his agency provides.

Figure 8.1 Appealing to an Audience's Broader Goals

Source: Martinez, 2011 <[www.archives.gov/careers/employees/martinez.html](#)>.

Working Within Constraints

In planning a persuasive document, you need to work within the constraints that shape your environment on the job. As a student, you routinely work within constraints: the amount of information you can gather for a paper, the required length and format, the due date, and so forth. On the job, you will face similar constraints that fall into eight categories: ethical, legal, political, informational, personnel, financial, time, and format and tone.

Ethical Constraints Your greatest responsibility is to your own sense of what constitutes ethical behavior. Being asked to lie or mislead directly chal-

 **In This Book**

For more about ethical and legal constraints, see Ch. 2.

lenges your ethical standards, but in most cases, you have options. Some organizations and professional communities have a published code of conduct. In addition, many large companies have ombudspersons, who use mediation to help employees resolve ethical conflicts.

Legal Constraints You must abide by all applicable laws on labor practices, environmental issues, fair trade, consumer rights, and so forth. If you think you have been asked to do something that might be illegal, meet with your organization's legal counsel and, if necessary, with attorneys outside the organization.

Political Constraints Don't spend all your energy and credibility on a losing cause. If you know that your proposal would help the company but that management disagrees with you or that the company can't afford to approve it, consider what you might achieve through some other means, or scale back the idea. Two big exceptions to this rule are matters of ethics and matters of safety. As discussed in Chapter 2, ethical and legal constraints may mean compromise is unacceptable.

Informational Constraints The most common informational constraint you might face is that you cannot get the information you need. You might want your organization to buy a piece of equipment, for example, but you can't find unbiased evidence that would convince a skeptical reader.

What do you do? You tell the truth. Explain the situation, weighing the available evidence and carefully noting what is missing. If you unintentionally suggest that your evidence is better than it really is, you will lose your most important credential: your credibility.

 **In This Book**

For more about collaboration, see Ch. 4.

Personnel Constraints The most typical personnel constraint you might face is a lack of access to as many collaborators as you need. In such cases, present a persuasive proposal to hire the personnel you need. However, don't be surprised if you have to make do with fewer people than you want.

Financial Constraints Financial constraints are related to personnel constraints: if you had unlimited funds, you could hire all the personnel you need. But financial constraints can also affect other kinds of resources: you might not be able to print as many copies of a document as you want, or you might need to settle for black and white instead of full color.

Time Constraints Start by determining the document's deadline. (Sometimes a document will have several intermediate deadlines.) Then create a schedule. Keep in mind that tasks almost always take longer than estimated. And when you collaborate, the number of potential problems increases, because when one person is delayed, others may lack the necessary information to proceed, causing a logjam.

 **In This Book**

For more about scheduling, see Ch. 3, p. 46.

Format and Tone Constraints You will be expected to work within one additional set of constraints:

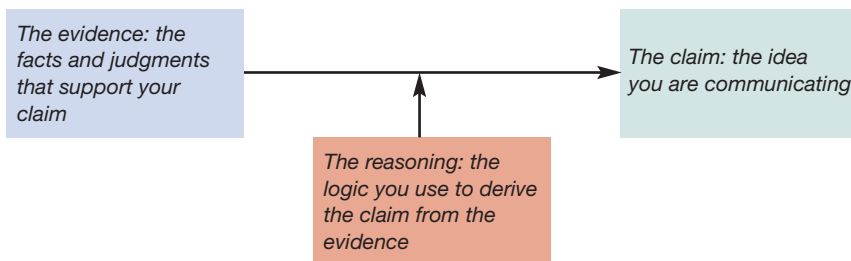
- **Format.** Format constraints are limitations on the size, shape, or style of a document. For example, your reader might like to see all tables and figures presented at the end of the report. If you are writing to someone in your own organization, follow the format constraints described in the company style guide, if there is one, or check similar documents to see what other writers have done. Also ask more-experienced co-workers for their advice. If you are writing to someone outside your organization, learn what you can about that organization's preferences.
- **Tone.** When addressing superiors, use a formal, polite tone. When addressing peers or subordinates, use a less formal tone but be equally polite.

CRAFTING A PERSUASIVE ARGUMENT

Persuasion is important, whether you wish to affect a reader's attitude or merely present information clearly. To make a persuasive case, you must identify the elements of your argument, use the right kinds of evidence, consider opposing viewpoints, appeal to emotions responsibly, decide where to state your claim, and understand the role of culture in persuasion.

Identifying the Elements of Your Argument

A persuasive argument has three main elements:



The *claim* is the conclusion you want your readers to accept. For example, your claim might be that your company should institute flextime, a scheduling approach that gives employees some flexibility in when they begin and end their workdays. You want your readers to agree with this idea and to take the next steps toward instituting flextime.

The *evidence* is the information you want your readers to consider. For the argument about flextime, the evidence might include the following:

- The turnover rate of our female employees is double that of our male employees.

- At exit interviews, 40 percent of our female employees under the age of 38 state that they quit so that they can be home for their school-age children.
- Replacing a staff-level employee costs us about one-half the employee's annual salary; a professional-level employee costs a whole year's salary.
- Other companies have found that flextime significantly decreases turnover among female employees under the age of 38.
- Other companies have found that flextime has additional benefits and introduces no significant problems.

The *reasoning* is the logic you use to connect the evidence to your claim. In the discussion of flextime, the reasoning involves three links:

- Flextime appears to have reduced the turnover problem among younger female employees at other companies.
- Our company is similar to these other companies.
- Flextime therefore is likely to prove helpful at our company.

Using the Right Kinds of Evidence

People most often react favorably to four kinds of evidence: “commonsense” arguments, numerical data, examples, and expert testimony.

- “*Commonsense*” arguments. Here, *commonsense* means, “Most people would think that . . .” The following sentence presents a commonsense argument that flextime is a good idea:

Flextime makes sense because it gives people more control over how they plan their schedules.

A commonsense argument says, “I don’t have hard evidence to support my conclusion, but it stands to reason that . . .” In this case, the argument is that people like to have as much control over their time as possible. If your audience’s commonsense arguments match yours, your argument is likely to be persuasive.

- *Numerical data*. Numerical data—statistics—are generally more persuasive than commonsense arguments.

Statistics drawn from the personnel literature (McClellan, 2010) show that, among Fortune 500 companies, flextime decreases turnover by 25 to 35 percent among female employees younger than 38.

Notice that the writer states that the study covered many companies, not just one or a handful. If the sample size were small, the claim would be much less persuasive. (The discussion of logical fallacies later in this chapter explains such *hasty generalizations*.)

- *Examples*. An example makes an abstract point more concrete and therefore more vivid and memorable.

Mary Saunders tried for weeks to arrange for child care for her two preschoolers that would enable her to start work at 7 A.M., as required at her workplace. The best she could manage was having her children stay with a nonlicensed provider. When conditions at that provider led to ear infections in both her children, Mary decided that she could no longer continue working.

Examples are often used along with numerical data. The example above gives the problem a human dimension, but the argument also requires numerical data to show that the problem is part of a pattern, not a coincidence.

- *Expert testimony.* A message from an expert is more persuasive than the same message from someone without credentials. A well-researched article on flextime written by a respected business scholar in a reputable business journal is likely to be persuasive. When you make arguments, you will often cite expert testimony from published sources or interviews you have conducted.

 **In This Book**

For advice on evaluating information from the Internet, see Ch. 6, p. 133.

Considering Opposing Viewpoints

When you present an argument, you need to address opposing points of view. If you don't, your opponents will simply conclude that your proposal is flawed because it doesn't address problems that they think are important. In meeting the skeptical or hostile reader's possible objections to your case, you can use one of several tactics:

- *The opposing argument is based on illogical reasoning or on inaccurate or incomplete facts.* You can counter the argument that flextime increases utility bills by citing unbiased research studies showing that it does not.
- *The opposing argument is valid but less powerful than your own.* If you can show that the opposing argument makes sense but is outweighed by your own argument, you will appear to be a fair-minded person who understands that reality is complicated. You can counter the argument that flextime reduces carpooling opportunities by showing that only 3 percent of your employees use carpooling and that three-quarters of these employees favor flextime anyway because of its other advantages.
- *The two arguments can be reconciled.* If an opposing argument is not invalid or clearly inferior to your own, you can offer to study the situation thoroughly to find a solution that incorporates the best from each argument. For example, if flextime might cause serious problems for your company's many carpoolers, you could propose a trial period during which you would study several ways to help employees find other carpooling opportunities. If the company cannot solve the problem, or if most of the employees prefer the old system, you will switch back to it. This proposal can remove much of the threat posed by your ideas.

INTERACTIVE SAMPLE DOCUMENT

Analyzing Evidence in an Argument

In this excerpt from the Web site of the National Recycling Coalition (2010), the writer presents an argument that recycling is important. The questions in the margin ask you to consider this passage as an argument.

1. In “Why Recycling Is Important,” the writer presents a claim but offers no evidence or reasoning to support it. Would it be possible for the writer to support this claim? Does the lack of support for this claim undermine the entire argument that follows?
2. Does “Getting Back to Basics” use a kind of evidence discussed in the section “Using the Right Kinds of Evidence” (p. 188)? If so, which one?
3. What kinds of evidence are used in “The Garbage Crisis”? Are these types of evidence used effectively?
4. “Recycling—An Important Part of the Solution” presents both numerical data and examples. How effective are the data and examples in making the case that recycling can make a big difference?



Why Recycling Is Important

As stewards of the environment, we are responsible for preserving and protecting our resources for ourselves and for future generations.

Getting Back to Basics

Recycling is really just common sense, and until the “modern era,” it was a common household activity. Before the 1920s, 70% of U.S. cities ran programs to recycle certain materials. During World War II, industry recycled and reused about 25% of the waste stream. Because of concern for the environment, recycling is again on the upswing. The nation’s composting and recycling rate rose from 7.7% of the waste stream in 1960 to 17% in 1990. It’s currently up to around 33%.

The Garbage Crisis

The world has changed a lot in the past century. From individually packaged food servings to disposable diapers, more garbage is generated now than ever before. The average American discards 4.6 pounds of garbage every day. This garbage, the solid waste stream, goes mostly to landfills, where it’s compacted and buried. As the waste stream continues to grow, so will pressure on our landfills, our resources and our environment.

Recycling—An Important Part of the Solution

Recycling is one of the easiest ways you can help slow climate change and global warming. By recycling at home, you help significantly lower carbon emissions associated with extracting virgin materials, manufacturing products and waste disposal.

Last year the amount of energy saved from recycling aluminum and steel cans, plastic PET and glass containers, newsprint and corrugated packaging was equivalent to:

- The amount of electricity consumed by 17.8 million Americans in one year.
- 29% of nuclear electricity generation in the U.S. in one year.
- 7.9% of electricity generation from fossil fuels in the U.S. in one year.
- 11% of the energy produced by coal-fired power plants in the U.S.
- The energy supplied from 2.7% of imported barrels of crude oil into the U.S.
- The amount of gasoline used in almost 11 million passenger automobiles in one year.

Source: National Recycling Coalition, 2010 <www.nrc-recycle.org/whyitsimportant.aspx>.

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 8 on <bedfordstmartins.com/techcomm>.

When you address an opposing argument, be gracious and understated. Focus on the argument, not on the people who oppose you. If you embarrass or humiliate them, you undermine your own credibility and motivate your opponents to continue opposing you.

There is no one best place to address opposing arguments. In general, however, if you know that important readers hold opposing views, address those views relatively early. Your goal is to show *all* your readers that you are a fair-minded person who has thought carefully about the subject and that your argument is stronger than the opposing arguments.

Appealing to Emotions Responsibly

Writers sometimes appeal to the emotions of their readers. Writers usually combine emotional appeals with appeals to reason. For example, an argument that we ought to increase foreign aid to drought-stricken African countries might describe (and present images of) the human plight of the victims but also include reason-based arguments about the extent of the problem, the causes, the possible solutions, and the pragmatic reasons we might want to increase foreign aid.

When you use emotional appeals, do not overstate or overdramatize them, or you will risk alienating readers. Try to think of additional kinds of evidence to present that will also help support your claim. Figure 8.2 shows a brief argument that relies on an emotional appeal.

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'Kentucky Fried Cruelty' with Pamela Anderson
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Cruelty Capital, USA

KFC suppliers cram birds into huge waste-filled factories, breed and drug them to grow so large that they can't even walk, and often break their wings and legs. At slaughter, the birds' throats are slit and they are dropped into tanks of scalding-hot water—often while they are still conscious. It would be illegal for KFC to abuse dogs, cats, pigs, or cows in these ways.

KFC's own animal welfare advisors have asked the company to take steps to eliminate these abuses, but KFC refuses to do so. Many advisors have now resigned in frustration.

Please join Pamela Anderson, Sir Paul McCartney, His Holiness the Dalai Lama, The Rev. Al Sharpton, and countless other kind people worldwide by not eating at KFC.

This document from People for the Ethical Treatment of Animals (PETA) relies on emotion in describing what it calls the “abuses” of KFC. The bulk of the passage details the physical suffering endured by the chickens. To the extent that readers are moved emotionally by these descriptions, the argument will be persuasive.

The passage also uses another strategy: the celebrity of the people supporting the message. This strategy is a weak form of the argument from authority (see Table 8.1 on p. 193).

Figure 8.2 An Argument That Uses an Emotional Appeal

Source: KentuckyFriedCruelty.com, 2008 <www.kentuckyfriedcruelty.com>.

Deciding Where to Present the Claim

In most cases, the best place to state your claim is at the start of the argument. Then provide the evidence and, if appropriate, the reasoning. Sometimes, however, it is more effective to place the claim *after* the evidence and the reasoning. This indirect structure works best if a large number of readers oppose your claim. If you present your claim right away, these readers might become alienated and stop paying attention. You want a chance to present your evidence and your reasoning without causing this kind of undesirable reaction.

Understanding the Role of Culture in Persuasion

If you are making a persuasive argument to readers from another culture, keep in mind that cultures differ significantly not only in matters such as business customs but also in their most fundamental values. These differences can affect persuasive writing. Culture determines both what makes an argument persuasive and how arguments are structured:

- *What makes an argument persuasive.* Statistics and experimental data are fundamental kinds of evidence in the West, but testimony from respected authority figures can be much more persuasive in the East.
- *How to structure an argument.* In a Western culture, the claim is usually presented up front. In an Eastern culture, it is likely to be delayed or to remain unstated but implied.

When you write for an audience from another culture, use two techniques:

- Study that culture, and adjust the content, structure, and style of your arguments to fit.
- Include in your budget the cost of having your important documents reviewed and edited by a person from the target culture. Few people are experts on cultures other than their own.

In This Book

For more about writing to people from other cultures, see Ch. 5, p. 101.

On TechComm Web

For exercises on logical fallacies, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 8 on <bedfordstmartins.com/techcomm>.

AVOIDING LOGICAL FALLACIES

A logical fallacy, a mistake in reasoning, can undercut the persuasiveness of your writing. An example is if someone says, “Antidepressants are a scam; I know that because Tom Cruise says so, and he’s a world-famous actor.” Although it is true that Tom Cruise is a world-famous actor, it does not follow that what he thinks about antidepressants is true because he says so. Table 8.1 explains some of the most common logical fallacies.

TABLE 8.1 ► Common Logical Fallacies

Fallacy	Explanation	Example and comment
Ad hominem argument; also called <i>argument against the speaker</i>	An argument against the writer, not against the writer's argument	"Of course Matthew wants us to buy more computers—he's a computer geek." The fact that Matthew is a "computer geek" doesn't necessarily mean that his argument for buying more computers is unwise.
Argument from ignorance	An argument that a claim is true because it has never been proven false, or false because it has never been proven true	"Nobody has ever proven that global warming is occurring. Therefore, global warming is a myth." The fact that a concept has not yet been proven does not necessarily mean that it is false. Perhaps the measurement techniques are insufficiently precise or not yet available.
Appeal to pity	An argument based on emotion, not reason	"We shouldn't sell the Ridgeway division. It's been part of the company for over 40 years." The fact that the division has long been a part of the company is not in itself a good reason to retain it.
Argument from authority	An argument that a claim is valid because the person making the claim is an authority	"According to world-renowned climatologist Dr. William Smith, global warming is definitely a fact." Even if Dr. Smith is a recognized authority in this field, saying that global warming is a fact is not valid unless you present a valid argument to support it.
Circular argument; also called <i>begging the question</i>	An argument that assumes what it is attempting to prove	"HP is more successful than its competitors because of its consistently high sales." Because "more successful" means roughly the same thing as achieving "consistently high sales," this statement says only that HP outsells its competitors. The writer needs to explain <i>why</i> HP outsells its competitors and is therefore more successful.
Either-or argument	An argument that poses only two alternatives when in fact there might be more	"If we don't start selling our products online, we're going to be out of business within a year." This statement does not explain why these are the only two alternatives. The company might improve its sales by taking measures other than selling online.
<i>Ad populum</i> argument; also called <i>bandwagon argument</i>	An argument that a claim is valid because many people think it is or act as if it is	"Our four major competitors have started selling online. We should, too." The fact that our competitors are selling online is not in itself an argument that we should sell online, too.
Hasty generalization; sometimes called <i>inadequate sampling</i>	An argument that draws conclusions based on an insufficient number of cases	"The new Tata is an unreliable car. Two of my friends own Tatas, and both have had reliability problems." Before reaching any valid conclusions, you would have to study a much larger sample and compare your findings with those for other cars in the Tata's class.



TABLE 8.1 ► Common Logical Fallacies (continued)

Fallacy	Explanation	Example and comment
Post hoc reasoning (the complete phrase is <i>post hoc, ergo propter hoc</i>)	An argument that claims that because A precedes B, A caused B	<p>“There must be something wrong with the new circuit breaker in the office. Ever since we had it installed, the air conditioners haven’t worked right.”</p> <p>Maybe the air conditioners are malfunctioning because of the circuit breaker, but the malfunctioning might have other causes.</p>
Oversimplifying	An argument that omits important information in establishing a causal link	<p>“The way to solve the balance-of-trade problem is to improve the quality of the products we produce.”</p> <p>Although improving quality is important, international trade balances are determined by many factors, including tariffs and currency rates, and therefore cannot be explained by simple cause-and-effect reasoning.</p>

PRESENTING YOURSELF EFFECTIVELY

A big part of presenting yourself effectively is showing that you know the appropriate information about your subject. However, you also need to come across as a professional.

Guidelines

Creating a Professional Persona

Your *persona* is how you appear to your readers. Demonstrating the following four characteristics will help you establish an attractive professional persona.

- ▶ **Cooperativeness.** Make clear that your goal is to solve a problem, not advance your own interests.
- ▶ **Moderation.** Be moderate in your judgments. The problem you are describing will not likely spell doom for your organization, and the solution you propose will not solve all the company’s problems.
- ▶ **Fair-mindedness.** Acknowledge the strengths of opposing points of view, even as you offer counterarguments.
- ▶ **Modesty.** If you fail to acknowledge that you don’t know everything, someone else will be sure to volunteer that insight.

The following paragraph shows how a writer can demonstrate the qualities of cooperativeness, moderation, fair-mindedness, and modesty:

This plan is certainly not perfect. For one thing, it calls for a greater up-front investment than we had anticipated. And the return on investment through the first three quarters is likely to fall short of our initial goals. However, I think this plan is the best of the three alternatives for the following reasons. . . . Therefore, I recommend that we begin planning immediately to implement the plan. I am confident that this plan will enable us to enter the flat-screen market successfully, building on our fine reputation for high-quality advanced electronics.

In the first three sentences, the writer acknowledges the problems with his recommendation.

The use of "I think" adds an attractive modesty; the recommendation might be unwise.

The recommendation itself is moderate; the writer does not claim that the plan will save the world.

In the last two sentences, the writer shows a spirit of cooperativeness by focusing on the company's goals.

USING GRAPHICS AS PERSUASIVE ELEMENTS

Graphics are fundamentally important in communicating persuasively because they help you convey both technical data and nontechnical information. Figure 8.3, for example, shows how a combination of verbal and visual techniques can make a persuasive argument.

Photographs can be used to convey technical evidence, as shown in Figure 8.4.



The caption of this photograph reads, "A young boy works 12-hour days packing mud bricks in Liberia." The thin arms on this boy make the point about child labor more effectively than words alone could.

Figure 8.3 Verbal and Visual Techniques in Persuasion

Source: U.S. Department of State, 2009 <www.state.gov/documents/organization/123360.pdf>.

In a report on a crash test, this photograph is used to illustrate the following sentence: "Smearred greasepaint shows where the driver dummy's head was protected from being hit by hard structures by the side curtain airbag."



Figure 8.4 A Photograph Used to Provide Technical Information

Source: Insurance Institute for Highway Safety, 2008 <www.iihs.org/ratings/rating.aspx?id=867>.

ETHICS NOTE

Seeming Honest Versus Being Honest in Persuasive Writing

The young actor asks the old actor, "What's the key to great acting?" The old actor replies, "Sincerity. Once you learn how to fake sincerity . . ." Any discussion of image and persuasion has to address the question at the heart of this old joke. Does a writer have to be honest to appear honest?

There are tricks for appearing honest, and they can work for a while. But the easiest way to appear honest is to *be* honest. As suggested in Chapter 2, you need to tell the truth and not mislead your readers. As suggested in Chapter 4, you also need to be cooperative, diplomatic, and constructive. And as suggested in this chapter, you need to remember people's broader goals: to protect their own security, to achieve recognition, to learn and grow in their professional lives, and to connect with others.

A LOOK AT SEVERAL PERSUASIVE ARGUMENTS

The following examples of technical communication show how the persuasive elements of an argument differ depending on a writer's purpose. Figure 8.5 presents two paragraphs from a student's job-application letter.

Figure 8.6, from the TiVo Web site, shows an effective use of testimonials.

At Western State University, I have earned 87 credits toward a degree in Technical Communication. I have been a full-time student (no fewer than 12 credit hours per semester) while working full-time for the Northwest Watershed Research Center. The four upper-division courses I am taking this semester, including Advanced Technical Communication and Technical Editing, are required for the BA in Technical Communication.

In addition to my formal education, I have completed 34 training courses on the job. These courses have included diverse topics such as financial management, the Fair Labor Standards Act, the Americans with Disabilities Act, career-development opportunities in public affairs, and software applications such as MS Office, Quark XPress, and RoboHelp.

A student writer uses specific examples to persuade a prospective employer.

Without making her claim explicit, the writer presents evidence that she is hardworking and lets the prospective employer draw his or her own conclusions.

In listing some of the training courses she has taken, the writer supports an earlier claim that her broad background might be of use to her next employer.

Figure 8.5 Persuading a Prospective Employer



TiVo Premiere press reviews

PCWorld

“...I can highly recommend TiVo Premiere to anyone fed up with the sorry functionality of their cable DVR, especially those who make use of Web services like Netflix or Amazon Video on Demand. It's a small price to pay for a vastly better TV-watching experience.”

[See full review](#)

- PC World, March 2010

cnet

“TiVo newbies -- those who have suffered with “generic” DVRs from their cable providers and are coming to a real TiVo for the first time -- will find themselves getting an all-in-one digital gateway to a wide range of TV and online video and audio entertainment.”

[See full review](#)

- CNET News, 03/24/2010

WIRED

“...TiVo fans will no doubt cheer this entertainment powerhouse's knockout blows: Massive storage, internet video streaming, an improved interface and a kick-ass way to search for and find new content.”

[See full review](#)

- Wired, March 2010

At the bottom of its Web page about TiVo Premiere, the company presents these three testimonials from highly reputable publications about high-tech commercial products. The testimonials are enhanced by the use of the publications' logos.

Figure 8.6 Using Testimonials to Make a Persuasive Argument

Source: TiVo, 2010 <www.tivo.com/what-is-tivo/tivo-is/index.html>.

Figure 8.7, from a product description, uses text and a photograph effectively to present persuasive arguments.


This page from a Honeywell brochure presents a persuasive argument using words and an image.

The photograph, with the colored shapes representing how the system isolates individuals, functions as an example of what the user of the system will see.

The name of the product—Active Alert—is followed immediately by the phrase the company hopes its readers will remember: “smarter video, tighter security.”

The three passages of text function to present technical data about the product.

The Customer Benefits list shifts the focus from how the system works to how the system helps the user.



Honeywell

Gate A17

↑ Gates A19 to A78
Concourses B and C

Terminal
Luggage Claim
Hotel

Active Alert®

Smarter Video, Tighter Security

Honeywell Active Alert automatically detects, analyzes and classifies the behaviors of individuals and vehicles as they move through a scene to provide real-time alarms and search tools that enhance manned and unmanned video surveillance systems. It significantly reduces false alarms by suppressing environmental triggers such as rain, snow, shadows, reflections, flying birds, and waving trees. It also provides instantaneous histories of scene activity against user-selected parameters to enable fast interactive searches on site and/or remotely.

This unique, patented software tracks up to 20 targets in each camera view and reports on more than 35 actionable events and behaviors. Real-time alarms are received via local voice/visual notification, relay closure for integration with alarm panels, e-mail, text messages, and Remote Network Client. Data mining capabilities enable end users to spot trends and modify operations to maximize security.

Active Alert Features:

- Enables user-defined event and alarm settings for each camera view
- Remote Client allows full distributed system access regardless of location
- Powerful search tools offer an instantaneous method of searching and locating video

Customer Benefits:

- Increased accuracy of event detection virtually eliminates false alarms
- Increases the number of cameras that an operator can monitor at one time
- Retrieve incidents rapidly using built-in search tools
- Easy auditing and rapid event analysis with the indexed database
- Significantly expands video storage capacity

Reprinted with permission of Honeywell International Inc. Copyright © 2011.

Figure 8.7 Using Text and Graphics to Present a Persuasive Argument

Source: Honeywell International, 2011 <www.honeywellvideo.com/documents/L_ACTIVLF_D.pdf>.

Writer's Checklist

In analyzing your audience, did you consider their broader goals of

- maintaining security? (p. 184)
- achieving recognition? (p. 184)
- growing professionally? (p. 184)
- staying connected? (p. 184)

In planning, did you consider the following constraints:

- ethical? (p. 185)
- legal? (p. 186)
- political? (p. 186)
- informational? (p. 186)
- personnel? (p. 186)
- financial? (p. 186)
- time? (p. 186)
- format and tone? (p. 187)

In crafting a persuasive argument, did you

- use the three-part structure of claim, evidence, and reasoning? (p. 187)
- choose appropriate kinds of evidence? (p. 188)
- consider opposing viewpoints? (p. 189)
- appeal to emotions responsibly? (p. 191)

- decide where to present the claim? (p. 192)
- consider the role of your readers' culture? (p. 192)


In writing the argument, did you avoid the following logical fallacies:

- ad hominem argument? (p. 193)
- argument from ignorance? (p. 193)
- appeal to pity? (p. 193)
- argument from authority? (p. 193)
- circular argument? (p. 193)
- either-or argument? (p. 193)
- ad populum* argument? (p. 193)
- hasty generalization? (p. 193)
- post hoc reasoning? (p. 194)
- oversimplifying? (p. 194)

In drafting your argument, did you create a persona that is

- cooperative? (p. 194)
- moderate? (p. 194)
- fair-minded? (p. 194)
- modest? (p. 194)
- Did you consider using graphics as persuasive elements? (p. 195)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1. INTERNET EXERCISE** Visit the Web site of a car manufacturer, such as Ford <www.ford.com> or Mercedes Benz <www.mbusa.com>. Identify the major techniques of persuasion used in the words and graphics on the site. For example, what claims are made? What types of evidence are used? Is the reasoning sound?
- 2.** Victory Air has been criticized in the press lately because of its new policy of charging an overweight passenger for a second seat if he or she cannot fit in a single coach seat without his or her body crossing the armrest boundary. In a public letter printed on its Web site, Victory used the following evidence as part of its defense of its new policy:
 - a. In 2003, a commuter plane crashed on takeoff from Charlotte, North Carolina, in part due to excess

weight. We need to be able to require that a heavier passenger pay for and use two seats in order to keep the plane's total weight within acceptable limits for safe operation of the plane.

- b. Our policy is not an attempt to increase revenues: if there is an available empty seat, we do not charge the heavier passenger for a second seat.
- c. Every passenger pays more for a ticket because heavier passengers increase fuel consumption. It's only fair that heavier passengers pay extra for the increased fuel consumption.
- d. According to a study by the National Transportation Safety Board, an overweight passenger squeezed into a single coach seat might be a safety risk to another passenger or to himself or herself if the plane must be evacuated quickly.

- e. The average weight of a passenger climbed from 180 pounds in 1995 to 190 pounds in 2003. Estimates place the current average weight at almost 195 pounds.

For each of these five items, write a brief paragraph in which you identify the nature of the evidence—commonsense argument, numerical data, example, or expert testimony—and comment on its effectiveness. If you think the evidence is not as effective as it might be, what is the problem, and how would you make it more effective?

3. For each of the following claims, write one paragraph identifying the logical flaw:
- The election couldn't have been fair—I don't know anyone who voted for the winner.
 - It would be wrong to prosecute Allied for age discrimination; Allied has always been a great corporate neighbor.
 - The decrease in smoking can be attributed to increased restrictions on smoking in public.
 - Bill Jensen's proposal to create an on-site day-care center is just the latest of his harebrained ideas.
 - Since the introduction of cola drinks at the start of the twentieth century, cancer has become the second-greatest killer in the United States. Cola drinks should be outlawed.
 - If mutual-fund guru Peter Lynch recommends this investment, I think we ought to buy it.
 - We should not go into the flash-memory market; we have always been a leading manufacturer of DRAM.
 - The other two hospitals in the city have implemented computerized patient record keeping; I think we need to do so, too.

- Our Model X500 didn't succeed because we failed to sell a sufficient number of units.
- No research has ever established that Internet businesses can earn money; they will never succeed.

4. **GROUP/INTERNET EXERCISE** Form groups of two for this research project on multicultural communication styles. Follow these steps:

- Working by yourself, enter the name of a country and the word *business* in a search engine. For example, enter "Nicaragua business." Find the Web site of a business in that country, and then print out the About the Company page or some similar page, such as Mission or Projects. Or enter the name of a country and the word *government*, such as "Nicaragua government." Find a government agency in that country that has published a report that is available on the Internet. Print several pages of the report.
- On your copy of the pages you have printed, disguise the country of origin by blacking out the name of the company or government agency and any other information that would indicate the country of origin.
- Exchange pages with the other person in your group. Study your partner's pages. Do the pages show a different strategy of persuasion than you would expect from a U.S. writer? For instance, does the writer support his or her claims with the kinds of evidence you would expect to see in the United States? Is the information organized as you would expect? Does the writer create a persona that you would expect to see?
- Meet with your partner and explain to him or her what you see in the pages that is similar or different from what you would expect if the document came from the United States. Ask your partner whether he or she saw the same things. Present your findings in a memo to your instructor.

Case 8: Analyzing the Fitness of Arguments

Background

"As you know," Manuel Gutierrez says, "we're carrying out our annual review of our marketing campaigns for our various products, and I'd like you to help me with our Incline Trainer X3." Manuel Gutierrez oversees the Web advertising for Nordic Track, the manufacturer of exercise equipment, and you are his assistant. "Our association

with Jillian Michaels from *The Biggest Loser* has been great—she's a tremendous spokesperson for us because of her exposure on the TV show. The results speak for themselves; it's as simple as that."

"I agree," you say. "What would you like me to do?"

"Take a look at the pages for the Incline Trainer X3. With a retail price of over \$1,500, the Incline Trainer is a

big investment. We need to make sure we do everything we can to show why it's not only the best product on the market but also a terrific investment. Our customers are smart, and they'll run away in a second if we don't make a solid case that the Incline Trainer is going to deliver the results they're looking for."

You pull up the Web pages for the Incline Trainer. "Okay," you say, "let's look at the main pages—here's the '5X calorie burn' page." (See Document 8.1.)

"Yeah," Manuel says, "that's a really important part of the argument. You can burn a ton of calories by adjusting the incline, so we wanted to focus on the facts. That's why we have that diagram and the graph."

"And the 'Reflex Cushioning' page," you say, "what are we going for there?" (See Document 8.2.)

"We have the best cushioning in the industry. It's a safety feature—without cushioning you can develop all kinds of problems if you really push it. I think the diagram shows that."

"And the video shows that, too. I see the video repeats the green lines from the photograph."

"That's right. But take a look, too, at the testimonials," Manuel says. (See Document 8.3.) "I think this is the best section. The before-and-after photographs, with the customers' own words, tell the story."

Your Assignment

1. Write a 1,000-word memo to Manuel Gutierrez analyzing the effectiveness of each of the three pages from the Nordic Track site displayed here. Focusing on both the text and the graphics in each of the three screens, comment on the effectiveness of the arguments. Does each argument use appropriate evidence, reasoning, and claims? Does each page present its argument clearly and attractively? If not, what recommendations can you offer to improve its effectiveness?
2. Choose one of the three screens presented in this case. Using a word processor, graphics software, or a pen and paper, revise the screen so that it makes a stronger case. If appropriate, perform secondary research to gather additional information. If you think different graphics would strengthen the argument, describe those graphics.

Burn 5X the Calories - Just by Walking

Burn more calories — with the Incline Trainer™.
The greater the incline, the greater the calories burned. It's a simple fact: walking at an incline requires more muscle activity because it requires a greater range of motion — which burns more calories.

How? First, walking at an incline engages the lower body — the body's largest muscle group. Second, walking at an incline forces you to climb the incline with each step — forcing you to exert yourself even more. The combination of these two things helps burn significantly more calories than walking on a flat surface.

Tone Your Muscles While You Walk.
With the Incline Trainer, you won't just burn calories — you'll build and sculpt muscle as never before. This graph illustrates the muscle activity of walking at a 25% incline compared to walking on a flat surface for 20 minutes at 2 mph. With the Incline Trainer, you're just steps away from a whole new you.

Muscle Group	0% Incline	25% Incline
Glutes	~15%	~35%
Hamstring	~10%	~25%
Fore Leg	~10%	~25%
Quad	~10%	~25%
Calf	~10%	~25%

1. Graph based on a study conducted at Utah State University by Edward M. Heath and Rodney L. Hammer, MS (Exercise Science).

Burn 5X the calories!
Burn 398 calories
Burn 317 calories
Burn 236 calories
Burn 74 calories

40% Incline
30% Incline
20% Incline
0% Incline

CALORIES BURNED WALKING AT 2 MPH FOR 20 MINUTES

Document 8.1 "Burn 5X the Calories" Section of the Site

Source: NordicTrack, 2011 <www.inclinetraainer.com/power_incline.html>.

Reflex™ Cushioning

Just as your car's suspension keeps you comfortable and isolated from jarring road conditions, Reflex™ Cushioning increases workout comfort, while keeping your joints protected from the rigors of exercise. Most cushions use a single isolator in the middle of the deck to absorb some impact. Reflex™ Cushioning suspends nearly the entire length of the deck between two isolators—giving it the ability to absorb more impact at heel-strike, while maintaining stability at toe-off. And, because we've exhaustively tested this unique cushion system with a maximum load for countless hours, you can be assured it will stand the test of time. Reflex™ Cushioning offers the ultimate impact-absorption technology.

[Click Below to See the Reflex in Action](#)



Document 8.2 “Reflex Cushioning” Section of the Site

Source: NordicTrack, 2011 <www.inclinetrainer.com/benefit_reduces_impact.html>.

What Can the Incline Trainer™ Do For You?

See how the revolutionary Incline Trainer™ is helping people like you.*



Jillian Michaels

"Incline training is more efficient than other aerobic exercises. At just 25% incline, and 2 mph, you'll burn 3 times the calories compared to walking on a level surface. When you increase the incline to 40% you're burning 5 times the calories, just by walking. That's why I use it with the contestants on TV. Incline training works, and it's fast. And because all you have to do is walk, incline training is virtually zero impact. This means you'll be able to work out longer and see the results faster."

"I've made it my life's work to help other people get in shape. So, if you're serious about losing weight, about feeling great and about really making a difference in the quality of your life, put the NordicTrack Incline Trainer in your home today. "

- » Jose Esnard
- » Michelle Tidwell
- » Renee Farrer
- » Megan Peterson
- » Webb Farrer
- » Renata Rokicki
- » Lisa Detamore
- » Craig Bloom
- » Sebastian Belanger
- » Janice Francois
- » Gail Ohls
- » Kathy Cronin
- » Michelle Burt

Document 8.3 “Testimonials” Section of the Site

Source: NordicTrack, 2011 <www.inclinetrainer.com/testimonials.html>.

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents for Ch. 8 on <bedfordstmartins.com/techcomm>.

Writing Coherent Documents

iStockphoto. Photo composition by Jimmie Young.



Make sure the document is coherent before it gets to the reader.

Reviewing the Whole Document for Coherence 204

Writing Coherent Titles 205

Writing Coherent Headings 206

Writing Coherent Lists 209

Writing Coherent Paragraphs 211

Structure Paragraphs Clearly 212

Use Coherence Devices Within and Between Paragraphs 217

Creating a Coherent Design 220

Use Headers and Footers to Enhance Coherence 220

Use Typefaces to Enhance Coherence 220

When they read a section in a coherent document, readers don't wonder what information it contains, why it appears where it does, how it relates to other sections, or how to find what they need. They don't wonder because the writer has used words, images, and design features to help them understand where they are and how they can get where they want to be. For this reason, they can concentrate on understanding what the document says.

Should you worry about coherence when you draft or when you revise and edit? Because many writers need to concentrate fully on making the information clear and accurate when they draft, they concentrate on coherence only after they have a complete draft. More-experienced writers automatically incorporate coherence techniques as they draft. Whichever process you choose, use the advice in this chapter to make sure the document is coherent before it gets to the reader.

Start by reviewing the whole document for coherence, and then focus on the most important structural components of the document: titles, headings, lists, and paragraphs.

REVIEWING THE WHOLE DOCUMENT FOR COHERENCE

In looking for problems that need fixing, most writers look for the largest, most important problems first, then work on the smaller, less important ones. That way, they don't waste time on awkward paragraphs they might eventually decide to delete. They begin by reviewing the document as a whole (for organization, development, and content), saving the sentence-level concerns (such as grammar, punctuation, and spelling) for later.

For example, you might review your document and answer questions such as these:

- Have I left out anything in turning my outline into a draft?
- Have I included all the elements my readers expect to see?
- Have I organized the document logically?
- Is the document persuasive?
- Do I come across as reliable, honest, and helpful?
- Have I presented all the elements consistently?
- Is the emphasis appropriate throughout the document?

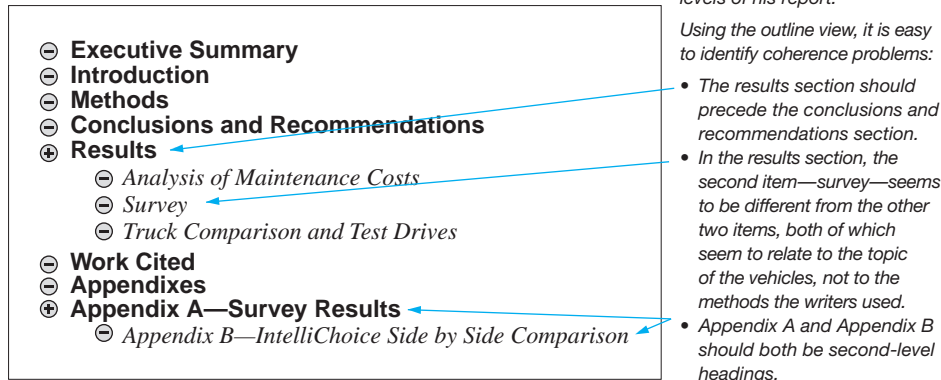


Figure 9.1 Studying the Coherence of a Document Using the Outline View

Perhaps the best way to review your whole document for coherence is to study the outline view of the document. Figure 9.1 shows how the outline view helps you get a bird’s-eye view of the text.

WRITING COHERENT TITLES

The title of a document is crucial because it is your first chance to define your subject and purpose for your readers, giving them their first clue in deciding if the document contains the information they need. The title is an implicit promise to readers: “This document is about Subject A, and it was written to achieve Purpose B.” Everything that follows has to relate clearly to the subject and purpose defined in the title; if it doesn’t, then either the title is misleading or the document has failed to make good on the title’s promise.

You might want to put off giving a final title to your document. Until you have completed the document, you cannot be sure that the subject and purpose you established during the planning stages will not change. However, you should jot down a working title before you start drafting, then come back to revise it later. The working title will give you a strong sense of direction if it defines not only the subject of the document but also its purpose. The working title “Snowboarding Injuries” is okay, but “How to Prevent Snowboarding Injuries” is better because it helps keep you focused on your purpose.

An effective title is precise. For example, if you are writing a feasibility study on the subject of offering free cholesterol screening at your company, the title should contain the key terms *free cholesterol screening* and *feasibility*. The following title would be effective:

Offering Free Cholesterol Screening at Thrall Associates: A Feasibility Study

In This Book

For more about revising your document, see Ch. 13, p. 352.

On TechComm Web

For more advice on revising the whole document, see Purdue University’s Online Writing Lab handouts on revising. Click on Links Library for Ch. 9 on <bedfordstmartins.com/techcomm>.

If your document is an internal report discussing company business, you might not need to identify the company. In that case, the following would be clear:

Offering Free Cholesterol Screening: A Feasibility Study

Or you could present the purpose before the subject:

A Feasibility Study of Offering Free Cholesterol Screening

Avoid substituting general terms, such as *health screening* for *cholesterol screening* or *study* for *feasibility study*; the more precise your terms, the more useful your readers will find the title. An added benefit of using precise terms is that your document can be more accurately and effectively indexed in databases and online libraries, increasing the chances that someone researching your subject will be able to find the document.

Before settling on a title, test its effectiveness by asking whether readers will be able to paraphrase it in a clear, meaningful sentence. For instance, “A Feasibility Study of Offering Free Cholesterol Screening to Employees of Thrall Associates” could be paraphrased as: “This document reports on a study conducted to determine whether it is feasible to offer free cholesterol screening to employees of Thrall Associates.”

But notice what happens when the title is incomplete: “Free Cholesterol Screening.” With only those three words to go on, the reader can only guess about the document’s purpose. The reader knows that the document has something to do with free cholesterol screening, but is the writer recommending that screening be implemented, modified, or discontinued? Or is the writer reporting on the success of an existing screening program?

You’ll notice that clear, comprehensive titles tend to be long. If you need eight or ten words to say what you want to say about your subject and purpose, use them.

WRITING COHERENT HEADINGS

Headings, which are lower-level titles for the sections and subsections in a document, do more than announce the subject that will be discussed in the document. Collectively, they create a *hierarchy of information*, dividing the document into major sections and subdividing those sections into subsections. In this way, coherent headings communicate the relative importance and generality of the information that follows, helping readers recognize major sections as *primary* (likely to contain more-important and more-general information) and subsections as *secondary* or *subordinate* (likely to contain less-important and more-specific information).

Coherent, well-designed headings communicate this relationship not only through their content, but also through their design. For this reason, you should ensure that the design of a primary heading (sometimes referred to as a *level 1 heading*, *1 heading*, or *A heading*) clearly distinguishes it from a subordinate heading (a *level 2 heading*, *2 heading*, or *B heading*), and that the design

of that subordinate heading clearly distinguishes it from a subordinate heading at a lower level (a *level 3 heading*, *3 heading*, or *C heading*).

The headings used in this book illustrate this principle, as does the example below. Notice that the example uses both typography and indentation to distinguish one heading from another and to communicate visually how information at one level logically relates to information at other levels.

Level 1 Heading

Level 2 Heading

Level 3 Heading

Because a heading is a type of title, much of the advice about titles in the previous section also applies to headings. For instance, a clear, informative heading is crucial because it announces the subject and purpose of the discussion that follows it, just as a title does for the whole document. Announcing the subject and purpose in a heading helps readers understand what they will be reading or, in some cases, helps them decide whether they need to read it at all. For the writer, a heading eliminates the need for awkward transitional sentences such as “Let us now turn to the advantages of the mandatory enrollment process” or “The next step in replacing the saw blade is to remove the arbor nut from the drive shaft.”

Effective headings can help both reader and writer by forecasting not only the subject and purpose of the discussion that follows but also its scope and organization. When readers encounter the heading “Three Health Benefits of Yoga: Improved Muscle Tone, Enhanced Flexibility, Better Posture,” they can reasonably assume that the discussion will consist of three parts (not two or four) and that it likely will begin with a discussion of muscle tone, followed by a discussion of flexibility and then posture.

Because headings introduce text that discusses or otherwise elaborates on the subject defined by the heading, you should avoid creating back-to-back headings. In other words, avoid following one heading directly with another heading:

3. Approaches to Neighborhood Policing

3.1 Community Policing

According to the COPS Agency (a component of the U.S. Department of Justice), “Community policing focuses on crime and social disorder.” . . .

What’s wrong with back-to-back headings? First, they’re illogical. If your document contains a level 1 heading, you have to say something at that level before jumping to the discussion at level 2. Second, back-to-back headings distract and confuse readers. The heading “3. Approaches to Neighborhood Policing” announces to readers that you have something to say about neighborhood policing—but you don’t say anything. Instead, another, subordinate heading appears, announcing to readers that you now have something to say about community policing.

To avoid confusing and frustrating readers, separate the headings with text, as in this example:

3. Approaches to Neighborhood Policing

Over the past decade, the scholarly community has concluded that community policing offers significant advantages over the traditional approach based on patrolling in police cars. However, the traditional approach has some distinct strengths. In the following discussion, we define each approach and then explain its advantages and disadvantages. Finally, we profile three departments that have successfully made the transition to community policing while preserving the major strengths of the traditional approach.

3.1 Community Policing

According to the COPS Agency (a component of the U.S. Department of Justice), “Community policing focuses on crime and social disorder.” . . .

The text after the heading “3. Approaches to Neighborhood Policing” is called an *advance organizer*. It indicates the background, purpose, scope, and organization of the discussion that follows it. Advance organizers improve coherence by giving readers an overview of the discussion before they encounter the details in the discussion itself.

Guidelines

Revising Headings

Follow these four suggestions to make your headings more effective.

- ▶ **Avoid long noun strings.** The following example is ambiguous and hard to understand:

Proposed Production Enhancement Strategies Analysis Techniques

Is the heading introducing a discussion of techniques for analyzing strategies that have been proposed? Or is it introducing a discussion that proposes using certain techniques to analyze strategies? Readers shouldn’t have to ask such questions. Adding prepositions makes the heading clearer:

Techniques for Analyzing the Proposed Strategies for Enhancing Production

This heading announces more clearly that the discussion describes techniques for analyzing strategies, that those strategies have been proposed, and that the strategies are aimed at enhancing production. It’s a longer heading than the original, but that’s okay. It’s also much clearer.

- ▶ **Be informative.** In the preceding example, you could add information about how many techniques will be described:

Three Techniques for Analyzing the Proposed Strategies for Enhancing Production

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For more about noun strings, see Ch. 10, p. 245.

You can go one step further by indicating what you wish to say about the three techniques:

Advantages and Disadvantages of the Three Techniques for Analyzing the Proposed Strategies for Enhancing Production

Again, don't worry if the heading seems too long; clarity is more important than conciseness.

- ▶ **Use a grammatical form appropriate to your audience.** The question form works well for less-knowledgeable readers (Benson, 1985) or for nonnative speakers:

What Are the Three Techniques for Analyzing the Proposed Strategies for Enhancing Production?

The “how-to” form is best for instructional material, such as manuals:

How to Analyze the Proposed Strategies for Enhancing Production

The gerund form (*-ing*) works well for discussions and descriptions of processes:

Analyzing the Proposed Strategies for Enhancing Production

- ▶ **Avoid back-to-back headings.** Use advance organizers to separate the headings.

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For more about how to format headings, see Ch. 11, p. 283.

WRITING COHERENT LISTS

Although academic writing typically consists of conventional paragraphs, technical documents often contain paragraphs in list format. Lists are especially effective in conveying information that can be itemized (such as three physical conditions that frequently lead to patients' developing adult-onset diabetes). Lists also work well for presenting information that can be expressed in a sequence (such as the operation of a four-stroke gasoline engine: *intake, compression, ignition, exhaust*). See Figure 9.2 for an example of paragraphs in list format.

Why use a list format instead of traditional paragraphs? Lists add a visual dimension to the text. They make it easier for readers to understand the discussion, and they make it easier for writers to express ideas clearly and coherently.

For readers, the chief advantage of a list is that it makes the information easier to read and remember. Readers see the structure of the discussion—often in a single glance—before they read the details. Once they start reading the list, they can more easily follow the discussion because its design mirrors its logic. For example, a list-format discussion of the four stages of mitosis (*prophase, metaphase, anaphase, telophase*) would arrange the discussion in the order in which each stage occurs and would use bullets or numbers to distinguish one stage from another. As a result, the list format enables readers to navigate the discussion easily and confidently, if only because they can see

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For a discussion of lists at the sentence level, see Ch. 10, pp. 228–32.

The authors are discussing the idea that engineers have a special social responsibility.

Turning the paragraph into a list forces the writer to create headings that sharply focus each bulleted entry.

By deleting the wordy topic sentences from the paragraph version, the writer saves space. The list version of the passage is not significantly longer than the paragraph version, despite the indentations.

Notice that the writer of the list uses italics to emphasize the key data at the start of each bullet item.

Paragraph format

Currently, there are three conceptions of the relation between engineering as a profession and society as a whole.

The first conception is that there is no relation. Engineering's proper regard is instrumental, with no constraints at all. Its task is to provide purely technical solutions to problems.

The second conception is that engineering's role is to protect society. It must be concerned, as a profession, with minimizing the risk to the public. The profession is to operate on projects as presented to it, as an instrument; but the profession is to operate in accordance with important safety constraints, which are integral to its performing as a profession.

The third conception is that engineering has a positive social responsibility to try to promote the public good, not merely to perform the tasks that are set for it, and not merely to perform those tasks such that risk is minimized or avoided in performing them.

List format

Currently, there are three conceptions of the relation between engineering as a profession and society as a whole:

- *There is no relation.* Engineering's proper regard is instrumental, with no constraints at all. Its task is to provide purely technical solutions to problems.
- *The engineer's role is to protect society.* Engineering is concerned, as a profession, with minimizing the risk to the public. The profession is to operate on projects as presented to it, as an instrument; but the profession is to operate in accordance with important safety constraints, which are integral to its performing as a profession.
- *The engineer's role is to promote the public good.* Engineering has a positive social responsibility to try to promote the public good, not merely to perform the tasks that are set for it, and not merely to perform those tasks such that risk is minimized or avoided in performing them.

Figure 9.2 Paragraph Format and List Format

Source: Based on Cohen and Grace, 1994.

where the discussion of prophase ends and the discussion of metaphase begins. Reaching the end of the list, they know without having to read further that they have arrived at the end of the discussion of the four stages.

For you as a writer, turning paragraphs into lists has four advantages:

- *It forces you to look at the big picture.* While drafting a document, you can easily lose sight of the information outside the paragraph you are writing. Turning traditional paragraphs into lists expands your perspective beyond a single paragraph. By looking for opportunities to create lists as you revise, you not only focus on the key idea in each paragraph, you also consider how that key idea relates to the key ideas of other paragraphs. Revising this way increases your chances of noticing that an important item is missing or that an item is unclear. It also increases the chances that you'll think more deeply about how items and key ideas are related to one another.
- *It forces you to examine the sequence.* As you turn some of your paragraphs into lists, you get a chance to reconsider whether the sequence of the information is logical. Sometimes, the visual dimension that lists add to the text will reveal an illogical sequence you might have overlooked in traditional paragraphs.

- *It forces you to create a helpful lead-in.* Every list requires a *lead-in*, or introduction to the list; without one, readers are left to guess at how the list relates to the discussion and how the items in the list relate to each other. In the *lead-in*, you can add a number signal that further forecasts the content and organization of the material that follows:

Auto sales declined last year because of four major factors:

You can add the same kind of number signal in a traditional paragraph, but you are less likely to think about adding one if you are not focusing on creating a list.

- *It forces you to tighten and clarify your prose.* When you make a list, look for a word, phrase, or sentence that identifies each item. Your focus shifts from weaving sentences together in a paragraph to highlighting key ideas, thereby giving you an opportunity to critically consider those key ideas and revise accordingly.

In many other cultures, headings and lists are considered too informal for some documents. To address this cultural difference, try to find samples written by people from the culture you are addressing to examine their use of headings and lists. Consider the following questions in studying documents from other cultures:

- *How does the writer make the information accessible?* That is, how does the writer help readers easily find the information they need, without flipping through pages or clicking links unnecessarily?
- *How does the writer show the relationship among types of information?* Are they grouped, highlighted, listed, set off by headings, or set in a typeface different from that used for other types of information? When conveying information that can be itemized or sequenced, what form does the itemization or sequencing take?
- *How does the writer communicate to readers the organization of the document as a whole and of the parts making up the whole?*
- *How does the writer make transitions from one subject to another?* As noted earlier, a heading eliminates the need for awkward transitional sentences. In some cultures, however, the heading itself would be considered awkward—and possibly brusque, informal, or disrespectful.

WRITING COHERENT PARAGRAPHS

There are two kinds of paragraphs: body paragraphs and transitional paragraphs.

A *body paragraph*, the basic unit for communicating information, is a group of sentences (or sometimes a single sentence) that is complete and self-sufficient and that contributes to a larger discussion. In an effective paragraph, all the sentences clearly and directly articulate one main point,

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For advice on writing effective lead-ins, see Ch. 10, pp. 230–31.

either by introducing the point or by providing support for it. In addition, the whole paragraph follows logically from the material that precedes it.

A *transitional paragraph* helps readers move from one major point to another. Like a body paragraph, it can consist of a group of sentences or be a single sentence. Usually it summarizes the previous point, introduces the next point, and helps readers understand how the two are related.

The following example of a transitional paragraph appeared in a discussion of how a company plans to use this year's net proceeds.

Our best estimate of how we will use these net proceeds, then, is to develop a second data center and increase our marketing efforts. We base this estimate on our current plans and on projections of anticipated expenditures. However, at this time we cannot precisely determine the exact cost of these activities. Our actual expenditures may exceed what we've predicted, making it necessary or advisable to reallocate the net proceeds within the two uses (data center and marketing) or to use portions of the net proceeds for other purposes. The most likely uses appear to be reducing short-term debt and addressing salary inequities among software developers; each of these uses is discussed below, including their respective advantages and disadvantages.

The first sentence contains the word then to signal that it introduces a summary.

The final sentence clearly indicates the relationship between what precedes it and what follows it.

Structure Paragraphs Clearly

Most paragraphs consist of a topic sentence and supporting information.

The Topic Sentence Because a topic sentence states, summarizes, or forecasts the main point of the paragraph, put it up front. Technical communication should be clear and easy to read, not suspenseful. If a paragraph describes a test you performed, include the result of the test in your first sentence:

The point-to-point continuity test on Cabinet 3 revealed an intermittent open circuit in the Phase 1 wiring.

Then go on to explain the details. If the paragraph describes a complicated idea, start with an overview. In other words, put the “bottom line” on top:

Mitosis is the usual method of cell division, occurring in four stages: (1) prophase, (2) metaphase, (3) anaphase, and (4) telophase.

Notice how difficult the following paragraph is to read:

DRAFT A solar panel affixed to a satellite in distant geosynchronous orbit receives about 1400 watts of sunlight per square meter. On Earth, cut this number in half, due to the day/night cycle. Cut it in half again because sunlight hits the Earth obliquely (except exactly on the equator). Cut it in half again due to clouds and dust in the atmosphere. The result: eight times the amount of sunlight falls on a solar panel in sun-synchronous orbit than falls on the same size area on Earth.

Putting the bottom line on top makes the paragraph much easier to read, as illustrated by this revision:

REVISION Eight times the amount of sunlight falls on a solar panel in distant geosynchronous orbit than falls on the same size area on Earth. A solar panel affixed to a satellite in sun-synchronous orbit receives about 1400 watts of sunlight per square meter. On Earth, cut this number in half, due to the day/night cycle. Cut it in half again because sunlight hits the Earth obliquely (except exactly on the equator). Cut it in half again due to clouds and dust in the atmosphere.

Make sure each of your topic sentences relates clearly to the organizational pattern you are using. In a discussion of the physical condition of a building, for example, you might use a spatial pattern and start a paragraph with the following topic sentence:

On the north side of Building B, water damage to about 75 percent of the roof insulation and insulation in some areas in the north wall indicates that the roof has been leaking for some time. The leaking has contributed to . . .

ETHICS NOTE

Avoiding Burying Bad News in Paragraphs

The most emphatic location in a paragraph is the topic sentence, usually the first sentence in a paragraph. The second most emphatic location is the end of the paragraph. Do not bury bad news in the middle of the paragraph, hoping readers won't see it. It would be misleading to structure a paragraph like this:

In our proposal, we stated that the project would be completed by May. In making this projection, we used the same algorithms that we have used successfully for more than 14 years. In this case, however, the projection was not realized, due to several factors beyond our control. . . . We have since completed the project satisfactorily and believe strongly that this missed deadline was an anomaly that is unlikely to be repeated. In fact, we have beaten every other deadline for projects this fiscal year.

The writer has buried the bad news in a paragraph that begins with a topic sentence that appears to suggest good news. The last sentence, too, suggests good news.

A more forthright approach would be as follows:

We missed our May deadline for completing the project. Although we derived this schedule using the same algorithms that we have used successfully for more than 14 years, several factors, including especially bad weather at the site, delayed the construction. . . .

Here the writer forthrightly presents the bad news in a topic sentence. Then he creates a separate paragraph with the good news.

However, we have since completed the project satisfactorily and believe strongly that this missed deadline was an anomaly that is unlikely to be repeated. . . . In fact, we have beaten every other deadline for projects this fiscal year.

Your next paragraph should begin with a topic sentence that continues the spatial organizational pattern:

On the east side of the building, a downspout has eroded the lawn and has caused a small silt deposit to form on the neighboring property directly to the east. Riprap should be placed under the spout to . . .

Note that the phrases “on the north side” and “on the east side” signal that the discussion is following the points of the compass in a clockwise direction, further emphasizing the spatial pattern. Readers can reasonably assume that the next two parts of the discussion will be about the south side of the building and the west side, in that order.

Similarly, if your first topic sentence is “First, we need to . . .,” your next topic sentence should refer to the chronological pattern: “Second, we should . . .” (Of course, sometimes well-written headings can make such references to the organizational pattern unnecessary, as when headings are numbered to emphasize that the material is arranged in a chronological pattern.)

The Supporting Information The supporting information makes the topic sentence clear and convincing. Sometimes a few explanatory details provide all the support you need. At other times, however, you need a lot of information to clarify a difficult thought or defend a controversial idea. How much supporting information to provide also depends on your audience and purpose. Readers knowledgeable about your subject may require little supporting information compared to less-knowledgeable readers. Likewise, you may need to provide little supporting information if your purpose is merely to state a controversial point of view rather than *persuade* your reader to agree with it. In deciding such matters, your best bet is to be generous with your supporting information. Paragraphs with too little support are far more common than paragraphs with too much.

Supporting information is most often developed using the basic patterns of organization discussed in Chapter 7, and it usually fulfills one of these five roles:

- It defines a key term or idea included in the topic sentence.
- It provides examples or illustrations of the situation described in the topic sentence.
- It identifies causes: factors that led to the situation.
- It defines effects: implications of the situation.
- It supports the claim made in the topic sentence.

Joseph Williams (2007), a respected authority on style, says that writers should think of writing a topic sentence as being the same as making a promise to readers. At the very least, when you write a topic sentence that says “Within five years, the City of McCall will need to upgrade its wastewater-treatment facilities because of increased demands from a rapidly rising population,” you are implicitly promising readers that the paragraph not only

will be about wastewater-treatment facilities but also will explain that the rapidly rising population is *why* the facilities need to be upgraded. If your paragraph fails to discuss these things, it has failed to deliver on the promise you made. If the paragraph discusses these things but also goes on to speculate about the price of concrete over the next five years, it is delivering on promises that the topic sentence never made. As Williams points out, both situations result in a paragraph gone astray.

Paragraph Length How long should a paragraph be? In general, 75 to 125 words are enough for a topic sentence and four or five supporting sentences. Long paragraphs are more difficult to read than short paragraphs because they require more focused concentration. They can also intimidate some readers, who skip over them.

But don't let arbitrary guidelines about length take precedence over your own analysis of the audience and purpose. You might need only one or two sentences to introduce a graphic, for example. Transitional paragraphs are also likely to be quite short. If a brief paragraph fulfills its function, let it be. Do not combine two ideas in one paragraph simply to achieve a minimum word count.

You may need to break up your discussion of one idea into two or more paragraphs. An idea that requires 200 or 300 words to develop should probably not be squeezed into one paragraph.

A note about one-sentence paragraphs: body paragraphs and transitional paragraphs alike can consist of a single sentence. However, many single-sentence paragraphs are likely to need revision. Sometimes the idea in that sentence belongs with the paragraph immediately before it or immediately after it, or in another paragraph elsewhere in the document. Sometimes the idea needs to be developed into a paragraph of its own. And sometimes the idea doesn't belong in the document at all.

Guidelines

Dividing Long Paragraphs

Here are three techniques for dividing long paragraphs.

<i>Technique</i>	<i>Example</i>
<p>Break the discussion at a logical place.</p> <p>The most logical place to divide this paragraph is at the introduction of the second factor (see p. 216). Because the paragraphs are still relatively long, this strategy works best for skilled readers.</p>	<p>High-tech companies have been moving their operations to the suburbs for two main reasons: cheaper, more modern space and a better labor pool. A new office complex in the suburbs will charge from one-half to two-thirds of the rent charged for the same square footage in the city. And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site.</p>



<i>Technique</i>	<i>Example</i>
<p>Make the topic sentence a separate paragraph and break up the supporting information.</p> <p>This revision is easier for all readers to understand because the brief paragraph at the start clearly introduces the information. In addition, each of the two main paragraphs now has a clear topic sentence.</p>	<p>The second major factor attracting high-tech companies to the suburbs is the availability of experienced labor. Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.</p> <p>High-tech companies have been moving their operations to the suburbs for two main reasons: cheaper, more modern space and a better labor pool.</p> <p>First, office space is a bargain in the suburbs. A new office complex in the suburbs will charge from one-half to two-thirds of the rent charged for the same square footage in the city. And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site.</p> <p>Second, experienced labor is plentiful. Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.</p>
<p>Use a list.</p> <p>This is the easiest of the three versions for all readers because of the extra visual cues provided by the list format.</p>	<p>High-tech companies have been moving their operations to the suburbs for two main reasons:</p> <ul style="list-style-type: none"> • <i>Cheaper, more modern space.</i> Office space is a bargain in the suburbs. A new office complex in the suburbs will charge anywhere from one-half to two-thirds of the rent charged for the same square footage in the city. And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site. • <i>A better labor pool.</i> Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.

When you think about paragraph length, consider how the information will be printed or displayed. If the information will be presented in a narrow column, such as in a newsletter, short paragraphs are much easier to read. If the information will be presented in a wider column, readers will be able to handle a longer paragraph.

Use Coherence Devices Within and Between Paragraphs

In a coherent paragraph, ideas are linked together clearly and logically. Parallel ideas are expressed in parallel grammatical constructions. Even if the paragraph already moves smoothly from sentence to sentence, you can emphasize the coherence by adding transitional words and phrases, repeating key words, and using demonstrative pronouns followed by nouns.

Adding Transitional Words and Phrases Transitional words and phrases help the reader understand a discussion by explicitly stating the logical relationship between two ideas. Table 9.1 lists the most common logical relationships between two ideas and some of the common transitions that express those relationships.

Transitional words and phrases benefit both readers and writers. When a transitional word or phrase explicitly states the logical relationship between two ideas, readers don't have to guess at what that relationship might be. As a writer, using transitional words and phrases forces you to think more deeply about the logical relationships between ideas than you might otherwise.

To better understand how transitional words and phrases benefit both reader and writer, consider the following pairs of examples:

WEAK	Demand for flash-memory chips is down by 15 percent. We have laid off 12 production-line workers.
IMPROVED	Demand for flash-memory chips is down by 15 percent; <i>as a result</i> , we have laid off 12 production-line workers.

TABLE 9.1 ► Transitional Words and Phrases

Relationship	Transition
addition	also, and, finally, first (second, etc.), furthermore, in addition, likewise, moreover, similarly
comparison	in the same way, likewise, similarly
contrast	although, but, however, in contrast, nevertheless, on the other hand, yet
illustration	for example, for instance, in other words, to illustrate
cause-effect	as a result, because, consequently, hence, so, therefore, thus
time or space	above, around, earlier, later, next, to the right (left, west, etc.), soon, then
summary or conclusion	at last, finally, in conclusion, to conclude, to summarize

WEAK	The project was originally expected to cost \$300,000. The final cost was \$450,000.
IMPROVED	The project was originally expected to cost \$300,000. <i>However</i> , the final cost was \$450,000.

This next sentence pair differs from the others in that the weak example *does* contain a transitional word, but it's a weak transitional word:

WEAK	According to the report from Human Resources, the employee spoke rudely to a group of customers waiting to enter the store, <i>and</i> he repeatedly ignored requests from co-workers to unlock the door so the customers could enter.
IMPROVED	According to the report from Human Resources, the employee spoke rudely to a group of customers waiting to enter the store; <i>moreover</i> , he repeatedly ignored requests from co-workers to unlock the door so the customers could enter.

In the weak version, *and* implies simple addition: the employee did this, and then he did that. The improved version is stronger, adding to simple addition the idea that refusing to unlock the door compounded the employee's rude behavior, elevating it to something more serious. By using *moreover*, the writer is saying that the employee's behavior was bad enough in that he spoke rudely to customers, but he *really* crossed the line when he refused to open the door.

Whichever transitional words and phrases you use, place them as close as possible to the beginning of the second idea. As shown in the examples above, the link between two ideas should be near the start of the second idea, to provide context for it. Consider the following example:

The vendor assured us that the replacement parts would be delivered in time for the product release. The parts were delivered nearly two weeks after the product release, however.

The idea of Sentence 2 stands in contrast to the idea of Sentence 1, but the reader doesn't see the transition until the end of Sentence 2. Put the transition at the start of the second idea, where it will do the most good.

You should also use transitional words to maintain coherence *between* paragraphs, just as you use them to maintain coherence *within* paragraphs. The link between two paragraphs should be near the start of the second paragraph.

Repeating Key Words Repeating key words—usually nouns—helps readers follow the discussion. In the following example, the first version could be confusing:

UNCLEAR	For months the project leaders carefully planned their research. The cost of the work was estimated to be over \$200,000. <i>What is the work: the planning or the research?</i>
---------	---

CLEAR For months the project leaders carefully planned their research. The cost of the research was estimated to be over \$200,000.

From a misguided desire to be interesting, some writers keep changing their important terms. *Plankton* becomes *miniature seaweed*, then *the ocean's fast food*. Avoid this kind of word game; it can confuse readers.

Of course, too much repetition can be boring. You can vary nonessential terms as long as you don't sacrifice clarity.

SLUGGISH The purpose of the new plan is to **reduce** the **problems** we are seeing in our accounting operations. We hope to see a **reduction** in the **problems** by early next quarter.

BETTER The purpose of the new plan is to reduce the problems we are seeing in our accounting operations. We hope to see an improvement by early next quarter.

Using Demonstrative Pronouns Followed by Nouns Demonstrative pronouns—*this*, *that*, *these*, and *those*—can help you maintain the coherence of a discussion by linking ideas securely. In almost all cases, demonstrative pronouns should be followed by nouns, rather than stand alone in the sentence. In the following examples, notice that a demonstrative pronoun by itself can be vague and confusing.

UNCLEAR New screening techniques are being developed to combat viral infections. *These* are the subject of a new research effort in California. *What is being studied in California: new screening techniques or viral infections?*

CLEAR New screening techniques are being developed to combat viral infections. *These techniques* are the subject of a new research effort in California.

UNCLEAR The task force could not complete its study of the mine accident. *This* was the subject of a scathing editorial in the union newsletter. *What was the subject of the editorial: the mine accident or the task force's inability to complete its study of the accident?*

CLEAR The task force failed to complete its study of the mine accident. *This failure* was the subject of a scathing editorial in the union newsletter.

Even when the context is clear, a demonstrative pronoun used without a noun might interrupt the readers' progress by forcing them to refer back to an earlier idea.

INTERRUPTIVE The law firm advised that the company initiate proceedings. This caused the company to search for a second legal opinion.

FLUID The law firm advised that the company initiate proceedings. *This advice* caused the company to search for a second legal opinion.

1. In what ways does the topic sentence function as it should?
2. Identify the transitional words or phrases. How are they used effectively?
3. Identify the repeated key words. How effectively does the writer use key words?
4. Identify the demonstrative pronouns followed by nouns. How effectively does the writer use them?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 9 on <bedfordstmartins.com/techcomm>.

INTERACTIVE SAMPLE DOCUMENT

Identifying the Elements of a Coherent Paragraph

The following paragraph is taken from a report published by a water company. In this paragraph, the writer is describing how he decided on a method for increasing the company's business within his particular branch. (The sentences are numbered.)

The questions in the margin ask you to think about the qualities of coherent paragraphs (as outlined on pages 211–19).

(1) We found that the best way to improve the Montana branch would be to add a storage facility to our existing supply sources. (2) Currently, we can handle the average demand on a maximum day; the storage facility will enable us to meet peaking requirements and fire-protection needs. (3) In conducting our investigation, we considered developing new supply sources with sufficient capacity to meet current and future needs. (4) This alternative was rejected, however, when our consultants (Smith and Jones) did groundwater studies that revealed that insufficient groundwater is available and that the new wells would have to be located too far apart if they were not to interfere with each other.

CREATING A COHERENT DESIGN

So far, this chapter has focused on making the words in your document coherent. You should also make sure the design of your document is coherent. The skillful design of headers and footers and the adept use of typefaces will enhance your document's coherence.

Use Headers and Footers to Enhance Coherence

Headers and footers, which appear at the tops and bottoms of pages, contain information that helps readers navigate the document. This information might include page number, chapter or section number and title, and document title. You can create headers and footers using your word-processing software. Figure 9.3 shows a header and a footer in a report.

Use Typefaces to Enhance Coherence

Using different typefaces is one way to create visual distinctions throughout your document. Visually distinct headings help keep readers oriented as they navigate through the document, reminding them where they are in the dis-

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For more about headers and footers, see Ch. 11, p. 292.



Figure 9.3 Headers and Footers Enhance Coherence

Source: U.S. Department of State, 2007 <www.usaid.gov/policy/coordination/stratplan_fy07-12.pdf>.

cussion. For similar reasons, body text should be visually distinct from headings, and both should be visually distinct from headers and footers. Using different typefaces consistently is one way to add coherence to a document.

As discussed in Chapter 3, the best way to make sure you use typefaces consistently is to use styles in your word-processing software. (A style is a set of formatting instructions that you can apply to all headings or other design elements that you want to look alike.) Because you create a style only once but then apply it to any number of headings or other design elements, you're far more likely to format these items consistently than if you were to format each one individually.

Styles also speed up the process of changing the appearance of headings and other design elements. As you revise, you might notice that two levels of headings are insufficiently distinct. You can easily use the styles function to change the design of one of those headings so it is distinct and therefore does a better job of helping readers follow the discussion and understand where they are in the document. In addition, you can create new styles to ensure consistency when, for instance, you further subdivide a subsection of a document or introduce bulleted lists into the discussion.

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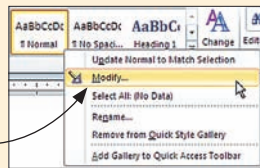
For more about typefaces, see Ch. 11, p. 276.

TECH TIP

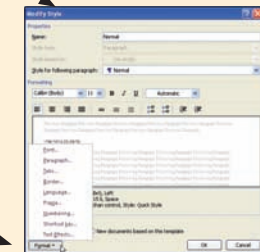
How to Modify and Create Styles

As you write, you can use the **Styles** group to modify and create styles to address your specific writing situation.

1. To modify a style, right-click the style you wish to modify in the **Styles** group on the **Home** tab. Select **Modify** from the drop-down menu that appears.



Use the **Modify Style** dialog box to make changes.



For additional formatting options for elements such as fonts, paragraphs, and numbering, select the **Format** button.

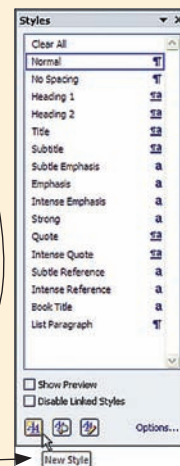
2. To create a new style, apply the desired character formatting to some text or the desired paragraph formatting to a paragraph. Next, select the desired text or paragraph and then right-click it.



Choose **Styles** and then **Save Selection as a New Quick Style**.

Use the **Create New Style from Formatting** dialog box to name your new style. Apply additional formatting to the style by selecting the **Modify** button.

3. You can also create a new style by selecting the **Styles** dialog box launcher and then selecting the **New Style** button. Use the dialog box that appears to create a new style.



KEYWORDS: styles group, quick styles, create new quick styles, modify styles, new styles

Writer's Checklist

- Did you revise the title of your document so that it
- clearly states the subject and purpose of your document? (p. 205)
 - is precise and informative? (p. 205)

- Did you revise the headings to
- avoid long noun strings? (p. 208)
 - be informative? (p. 208)
 - use the question form for less-knowledgeable readers? (p. 209)


- use the “how-to” form in instructional materials? (p. 209)
- use the gerund form (*-ing*) for the discussion of a process? (p. 209)
- Did you avoid back-to-back headings by including an advance organizer? (p. 209)
- Did you look for opportunities to turn traditional paragraphs into lists? (p. 209)

One formula that appeared foolproof for selling computers was direct sales by the manufacturer to the consumer. Dell, _____, climbed to number two in PC sales by selling customized products directly on its Web site. _____, the recent success of Acer, now number three in sales, suggests that the older formula of distributing commodity items through retailers might be best for today's PC industry. Acer's success can be attributed to three decisions it made. First, it sold off its division that manufactured components for other PC brands. _____, it correctly concluded that consumers, who generally prefer preconfigured PCs, would outnumber business customers. And _____, it decided to expand its line of inexpensive netbooks (small PCs for surfing the Web) just when the economic downturn increased the demand for cheaper PC products. These decisions appear to have paid off for Acer: last year, its market share rose 3 per-

centage points, from 8 to 11. _____, Dell rose only 0.1 point, from 14.8 to 14.9.

6. In each of the following exercises, the second sentence begins with a demonstrative pronoun. Add a noun after the demonstrative to enhance coherence.
- The Zoning Commission has scheduled an open hearing for March 14. This _____ will enable concerned citizens to voice their opinions on the proposed construction.
 - The university has increased the number of parking spaces, instituted a shuttle system, and increased parking fees. These _____ are expected to ease the parking problems.
 - Congress's decision to withdraw support for the supercollider in 1994 was a shock to the U.S. particle-physics community. This _____ is seen as instrumental in the revival of the European research community.

Case 9: Highlighting the Coherence of a Passage

 **On TechComm Web** For digital versions of case documents, click on Downloadable Case Documents for Ch. 9 on <bedfordstmartins.com/techcomm>.

Background

You are a member of a three-person team in your technical-communication class. The other two team members are Melissa Anderson, a mechanical engineering major, and Paul Kersten, a biology major. You are a history major. Your team is now working on a recommendation report, an assignment that will count as 20 percent of your final grade.

Your team has been successful in its previous assignments. Melissa and Paul are easy to work with, and because all three of you want to earn the highest grades you can, motivation has not been a problem. In your collaboration, you have used a work system in which you meet in person, and then each of you writes a portion of the assignment. Finally, you edit by sending revisions to one another by e-mail. Because your team has worked on three previous assignments, you have learned what each member of the team does well. Melissa is the technical expert on the subject you are writing about. Paul is an excellent researcher and is great at seeing ways to improve the content in your documents. You are the best in the team at revising, editing, and proofreading.

The subject of the recommendation report is a problem that Melissa encountered last year on a summer internship

working for Blaine Pipe Company, which supplies pipe and other construction materials to contractors. The problem Melissa worked on was that bad weather and sunlight can degrade PVC pipe by breaking down its molecular structure. Melissa studied options for creating various types of shelters that would protect the PVC pipe from exposure to the elements before being shipped to the customer.

Your team is drafting its recommendation report. Melissa has e-mailed a draft of the research-methods section (Document 9.1) to you and Paul. A few hours later, you and Melissa receive an e-mail from Paul (Document 9.2) suggesting aspects of the draft that could be strengthened.

Your Assignment

- Review this chapter. Identify three ways in which the draft violates this chapter's advice, and write a set of guidelines that addresses these coherence problems. Consider such topics as approaches to writing coherent headings, lists, and paragraphs. Where appropriate, use portions of the text from Document 9.1 to create before-and-after samples.
- Revise Document 9.1 so that it reflects the guidelines you wrote in response to Assignment 1.

**Document 9.1 Original
Version of the Research-
Methods Section of the
Report****Research Methods**

The previous quarterly inventory reports were used to determine the financial losses caused by UV degeneration of the pipe's tensile strength, as well as other causes. We calculated the costs of the gas and the hourly wages of delivery drivers transporting the pipe, removal from our customers' sites of the defective pipe, and replacement of the defective pipe. We evaluated these to investigate protective shelters for the inventory of pipes.

We searched major manufacturers of sheet metal, fabric, and polyurethane shelters to deliver and build a shelter for our company's PVC inventory. We have also spoken with companies who have invested in similar shelters and noted their success and the cons associated with each. The shelters' manufacturers we contacted have given us rough estimates for constructed coverings: fabric shelter (\$20,000), polyurethane shelter (\$33,000), and sheet metal shelter (\$26,000). All are within our capital budget. We thought about how to determine the main criteria against which we would evaluate the different shelters. We researched journals and articles to study what contributes to UV degeneration and how to prevent it. We studied how these affect the mechanical properties and tensile strength of the pipe.

We dispersed a questionnaire to employees of Blaine Pipe Co. We conducted an in-person expert interview with David Rose (see Appendix B) to determine other criteria that should be considered. Visiting with local owners of various kinds of shelters helped us with our assessment when considering a shelter. The qualities deemed necessary for the shelter provided through the research are the following. Because the initial problem of UV breakdown is most crucial, we need a shelter that can withstand all types of weather including snow and UV rays. Having a shelter that can endure these will eliminate the need to replace the covering. It would be good if it is lightweight so that it is mobile. Also, there needs to be great access to allow movement of inventory which it contains. Maybe the most important criterion is that since the shelter will be outdoors, the covering needs to be able to withstand all types of weather. The shelter needs to block the majority of UV rays and resist water from reaching the pipe.

We invited a representative from each manufacturer to meet with us and discuss their products. These representatives discussed the company's design, functionality, materials, and the shelters' resistance to weather. We sought advice from our company's engineering department to determine the best shelter in protecting them. These helped us learn about each of the options. As a team, we devised a grading system used to determine the best shelter in protecting the inventory of pipe by assigning it an overall grade. The system allowed us to evaluate the functionality of each type of shelter by the particular criteria desired to protect our inventory from UV degradation. This task was completed after visiting three sites which each had one of the models. This constituted the evaluation of our shelter options using our evaluation criteria.

**Document 9.2 Paul's
E-mail Suggesting Areas
for Revision**

Hi Melissa and [your name]—

I think Melissa's draft is a good start. It covers all the things we did as part of the methodology and clearly points the reader to the next section: the results of our investigation.

There are a couple things I think we could do to beef this up:

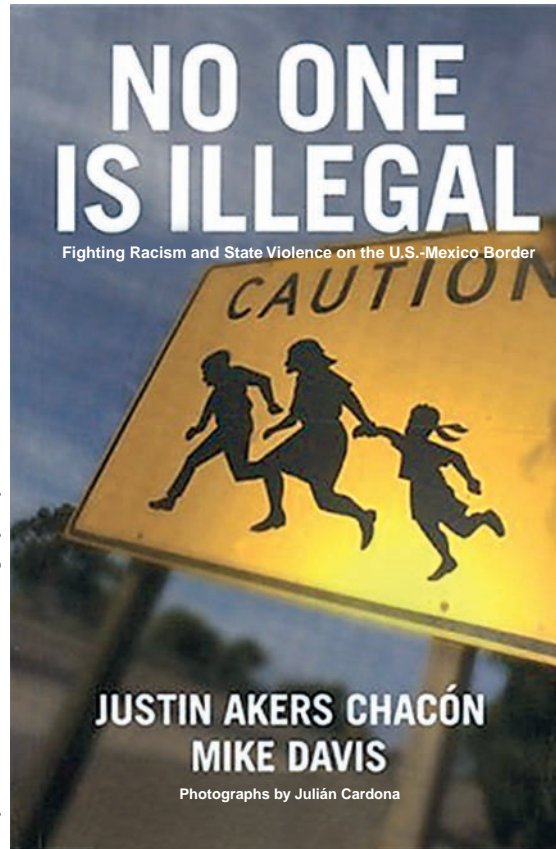
1. I'm a little sketchy about the exact nature of the problem—that is, whether we're talking about weather such as snow and blowing sand or primarily about UV rays. Do you think we should treat the two problems separately (since they cause different kinds of damage), or maybe the differences don't really matter because any decent kind of shelter prevents both problems? Remember what Dr. Willerton said a few weeks ago in class: sometimes you have to write stuff not primarily because the reader needs to read it but because the reader needs to believe that you know what you're talking about.

2. A related note: we've done a lot of research, but I don't see it reflected in this passage. If we could cite the secondary sources, we'll look more professional. We should at least give some of the particulars about the different manufacturers of the shelters and the names and dates of the meetings with manufacturer reps.

Anything anyone else wants to add before Melissa does a second draft?

Paul

Writing Effective Sentences



©Haymarket Books 2006. Cover design by Amy Balkin.

If you write well, you sound like someone worth reading.

Structuring Effective Sentences 228

Use Lists 228

Emphasize New and Important Information 232

Choose an Appropriate Sentence Length 232

Focus on the “Real” Subject 234

Focus on the “Real” Verb 236

Use Parallel Structure 236

Use Modifiers Effectively 237

Choosing the Right Words and Phrases 240

Select an Appropriate Level of Formality 240

Be Clear and Specific 241

Be Concise 246

Use Inoffensive Language 249

Understanding Simplified English for Nonnative Speakers 252**Preparing Text for Translation** 253

The title of the book shown in the photograph refers to the controversy about whether people who enter the United States unlawfully should be considered “illegal immigrants” or “undocumented aliens.” The authors make their perspective clear in the title and the subtitle: *No One Is Illegal: Fighting Racism and State Violence on the U.S.–Mexico Border*. Word choice matters.

Managers in business, industry, and government think that it’s important to choose words carefully and write accurate, clear, concise, and forceful sentences. If a sentence doesn’t say what you intended, misunderstandings can occur, and misunderstandings cost money. More important, the ability to write well—word by word and sentence by sentence—reflects positively on you and your organization. If you write well, you sound like a professional; you sound like someone worth reading. Regardless of your field, you will be judged by how well you can construct sentences.

STRUCTURING EFFECTIVE SENTENCES

Good technical communication consists of clear, correct, and graceful sentences that convey information economically. This section describes seven principles for structuring effective sentences:

- Use lists.
- Emphasize new and important information.
- Choose an appropriate sentence length.
- Focus on the “real” subject.
- Focus on the “real” verb.
- Use parallel structure.
- Use modifiers effectively.

Use Lists

Many sentences in technical communication are long and complicated:

We recommend that more work on heat-exchanger performance be done with a larger variety of different fuels at the same temperature, with similar fuels at different temperatures, and with special fuels such as diesel fuel and shale-oil-derived fuels.

Here readers cannot concentrate fully on the information because they are trying to remember all the “with” phrases following “done.” If they could see how many phrases they have to remember, their job would be easier:

We recommend that more work on heat-exchanger performance be done

- with a larger variety of different fuels at the same temperature
- with similar fuels at different temperatures
- with special fuels such as diesel fuel and shale-oil-derived fuels

In this version, the arrangement of the words on the page reinforces the meaning. The bullets direct readers to the three items in the series, and the fact that each item begins at the same left margin helps, too.

If you don’t have enough space to list the items vertically, or if you are not permitted to do so, number the items within the sentence:

We recommend that more work on heat-exchanger performance be done (1) with a larger variety of different fuels at the same temperature, (2) with similar fuels at different temperatures, and (3) with special fuels such as diesel fuel and shale-oil-derived fuels.

Guidelines

Creating Effective Lists

► **Set off each listed item with a number, a letter, or a symbol (usually a bullet).**

— Use numbered lists to suggest sequence (as in the steps in a set of instructions) or priority (the first item being the most important). Using numbers helps readers see the total number of items in a list. For sublists, use lower-case letters:

1. Item
 - a. subitem
 - b. subitem
2. Item
 - a. subitem
 - b. subitem

— Use bullets to avoid suggesting either sequence or priority, such as for lists of people (everyone except number 1 gets offended). For sublists, use dashes.

- Item
 - subitem
 - subitem

— Use an open (unshaded) box () for checklists.

► **Break up long lists.** Because most people can remember only 5 to 9 items easily, break up lists of 10 or more items.

 **In This Book**

For more about designing checklists, see Ch. 12, p. 336.



Original list

- Tool kit:
- handsaw
 - coping saw
 - hacksaw
 - compass saw
 - adjustable wrench
 - box wrench
 - Stillson wrench
 - socket wrench
 - open-end wrench
 - Allen wrench

Revised list

- Tool kit:
- Saws
 - handsaw
 - coping saw
 - hacksaw
 - compass saw
 - Wrenches
 - adjustable wrench
 - box wrench
 - Stillson wrench
 - socket wrench
 - open-end wrench
 - Allen wrench

 **In This Book**

For more about parallelism, see p. 236.

- **Present the items in a parallel structure.** A list is parallel if all the items take the same grammatical form. For instance, in the parallel list below, each item is a verb phrase.

Nonparallel

- Here is the sequence we plan to follow:
1. writing of the preliminary proposal
 2. do library research
 3. interview with the Bemco vice president
 4. first draft
 5. revision of the first draft
 6. preparing the final draft

Parallel

- Here is the sequence we plan to follow:
1. write the preliminary proposal
 2. do library research
 3. interview the Bemco vice president
 4. write the first draft
 5. revise the first draft
 6. prepare the final draft

- **Structure and punctuate the lead-in correctly.** A lead-in introduces a list. As noted in Chapter 9, every list requires a lead-in; without one, readers are left to guess at how the list relates to the discussion and how the items in the list relate to each other. Although standards vary from organization to organization, the most common lead-in consists of a grammatically complete clause followed by a colon, as shown in the following examples:

Following are the three main assets:

The three main assets are as follows:

The three main assets are the following:

If you cannot use a grammatically complete lead-in, use a dash or no punctuation at all:

The committee found that the employee

- did not cause the accident
- acted properly immediately after the accident
- reported the accident according to procedures

► **Punctuate the list correctly.** Because rules for punctuating lists vary, you should find out whether people in your organization have a preference. If not, punctuate lists as follows:

— If the items are phrases, use a lowercase letter at the start. Do not use a period or a comma at the end. The white space beneath the last item indicates the end of the list.

The new facility will offer three advantages:

- lower leasing costs
- shorter commuting distance
- a larger pool of potential workers

— If the items are complete sentences, use an uppercase letter at the start and a period at the end.

The new facility will offer three advantages:

- The leasing costs will be lower.
- The commuting distance for most employees will be shorter.
- The pool of potential workers will be larger.

— If the items are phrases followed by complete sentences, use an initial uppercase letter and a final period. Begin the complete sentences with uppercase letters and end them with periods. Use italics to emphasize the main idea in each bullet point.

The new facility will offer three advantages:

- *Lower leasing costs.* The lease will cost \$1,800 per month; currently we pay \$2,300.
- *Shorter commuting distance.* Our workers' average commute of 18 minutes would drop to 14 minutes.
- *Larger pool of potential workers.* In the last decade, the population has shifted westward to the area near the new facility. As a result, we would increase our potential workforce in both the semiskilled and managerial categories.

— If the list consists of two kinds of items—phrases and complete sentences—capitalize each item and end it with a period.

The new facility will offer three advantages:

- Lower leasing costs.



- Shorter commuting distance. Our workers' average commute of 18 minutes would drop to 14 minutes.
- Larger pool of potential workers. In the last decade, the population has shifted westward to the area near the new facility. As a result, we would increase our potential workforce in both the semiskilled and managerial categories.

In most lists, the second and subsequent lines, called *turnovers*, align under the first letter of the first line, highlighting the bullet or number to the left of the text. This *hanging indentation* helps the reader see and understand the organization of the passage.

Emphasize New and Important Information

Sentences are often easier to understand and more emphatic if new information appears at the end. For instance, if your company has labor problems and you want to describe the possible results, structure the sentence like this:

Because of labor problems, we anticipate a three-week delay.

In this case, the "three-week delay" is the new information.

If your readers already expect a three-week delay but don't know the reason for it, reverse the structure:

We anticipate the three-week delay in production because of labor problems.

Here, "labor problems" is the new and important information.

Try not to end the sentence with qualifying information that blunts the impact of the new information.

WEAK The joint could fail under special circumstances.

IMPROVED Under special circumstances, the joint could fail.

Put orienters to time and space at the beginning of the sentence, where they can provide context for the idea that the main sentence expresses.

Since the last quarter of 2011, we have experienced an 8 percent turnover rate in personnel assigned to the project.

On the north side of the building, water from the leaking pipes has damaged the exterior siding and the sheetrock on some interior walls.

Choose an Appropriate Sentence Length

Sometimes sentence length affects the quality of the writing. In general, an average of 15 to 20 words is effective for most technical communication. A series of 10-word sentences would be choppy. A series of 35-word sentences

TECH TIP

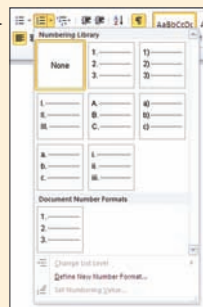
How to Create Numbered and Bulleted Lists

To structure and emphasize information in your document, you can format text in a numbered or bulleted list. You can create a list by selecting either the **Numbering** or **Bullets** button in the **Paragraph** group or by applying a list style using the **Styles** group.

Highlight the text you wish to include in a list and then select either the **Numbering** or **Bullets** button in the **Paragraph** group.

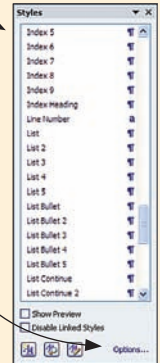


You can modify, format, and customize your list by using the drop-down menu on the **Numbering** or **Bullets** button.



If you wish to apply the same list style consistently throughout your document and make it easy to modify the style, you can apply a list style to highlighted text by selecting the **Styles** dialog box launcher and then selecting the list style you wish to use.

If you want more list styles to choose from, select **Options** to display the **Style Pane Options** dialog box.



KEYWORDS: lists, bullets, numbering

would probably be too demanding. And a succession of sentences of approximately the same length would be monotonous.

In revising a draft, use your software to compute the average sentence length of a representative passage.

Avoid Overly Long Sentences How long is too long? There is no simple answer, because ease of reading depends on the vocabulary, sentence structure, and sentence length; the reader's motivation and knowledge of the topic; the purpose of the communication; and the conventions of the application you are using. For instance, you use shorter sentences in tweets and text messages than in reports.

Often a draft will include sentences such as the following:

The construction of the new facility is scheduled to begin in March, but it might be delayed by one or even two months by winter weather conditions, which can make it impossible or nearly impossible to begin excavating the foundation.

On TechComm Web

For more about varying sentence length, search for "sentence variety" in Guide to Grammar & Writing. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

To avoid creating such long sentences, say one thing clearly and simply before moving on to the next idea. For instance, to make this difficult 40-word sentence easier to read, divide it into two sentences:

The construction of the new facility is scheduled to begin in March. However, construction might be delayed until April or even May by winter weather conditions, which can make it impossible or nearly impossible to begin excavating the foundation.

Sometimes an overly long sentence can be fixed by creating a list (see the Guidelines box on page 229).

Avoid Overly Short Sentences Just as sentences can be too long, they can also be too short and choppy, as in the following example:

Customarily, environmental cleanups are conducted on a “time-and-materials” (T&M) basis. Using the T&M basis, the contractor performs the work. Then the contractor bills for the hours worked and the cost of equipment and materials used during the work. With the T&M approach, spending for environmental cleanups by private and government entities has been difficult to contain. Also, actual contamination reduction has been slow.

The problem here is that some of the sentences are choppy and contain too little information, calling readers’ attention to how the sentences are constructed rather than to what the sentences say. In cases like this, the best way to revise is to combine sentences:

Customarily, environmental cleanups are conducted on a “time-and-materials” (T&M) basis: the contractor performs the work, then bills for the hours worked and the cost of equipment and materials. With the T&M approach, spending for environmental cleanups by private and government entities has been difficult to contain, and contamination reduction has been slow.

Another problem with excessively short sentences is that they needlessly repeat key terms. Again, consider combining sentences:

SLUGGISH I have experience working with various *microprocessor-based systems*. Some of these *microprocessor-based systems* include the T90, RCA 9600, and AIM 7600.

BETTER I have experience working with various microprocessor-based systems, including the T90, RCA 9600, and AIM 7600.

On TechComm Web

For more about using “real” subjects, see the e-handout on revising prose from the Center for Communication Practices at Rensselaer Polytechnic Institute. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

Focus on the “Real” Subject

The conceptual or “real” subject of the sentence should also be the grammatical subject. Don’t disguise or bury the real subject in a prepositional phrase following a weak grammatical subject. In the following examples, the weak subjects obscure the real subjects. (The grammatical subjects are italicized.)

WEAK	The <i>use</i> of this method would eliminate the problem of motor damage.
STRONG	This <i>method</i> would eliminate the problem of motor damage.
WEAK	The <i>presence</i> of a six-membered lactone ring was detected.
STRONG	A six-membered lactone <i>ring</i> was detected.

In revising a draft, look for the real subject (the topic) and ask yourself whether the sentence would be more effective if the real subject was also the grammatical subject. Sometimes all that is necessary is to ask yourself this question: *What is the topic of this sentence?* The author of the first example above wasn't trying to say something about *using* a method; she was trying to say something about the method itself. Likewise, in the second example, it wasn't the *presence* of a lactone ring that was detected; rather, the lactone ring itself was detected.

Another way to make the subject of the sentence prominent is to reduce the number of grammatical expletives. *Expletives* are words that serve a grammatical function in a sentence but have no meaning. The most common expletives are *it is*, *there is*, *there are*, and related phrases.

WEAK	There is no alternative for us except to withdraw the product.
STRONG	We have no alternative except to withdraw the product.
WEAK	It is hoped that testing the evaluation copies of the software will help us make this decision.
STRONG	We hope that testing the evaluation copies of the software will help us make this decision.

This second example uses the expletive *it is* with the passive voice. The problem is that the sentence does not make clear who is doing the hoping.

Expletives are not errors. Rather, they are conversational expressions that can clarify meaning by emphasizing the information that follows them.

WITH THE EXPLETIVE	It is hard to say whether the recession will last more than a few months.
WITHOUT THE EXPLETIVE	Whether the recession will last more than a few months is hard to say.

The second version is harder to understand because the reader has to remember a long subject ("Whether the recession will last more than a few months") before getting to the verb ("is"). Fortunately, you can revise the sentence in other ways to make it easier to understand and to eliminate the expletive.

- I don't know whether the recession will last more than a few months.
- Nobody knows whether the recession will last more than a few months.

In This Book

For more about using the passive voice, see p. 241.

Use the search function of your word processor to locate both weak subjects (usually they precede the word *of*) and expletives (search for *it is*, *there is*, and *there are*).

Focus on the “Real” Verb

A “real” verb, like a “real” subject, should stand out in every sentence. A common problem in technical communication is the inappropriate use of a *nominalized* verb—a verb that has been changed into a noun, then coupled with a weaker verb. *To install* becomes *to effect an installation*; *to analyze* becomes *to conduct an analysis*. Notice how nominalizing the verbs makes the following sentences both awkward and unnecessarily long (the nominalized verbs are italicized).

WEAK Each *preparation* of the solution is done twice.

STRONG Each solution is prepared twice.

WEAK *Consideration* should be given to an acquisition of the properties.

STRONG We should consider acquiring the properties.

Like expletives, nominalizations are not errors. In fact, many common nouns are nominalizations: *maintenance*, *requirement*, and *analysis*, for example. In addition, nominalizations often effectively summarize an idea from a previous sentence (in italics below).

Congress recently passed a bill that restricts how High-Definition Television (HDTV) can be marketed to consumers. The new *legislation* could delay our *entry* into the HDTV market. This *delay* could cost us millions.

Some software programs search for common nominalizations. With any word processor, however, you can identify most of them by searching for character strings such as *tion*, *ment*, *sis*, *ence*, *ing*, and *ance*, as well as the word *of*.

Use Parallel Structure

A sentence is parallel if its coordinate elements follow the same grammatical form: for example, all the clauses are either passive or active, all the verbs are either infinitives or participles, and so on. Parallel structure creates a recognizable pattern, making a sentence easier for the reader to follow. Non-parallel structure creates no such pattern, distracting and possibly confusing readers. For example, the verbs in the following examples are nonparallel because they do not use the same verb form (verbs are italicized).

NONPARALLEL Our present system *is costing* us profits and *reduces* our productivity.

PARALLEL Our present system *is costing* us profits and *reducing* our productivity.

- NONPARALLEL** The compositor *should follow* the printed directions; *do not change* the originator's work.
- PARALLEL** The compositor *should follow* the printed directions and *should not change* the originator's work.

When using parallel constructions, make sure that parallel items in a series do not overlap, causing confusion or even changing the meaning of the sentence:

- CONFUSING** The speakers will include partners of law firms, businesspeople, and civic leaders.
“Partners of” appears to apply to “businesspeople” and “civic leaders,” as well as to “law firms.” That is, “partners of” carries over to the other items in the series. The following revision solves the problem by rearranging the items so that “partners” can apply only to “law firms.”
- CLEAR** The speakers will include businesspeople, civic leaders, and partners of law firms.
- CONFUSING** We need to buy more lumber, hardware, tools, and hire the subcontractors.
The writer has linked two ideas inappropriately. The first idea is that we need to buy three things: lumber, hardware, and tools. The second is that we need to hire the subcontractors. Hiring is not in the same category as the items to buy. In other words, the writer has structured and punctuated the sentence as if it contains a four-item series, when in fact it should contain a three-item series followed by a second verb phrase.
- CLEAR** We need to buy more lumber, hardware, and tools, and we need to hire the subcontractors.

Use Modifiers Effectively

Modifiers are words, phrases, and clauses that describe other elements in the sentence. To make your meaning clear, you must indicate whether a modifier provides necessary information about the word or phrase it refers to (its referent) or whether it simply provides additional information. You must also clearly identify the referent—the element in the sentence that the modifier is describing or otherwise referring to.

Distinguish Between Restrictive and Nonrestrictive Modifiers As the term implies, a *restrictive modifier* restricts the meaning of its referent; it provides information that the reader needs to identify the referent and is, therefore,

crucial to understanding the sentence. Notice that restrictive modifiers—italicized in the following examples—are not set off by commas:

The airplanes *used in the exhibitions* are slightly modified.

The modifying phrase “used in the exhibitions” identifies which airplanes the writer is referring to. Presumably, there are at least two groups of airplanes: those that are used in the exhibitions and those that are not. The restrictive modifier tells readers which of the two is being discussed.

Please disregard the notice *you recently received from us*.

The modifying phrase “you recently received from us” identifies which notice. Without it, the sentence could be referring to one of any number of notices.

In most cases, the restrictive modifier doesn't require a relative pronoun, such as *that*, but you can choose to use the pronoun *that* (or *who*, for people):

Please disregard the notice *that* you recently received from us.

A *nonrestrictive modifier* does not restrict the meaning of its referent: the reader does not need the information to identify what the modifier is describing or referring to. If you omit the nonrestrictive modifier, the basic sentence retains its primary meaning.

The Hubble telescope, *intended to answer fundamental questions about the origin of the universe*, was last repaired in 2002.

Here, the basic sentence is “The Hubble telescope was last repaired in 2002.” Removing the modifier doesn't change the meaning of the basic sentence.

If you use a relative pronoun with a nonrestrictive modifier, choose *which* (or *who* or *whom* for a person).

Go to the Registration Area, *which is located on the second floor*.

Use commas to separate a nonrestrictive modifier from the rest of the sentence. In the first example, a pair of commas separates the nonrestrictive modifier from the rest of the sentence. In that respect, the commas function much like parentheses, indicating that the modifying information is parenthetical. In the second example, the comma indicates that the modifying information is tacked on at the end of the sentence as additional information.

Avoid Misplaced Modifiers The placement of the modifier often determines the meaning of the sentence, as the placement of *only* illustrates in the following sentences:

Only Turner received a cost-of-living increase last year.

Meaning: Nobody else received one.

Turner received *only* a cost-of-living increase last year.

Meaning: He didn't receive a merit increase.

Turner received a cost-of-living increase *only* last year.

Meaning: He received a cost-of-living increase as recently as last year.

Turner received a cost-of-living increase last year *only*.

Meaning: He received a cost-of-living increase in no other year.

Misplaced modifiers—those that appear to modify the wrong referent—are a common problem. Usually, the best solution is to place the modifier as close as possible to its intended referent.

MISPLACED The subject of the meeting is the future of geothermal energy *in the downtown Webster Hotel*.

CORRECT The subject of the meeting *in the downtown Webster Hotel* is the future of geothermal energy.

A *squinting modifier* falls ambiguously between two possible referents, so the reader cannot tell which one is being modified:

UNCLEAR We decided *immediately* to purchase the new system.
Did we decide *immediately*, or did we decide to make the purchase *immediately*?

CLEAR We *immediately* decided to purchase the new system.

CLEAR We decided to purchase the new system *immediately*.

A subtle form of misplaced modification can also occur with *correlative constructions*, such as *either . . . or*, *neither . . . nor*, and *not only . . . but also*:

MISPLACED The new refrigerant *not only decreases* energy costs *but also* spoilage losses.

Here, the writer is implying that the refrigerant does at least two things to energy costs: it decreases them and then does something else to them. Unfortunately, that's not how the sentence unfolds. The second thing the refrigerant does to energy costs never appears.

CORRECT The new refrigerant *decreases not only* energy costs *but also* spoilage losses.

In the revised sentence, the phrase “decreases not only” implies that at least two things will be decreased, and as the sentence develops that turns out to be the case. “Decreases” applies to both “energy costs” and “spoilage losses.” Therefore, the first half of the correlative construction (“not only”) follows the verb (“decreases”). Note that if the sentence contains two different verbs, each half of the correlative construction precedes a verb:

The new refrigerant *not only decreases* energy costs *but also reduces* spoilage losses.

Avoid Dangling Modifiers A *dangling modifier* has no referent in the sentence and can therefore be unclear:

DANGLING Trying to solve the problem, the instructions seemed unclear.

This sentence says that the instructions are trying to solve the problem. To correct the sentence, rewrite it, adding the clarifying information either within the modifier or next to it:

CORRECT As I was trying to solve the problem, the instructions seemed unclear.

CORRECT Trying to solve the problem, I thought the instructions seemed unclear.

Sometimes you can correct a dangling modifier by switching from the *indicative mood* (a statement of fact) to the *imperative mood* (a request or command):

DANGLING To initiate the procedure, the BEGIN button should be pushed. (*indicative mood*)

CORRECT To initiate the procedure, push the BEGIN button. (*imperative mood*)

CHOOSING THE RIGHT WORDS AND PHRASES

This section discusses four principles that will help you use the right words and phrases in the right places: select an appropriate level of formality, be clear and specific, be concise, and use inoffensive language.

Select an Appropriate Level of Formality

Although no standard definition of levels of formality exists, most experts would agree that there are three levels:

INFORMAL The Acorn 560 is a real screamer. With 3.8 GHz of pure computing power, it slashes through even the thickest spreadsheets before you can say $2 + 2 = 4$.

MODERATELY
FORMAL With its 3.8 GHz microprocessor, the Acorn 560 can handle even the most complicated spreadsheets quickly.

HIGHLY FORMAL With a 3.8 GHz microprocessor, the Acorn 560 is a high-speed personal computer appropriate for computation-intensive applications such as large, complex spreadsheets.

Technical communication usually requires a moderately formal or highly formal style.

To achieve the appropriate level and tone, think about your audience, your subject, and your purpose:

- **Audience.** You would probably write more formally to a group of retired executives than to a group of college students. You would likewise write more formally to the company vice president than to your co-workers,

In This Book

For more about writing to a multicultural audience, see Ch. 5, p. 101.

and you would probably write more formally to people from most other cultures than to people from your own.

- *Subject.* You would write more formally about a serious subject—safety regulations or important projects—than about plans for an office party.
- *Purpose.* You would write more formally in a report to shareholders than in a company newsletter.

In general, it is better to err on the side of formality. Avoid an informal style in any writing you do at the office, for two reasons:

- *Informal writing tends to be imprecise.* In the example “The Acorn 560 is a real screamer,” what exactly is a *screamer*?
- *Informal writing can be embarrassing.* If your boss spots your e-mail to a colleague, you might wish it didn’t begin, “Sup, dawg?”

Be Clear and Specific

Follow these seven guidelines to make your writing clear and specific:

- Use active and passive voice appropriately.
- Be specific.
- Avoid unnecessary jargon.
- Use positive constructions.
- Avoid long noun strings.
- Avoid clichés.
- Avoid euphemisms.

Use Active and Passive Voice Appropriately In a sentence using the active voice, the subject performs the action expressed by the verb: the “doer” of the action is the grammatical subject. By contrast, in a sentence using the passive voice, the recipient of the action is the grammatical subject. Compare the following examples (the subjects are italicized):

ACTIVE *Dave Brushaw* drove the launch vehicle.
 The doer of the action is the subject of the sentence.

PASSIVE The launch *vehicle* was driven by Dave Brushaw.
 The recipient of the action is the subject of the sentence.

In most cases, the active voice works better than the passive voice because it emphasizes the *agent* (the doer of the action). An active-voice sentence also is shorter because it does not require a form of the verb *to be* and the past participle, as a passive-voice sentence does. In the active version of the example sentence, the verb is “drove” rather than “was driven,” and the word “by” does not appear.

On TechComm Web

For more on choosing an appropriate voice, see “The Passive Engineer” by Helen Moody. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

The passive voice, however, is generally better in these four cases:

- When the agent is clear from the context:

Students are required to take both writing courses.
Here, the context makes it clear that the college sets the requirements.
- When the agent is unknown:

The comet was first referred to in an ancient Egyptian text.
We don't know who wrote this text.
- When the agent is less important than the action:

The blueprints were hand-delivered this morning.
It doesn't matter who the messenger was.
- When a reference to the agent is embarrassing, dangerous, or in some other way inappropriate:

Incorrect figures were recorded for the flow rate.
It might be unwise or tactless to specify who recorded the incorrect figures. Perhaps it was your boss. However, it is unethical to use the passive voice to avoid responsibility for an action.

The passive voice can also help you maintain the focus of your paragraph.

Cloud computing offers three major advantages. First, the need for server space is reduced. Second, security updates are installed automatically . . .

Some people believe that the active voice is inappropriate in technical communication because it emphasizes the person who does the work rather than the work itself, making the writing less objective. In many cases, this objection is valid. Why write “I analyzed the sample for traces of iodine” if there is no ambiguity about who did the analysis or no need to identify who did it? The passive focuses on the action, not the actor: “The samples were analyzed for traces of iodine.” But if in doubt, use the active voice.

Other people argue that the passive voice produces a double ambiguity. In the sentence “The samples were analyzed for traces of iodine,” the reader is not quite sure who did the analysis (the writer or someone else) or when it was done (during the project or some time previously). Identifying the actor can often clarify both ambiguities.

The best approach is to recognize that the two voices differ and to use each one where it is most effective.

Many grammar-checkers can help you locate the passive voice. Some of them will advise you that the passive is undesirable, almost an error, but this advice is misleading. Use the passive voice when it works better than the active voice for your purposes.

In This Book

For more about ethics, see Ch. 2.

In This Book

For more about the use of the passive voice in lab reports, see Ch. 18, p. 496.

Any word processor allows you to search for the forms of *to be* used most commonly in passive-voice expressions: *is*, *are*, *was*, and *were*. You can also search for *ed* to isolate past participles (for example, *purchased*, *implemented*, and *delivered*); such past participles appear in most passive-voice constructions.

Be Specific Being specific involves using precise words, providing adequate detail, and avoiding ambiguity.

- *Use precise words.* A Ford Focus is an automobile, but it is also a vehicle, a machine, and a thing. In describing the Focus, *automobile* is better than the less-specific *vehicle*, because *vehicle* can also refer to pickup trucks, trains, hot-air balloons, and other means of transport. As words become more abstract—from *machine* to *thing*, for instance—chances for misunderstanding increase.
- *Provide adequate detail.* Readers probably know less about your subject than you do. What might be perfectly clear to you might be too vague for them.

VAGUE An engine on the plane experienced some difficulties.
Which engine? What plane? What kinds of difficulties?

CLEAR The left engine on the Cessna 310 temporarily lost power during flight.

- *Avoid ambiguity.* Don't let readers wonder which of two meanings you are trying to convey.

AMBIGUOUS After stirring by hand for 10 seconds, add three drops of the iodine mixture to the solution.
After stirring the iodine mixture or the solution?

CLEAR Stir the iodine mixture by hand for 10 seconds. Then add three drops to the solution.

CLEAR Stir the solution by hand for 10 seconds. Then add three drops of the iodine mixture.

If you don't have the specific data, you should approximate—and clearly tell readers you are doing so—or explain why the specific data are unavailable and indicate when they will be available:

The fuel leakage is much greater than we had anticipated; we estimate it to be at least five gallons per minute, not two.

The fuel leakage is much greater than we had anticipated; we expect to have specific data by 4 P.M. today.

Avoid Unnecessary Jargon Jargon is shoptalk. To an audiophile, *LP* is a long-playing record; to an engineer, it is liquid propane; to a physician, it is a lumbar puncture; to a drummer, it is Latin Percussion, a drum maker.

Jargon is often ridiculed; many dictionaries define it as “writing that one does not understand” or “nonsensical, incoherent, or meaningless talk.” However, jargon is useful in its proper sphere. For one thing, jargon enables members of a particular profession to communicate clearly and economically with one another.

That said, using unnecessary jargon is inadvisable for four reasons:

- *It can be imprecise.* If you ask a co-worker to review a document and provide *feedback*, are you asking for a facial expression, body language, a phone call, or a written evaluation?
- *It can be confusing.* If you ask a computer novice to *cold swap the drive*, he or she might have no idea what you’re talking about.
- *It is often seen as condescending.* Many readers will react as if you are showing off—displaying a level of expertise that excludes them. If readers feel alienated, they will likely miss your message.
- *It is often intimidating.* People might feel inadequate or stupid because they do not know what you are talking about. Obviously, this reaction undermines communication.

If you are addressing a technically knowledgeable audience, use jargon recognized in that field. However, keep in mind that technical documents often have many audiences in addition to the primary audience. When in doubt, avoid jargon; use more-common expressions or simpler terms.

On TechComm Web

For advice on positive constructions, see the Security and Exchange Commission’s *A Plain English Handbook*. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

Use Positive Constructions The term *positive construction* has nothing to do with being cheerful. It indicates that the writer is describing what something is instead of what it is not. In the sentence “I was sad to see this project completed,” “sad” is a positive construction. The negative construction would be “not happy.”

Here are a few more examples of positive and negative constructions:

Positive Construction	Negative Construction
most	not all
few	not many
on time	not late, not delayed
positive	not negative
inefficient	not efficient
reject	cannot accept
impossible	not possible

Readers understand positive constructions more quickly and more easily than negative constructions. Consider the following examples:

DIFFICULT	Because the team did not have sufficient time to complete the project, it was unable to produce a satisfactory report.
-----------	--

SIMPLER Because the team had too little time to complete the project, it produced an unsatisfactory report.

Avoid Long Noun Strings A noun string contains a series of nouns (or nouns, adjectives, and adverbs), all of which modify the last noun. For example, in the phrase *parking-garage regulations*, the first two words modify *regulations*. Noun strings save time, and if your readers understand them, they are fine. It is easier to write *passive-restraint system* than *a system that uses passive restraints*.

Hyphens can clarify noun strings by linking words that go together. For example, in the phrase *flat-panel monitor*, the hyphen links *flat* and *panel*. Together they modify *monitor*. In other words, it is not a *flat panel*, or a *panel monitor*, but a *flat-panel monitor*. However, noun strings are sometimes so long or so complex that hyphens can't ensure clarity. To clarify a long noun string, untangle the phrases and restore prepositions, as in the following example:

UNCLEAR preregistration procedures instruction sheet update

CLEAR an update of the instruction sheet for preregistration procedures

Noun strings can sometimes be ambiguous—they can have two or more plausible meanings, leaving readers to guess at which meaning you're trying to convey.

AMBIGUOUS The building contains a special incoming materials storage area.
What's special? Are the incoming materials special? Or is the area they're stored in special?

UNAMBIGUOUS The building contains a special area for storing incoming materials.

UNAMBIGUOUS The building contains an area for storing special incoming materials.

An additional danger is that noun strings can sometimes sound pompous. If you are writing about a simple smoke detector, there is no reason to call it a *smoke-detection device* or, worse, a *smoke-detection system*.

Avoid Clichés Good writing is original and fresh. Rather than use a cliché, say what you want to say in plain English. Current clichés include *pushing the envelope*; *synergy*; *mission critical*; *paradigm shift*; and *been there, done that*. The best advice is to avoid clichés: if you are used to hearing or reading a phrase, don't use it. Don't think outside the box, bring your "A" game, be a change agent, raise the bar, throw anyone under a bus, be proactive, put lipstick on a pig, or give 110 percent. And you can assume that everyone already knows that it is what it is.

Avoid Euphemisms A euphemism is a polite way of saying something that makes people uncomfortable. For instance, a near miss between two airplanes is officially an "air proximity incident." The more uncomfortable the

 **In This Book**

For more about hyphens, see Appendix, Part C, p. 733.

subject, the more often people resort to euphemisms. Dozens of euphemisms deal with drinking, bathrooms, sex, and death. Here are several euphemisms for firing someone:

personnel-surplus reduction	dehiring
workforce-imbalance correction	decruting
rightsizing	redundancy elimination
indefinite idling	career-change-opportunity creation
downsizing	permanent furloughing
administrative streamlining	personnel realignment
synergy-related headcount	
restructuring	

ETHICS NOTE

Euphemisms and Truth Telling

There is nothing wrong with using the euphemism *restroom*, even though few people visit one to rest. The British use the phrase *go to the toilet* in polite company, and nobody seems to mind. In this case, if you want to use a euphemism, no harm done.

But it is unethical to use a euphemism to gloss over an issue that has important implications for people or the environment. People get uncomfortable when discussing layoffs—and they should. It’s an uncomfortable issue. But calling a layoff a *redundancy elimination initiative* ought to make you even more uncomfortable. Don’t use language to cloud reality. It’s an ethical issue.

Be Concise

The following five principles promote concise technical communication:

- Avoid obvious statements.
- Avoid filler.
- Avoid unnecessary prepositional phrases.
- Avoid wordy phrases.
- Avoid fancy words.

Avoid Obvious Statements Writing can become sluggish if it overexplains. The italicized words in the following example are sluggish:

SLUGGISH	The market for <i>the sale of</i> flash memory chips is dominated by <i>two chip manufacturers</i> : Intel and Advanced Micro Systems. These two <i>chip manufacturers</i> are responsible for 76 percent of the \$1.3 billion market <i>in flash memory chips</i> last year.
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IMPROVED The market for flash memory chips is dominated by Intel and Advanced Micro Systems, two companies that claimed 76 percent of the \$1.3 billion industry last year.

Avoid Filler In our writing, we sometimes use filler, much of which is more suited to speech. Consider the following examples:

basically	kind of
certain	rather
essentially	sort of

Such words are common in oral communication, when you have to think fast, but they are meaningless in writing.

BLOATED *I think that, basically, the board felt sort of betrayed, in a sense, by the kind of behavior the president displayed.*

BETTER The board felt betrayed by the president's behavior.

But modifiers are not always meaningless. For instance, it might be wise to use *I think* or *it seems to me* to show that you are aware of other views.

BLUNT Next year we will face unprecedented challenges to our market dominance.

LESS BLUNT In my view, next year we will face unprecedented challenges to our market dominance.

Of course, a sentence that sounds blunt to one reader can sound self-confident to another. As you write, keep your audience's preferences and expectations in mind.

Other fillers include redundant expressions, such as *collaborate together*, *past history*, *end result*, *any and all*, *still remain*, *completely eliminate*, and *very unique*. Say it once.

REDUNDANT This project would not have succeeded if not for the *hard work and considerable effort of each and every one* of the auditors assigned to the project.

BETTER This project would not have succeeded if not for the *hard work of every one* of the auditors assigned to the project.

Avoid Unnecessary Prepositional Phrases A prepositional phrase consists of a preposition followed by a noun or a noun equivalent, such as *in the summary*, *on the engine*, and *under the heading*. Unnecessary prepositional phrases, often used along with abstract nouns and nominalizations, can make your writing long and boring.

LONG	The increase <i>in</i> the number <i>of</i> students enrolled <i>in</i> the materials-engineering program <i>at</i> Lehigh University is suggestive <i>of</i> the regard <i>in</i> which that program is held <i>by</i> the university's new students.
SHORTER	The increased enrollment in Lehigh University's materials-engineering program suggests that the university's new students consider it a good program.

Avoid Wordy Phrases Wordy phrases also make writing long and boring. For example, some people write *on a daily basis* rather than *daily*. The long phrase may sound more important, but *daily* says the same thing more concisely.

Table 10.1 lists common wordy phrases and their more concise equivalents.

TABLE 10.1 ► Wordy Phrases and Their Concise Equivalents

Wordy phrase	Concise phrase	Wordy phrase	Concise phrase
a majority of	most	in the event that	if
a number of	some, many	in view of the fact that	because
at an early date	soon	it is often the case that	often
at the conclusion of	after, following	it is our opinion that	we think that
at the present time	now	it is our recommendation that	we recommend that
at this point in time	now	it is our understanding that	we understand that
based on the fact that	because	make reference to	refer to
check out	check	of the opinion that	think that
despite the fact that	although	on a daily basis	daily
due to the fact that	because	on the grounds that	because
during the course of	during	prior to	before
during the time that	during, while	relative to	regarding, about
have the capability to	can	so as to	to
in connection with	about, concerning	subsequent to	after
in order to	to	take into consideration	consider
in regard to	regarding, about	until such time as	until

TABLE 10.2 ▶ Fancy Words and Their Plain Equivalents

Fancy word	Plain word	Fancy word	Plain word
advise	tell	herein	here
ascertain	learn, find out	impact (verb)	affect
attempt (verb)	try	initiate	begin
commence	start, begin	manifest (verb)	show
demonstrate	show	parameters	variables, conditions
due to	because of	perform	do
employ (verb)	use	prioritize	rank
endeavor (verb)	try	procure	get, buy
eventuate	happen	quantify	measure
evidence (verb)	show	terminate	end, stop
finalize	end, settle, agree, finish	utilize	use
furnish	provide, give		

Compare the following wordy sentence and its concise translation:

WORDY I am of the opinion that, in regard to profit achievement, the statistics pertaining to this month will appear to indicate an upward tendency.

CONCISE I think this month's statistics will show an increase in profits.

Avoid Fancy Words Writers sometimes think they will impress their readers by using fancy words—*utilize* for *use*, *initiate* for *begin*, *perform* for *do*, *due to* for *because*, and *prioritize* for *rank*. In technical communication, plain talk is best. Compare the following fancy sentence with its plain-English version:

FANCY The purchase of a database program will enhance our record-maintenance capabilities.

PLAIN Buying a database program will help us maintain our records.

Table 10.2 lists commonly used fancy words and their plain equivalents.

Use Inoffensive Language

Writing to avoid offense is not merely a matter of politeness; it is a matter of perception. Language reflects attitudes, but it also helps to form attitudes. Writing inoffensively is one way to break down such stereotypes.

INTERACTIVE SAMPLE DOCUMENT

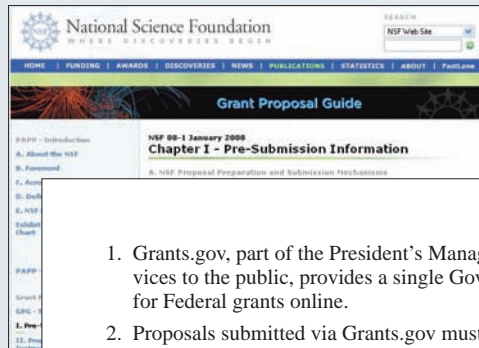
Revising for Conciseness and Simplicity

The following passage is from a request for proposals published by the National Science Foundation. (Sentence numbers have been added here.) The questions in the margin ask you to think about word choice (as discussed on pages 246–49).

1. This passage contains many prepositional phrases. Identify two of them. For each one, is its use justified, or would the sentence be easier to understand if the sentence were revised to eliminate it?
2. Part of this passage is written in the passive voice. Select one sentence in the passive voice that would be clearer in the active voice, and rewrite it in the active voice.
3. This passage contains a number of examples of fancy words. Identify two of them. How can they be translated into plain English?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 10 on <bedfordsmartins.com/techcomm>.



1. Grants.gov, part of the President's Management Agenda to improve government services to the public, provides a single Government-wide portal for finding and applying for Federal grants online.
2. Proposals submitted via Grants.gov must be prepared and submitted in accordance with the *NSF Grants.gov Application Guide*, available through Grants.gov as well as on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf>.
3. The Grants.gov Application Guide contains important information on:
 - general instructions for submission via Grants.gov, including the Grants.gov registration process and Grants.gov software requirements;
 - NSF-specific instructions for submission via Grants.gov, including creation of PDF files;
 - grant application package instructions;
 - required SF 424 (R&R) forms and instructions; and
 - NSF-specific forms and instructions.
4. Upon successful insertion of the Grants.gov submitted proposal in the NSF FastLane system, no further interaction with Grants.gov is required.
5. All further interaction is conducted via the NSF FastLane system.

Source: National Science Foundation, 2008 <www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_1.jsp#IA1>.

Use Nonsexist Language Sexist language suggests that some kinds of work are appropriate for women and some kinds for men. Policy manuals that consistently use *she* to refer to administrative assistants suggest that most or all administrative assistants are female. Manuals that use *he* to refer to engineers suggest that most or all engineers are male. In this way, sexist language stereotypes people. In almost all cases of sexist language, women are assigned to duties and jobs that are less prestigious and lower paid than those to which men are assigned.

On TechComm Web

For more about sexist language, see the e-handout from the Center for Communication Practices. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

Guidelines

Avoiding Sexist Language

Follow these six suggestions for writing gender-neutral text.

- ▶ **Replace the male-gender words with non-gender-specific words.** *Chairman*, for instance, can become *chairperson* or *chair*. *Firemen* are *firefighters*; *police-men* are *police officers*.

- ▶ **Switch to a different form of the verb.**

SEXIST The operator must pass rigorous tests before he is promoted.

NONSEXIST The operator must pass rigorous tests before being promoted.

- ▶ **Switch to the plural.**

NONSEXIST Operators must pass rigorous tests before they are promoted.

Some organizations accept the use of plural pronouns with singular nouns, particularly in memos and other informal documents:

If an employee wishes to apply for tuition reimbursement, they should consult Section 14.5 of the Employee Manual.

Careful writers and editors, however, resist this construction because it is grammatically incorrect (it switches from singular to plural). In addition, switching to the plural can make the sentence unclear:

UNCLEAR Operators are responsible for their operating manuals.

Does each operator have one operating manual or more than one?

CLEAR Each operator is responsible for his or her operating manual.

- ▶ **Switch to *he* or *she*, *he/she*, *s/he*, or *his* or *her*.** *He* or *she*, *his* or *her*, and related constructions are awkward, especially if overused, but at least they are clear and inoffensive.
- ▶ **Address the reader directly.** Use *you* and *your*, or the understood *you* (as in “[You] Enter the serial number in the first text box”).
- ▶ **Alternate *he* and *she*.** Language scholar Joseph Williams (2007) and many other language authorities recommend alternating *he* and *she* from one paragraph or section to the next.

In This Book

For books about nonsexist writing, see the Selected Bibliography, p. 765.

You can use your word processor to search for *he*, *man*, and *men*, the words and parts of words most often associated with sexist writing. Some grammar-checkers identify common sexist terms and suggest alternatives. But use what you know about the world. You don't want to produce a sentence like this one from a benefits manual: "Every employee is responsible for the cost of his or her gynecological examination."

Use Inoffensive Language When Referring to People with Disabilities One in six Americans—some 50 million people—has a physical, sensory, emotional, or mental impairment that interferes with daily life (U.S. Department of Labor, 2010). In writing about people with disabilities, use the "people-first" approach: treat the person as someone with a disability, not as someone defined by that disability. The disability is a condition the person has, not what the person is.

Guidelines

Using the People-First Approach

When writing about people with disabilities, follow these five guidelines, which are based on Snow (2009).

- ▶ **Refer to the person first, the disability second.** Write "people with mental retardation," not "the mentally retarded."
- ▶ **Don't confuse *handicap* with *disability*.** *Disability* refers to the impairment or condition; *handicap* refers to the interaction between the person and his or her environment. A person can have a disability without being handicapped.
- ▶ **Don't refer to victimization.** Write "a person with AIDS," not "an AIDS victim" or "an AIDS sufferer."
- ▶ **Don't refer to a person as "wheelchair bound" or "confined to a wheelchair."** People who use wheelchairs to get around are not confined.
- ▶ **Don't refer to people with disabilities as abnormal.** They are atypical, not abnormal.

UNDERSTANDING SIMPLIFIED ENGLISH FOR NONNATIVE SPEAKERS

Because English is the language of more than half of the world's scientific and technical communication, millions of nonnative speakers of English read technical communication in English. To address the information needs of such readers, many companies and professional associations have created versions of Simplified English. Each version consists of a basic set of grammar rules and a vocabulary of about 1,000 words, each of which has only one meaning; for example, *right* is the opposite of *left*; it does not mean "correct."

On TechComm Web

For more about Simplified English, see Userlab's manual on Simplified English. Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

Each version of Simplified English is made for a specific discipline. For example, ASD Simplified English is intended for aerospace workers.

Here is a sample of text and its Simplified English version.

ORIGINAL VERSION	Before filling the gas tank, it is necessary to turn off the propane line to the refrigerator. Failure to do so significantly increases the risk of explosion.
SIMPLIFIED ENGLISH VERSION	Before you pump gasoline into the gas tank, turn off the propane line to the refrigerator. If you do not turn off the propane line, it could explode.

For more on Simplified English, see ASD (2010).

PREPARING TEXT FOR TRANSLATION

As discussed in Chapter 5, more and more organizations prepare their documents and Web sites not only in English but also in other languages. Although you won't have to do the translating yourself, you should be aware of some simple steps you can take to make it easier for someone else to translate your writing. Luckily, most of the following seven steps are the same ones you use to make your writing clear and easy to read in English.

- *Use short sentences.* Try for an average of no more than 20 words per sentence.
- *Use the active voice.* The active voice (“You should do this procedure after the engine has run for 100 hours”) is easier to translate than the passive voice (“This procedure should be done after the engine has run for 100 hours”).
- *Use simple words.* Translators will find it easier to translate *do* than *perform*.
- *Include a glossary.* If you need to use technical terms, define them in a glossary.
- *Use words that have only one meaning.* Write “This is the correct valve,” not “This is the right valve,” because *right* could also mean “the one on the right side.”
- *Use pronouns carefully.* Don't write “Matthews phoned Hawkins to ask if he was scheduled to speak at the meeting.” The translator might not know which person *he* refers to. Instead, write “Matthews phoned Hawkins to ask if Hawkins was scheduled to speak at the meeting.”
- *Avoid jokes, puns, and culture-bound references.* Humor doesn't translate well. If you refer to a box of computer pointing devices as “a box of mice,” the translator might translate the words literally because the device (a mouse) is not known by that name everywhere. Also avoid other culture-bound references, such as sports metaphors (*hat trick* or *grand slam*) or references to national heroes or holidays (*George Washington* or *Fourth of July*).

On TechComm Web

For more on preparing text for translation, see George Rimalower's essay, “Crossing Borders.” Click on Links Library for Ch. 10 on <bedfordstmartins.com/techcomm>.

In This Book

For more on glossaries, see Ch. 19, p. 530.

Writer's Checklist

Lists

- Is each list of the appropriate kind: numbered, lettered, bulleted, or checklist? (p. 229)
- Does each list contain an appropriate number of items? (p. 229)
- Are all the items in each list grammatically parallel? (p. 230)
- Is the lead-in to each list structured and punctuated properly? (p. 230)
- Are the items in each list punctuated properly? (p. 231)

Sentences

- Are the sentences structured with the new or important information near the end? (p. 232)
- Are the sentences the appropriate length: neither long and difficult to understand nor short and choppy? (p. 232)
- Does each sentence focus on the “real” subject? (p. 234)
- Have you reduced the number of expletives used as sentence openers? (p. 235)
- Does each sentence focus on the “real” verb, without weak nominalizations? (p. 236)
- Have you used parallel structure in your sentences? (p. 236)
- Have you used restrictive and nonrestrictive modifiers appropriately? (p. 237)


- Have you eliminated misplaced modifiers, squinting modifiers, and dangling modifiers? (p. 238)

Words and Phrases

Did you

- select an appropriate level of formality? (p. 240)
 - use active and passive voice appropriately? (p. 241)
 - use precise words? (p. 243)
 - provide adequate detail? (p. 243)
 - avoid ambiguity? (p. 243)
 - avoid unnecessary jargon? (p. 243)
 - use positive rather than negative constructions? (p. 244)
 - avoid long noun strings? (p. 245)
 - avoid clichés? (p. 245)
 - avoid euphemisms? (p. 245)
 - avoid stating the obvious? (p. 246)
 - avoid filler? (p. 247)
 - avoid unnecessary prepositional phrases? (p. 247)
 - use the most concise phrases? (p. 248)
 - avoid fancy words? (p. 249)
- Did you use nonsexist language? (p. 251)
 - Did you use the people-first approach in referring to people with disabilities? (p. 252)
 - Is your document easy to translate? (p. 253)

Exercises

 **In This Book** For advice on how to critique a draft effectively, see Ch. 4, p. 68. For more about memos, see Ch. 14, p. 385.

NOTE: Pay close attention to what you are being asked to do in each exercise, and do only as much revising as is necessary. Take special care to preserve the meaning of the original material. If necessary, invent reasonable details.

1. Refer to the advice on pages 228–32, and rewrite each of the following sentences in the form of a list.
 - a. The causes of burnout can be studied from three perspectives: physiological—the roles of sleep, diet, and physical fatigue; psychological—the roles of guilt, fear, jealousy, and frustration; environmental—the role of physical surroundings at home and at work.
 - b. There are several problems with the online registration system at Dickerson University. First, lists of closed sections are updated only once a day. Second, there is no waiting list or notification system for students who wish to enroll in a full course. Third, the Registrar's office does not have enough trained people on hand to help with problems.
2. The following sentences might be too long for some readers. Refer to the advice on pages 232–34, and break each sentence into two or more sentences.
 - a. If we get the contract, we must be ready by June 1 with the necessary personnel and equipment, so with this in mind a staff meeting, which all group

- managers are expected to attend, is scheduled for February 12.
- b. Once we get the results of the stress tests on the 125-Z fiberglass mix, we will have a better idea of whether the project is on schedule, because if the mix isn't suitable we will really have to hurry to find and test a replacement by the Phase 1 deadline.
 - c. Although we had a frank discussion with Backer's legal staff, we were unable to get them to specify what they would be looking for in an out-of-court settlement, but they gave us a strong impression that they would rather settle out of court.
- 3.** The following examples contain choppy, abrupt sentences. Refer to the advice on pages 232–34, and combine sentences to create a smoother style.
- a. I need a figure on the surrender value of a policy. The number of the policy is A4399827. Can you get me this figure by tomorrow?
 - b. The program obviously contains an error. We didn't get the results we anticipated. Please ask Paul Davis to test the program.
 - c. The supervisor is responsible for processing the outgoing mail. He is also responsible for maintaining and operating the equipment.
- 4.** In the following sentences, the real subjects are buried in prepositional phrases or obscured by expletives. Refer to the advice on pages 234–35, and revise the sentences so that the real subjects appear prominently.
- a. There has been a decrease in the number of students enrolled in our training sessions.
 - b. It is on the basis of recent research that I recommend the new CAD system.
 - c. The use of in-store demonstrations has resulted in a dramatic increase in business.
- 5.** In the following sentences, unnecessary nominalization obscures the real verb. Refer to the advice on page 236, and revise the sentences to focus on the real verb.
- a. Pollution constitutes a threat to the Matthews Wildlife Preserve.
 - b. Evaluation of the gumming tendency of the four tire types will be accomplished by comparing the amount of rubber that can be scraped from the tires.
 - c. Reduction of the size of the tear-gas generator has already been completed.
- 6.** Refer to the advice on pages 236–37, and revise the following sentences to eliminate nonparallelism.
- a. The next two sections of the manual discuss how to analyze the data, the conclusions that can be drawn from your analysis, and how to decide what further steps are needed before establishing a journal list.
 - b. In the box, we should include a copy of the documentation, the cables, and the docking station.
 - c. Sections 1 and 2 will introduce the entire system, while Sections 3 and 4 describe the automatic application and step-by-step instructions.
- 7.** Refer to the advice on pages 237–38, and revise the following sentences to correct punctuation or pronoun errors related to modifiers.
- a. Press the Greeting-Record button to record the greeting that is stored on a microchip inside the machine.
 - b. This problem that has been traced to manufacturing delays, has resulted in our losing four major contracts.
 - c. Please get in touch with Tom Harvey who is updating the instructions.
- 8.** Refer to the advice on pages 238–39, and revise the following sentences to eliminate the misplaced modifiers.
- a. Over the past three years we have estimated that eight hours per week are spent on this problem.
 - b. Information provided by this program is displayed at the close of the business day on the information board.
 - c. The computer provides a printout for the Director that shows the likely effects of the action.
- 9.** Refer to the advice on page 240, and revise the following sentences to eliminate the dangling modifiers.
- a. By following these instructions, your computer should provide good service for many years.
 - b. To examine the chemical homogeneity of the plaque sample, one plaque was cut into nine sections.
 - c. The boats in production could be modified in time for the February debut by choosing this method.
- 10.** Refer to the advice on pages 240–41, and revise the following informal sentences to make them moderately formal.
- a. The learning modules were put together by a couple of pros in the department.

- b. The biggest problem faced by multimedia designers is that users freak if they don't see a button—or, heaven forbid, if they have to make up their own buttons!
- c. If the University of Arizona can't figure out where to dump its low-level radioactive waste, Uncle Sam could pull the plug on millions of dollars of research grants.
- 11.** Refer to the advice on pages 241–43, and rewrite the following sentences to remove inappropriate use of the passive voice.
- a. Most of the information you need will be gathered as you document the history of the journals.
- b. Mistakes were made.
- c. Come to the reception desk when you arrive. A packet with your name on it can be picked up there.
- 12.** Refer to the advice on pages 246–49, and revise the following sentences to remove the redundancies.
- a. In grateful appreciation of your patronage, we are pleased to offer you this free gift as a small token gesture of our gratitude.
- b. An anticipated major breakthrough in storage technology will allow us to proceed ahead in the continuing evolution of our products.
- c. During the course of the next two hours, you will see a demonstration of our improved speech-recognition software, which will be introduced for the first time in November.
- 13.** Refer to the advice on page 243, and revise the following sentences by replacing the vague elements with specific information. Make up any reasonable details.
- a. The results won't be available for a while.
- b. The chemical spill in the lab caused extensive damage.
- c. Analysis of the soil beneath the new stadium revealed an interesting fact.
- 14.** Refer to the advice on pages 243–44, and revise the following sentences to remove unnecessary jargon.
- a. We need to be prepared for blowback from the announcement.
- b. Police apprehended the perpetrator and placed her under arrest directly adjacent to the scene of the incident.
- c. The mission-critical data on the directory will be migrated to a new server on Tuesday.
- 15.** Refer to the advice on pages 244–45, and revise the following sentences to convert the negative constructions to positive constructions.
- a. Management accused Williams of filing trip reports that were not accurate.
- b. We must make sure that all our representatives do not act unprofessionally to potential clients.
- c. The shipment will not be delayed if Quality Control does not disapprove any of the latest revisions.
- 16.** General readers might find the following sentences awkward or difficult to understand. Refer to the advice on page 245, and rewrite the following sentences to eliminate the long noun strings.
- a. The corporate-relations committee meeting location has been changed.
- b. The research team discovered a glycerin-initiated, alkylene-oxide-based, long-chain polyether.
- c. We are considering purchasing a digital-imaging capable, diffusion-pump equipped, tungsten-gun SEM.
- 17.** Refer to the advice on page 245, and revise the following sentences to eliminate clichés.
- a. We hope the new program will positively impact all our branches.
- b. If we are to survive this difficult period, we are going to have to keep our ears to the ground and our noses to the grindstone.
- c. At the end of the day, if everyone is on the same page and it turns out to be the wrong page, you're really up a creek without a paddle.
- 18.** Refer to the advice on pages 245–46, and revise the following sentences to eliminate euphemisms.
- a. Downsizing our workforce will enable our division to achieve a more favorable cash-flow profile.
- b. Of course, accident statistics can be expected to show a moderate increase in response to a streamlining of the training schedule.
- c. The airline announced its new policy regarding customers of size who cannot fit into one seat.
- 19.** Refer to the advice on pages 246–47, and revise the following sentences to eliminate the obvious material.
- a. To register to take a course offered by the university, you must first determine whether the university will be offering that course that semester.

- b. The starting date of the project had to be postponed for a certain period of time due to a delay in obtaining the necessary authorization from the Project Oversight Committee.
- c. After you have installed DataQuick, please spend a few minutes reading the feedback questionnaire, then respond to the questions and send your responses to us.
- 20.** Refer to the advice on page 247, and revise the following sentences to remove meaningless filler.
- a. It would seem to me that the indications are that the project has been essentially unsuccessful.
- b. For all intents and purposes, our company's long-term success depends to a certain degree on various factors that are in general difficult to foresee.
- c. The presentation was generally well received for the most part, despite the fact that we received a rather small number of questionnaire responses.
- 21.** Refer to the advice on pages 247–48, and revise the following sentences to eliminate unnecessary prepositional phrases.
- a. The complexity of the module will hamper the ability of the operator in the diagnosis of problems in equipment configuration.
- b. The purpose of this test of your aptitudes is to help you with the question of the decision of which major to enroll in.
- c. Another advantage of the approach used by the Alpha team is that interfaces of different kinds can be combined.
- 22.** Refer to the advice on pages 248–49, and revise the following sentences to make them more concise.
- a. The instruction manual for the new copier is lacking in clarity and completeness.
- b. The software packages enable the user to create graphic displays with a minimum of effort.
- c. We remain in communication with our sales staff on a weekly basis.
- 23.** Refer to the advice on page 249, and revise the following sentences to eliminate fancy words.
- a. This state-of-the-art soda-dispensing module is to be utilized by Marketing Department personnel.
- b. We have failed to furnish the proposal to the proper agency by the mandated date by which such proposals must be in receipt.
- c. Deposit your newspapers and other debris in the trash receptacles located on the station platform.
- 24.** Refer to the advice on pages 251–52, and revise the following sentences to eliminate sexist language.
- a. Each doctor is asked to make sure he follows the standard procedure for handling Medicare forms.
- b. Policemen are required to live in the city in which they work.
- c. Before he can log on to the system, the operator must enter a username and password.
- 25.** Refer to the advice on page 252, and revise the following sentences to eliminate the offensive language.
- a. This year, the number of female lung-cancer victims is expected to rise because of increased smoking.
- b. Mentally retarded people are finding greater opportunities in the service sector of the economy.
- c. This bus is specially equipped to accommodate the wheelchair-bound.
- 26. GROUP EXERCISE** Form small groups. Have one person in the group distribute a multipage document he or she has written recently, either in this class or in another. Have each member annotate a copy of this document according to the principles of sentence effectiveness discussed in this chapter. Then have each group member write a summary statement about the document, highlighting its effective techniques of sentence construction and possible improvements. Meet as a group, study these annotated documents, and write a memo to your instructor describing the sentence features cited by more than one group member, as well as those features cited by only one member. Overall, what are the basic differences between the group members' annotations and the summary statements? Do you think that, as a general practice, it would be worthwhile to have a draft reviewed and annotated by more than one person? What have you learned about the usefulness of peer review?

Case 10: Revising a Document for Nonnative Speakers and for Translation

Background

You are an assistant to Sandra Cammaroto, Division Manager for the U.S. Transportation Security Administration's Office of Screening of Persons with Disabilities. Ms. Cammaroto is in charge not only of formulating policy but also of communicating it to various audiences. She wants to give you an assignment.

"Now that we've revised the policy for screening people with disabilities at airports, we need to turn the policy into clear information for U.S. residents and people abroad."

"So we're going to translate it?" you ask.

"Yes, we're going to do about a dozen languages, but first we want to make it as simple and easy to understand as possible. Translation is very expensive, and we want to make sure we present the information as concisely as possible. Plus, millions of U.S. residents and citizens are nonnative speakers of English."

"I assume we're changing the audience and purpose?"

"Yes, that's a good point. The original is a statement of policy. What I want you to do is make it a consumer guide.

We're talking to people with disabilities and those who travel with them. We're going to put the information on our site for them to study before they travel, and we're going to have brochures at security checkpoints in the airports."

Your Assignment

1. Review this chapter and read the original statement of policy (Document 10.1). Then write a memo to Ms. Cammaroto explaining how you plan to approach the project and asking for her approval. In light of the new audience and purpose of the information, should you delete any of the information in the document? Do you need to add information? For the information that you think should be retained, which topics covered in this chapter should you focus on? For instance, are lists used appropriately in the document? Which aspects of sentence structure and word choice should you address?
2. Revise Document 10.1 according to the ideas you presented in your memo to Ms. Cammaroto.

Document 10.1 Policy Statement Regarding People with Disabilities

One of the primary goals of the Transportation Security Administration (TSA) is to provide the highest level of security and customer service to all who pass through our screening checkpoints. Our current policies and procedures focus on ensuring that all passengers, regardless of their personal situations and needs, are treated equally and with the dignity, respect, and courtesy they deserve. Although every person and item must be screened before entering each sterile area, it is the manner in which the screening is conducted that is most important.

In order to achieve that goal, TSA has established a program for screening persons with disabilities and their associated equipment, mobility aids, and devices. Our program covers all categories of disabilities (mobility, hearing, visual, and hidden). As part of that program, we established a coalition of over 60 disability-related groups and organizations to help us understand the concerns of persons with disabilities and medical conditions.

These groups have assisted TSA with integrating the unique needs of persons with disabilities into our airport operations. The purpose of this advisement is to inform those with disabilities and medical conditions of changes related to the ban on liquids, aerosols, and gels effective Tuesday, September 26. . . .

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordsmartins.com/techcomm>.

Document 10.1
(continued)

There are two changes: We are adjusting the current ban on liquids, aerosols, and gels to allow travelers to carry **travel-size toiletries (3 oz. or less) in ONE QUART-SIZE, clear plastic, sealable bag** through security checkpoints. In addition, travelers can now bring beverages and other items purchased in the secure boarding area on-board the aircraft. We are continuing to permit prescription liquid medications and other liquids needed by persons with disabilities and medical conditions. This includes:

- all prescription and over-the-counter medications (liquid, gel, and aerosol), including KY jelly, eye drops, and saline solution for medicinal purposes;
- liquids (to include water, juice, or liquid nutrition) or gels for passengers with a disability or medical condition;
- life-support and life-sustaining liquids (bone marrow, blood products, transplant organs);
- items used to augment the body for medical or cosmetic reasons (e.g., mastectomy products, prosthetic breasts, bras, or shells) containing gels, saline solution, or other liquids; and
- gels or frozen liquids needed to cool disability or medically related items used by persons with disabilities or medical conditions.

Passengers with disabilities and medical conditions can choose to put their small bottles/items of liquid medication in the one-quart sealable bag (mixed with toiletries) without the need to declare these items. However, if the liquid medications are in volumes larger than 3 oz. each, they may not be placed in the quart-size bag and must be declared to a Transportation Security Officer. A declaration can be made verbally, in writing, or by a person's companion, caregiver, interpreter, or family member. Declared liquid medications and other liquids for disabilities and medical conditions must be kept separate from all other property submitted for x-ray screening.

It is recommended (not required) that passengers bring along any supporting documentation (ID cards, letter from doctor, etc.) regarding their medication needs. It is recommended, not required, that the label on prescription medications match the passenger's boarding pass. If the name on the prescription medication label does not match the name of the passenger, the passenger should expect to explain why to the security officers. To ensure a smooth screening process, passengers are encouraged to limit quantities to what is needed for the duration of the flight.

Passengers will still be required to remove their shoes as part of the screening process; however, persons with disabilities, medical conditions, and prosthetic devices **DO NOT** have to remove their shoes. Those who keep their shoes on will be subjected to additional screening that includes a visual/physical and explosive trace detection sampling of their footwear while the footwear remains on their feet.

Source: Based on Cammaroto, 2006.

CHAPTER 11

Designing Documents and Web Sites



Courtesy Mayo Clinic.

Good design helps readers accomplish a task simply and easily.

The design of a page or a screen can help a writer achieve many goals: to entertain, to amaze, to intrigue, to sell. In technical communication, that goal is typically to help the reader accomplish a task. The Mayo Clinic page shown here is a good example of an effective design. Each link is clearly labeled to enable users to get where they want to go, quickly and easily. From this page, users can learn about medical issues, set up appointments, refer patients, look for a job or an educational opportunity, or search the Mayo Clinic site. When you look at a well-designed page or site, you intuitively understand how to use it.

Design refers to the physical appearance of documents and Web sites. For printed documents, design features include binding, page size, typography, and use of color. For Web sites, many of the same design elements apply, but there are unique elements, too, such as the use of navigation bars, the design of hyperlinks, and tables of contents on long pages.

The effectiveness of a document or Web site largely depends on how well it is designed, because readers see the document or site before they actually *read* it. In less than a second, the document or site makes an impression on them, one that might determine how well they read it—or even whether they decide to read it at all.

GOALS OF DOCUMENT AND WEB DESIGN

In designing a document or Web site, you have five major goals:

- *To make a good impression on readers.* Your document or site should reflect your own professional standards and those of your organization.
- *To help readers understand the structure and hierarchy of the information.* As they navigate a document or site, readers should know where they are and how to get where they are headed. They should also be able to see the hierarchical relationship between one piece of information and another.
- *To help readers find the information they need.* Usually, people don't read printed technical documents from cover to cover. Design elements (such as tabs, icons, and color), page design, and typography help readers find the information they need quickly and easily. On Web sites, helping

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readers find information is critical because they can see only the page that is currently displayed on the screen.

- *To help readers understand the information.* Effective design can clarify information. For instance, designing a set of instructions so that the text describing each step is next to the accompanying graphic makes the instructions easier to understand. A Web site in which the main sections are clearly displayed on a navigation bar is easier to understand than a site that doesn't have this feature.
- *To help readers remember the information.* An effective design helps readers create a visual image of the information, making it easier to remember. Text boxes, pull quotes, and similar design elements help readers remember important explanations and passages.

UNDERSTANDING DESIGN PRINCIPLES

To design effective documents and Web sites, you need to understand a few basic design principles. The following discussion is based on Robin Williams's *The Non-designer's Design Book* (2008), which describes four principles of design: proximity, alignment, repetition, and contrast.

Proximity

The principle of proximity is simple: group related items together. If two items appear close to each other, the reader will interpret them as related to each other. If they are far apart, the reader will interpret them as unrelated. Text describing a graphic should be positioned close to the graphic, as shown in Figure 11.1.

Alignment

The principle of alignment is that you should consciously place text and graphics on the page so that the reader can understand the relationships among these elements. Figure 11.2 shows how alignment works to help organize information.

Repetition

The principle of repetition is that you should treat the same kind of information in the same way to create consistent patterns. For example, all first-level headings should have the same typeface, type size, spacing above and below, and so forth. This repetition signals a connection between headings, making the content easier to understand. Other elements that are used to create consistent visual patterns are colors, icons, rules, and screens. Figure 11.3 on page 264 shows an effective use of repetition.

On TechComm Web

Also see Roger C. Parker's design site and Webmonkey's Web Typography Tutorial. Click on Links Library for Ch. 11 on <bedfordsmartins.com/techcomm>.

FUN ACTIVITIES

Are you in grades K-6? If so, this area is for you! Join, "Pat, your Passport Pal" and play some fun activities.

GO ▶

PARENTS AND EDUCATORS

Parents and Educators are the most important influencing factors on youth. Here are some resources to help you share the exciting world of foreign affairs with your children and students.

GO ▶

MY FUTURE WITH THE STATE DEPARTMENT

Learn how you can join the U.S. Department of State. Help develop a free, secure, and peaceful world. Create, represent, and implement U.S. foreign policy. Experience the world of a Foreign Service Officer. Explore opportunities for students at the Department of State.

GO ▶

Text and graphics are clearly related by the principle of proximity. The textual descriptions are placed next to the drawings to which they refer.

Figure 11.1 Effective Use of Proximity

Source: U.S. Department of State, 2011 <<http://future.state.gov>>.

First Floor

SciQuest
Step inside a wind tunnel, feel an earthquake or control a four-foot tornado as you explore the forces of nature, the physics of light and sound and the science of light and waves.

Rangos Omnimax Theater
A four-story, domed screen and hundreds of speakers allow you to take a leading role in this Omnimax Theater — the only one of its kind in Western Pennsylvania. Journey through new lands, be in the center of nature, or see popular feature films on this giant film screen. The OMNIMAX® experience is incredible every time you come to the movies.

XPLOR Carnegie Science Center Store
Visitors can take the Science Center home when they choose from a wide selection of books, games, toys, microscopes and a variety of telescopes selected by our expert Buhl Planetarium staff.

Highmark Science Stage
Get into the act as science comes alive in this participation demonstration theater.

Second Floor

Miniature Railroad & Village®
Speeding locomotives travel Western Pennsylvania's landscape, winding through 2,000 miniature replicas and 100 animated characters and scenes. (Closed June 14-18 and September 27-November 18, 2004).

Henry Buhl, Jr. Planetarium And Observatory
This 50-foot domed planetarium literally takes visitors into space. Explore Mars, navigate the stars or journey through the mysteries of the Cosmos. Come at night for a live Laser Fantasy show where color and music surround you every Friday and Saturday evening.

This panel from a museum brochure uses alignment to help organize the information.

The writer is using three levels of importance, signaled by the three levels of alignment.

Writers often use more than one technique at a time to help organize information. In this case, the first level of information is also presented in a larger-size type.

The second level of information is presented in a different color than the rest of the text.

Figure 11.2 Effective Use of Alignment

Source: Carnegie Science Center, n.d.

This page shows repetition used effectively as a design element.

Different colors, typefaces, and type sizes are used for the headings, figures, and definitions in the margin. For instance, the two graphics use the same beige background and the same typeface, style, and color for the titles and captions.

In the main text, the two headings and subheadings use the same typeface, size, and color.

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K	Z	R
Q	B	T
S	G	N

FIGURE 9.10
Momentary photographic memory
 When George Sperling flashed a group of letters similar to this for 1/20th of a second, people could recall only about half of the letters. But when signaled to recall a particular row immediately after the letters had disappeared, they could do so with near-perfect accuracy.

- **Iconic memory** a momentary sensory memory of visual stimuli; a photographic or picture-image memory lasting no more than a few tenths of a second.
- **Echoic memory** a momentary sensory memory of auditory stimuli; if attention is elsewhere, sounds and words can still be recalled within 3 or 4 seconds.

Sensory Memory

OBJECTIVE 8 | Contrast two types of sensory memory.

Consider what one intriguing memory experiment revealed about our sensory memory—the initial recording of sensory information in the memory system. As part of his doctoral research, George Sperling (1960) showed people three rows of three letters each for only 1/20th of a second (FIGURE 9.10). It was harder than reading by lightning flashes. After the nine letters disappeared from the screen, people could recall only about half of them.

Was it because they had insufficient time to glimpse them? No, Sperling cleverly demonstrated that even at faster than lightning-flash speed, people actually can see and recall all the letters, but only momentarily. Rather than ask them to recall all nine letters at once, Sperling sounded a high, medium, or low tone immediately after flashing the nine letters. This cue directed participants to report only the letters of the top, middle, or bottom row, respectively. Now they rarely missed a letter, showing that all nine letters were momentarily available for recall.

Sperling's experiment revealed that we have a fleeting photographic memory called **iconic memory**. For an instant, our eyes register an exact representation of a scene and we can recall any part of it in amazing detail—but only for a few tenths of a second. If Sperling delayed the tone signal by more than half a second, the iconic memory was gone and participants once again recalled only about half the letters. Your visual screen clears quickly, as it must, so that new images can be superimposed over old ones.

We also have an impeccable, though fleeting, sensory memory for auditory stimuli, called **echoic memory** (Cowan, 1988; Lu & others, 1992). If partially interpreted, an auditory echo lingers for 3 or 4 seconds. Picture yourself in conversation, as your attention veers to the TV. If your mildly irked conversational partner tests your attention by asking, "What did I just say?" you can recover the last few words from your mind's echo chamber.

FIGURE 9.11
Short-term memory decay
 Unless rehearsed, verbal information may be quickly forgotten. (From Peterson & Peterson, 1959.)

Time in seconds	Percentage who recalled consonants
0	100
3	75
6	55
9	40
12	25
15	15
18	10

Working/Short-Term Memory

OBJECTIVE 9 | Describe the duration and working capacity of short-term memory.

Among the vast amounts of information registered by our sensory memory, we illuminate some with our attentional flashlight. We also retrieve information from long-term storage for "on-screen" display. But unless our working memory meaningfully encodes or rehearses that information, it quickly disappears from our short-term store. During your finger's trip from phone book to phone, your memory of a telephone number may evaporate.

To find out how quickly a short-term memory will disappear, Lloyd Peterson and Margaret Peterson (1959) asked people to remember three-consonant groups, such as *CHJ*. To prevent rehearsal of the letters, the researchers asked participants, for example, to start at 100 and count aloud backwards by threes. After 3 seconds, people recalled the letters only about half the time; after 12 seconds, they seldom recalled them at all (FIGURE 9.11). Without active processing, short-term memories have a limited life.

Short-term memory is limited not only in duration but also in capacity. As noted earlier, our short-term memory typically stores just seven or so bits of information (give or take two). George Miller (1956) enshrined this recall capacity as the *Magic Number Seven, plus or minus two*. Not surprisingly, when some phone companies

Figure 11.3 Effective Use of Repetition

Source: Myers, 2007, p. 362.

Contrast

The principle of contrast works in several different ways in technical documents and Web sites. For example, black print is easiest to see against a white background; larger letters stand out among smaller ones; information printed in a color, such as red, grabs readers' attention better than information printed in black. Figure 11.4 shows effective use of contrast.

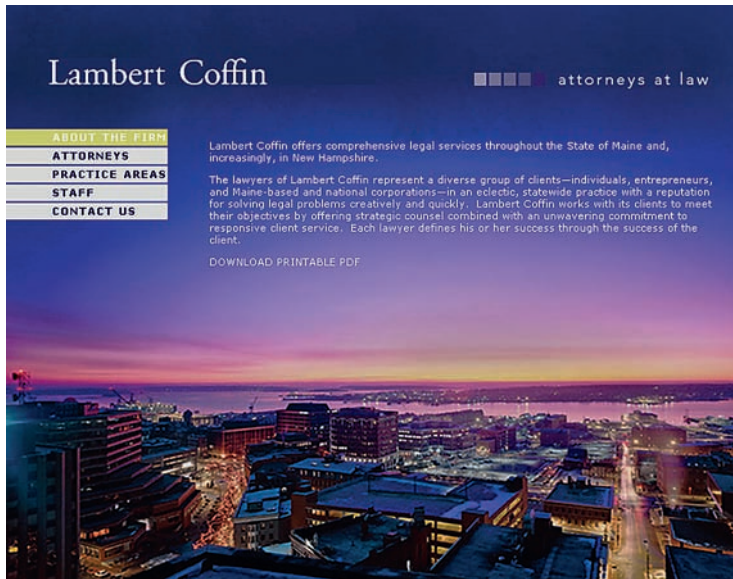


Figure 11.4 Effective Use of Contrast

Source: Lambert Coffin, 2010 <www.lambertcoffin.com/index.php?sid=2>.

The light-colored text at the top of this screen contrasts most effectively with the dark blue of the night sky. In the navigation buttons on the left, the dark text contrasts best against the light background. The text “About the Firm” uses negative type—light text against a dark background—but in this case the contrast is less sharp because the background color is lighter.

PLANNING THE DESIGN OF DOCUMENTS AND WEB SITES

The first step in designing a technical document or Web site is planning. Analyze your audience and purpose, and then determine your resources.

Analyze Your Audience and Purpose

Consider factors such as your readers’ knowledge of the subject, their attitudes, their reasons for reading, the way they will be using the document, and the kinds of tasks they will perform. For instance, if you are writing a benefits manual for employees, you know that few people will read it from start to finish but that many people will refer to it. Therefore, you should build in accessing tools: a table of contents, an index, tabs, and so forth.

Think too about your audience’s expectations. Readers expect to see certain kinds of information presented in certain ways. Try to fulfill those expectations. For example, hyperlinks in Web sites are often underscored and presented in blue type.

If you are writing for multicultural readers, keep in mind that many aspects of design vary from one culture to another. In memos, letters, reports,

In This Book

For more about analyzing your audience, see Ch. 5. For more about tables of contents, see Ch. 19, p. 529.

and manuals, you may see significant differences in design practice. The best advice, therefore, is to study documents from the culture you are addressing. Here are a few design elements to look for:

- *Paper size.* Paper size will dictate some aspects of your page design. If your document will be printed in another country, find out about standard paper sizes in that country.
- *Typeface preferences.* One survey found that readers in the Pacific Rim prefer sans-serif typefaces in body text, whereas Western readers prefer serif typefaces (Ichimura, 2001).
- *Color preferences.* In China, for example, red suggests happiness, whereas in Japan it suggests danger.
- *Text direction.* If some members of your audience read right to left but others read left to right, you might arrange your graphics vertically, from top to bottom; everybody reads from top to bottom. Or you might use Arabic numerals to indicate the order in which items are to be read (Horton, 1993).

Think, too, about your purpose or purposes. For example, imagine that you open a dental office and you want to create a Web site. The first question is: What is the purpose of the site? It's one thing to provide information on your hours and directions to the office. But do you also want patients to be able to find high-quality dental information? Set up or change appointments? Ask you a question? Each of these purposes affects the site design.

Determine Your Resources

Think about your resources of time, money, and equipment. Short, informal documents and Web sites are usually produced in-house; more-ambitious projects are often subcontracted to specialists. If your organization has a technical-publications department, consult the people there about scheduling and budgeting.

- *Time.* What is your schedule? A sophisticated design might require professionals at service bureaus and print shops, and their services can require weeks or months. Creating even a simple design for a site can require many hours.
- *Money.* Can you afford professional designers, print shops, and Web developers? Most managers would budget thousands of dollars to design an annual report but not an in-house newsletter.
- *Equipment.* Complex designs require graphics and Web software, as well as layout programs. A basic laser printer can produce attractive documents in black and white, but you need a more expensive printer for high-resolution color.

In This Book

Typography is discussed on p. 275.

In This Book

For more about analyzing your purpose, see Ch. 5, p. 109.

In This Book

For information on designing Web sites and pages, see pp. 292 and 297.

DESIGNING DOCUMENTS

Before you design individual pages for a printed document, design the whole document. You want the different elements to work together to accomplish your objectives. Consider these four elements in designing the whole document: size, paper, bindings, and accessing tools.

Size

Size refers to two aspects of document design: page size and page count.

- *Page size.* Think about the best page size for your information and about how the document will be used. For a procedures manual that will sit on a shelf most of the time, three-hole 8.5 × 11-inch paper is a good choice. For a software tutorial that will fit easily on a desk while the reader works at the keyboard, consider a 5.5 × 8.5-inch size. Paper comes precut in a number of standard sizes, such as 4.5 × 6 inches and 6 × 9 inches. Although paper can be cut to any size, nonstandard sizes are more expensive.
- *Page count.* Because paper is expensive and heavy, you want as few pages as possible, especially if you are printing and mailing many copies. And there is a psychological factor, too: people don't want to spend a lot of time reading technical communication. Therefore, if you can design the document so that it is 15 pages long rather than 30—but still attractive and easy to read—your readers will appreciate it.

Paper

Paper is made not only in different standard sizes but also in different weights and with different coatings.

The most widely used paper is the relatively inexpensive stock used in photocopier machines and laser printers. Others include bond (for letters and memos), book paper (a higher grade that permits better print resolution), and text paper (an even higher grade used for more formal documents such as announcements and brochures).

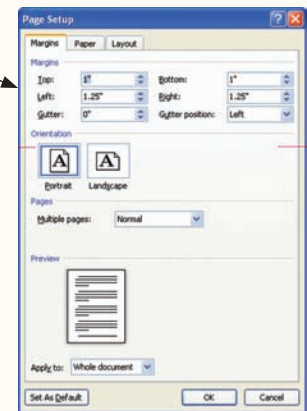
Paper comes coated or uncoated. The coating, which increases strength and durability, provides the best print resolution. However, some glossy coated papers produce a glare. To deal with this problem, designers often choose paper with a slight tint.

TECH TIP

How to Set Up Pages

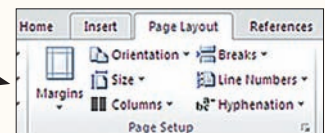
When designing a page to meet your audience's needs and expectations, you can control many design elements by using the **Page Setup** dialog box or the drop-down menus in the **Page Setup** group on the **Page Layout** tab.

In the **Page Setup** group, use the **Page Setup** dialog box launcher to display the **Page Setup** dialog box.



Use the **Margins**, **Paper**, and **Layout** tabs to specify such design elements as page margins, paper orientation, paper size, starting locations for new sections, and header and footer placement.

You can also use the drop-down menus on the **Page Setup** group to control many of the same design elements.



KEYWORDS: page layout tab, page setup group, page setup, margins, paper, layout

On TechComm Web

For more on bindings, see Jacqui Howard Bear's Binding Decisions. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

TABLE 11.1 ▶ Common Types of Binding



Loose-leaf binders. Loose-leaf binders are convenient when pages must be added and removed frequently. A high-quality binder can cost as much as several dollars.



Ring or spiral binders. The wire or plastic coils or combs that hold the pages together let you open the document on a desk or even fold it over so that it takes up the space of only one page. Print shops can bind documents of almost any size in plastic coils or combs for about a dollar each.



Saddle binding. The document is opened to its middle pages, and large staples are inserted from the outside. Saddle binding is impractical for large documents.



Perfect binding. Pages are glued together along the spine edge, and a cover is attached. Perfect binding, used in book publishing, produces the most formal appearance, but it is relatively fragile, and the open document usually does not lie flat.

Work closely with printing professionals. They know, for example, about UV-coated paper, which greatly reduces fading, and about recycled paper, which is constantly improving in quality and decreasing in price.

Bindings

Although documents of a few pages can be attached with a paper clip or a staple, longer documents require more-sophisticated binding techniques. Table 11.1 illustrates and describes the four types of bindings commonly used in technical communication.

Accessing Aids

In a well-designed document, readers can easily find the information they seek. Most accessing aids use the design principles of repetition and contrast to help readers navigate the document. Table 11.2 explains six common kinds of accessing aids.

TABLE 11.2 ▶ Typical Accessing Aids



Source: Google, 2010 <<http://groups.google.com/grhp?hl=en>>.

Icons. Icons are pictures that symbolize actions or ideas. An hourglass or a clock tells you to wait while the computer performs a task. Perhaps the most important icon is the stop sign, which alerts you to a warning. Icons depend on repetition: every time you see the warning icon, you know what kind of information the writer is presenting.

Don't be too clever in thinking up icons. One computer manual uses a cocktail glass about to fall over to symbolize "tip." This is a bad idea, because the pun is not functional: when you think of a cocktail glass, you don't think of a tip for using computers. Don't use too many different icons, or your readers will forget what each one represents.



Here the color red is used to emphasize the title of the feature, the heading for each letter, the erratum box, and the reference to more letters on the journal's Web site.

Source: Discover, 2005.

Color. Perhaps the strongest visual attribute is color (Keyes, 1993). Use color to draw attention to important features of the document, such as warnings, hints, major headings, and section tabs. But use it sparingly, or it will overpower everything else in the document.

Color exploits the principles of repetition (every item in a particular color is logically linked) and contrast (items in one color contrast with items in another color).

Use color logically. Third-level headings should not be in color, for example, if first- and second-level headings are printed in black.

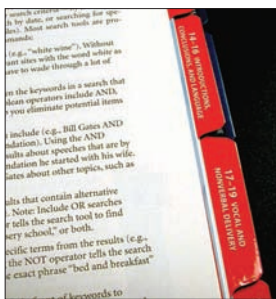
Using different-colored paper for each section of a document is another way to simplify access.

In This Book

For more about using color, see Ch. 12, p. 314.

On TechComm Web

Color Vision Simulator, from Vischeck, lets you see what graphics look like to people with different color disabilities. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm/>.



Dividers and tabs. You are already familiar with dividers and tabs from loose-leaf notebooks. A tab provides a place for a label, which enables readers to identify and flip to a particular section. Sometimes dividers and tabs are color-coded. Tabs work according to the design principle of contrast: the tabs literally stick out.



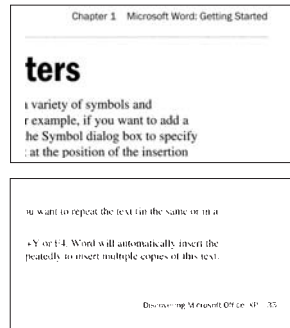
TABLE 11.2 ► Typical Accessing Aids (continued)

Read . . .	To learn to . . .
Ch. 1	connect to the router
Ch. 2	set up a firewall

Cross-reference tables. These tables, which exploit the principle of alignment, refer readers to related discussions.

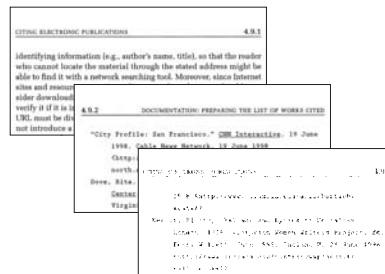
► On TechComm Web

For more about headers and footers, see the Document Design Tutorial on <bedfordstmartins.com/techcomm>.



Source: Microsoft, 2001.

Headers and footers. Headers and footers help readers see where they are in the document. In a book, for example, the headers on the left-hand pages might repeat the chapter number and title; those on the right-hand pages might contain the most recent first-level heading. Sometimes writers build other identifying information into the headers. For example, your instructor might ask you to identify your assignments with a header like the following: “Smith, Progress Report, English 302, page 6.” Headers and footers work according to the principle of repetition: readers learn where to look on the page to see where they are.



Source: Gibaldi, 1999.

Page numbering. For one-sided documents, use Arabic numerals in the upper right corner. (The first page of most documents is unnumbered.) For two-sided documents, put the page numbers near the outside margins.

Complex documents often use two number sequences: lowercase Roman numerals (i, ii, and so on) for front matter and Arabic numerals for the body. The title page is unnumbered; the page following it is ii.

Appendixes are often paginated with a letter and number combination: Appendix A begins with page A-1, followed by A-2, and so on; Appendix B starts with page B-1 and so on.

Sometimes documents list the total number of pages in the document (so recipients can be sure they have all of them). The second page is “2 of 17,” and the third page is “3 of 17.”

Documents that will be updated are sometimes numbered by section: Section 3 begins with page 3-1, followed by 3-2; Section 4 begins with 4-1. This way, a complete revision of one section does not affect the page numbering of subsequent sections.

DESIGNING PAGES

A page of technical communication is effectively designed if the reader can recognize a pattern, such as where to look for certain kinds of information.

Guidelines

Understanding Learning Theory and Page Design

In designing the page, create visual patterns that help readers find, understand, and remember information. Three principles of learning theory, the result of research into how people learn, can help you design effective pages: chunking, queuing, and filtering.

- **Chunking.** People understand information best if it is delivered to them in chunks—small units—rather than all at once. For single-spaced type, chunking involves double-spacing between paragraphs, as shown in Figure 11.5.

<p>During the 18th century, there were many wars in Europe caused by the ambition of various kings to make their domains larger and to increase their own incomes. King Louis XIV of France had built up a very powerful kingdom. Brave soldiers and skillful generals spread his rule over a great part of what is Belgium and Luxemburg, and annexed to the French kingdom the part of Germany between the Rhine River and the Vosges (Vo_zh) Mountains.</p> <p>Finally, the English joined with the troops of the Holy Roman Empire to curb the further growth of the French kingdom, and at the battle of Blenheim (1704), the English Duke of Marlborough, aided by the emperor's army, put an end to the further expansion of the French.</p> <p>The 18th century also saw the rise of a new kingdom in Europe. You will recall that there was a county in Germany named Brandenburg, whose count was one of the seven electors who chose the emperor. The capital of this county was Berlin. It so happened that a number of Counts of Brandenburg, of the family of Hohenzollern, had been men of ambition and ability. The little county had grown by adding small territories around it. One of these counts, called "the Great Elector," had added to Brandenburg the greater part of the neighboring county of Pomerania. His son did not have the ability of his father, but was a very proud and vain man.</p> <p>He happened to visit King William III of England, and was very much offended because during the interview, the king occupied a comfortable arm chair, while the elector, being simply a count, was given a chair to sit in which was straight-backed and had no arms. Brooding over this insult, as it seemed to him, he went home and decided that he too should be called a king. The question was, what should his title be. He could not call himself "King of Brandenburg," for Brandenburg was part of the Empire, and the emperor would not allow it. It had happened some one hundred years before, that, through his marriage with the daughter of the Duke of Prussia, a Count of Brandenburg had come into possession of the district known as East Prussia, at the extreme southeastern corner of the Baltic Sea.</p> <p>The son of this elector who first called himself king had more energy and more character than his father. He ruled his country with a rod of iron, and built up a strong, well-drilled army. He was especially fond of tall soldiers, and had agents out all over Europe, kidnapping men who were over six feet tall to serve in his famous regiment of Guards. He further increased the size of the Prussian kingdom.</p> <p>His son was the famous Frederick the Great, one of the most remarkable fighters that the world has ever seen. This prince had been brought up under strict discipline by his father. The old king had been insistent that his son should be no weakling. It is told that one day, finding Frederick playing upon a flute, he seized the instrument and snapped it in twain over his son's shoulder.</p>	<p style="text-align: center;">France in the 18th Century</p> <p>During the 18th century, there were many wars in Europe caused by the ambition of various kings to make their domains larger and to increase their own incomes. King Louis XIV of France had built up a very powerful kingdom. Brave soldiers and skillful generals spread his rule over a great part of what is Belgium and Luxemburg, and annexed to the French kingdom the part of Germany between the Rhine River and the Vosges (Vo_zh) Mountains.</p> <p>Finally, the English joined with the troops of the Holy Roman Empire to curb the further growth of the French kingdom, and at the battle of Blenheim (1704), the English Duke of Marlborough, aided by the emperor's army, put an end to the further expansion of the French.</p> <p style="text-align: center;">Prussia</p> <p>The 18th century also saw the rise of a new kingdom in Europe. You will recall that there was a county in Germany named Brandenburg, whose count was one of the seven electors who chose the emperor. The capital of this county was Berlin. It so happened that a number of Counts of Brandenburg, of the family of Hohenzollern, had been men of ambition and ability. The little county had grown by adding small territories around it. One of these counts, called "the Great Elector," had added to Brandenburg the greater part of the neighboring county of Pomerania. His son did not have the ability of his father, but was a very proud and vain man.</p> <p>He happened to visit King William III of England, and was very much offended because during the interview, the king occupied a comfortable arm chair, while the elector, being simply a count, was given a chair to sit in which was straight-backed and had no arms. Brooding over this insult, as it seemed to him, he went home and decided that he too should be called a king. The question was, what should his title be. He could not call himself "King of Brandenburg," for Brandenburg was part of the Empire, and the emperor would not allow it. It had happened some one hundred years before, that, through his marriage with the daughter of the Duke of Prussia, a Count of Brandenburg had come into possession of the district known as East Prussia, at the extreme southeastern corner of the Baltic Sea.</p> <p>The son of this elector who first called himself king had more energy and more character than his father. He ruled his country with a rod of iron, and built up a strong, well-drilled army. He was especially fond of tall soldiers, and had agents out all over Europe, kidnapping men who were over six feet tall to serve in his famous regiment of Guards. He further increased the size of the Prussian kingdom.</p>
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a. Without chunking

b. With chunking

Figure 11.5 Chunking

Chunking emphasizes units of related information. Note how the use of headings creates clear chunks of information.



- ▶ **Queuing.** Queuing refers to creating visual distinctions to indicate levels of importance. More-emphatic elements—those with bigger type or boldface type—are more important than less-emphatic ones. Another visual element of queuing is alignment. Designers start more-important information closer to the left margin and indent less-important information. (An exception is titles, which are often centered in reports in the United States.) Figure 11.6 shows queuing.
- ▶ **Filtering.** Filtering is the use of visual patterns to distinguish various types of information. Introductory material might be displayed in larger type, and notes might appear in italics, another typeface, and a smaller size. Figure 11.7 shows filtering.

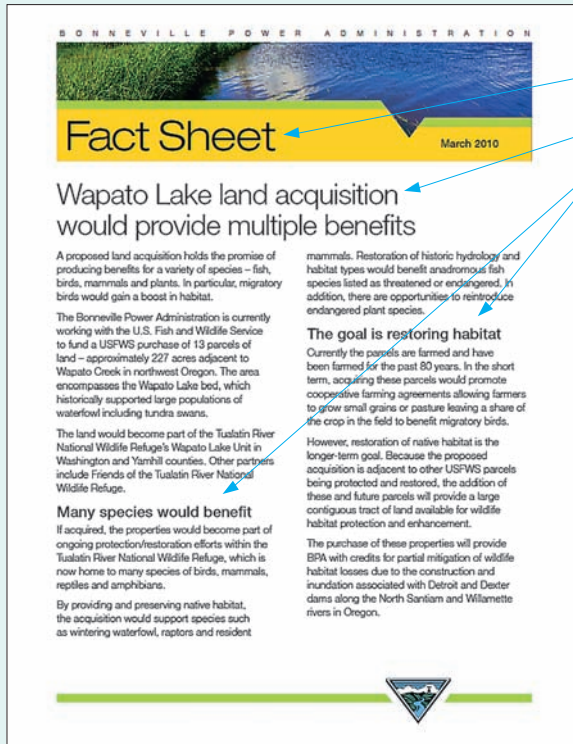


Figure 11.6 Queuing

Source: Bonneville Power Administration, 2010 <www.bpa.gov/corporate/pubs/fact_sheets/10fs/Wapato_Lake_-_March_2010.pdf>.

The size of the type used for the various headings indicates their importance.

The largest type identifies that this document is a fact sheet.

The next largest is the title.

The next largest are the headings.

This Web page uses color as a filtering device. The colors indicate the category of the program: movie, action, comedy, etc.

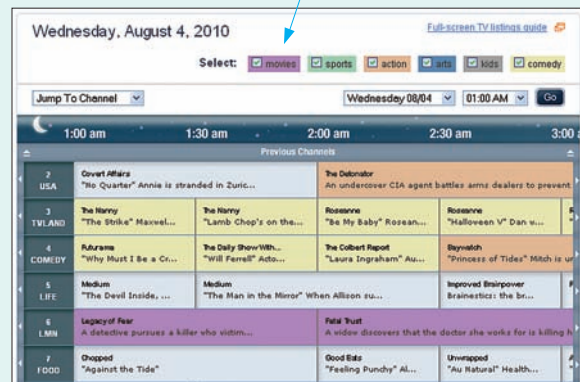


Figure 11.7 Filtering

Source: TiVo, 2010 <www3.tivo.com/tivo-tco/tvlistings.do>.

On TechComm Web

For information on design principles and software, see the discussion about document design at About.com. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

Page Layout

Every page has two kinds of space: white space and space devoted to text and graphics. The best way to design a page is to make a grid—a drawing of what the page will look like. In making a grid, you decide how to use white space and determine how many columns to have on the page.

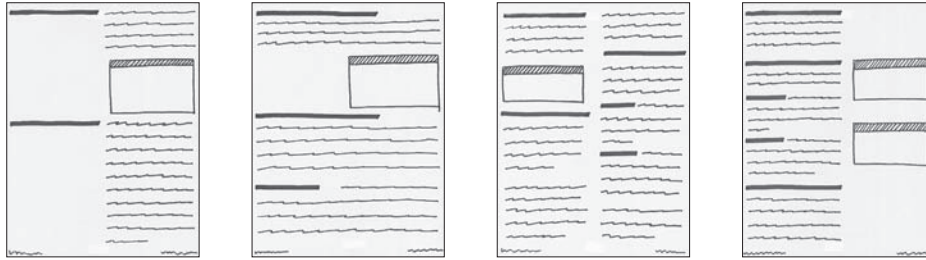


Figure 11.8 Thumbnail Sketches

Page Grids As the phrase suggests, a *page grid* is like a map on which you plan where the text, the graphics, and the white space will go. Many writers like to begin with a *thumbnail sketch*, a rough drawing that shows how the text and graphics will look on the page. Figure 11.8 shows several thumbnail sketches for a page from the body of a manual.

Experiment by sketching the different kinds of pages of your document: body pages, front matter, and so on. When you are satisfied, make page grids. You can use either a computer or a pencil and paper, or you can combine the two techniques.

Figure 11.9 shows two simple grids: one using picas (the unit that printing professionals use, which equals one-sixth of an inch) and one using inches.

Create different grids until the design is attractive, meets the needs of your readers, and seems appropriate for the information you are conveying. Figure 11.10 on page 274 shows some possibilities.

White Space Sometimes called *negative space*, white space is the area of the paper with no writing or graphics: the space between two columns of text, the space between text and graphics, and, most obviously, the margins.

On TechComm Web

For more information on page layout, see the Document Design Tutorial on <bedfordstmartins.com/techcomm>.

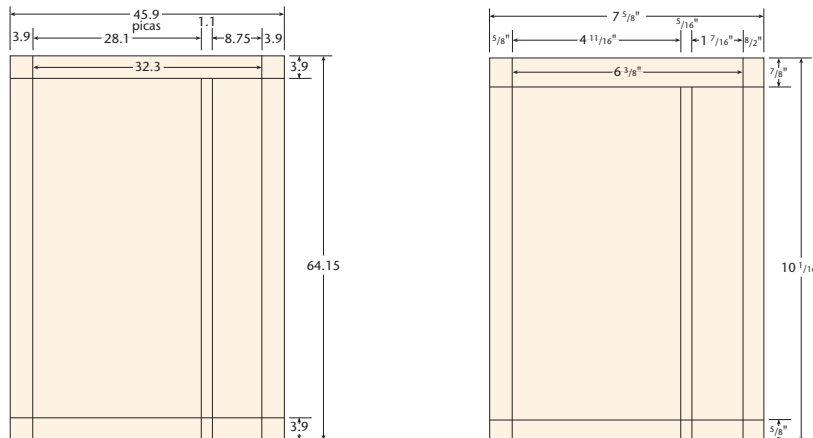


Figure 11.9 Sample Grids Using Picas and Inches

Source: Kerman and Tomlinson, 2004, p. 388



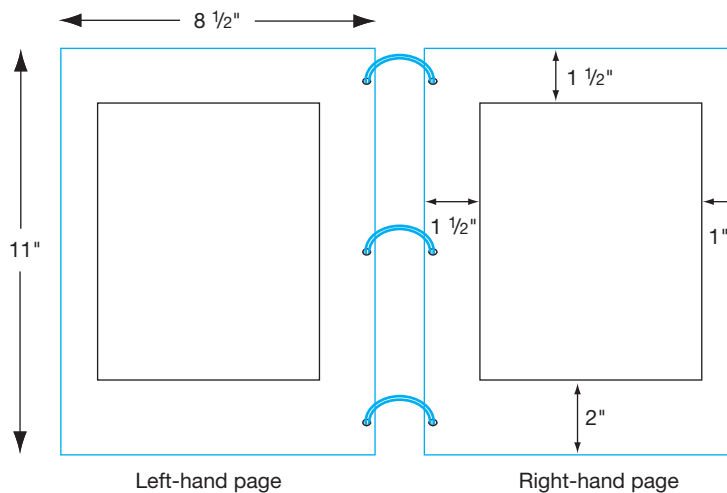


Figure 11.11 Typical Margins for a Document That Is Bound Like a Book

Increase the size of the margins if the subject is difficult or if your readers are not knowledgeable about it.

- They provide a neat frame around the type.
- They provide space for marginal glosses.

Figure 11.11 shows common margin widths for an 8.5 × 11-inch document.

White space can also set off and emphasize an element on the page. For instance, white space around a graphic separates it from the text and draws readers' eyes to it. White space between columns helps readers read the text easily. And white space between sections of text helps readers see that one section is ending and another is beginning.

Columns

Many workplace documents have multiple columns. A multicolumn design offers three major advantages:

- Text is easier to read because the lines are shorter.
- Columns allow you to fit more information on the page, because many graphics can fit in one column or extend across two or more columns. In addition, a multicolumn design can contain more words on a page than a single-column design.
- Columns let you use the principle of repetition to create a visual pattern, such as text in one column and accompanying graphics in an adjacent column.

Typography

Typography, the study of type and the way people read it, encompasses type-faces, type families, case, and type size, as well as the white space of typography: line length, line spacing, and justification.

In This Book

For more about marginal glosses, see p. 285.

TECH TIP

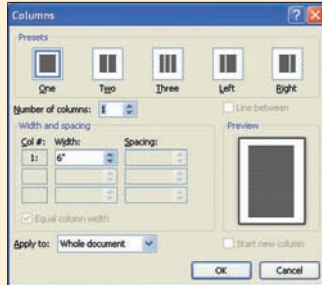
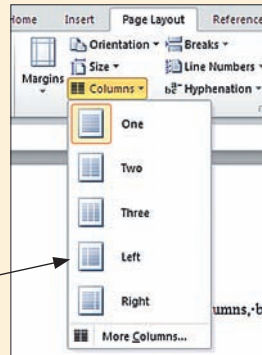
How to Format Columns

A multicolumn design allows you to fit more text on a page, create easier-to-read pages, and use more options when sizing graphics. To divide your document into multiple columns, select the **Page Layout** tab to use the **Columns** drop-down menu in the **Page Setup** group.

In the **Page Setup** group, select **Columns**.

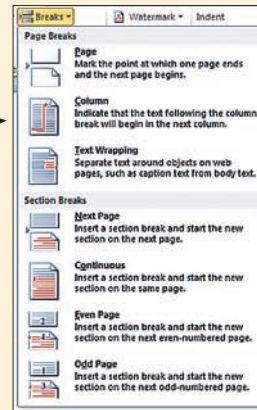
You can use **preset** layouts.

You can also select **More Columns** to launch the **Columns** dialog box. You can control the **number of columns** and specify the **width** and **spacing** yourself.



When you divide your document into columns, text flows from the bottom of one column to the top of the next column. Columns let you use the principle of repetition to create a visual pattern, such as text in one column and accompanying graphics in an adjacent column.

If you want to end a column of text in a specific location or create columns of equal length, use the **Breaks** drop-down menu to insert a **column break**. This action will move the text following the break to the next column.



KEYWORDS: columns, breaks, column break, page setup group

On TechComm Web

Webmonkey's Web Typography Tutorial offers excellent advice about typography for both online and print applications. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

Typefaces A typeface is a set of letters, numbers, punctuation marks, and other symbols, all bearing a characteristic design. There are thousands of typefaces, and more are designed every year. Figure 11.12 shows three contrasting typefaces.

As Figure 11.13 illustrates, typefaces are generally classified into two categories: *serif* and *sans serif*.

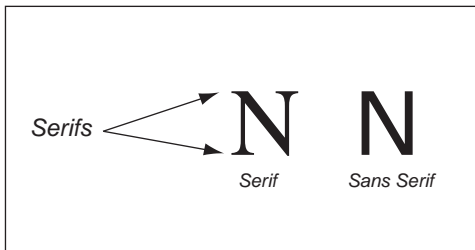
Most of the time you will use a handful of standard typefaces such as Times New Roman and Arial, which are included in your software and which your printer can reproduce.

This paragraph is typed in French Script typeface. You are unlikely to see this style of font in a technical document because it is too ornate and too hard to read. It is better suited to wedding invitations and other formal announcements.

This paragraph is Times Roman. It looks like the kind of type used by the *New York Times* and other newspapers in the nineteenth century. It is an effective typeface for text in the body of technical documents.

This paragraph is Univers, which has a modern, high-tech look. It is best suited for headings and titles in technical documents.

Figure 11.12 Three Contrasting Typefaces



Although scholars used to think that serif typefaces are easier to read because the serifs encourage readers' eyes to move along the line, most now believe that there is no difference in readability between serif and sans-serif typefaces, either in print or online.

Figure 11.13 Serif and Sans-Serif Typefaces

Type Families Each typeface belongs to a family of typefaces, which consist of variations on the basic style, such as italic and boldface. Figure 11.14, for example, shows the Helvetica family.

Be careful not to overload your text with too many different members of the same family. Used sparingly and consistently, they can help you with filtering: calling attention to various kinds of text, such as warnings and notes. Use italics for book titles and other elements, and use bold type for emphasis and headings. Stay away from outlined and shadowed variations. You can live a full, rewarding life without ever using them.

 **On TechComm Web**
For more information on typography, see the Document Design Tutorial on <bedfordstmartins.com/techcomm>.

Helvetica Light	Helvetica Bold Italic
<i>Helvetica Light Italic</i>	Helvetica Heavy
Helvetica Regular	Helvetica Heavy Italic
<i>Helvetica Regular Italic</i>	Helvetica Regular Condensed
Helvetica Bold	<i>Helvetica Regular Condensed Italic</i>

Figure 11.14 Helvetica Family of Type

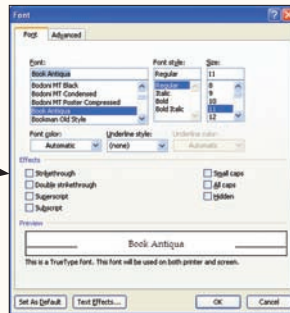
TECH TIP

How to Format Fonts

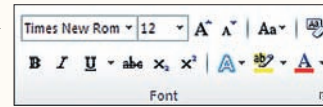
To improve the readability of your document, you can use the **Font** group on the **Home** tab to specify typographical elements such as typeface, style, size, color, character spacing, and text effects.

In the **Font group** menu, use the **Font** dialog box launcher to display the **Font** dialog box.

You can change the appearance of a typeface by checking **Effects** boxes.

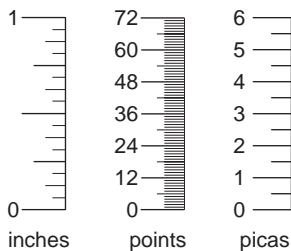


You can also specify basic font formatting such as typeface, type size, bold, italic, and underlining by using drop-down menus and buttons in the **Font** group.



KEYWORDS: font group, font, font style

Case To make your document easy to read, use uppercase and lowercase letters as you would in any other kind of writing (see Figure 11.15). The average person requires 10 to 25 percent more time to read text using all uppercase letters than to read text using both uppercase and lowercase. In addition, uppercase letters take up as much as 35 percent more space than lowercase letters (Haley, 1991). And if the text includes both cases, readers will find it easier to see where new sentences begin (Poulton, 1968).



Type Size Type size is measured with a unit called a *point*. There are 12 points in a *pica* and 72 points in an inch. In most technical documents 10-, 11-, or 12-point type is used for the body of the text:

This paragraph is printed in 10-point type. This size is easy to read, provided it is reproduced on a high-quality ink-jet printer or laser printer.

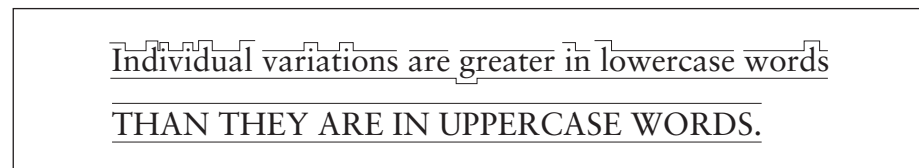


Figure 11.15 Individual Variations in Lowercase and Uppercase Type

Lowercase letters are easier to read than uppercase because the individual variations from one letter to another are greater.

This paragraph is printed in 12-point type. If the document will be read by people over age 40, 12-point type is a good size because it is more legible than a smaller size.

This paragraph is printed in 14-point type. This size is appropriate for titles or headings.

Type sizes used in other parts of a document include the following:

footnotes	8- or 9-point type
indexes	2 points smaller than body text
slides or transparencies	24- to 36-point type

In general, aim for at least a 2- to 4-point difference between the headings and the body. Too many size variations, however, suggest a sweepstakes advertisement rather than a serious text.

ETHICS NOTE

Using Type Sizes Responsibly

Text set in large type contrasts with text set in small type. It makes sense to use large type to emphasize headings and other important information. But be careful with small type. It is unethical (and, according to some court rulings, illegal) to use excessively small type (such as 6 points or smaller) to disguise information that you *don't* want to stand out. When you read the fine print in an ad for cell-phone service, you get annoyed when you figure out that the low rates are guaranteed for only three months or that you are committing to a long-term contract. You *should* get annoyed. It's annoying. Don't do it.

Line Length The line length most often used on an 8.5 × 11-inch page—about 80 characters—is somewhat difficult to read. A shorter line of 50 to 60 characters is easier, especially in a long document (Biggs, 1980).

Line Spacing Sometimes called *leading* (pronounced “ledding”), *line spacing* refers to the white space between lines or between a line of text and a graphic. If lines are too far apart, the page looks diffuse, the text loses coherence, and readers tire quickly. If lines are too close together, the page looks crowded and becomes difficult to read. Some research suggests that smaller type, longer lines, and sans-serif typefaces all benefit from extra line spacing. Figure 11.16 on page 280 shows three variations in line spacing.

Line spacing is usually determined by the kind of document you are writing. Memos and letters are single-spaced; reports, proposals, and similar documents are often double-spaced or one-and-a-half-spaced.

a. Excessive line spacing

Aronomink Systems has been contracted by Cecil Electric Cooperative, Inc. (CECI) to design a solid waste management system for the Cecil County plant, Units 1 and 2, to be built in Cranston, Maryland. The system will consist of two 600 MW pulverized coal-burning units fitted with high-efficiency electrostatic precipitators and limestone reagent FGD systems.

b. Appropriate line spacing

Aronomink Systems has been contracted by Cecil Electric Cooperative, Inc. (CECI) to design a solid waste management system for the Cecil County plant, Units 1 and 2, to be built in Cranston, Maryland. The system will consist of two 600 MW pulverized coal-burning units fitted with high-efficiency electrostatic precipitators and limestone reagent FGD systems.

c. Inadequate line spacing

Aronomink Systems has been contracted by Cecil Electric Cooperative, Inc. (CECI) to design a solid waste management system for the Cecil County plant, Units 1 and 2, to be built in Cranston, Maryland. The system will consist of two 600 MW pulverized coal-burning units fitted with high-efficiency electrostatic precipitators and limestone reagent FGD systems.

Figure 11.16 Line Spacing

Figure 11.17 shows how line spacing can be used to distinguish one section of text from another and to separate text from graphics.

Justification Justification refers to the alignment of words along the left and right margins. In technical communication, text is often *left-justified* (also called *ragged right*). Except for paragraph indentations, the lines begin along a uniform left margin but end on an irregular right border. Ragged right is most common in word-processed text (even though word processors can justify the right margin).

In *justified* text, also called *full-justified text*, both the left and right margins are justified. Justified text is seen most often in formal documents, such as books. The following passage (U.S. Department of Agriculture, 2002) is presented first in left-justified form and then in justified form:

Notice that the space between words is uniform in left-justified text.

We recruited participants to reflect the racial diversity of the area in which the focus groups were conducted. Participants had to meet the following eligibility criteria: have primary responsibility or share responsibility for cooking in their household; prepare food and cook in the home at least three times a week; eat meat and/or poultry; prepare meat and/or poultry in the home at least twice a week; and not regularly use a digital food thermometer when cooking at home.

Net (Cost)/Income (Dollars in Millions)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Earned Revenue	\$ 1,372.8	\$ 1,594.4	\$ 1,735.7	\$ 1,862.2	\$ 1,927.1
Program Cost	(1,424.0)	(1,514.2)	(1,769.6)	(1,892.6)	(1,981.9)
Net (Cost)/Income	\$ (51.2)	\$ 80.2	\$ (33.9)	\$ (30.4)	\$ (54.8)

STATEMENT OF NET COST

The Statement of Net Cost presents the USPTO's results of operations by the following responsibility segments—Patent, Trademark, and Intellectual Property Protection and Enforcement Domestically and Abroad. The above table presents the total USPTO's results of operations for the past five fiscal years. In FY 2005, the USPTO's operations resulted in a net cost. In FY 2006, the USPTO generated a net income due to the increased maintenance fees received and revenue recognition of previously deferred revenue collected subsequent to the fee increase on December 8, 2004. During FY 2007, FY 2008, and FY 2009 the USPTO's operations resulted in a net cost of \$33.9 million, \$30.4 million, and \$54.8 million, respectively.

The Statement of Net Cost compares fees earned to costs incurred during a specific period of time. It is not necessarily an indicator of net income or net cost over the life of a patent or trademark. Net income or net cost for the fiscal year is dependent upon work that has been completed over the various phases of the production life cycle. The net income calculation is based on fees earned during the fiscal year being reported, regardless of when those fees were collected. Maintenance fees also play a large part in whether a total net income or net cost is recognized. Maintenance fees collected in FY 2009 are a reflection of patent issue levels 3.5, 7.5, and 11.5 years ago, rather than a reflection of patents issued in FY 2009. Therefore, maintenance fees can have a significant impact on matching costs and revenue.

During FY 2009, with the number of patent filings decreasing by 2.3 percent over the prior year, the backlog for patent applications likewise decreased, decreasing deferred revenue and increasing earned revenue. This was evidenced by the Patent organization disposing of 22.9 percent more applications than were disposed of during FY 2008.

During FY 2009, with the number of trademark applications decreasing by 12.3 percent over the prior year, the Trademark organization was able to continue to address the existing inventory and reduce pendency by 0.3 months from FY 2008. The Trademark organization was able to do this while recognizing a slight decrease in revenue earned.

EARNED REVENUE

The USPTO's earned revenue is derived from the fees collected for patent and trademark products and services. Fee collections are recognized as earned revenue when the activities to complete the work associated with the fee are completed. The table below presents the earned revenue for the past five years.

Earned revenue totaled \$1,927.1 million for FY 2009, an increase of \$64.9 million, or 3.5 percent, over FY 2008 earned revenue of \$1,862.2 million. Of revenue earned during FY 2009, \$454.3 million related to fee collections that were deferred for revenue recognition in prior fiscal years, \$546.7 million related to maintenance fees collected during FY 2009, which were considered earned immediately, \$920.7 million related to work performed for fees collected during FY 2009, and \$5.4 million were not fee-related.

Earned Revenue (Dollars in Millions)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Patent	\$ 1,197.8	\$ 1,384.2	\$ 1,507.0	\$ 1,625.0	\$ 1,697.4
Percentage Change in Patent Earned Revenue	9.6%	15.6%	8.9%	7.8%	4.5%
Trademark	175.0	210.2	228.7	237.2	229.7
Percentage Change in Trademark Earned Revenue	19.5%	20.1%	8.8%	3.7%	(3.2)%
Total Earned Revenue	\$ 1,372.8	\$ 1,594.4	\$ 1,735.7	\$ 1,862.2	\$ 1,927.1
Percentage Change in Earned Revenue	10.8%	16.1%	8.9%	7.3%	3.5%

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The line spacing between two sections is greater than the line spacing within a section.

Line spacing is also used to separate the text from the graphics.

Figure 11.17 Line Spacing Used to Distinguish One Section from Another

Source: U.S. Patent and Trademark Office, 2010 <www.uspto.gov/about/stratplan/ar/2009/2009annualreport.pdf>.

In justified text, the spacing between words is irregular, slowing down the reader. Because a big space suggests a break between sentences, not a break between words, readers can become confused, frustrated, and fatigued.

We recruited participants to reflect the racial diversity of the area in which the focus groups were conducted. Participants had to meet the following eligibility criteria: have primary responsibility or share responsibility for cooking in their household; prepare food and cook in the home at least three times a week; eat meat and/or poultry; prepare meat and/or poultry in the home at least twice a week; and not regularly use a digital food thermometer when cooking at home.

Notice that the irregular spacing not only slows down reading but also can create "rivers" of white space. Readers are tempted to concentrate on the rivers running south rather than on the information itself.

Full justification can make the text harder to read in one more way. Some word processors and typesetting systems automatically hyphenate words that do not fit on the line. Hyphenation slows down and distracts the reader. Left-justified text does not require as much hyphenation as full-justified text.

TECH TIP

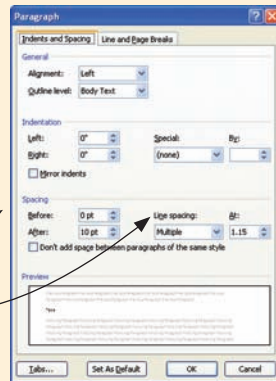
How to Modify Line Spacing

When designing a page, you can adjust the white space between lines of text and before or after each paragraph by using the **Paragraph** dialog box and the **Line Spacing** drop-down menu.

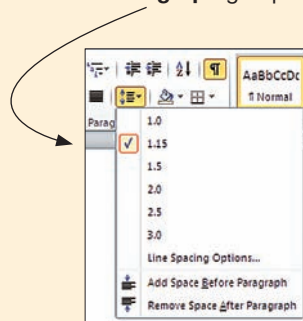
In the **Paragraph** group, use the **Paragraph** dialog box launcher to display the **Paragraph** dialog box.

In the **Paragraph** dialog box, you can change the **spacing before and after paragraphs**.

You can also specify the **line spacing**, the space between lines of text.



You can select **preset** line-spacing options by using the **Line Spacing** drop-down menu in the **Paragraph** group.



KEYWORDS: line spacing, paragraph spacing, paragraph group

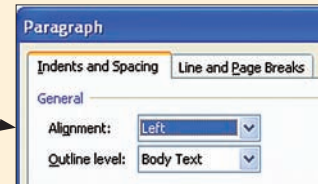
TECH TIP

How to Modify Justification





To increase the readability of your document, you can specify the alignment of words along the left and right margins by using the **Paragraph** dialog box or using buttons in the **Paragraph** group.

To modify justification using the **Paragraph** dialog box, select the **Paragraph** dialog box launcher.

You can specify that lines begin along a left margin, align at the right margin, are centered on the page, or are justified.



To modify justification using buttons in the **Paragraph** group, select one of the following buttons:

-  To left-align text
-  To right-align text
-  To center text
-  To justify text

KEYWORDS: alignment, justify text, justification, paragraph group

Titles and Headings

Titles and headings should stand out visually on the page because they present a new idea.

Titles Because a title is the most important heading in a document, it should be displayed clearly and prominently. If it is on a cover page or a title page, use boldface in a large size, such as 18 or 24 points. If it also appears at the top of the first page, make it slightly larger than the rest of the text—perhaps 16 or 18 points for a document printed in 12 point—but smaller than it is on the cover or title page. Many designers center titles on the page between the right and left margins.

Headings Readers should be able to tell when you are beginning a new topic. The most effective way to distinguish one level of heading from another is to use size variations (Williams & Spyridakis, 1992). Most readers will notice a 20 percent size difference between a first-level heading and a second-level heading. Boldface also sets off headings effectively. The least effective way to set off headings is underlining, because the underline obscures the *descenders*, the portions of letters that extend below the body of the letters, such as in *p* and *y*.

In general, the more important the heading level, the closer it is to the left margin: first-level headings usually begin at the left margin, second-level headings are often indented a half inch, and third-level headings are often indented an inch. Indented third-level headings can also be run into the text.

In designing headings, use line spacing carefully. A perceivable distance between a heading and the following text increases the impact of the heading. Consider these three examples:

Summary

In this example, the writer has skipped a line between the heading and the text that follows it. The heading stands out clearly.

Summary

In this example, the writer has not skipped a line between the heading and the text that follows it. The heading stands out, but not as emphatically.

Summary. In this example, the writer has begun the text on the same line as the heading. This run-in style makes the heading stand out the least.

 **In This Book**

For more about titling your document, see Ch. 9, p. 205.

 **In This Book**

For more about using headings, see Ch. 9, p. 206.

 **On TechComm Web**

For more information on designing headings, see the Document Design Tutorial on <bedfordstmartins.com/techcomm>.

Other Design Features

Table 11.3 shows five other design features that are used frequently in technical communication: rules, boxes, screens, marginal glosses, and pull quotes.

TABLE 11.3 ▶ Rules, Boxes, Screens, Marginal Glosses, and Pull Quotes

Two types of rules are used here: the vertical rules to separate the columns, and the blue horizontal rules to separate the items. Rules enable you to fit a lot of information on a page, but when overused they make the page look cluttered.



Source: Institute of Scientific and Technical Communicators, 2005, p. 43.

Rules. A *rule* is a design term for a straight line. Using the drawing tools in a word processor, you can add rules. Horizontal rules can separate headers and footers from the body of the page or divide two sections of text. Vertical rules can separate columns on a multicolumn page or identify revised text in a manual. Rules exploit the principles of alignment and proximity.



Source: Valley, 2005, p. 61.

Boxes. Adding rules on all four sides of an item creates a box. Boxes can enclose graphics or special sections of text, or form a border for the whole page. Boxed text is often positioned to extend into the margin, giving it further emphasis. Boxes exploit the principles of contrast and repetition.

TABLE 11.3 ▶ Rules, Boxes, Screens, Marginal Glosses, and Pull Quotes (continued)

The use of three different colors of screens clearly distinguishes the three sets of equations.

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Number of individuals that have the genotype divided by the total number of individuals in the population. Frequency of a gene (G) is the proportion of all G alleles in the population. Frequency of a gene (g) is the proportion of all g alleles in the population. Allele frequencies remain the same in the population of different generations in a Hardy-Weinberg population. The Hardy-Weinberg equilibrium equation is $p^2 + 2pq + q^2 = 1$. The Hardy-Weinberg equation is a mathematical model that predicts the genetic structure of a population. It is based on the following assumptions: 1. The population is large. 2. The population is isolated. 3. There is no mutation. 4. There is no migration. 5. There is no natural selection. 6. Mating is random. The Hardy-Weinberg equation is a mathematical model that predicts the genetic structure of a population. It is based on the following assumptions: 1. The population is large. 2. The population is isolated. 3. There is no mutation. 4. There is no migration. 5. There is no natural selection. 6. Mating is random. The Hardy-Weinberg equation is a mathematical model that predicts the genetic structure of a population. It is based on the following assumptions: 1. The population is large. 2. The population is isolated. 3. There is no mutation. 4. There is no migration. 5. There is no natural selection. 6. Mating is random.

Source: Purves, Sadava, Orians, and Heller, 2004, p. 466.

This author uses marginal glosses for presenting definitions of key words.

interest underlies all and minimize costs, utilitarianism. Social whether to donate and anxiety) against to anticipate rewards

nd give directions to the how we ought to learn the reciprocity to those who have rocky norm compels as we receive. With eive, we also learn a bur help, even if the ho each week attend y norm: They report and infirm than do (Wetzman, 1992).

- **bystander effect** the tendency for any given bystander to be less likely to give aid if other bystanders are present.
- **social exchange theory** the theory that our social behavior is an exchange process, the aim of which is to maximize benefits and minimize costs.
- **superordinate goals** shared goals that override differences among people and require their cooperation.

Source: Myers, 2003, p. 603.

This pull quote is placed in the margin, but it can go anywhere on the page, even spanning two or more columns or the whole page.

Puritan leaders, however, interpreted an error caused either by a misguided or by the malevolent power of Satan. the cause, errors could erated. As one Puritan roclaimed, "God doth in his word tolerate States, to give s to . . . adversaries of if they have power in to suppress them. The saith . . . there is no one."

y after banishing Roger Winthrop confronted another dis- time—as one New Englander ob- "Woman that Preaches better Gospell of your black-coates that have been at eversity." The woman was Anne n, a devout Puritan steeped in Scripture orbed by religious questions. n had received an excellent education uthor in England. The mother of four

Almost from the beginning, John Winthrop and other leaders had difficulty enforcing their views of Puritan orthodoxy.

Source: Roark et al., 2005, p. 115.

Screens. The background shading behind text or graphics for emphasis is called a *screen*. The density can range from 1 percent to 100 percent; 5 to 10 percent is usually enough to provide emphasis without making the text illegible. You can use screens with or without boxes. Screens exploit the principles of contrast and repetition.

Marginal glosses. A marginal gloss is a brief comment on the main discussion. Marginal glosses are usually set in a different typeface—and sometimes in a different color—from the main discussion. Although marginal glosses can be helpful in providing a quick overview of the main discussion, they can also compete with the text for readers' attention. Marginal glosses exploit the principles of contrast and repetition.

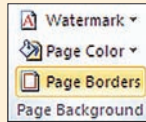
Pull quotes. A pull quote is a brief quotation (usually just a sentence or two) that is pulled from the text, displayed in a larger type size and usually in a different typeface, and sometimes enclosed in a box. Newspapers and magazines use pull quotes to attract readers' attention. Pull quotes are inappropriate for reports and similar documents because they look too informal. They are increasingly popular, however, in newsletters. Pull quotes exploit the principles of contrast and repetition.

TECH TIP

How to Create Borders and Screens

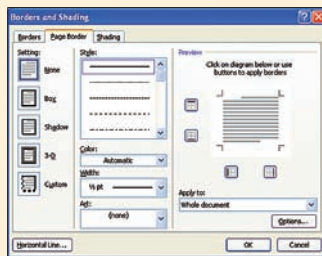
To emphasize page elements by enclosing them in a box or including background shading, use the **Borders and Shading** dialog box.

To create a **border** around a page element or an entire page, select the area you want to format. Select the **Page Layout** tab, and then select **Page Borders** in the **Page Background** group.

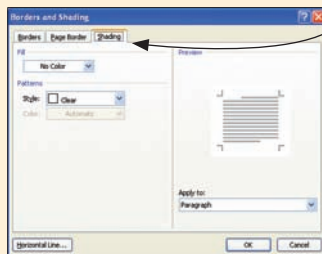


Select the **Borders** or **Page Border** tab.

You can specify the type of border, line style, color, and line width.



To create **shading**, also called a screen, select the area you want to format, and then select **Page Borders** on the **Page Background** group. Select the **Shading** tab.



You can specify the color within the box as well as the style of the pattern.

KEYWORDS: borders, page borders, shading, page background group

TECH TIP

How to Create Text Boxes

To emphasize graphics or special sections of text or to position such elements independently of your margins, use the **Text Box** feature in the **Text** group on the **Insert** tab.

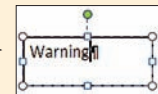


To **create** a text box, select **Draw Text Box** from the **Text Box** drop-down menu.

Click and drag your cursor to create your text box.

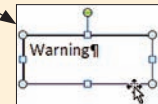


Click inside the text box and begin typing.



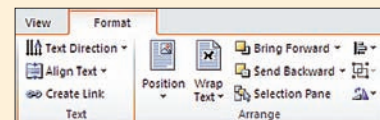
You can select the text box and move it around your page.

You can also insert a **built-in** text box from the **Text Box** drop-down menu.



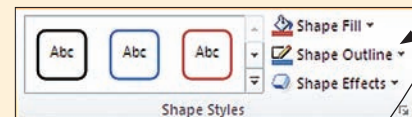
To **format** your text box, select the box and then select the **Format Shape** dialog box launcher from the **Shape Styles** group on the **Format** tab.

The **Arrange** group allows you to specify design elements such as the text box's position in relation to other objects and the wrapping style of the surrounding text.



After selecting the box, you can also use buttons on the **Format** tab to

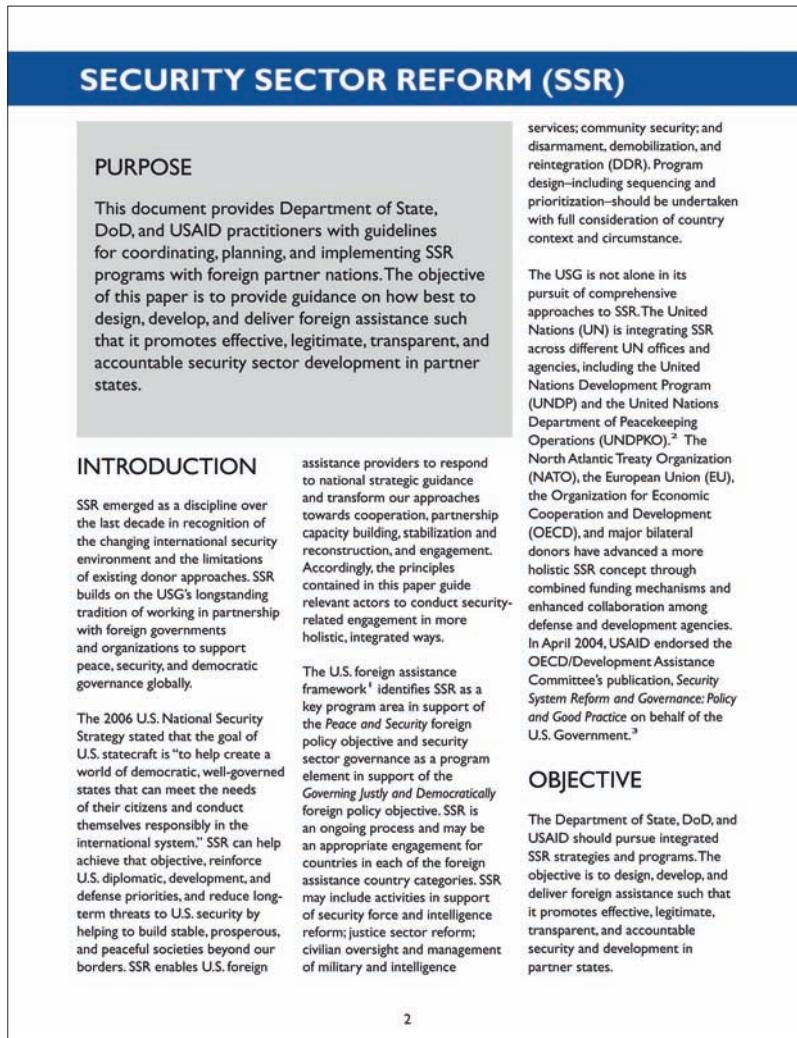
specify such design elements as fill color, line color, font color, line style, and other effects.



KEYWORDS: text box, drawing toolbar, fill color, line color

ANALYZING SOME PAGE DESIGNS

Figures 11.18 to 11.21 show typical page designs used in technical documents. These figures illustrate the concepts discussed in this chapter.



A multicolumn design can be flexible. Here, the writer emphasizes the "Purpose" section by breaking the three-column design, using a screen, and using a larger typeface than that used for the text.

Figure 11.18 A Multicolumn Design

Source: U.S. Agency for International Development, U.S. Department of Defense, and U.S. Department of State, 2009 <www.usaid.gov/our_work/democracy_and_governance/publications/pdfs/SSR_JS_Mar2009.pdf>.

This page from a government handbook shows one approach to a one-column design.

The main text column is relatively narrow, making the line easy to read.

The left margin is wide enough to accommodate notes.

How Do I Choose the Right Amount of Life Insurance?

Purchasing life insurance is a personal decision that only you can make. You should first consider the funds your survivors will need for immediate expenses, such as: uninsured medical costs, funeral expenses, lawyers' fees to settle an estate, debts, and taxes. Young single people, who often don't buy life insurance because they have no dependents, should consider that funeral expenses can amount to thousands of dollars and should be provided for in some way.

Here are some very general guidelines that may help you. Not everyone will need the same amount of life insurance. Fill in the blanks to estimate your family's needs. If a particular line doesn't apply, or you think it is too much coverage, just skip it. These results are just rules of thumb. For a complete analysis of your needs, you may want to consult a financial planner.

LIFE INSURANCE...HOW MUCH DO I NEED?

1. Multiple of your annual income (in dollars) that you wish to provide your family if something were to happen to you*	\$ _____ (1)
2. Annual expenses above and beyond daily living costs for you and your dependents (e.g., tuition, care for a disabled child or parent) +	_____ (2)
3. Emergency funds (3 to 6 months of living expenses) +	_____ (3)
4. Estimated amount for your funeral expenses (U.S. average is \$5,000 to \$10,000)†	+ _____ (4)
5. Total the estimate of your family's needs (add lines 1 through 4) =	_____ (5)
6. Your total liquid assets (e.g., savings accounts, CDs, money market funds, existing life insurance) -	_____ (6)
7. Subtract line 6 from line 5 and enter the difference here: = \$	_____ (7)

The net result (line 7) is an estimate of the shortfall your family could face upon your death. Remember, these results are just rules of thumb. For a complete analysis of your needs, you may want to consult a financial planner. The maximum coverage on your life available through FEGLI is about six times your salary (or about seven times for enrollees age 35 or under), through a combination of Basic, the Extra Benefit, Option A (\$10,000), and Option B (maximum of 5 times your salary). See the rest of this Booklet for details.

* Most life insurance consultants recommend at least five times your annual income. Source: Kiplinger's (Kiplinger.com, Jan., 2003).

† Source: AARP, Funeral and Burial Costs, 2002.

Consider the Way Things Are...

In addition to completing the calculation above, there are some other situations you might want to consider when determining how much life insurance you need. Remember to take into account whether you have:

- a spouse and/or dependent children;
- an aging parent and/or a disabled relative who depends on you for support;
- savings and/or accumulated debt;
- a sizable estate and/or a business.

Be sure to reevaluate your life insurance needs periodically. If you think you need more coverage, see page 11 for more information.

5

Figure 11.19 A One-Column Design

Source: U.S. Office of Personnel Management, 2004 <www.opm.gov/insure/life/reference/federal/booklet.pdf>.

HUMAN TRAFFICKING FOR ORGAN REMOVAL

Mohammad Salim Khan woke up in a strange house and felt an excruciating pain in his abdomen. Unsure where he was, Khan asked a man wearing a surgical mask what had happened. "We have taken your kidney," the stranger said, according to a January 2008 Associated Press report. "If you tell anyone, we'll shoot you."

Six days earlier, Khan, a 33-year-old Indian day laborer from New Delhi, had been approached by a bearded man offering a construction job. The man explained that the work would pay \$4 a day – not unusual in India – and would last three months. Khan, a father of five, jumped at the chance for work.

He traveled with the man to a small town several hours away. Once there, Khan was locked in a room and forced at gunpoint to give a blood sample and take drugs that made him unconscious. He didn't wake up until after surgery. Police raided the illegal clinic afterward, rescuing Khan and two other men. Khan never received money for his kidney, and it took months to recover physically. Indian authorities pursued charges against the doctor involved.

Khan was trafficked for the purpose of organ removal.

The UN TIP Protocol prohibits the use of human trafficking for the purpose of organ removal. This may include situations in which a trafficker causes the involuntary removal of another living person's organ, either for profit or for another benefit, such as to practice traditional medicine or witchcraft.

A far greater number of organs are obtained from people in the developing world, sometimes through exploitative means, and sold in a highly lucrative international market. The UN TIP Protocol does not cover this voluntary sale of organs for money, which is considered lawful in most countries.

But the demand for organs is rising as the world's rich are growing older. At the same time, the world's poor are growing poorer, and the potential for more human trafficking cases like Khan's is increasing. The World Health Organization (WHO) estimates that 10 percent of the 70,000 kidneys transplanted each year may originate on the black market.

or recruiters unlawfully exploit an initial debt the worker assumed as part of the terms of employment.

Workers may also inherit debt in more traditional systems of bonded labor. Traditional bonded labor in South Asia, for example, enslaves huge numbers of people from generation to generation. A January 2009 report by Anti-Slavery International, a London-based NGO, concluded that this form of forced labor, traditionally more prevalent in villages, is expanding into urban areas of the region, rather than diminishing on an aggregate level, as the result of development and modernization.

Debt Bondage Among Migrant Laborers

The vulnerability of migrant laborers to trafficking schemes is especially disturbing because the population is sizeable in some regions. There are three potential contributing factors: (1) abuse of contracts; (2) inadequate local laws governing the recruitment and employment

of migrant laborers; and (3) intentional imposition of exploitative and often illegal costs and debts on these laborers in the source country, often with the support of labor agencies and employers in the destination country.

Abuses of contracts and hazardous conditions

"We are blind to trafficking all around us, and we should be more alert to the fact that trafficking is not a 'remote' issue but rather something that is local to us and impacts on our communities."

Nick Kinsella, Chief Executive Officer of the UK Human Trafficking Centre.

INTRODUCTION

17

This page is a two-column design, with several embellishments.

The dark red bar functions as a header or footer, including the part title and the page number.

The "Human Trafficking for Organ Removal" section is distinguished from the main text by its single-column design, its screen, and the flush-left text with no paragraph indentations.

The pull quote uses reverse type: light text on a dark background. In addition, the pull quote extends to the edge of the page, giving it additional emphasis.

The headings use the same color as the bar at the edge of the page.

Figure 11.20 A Complex Page Design

Source: U.S. Department of State, 2009 <www.state.gov/documents/organization/123360.pdf>.

The writer of this document hasn't designed the page. He or she has simply hit the Enter key repeatedly.

The full justification makes for a boxy appearance and irregular spacing between words.

The wide column results in long, difficult-to-read lines.

The two hierarchical levels—lettered and numbered—have the same design and therefore are difficult to distinguish from each other.

In the table, the second column is misaligned.

The footer, which includes the date and the page number, is a useful design feature, however.

(f) *Drug Purity - DEA Form 7*

(1) The presentence report will normally provide drug weight/purity information from DEA Form 7. This is a complicated form. "Total net weight" [normally in Item 31] refers to the amount of the pure drug. This is the weight used in calculation of the Commission's severity rating. For your information, "gross weight" is the weight of the drug plus adulterants plus the container (normally found in Item 24). Also normally found in Item 24 is "net weight" (the weight of the drug plus adulterants). "Strength" (the percent purity of the drug) is normally found in Item 28. Multiplying "net weight" x "strength" is how DEA arrives at the "total net weight". Remember, "total net weight" is the weight of the pure drug to be used in assessing the Commission's severity rating.

(2) If a presentence report does not specify "total net weight", the probation officer should be contacted for clarification (please be specific as to the clarification necessary; this will enhance feedback/training). Note: DEA lab reports (DEA Form 7), if necessary, also may be obtained directly from the DEA field office for the geographic area in which the offense occurred. If a request to the DEA field office is required, provide the subject's name, date of birth, place of offense, and dates of offense.

(g) If neither weight nor purity is available, but only a money value, DEA may be requested to provide an estimate of the amount of pure drug associated with that money value. In the absence of a specific estimate from DEA pertaining to the particular case, DEA publishes a report (Domestic Drug Prices) providing estimates of average drug prices by year and region from which an estimate may be obtained.

(h) *Determining Offense Severity Relative to Simple Possession of Drugs.* In certain cases, the Commission must determine whether the offense behavior should be considered as "simple possession" of a controlled substance or "possession with intent to distribute." In making this determination, the Commission shall examine a variety of factors (if available). These factors are shown below. The presence of any of the following factors may be considered as a presumption of possession with intent to distribute. However, this presumption may be rebutted if there are circumstances in the individual case which indicate that there was no intention to distribute.

(1) *Weight/amount/purity of the substance:* Possession of the following amounts of controlled substances are presumed to indicate possession with intent to distribute:

Heroin	1 gm. at 100% purity, or equivalent amount; or more
Cocaine	5 gms. at 100% purity, or equivalent amount; or more
Marijuana	10 lbs. or more
Hashish	3 lbs. or more
Hash Oil	.3 lbs. or more
Drugs (other than above)	1,000 doses or more.

(2) *Other Factors:* The presence of any of the following factors may be considered indicative of intent to distribute: (A) the substance has been separated into multiple, individual packets; (B) the offender is a non-user of the substance in question; (C) the presence of instruments used in preparing

*Terms marked by an asterisk are defined in Chapter Thirteen.

11/15.07 Page 60 of 337


Figure 11.21 A Poorly Designed Page

Source: U.S. Department of Justice, 2010 <www.justice.gov/uspc/rules_procedures/uspc-manual111507.pdf>.

INTERACTIVE SAMPLE DOCUMENT


Analyzing a Page Design

The following page is from a government report. The questions in the margin ask you to think about page design (as discussed on pp. 271–86).



USAID | SUDAN

FROM THE AMERICAN PEOPLE




MONTHLY UPDATE

March 2010

New Girls' Secondary School in Blue Nile State Honors Fallen USAID Staff

USAID on March 8 officially presented to the Blue Nile State Ministry of Education the new Granville-Abbas Girls' Secondary School in Kurmuk. Designed as a model of girls' education for the region, the school was dedicated on International Women's Day to highlight the importance of educating girls.

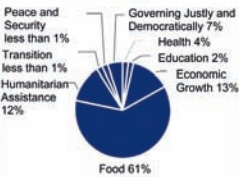


*A local music group celebrates at the opening of the Granville-Abbas Girls' Secondary School in Kurmuk, Blue Nile state.
Photo: Rebecca Dobbins/USAID*

The school was named in honor of John Granville, an American diplomat who worked for USAID in Sudan, and his Sudanese colleague Abdelrahman Abbas Rahama, who were both assassinated in Khartoum on January 1, 2008. The Granville-Abbas Girls' Secondary School serves as a testimony to their service and commitment to the people of Sudan.

The school, which can accommodate 120 female students, includes three sets of classrooms, a library, theater, cafeteria, dormitories, and teachers' offices. The Health, Education and Reconciliation (HEAR) Program Education Resource Center, a USAID-supported learning center attached to the school, provides students with Internet access and computer training. The school is part of USAID's efforts to increase Sudan's capacity to provide quality primary and secondary

USAID Assistance to Sudan FY 2009



Peace and Security	\$6.7
Governing Justly and Democratically	\$72.7
Health	\$47.1
Education	\$25.5
Economic Growth	\$140.8
Food Aid	\$679.7*
Humanitarian Assistance	\$127.6*
Transition	\$4.3
TOTAL	\$1,104.4

Note: Amounts in millions
* Includes eastern Chad

U.S. Agency for International Development
www.usaid.gov

1. Describe the use of proximity as a design principle on this page. How effective is it?
2. Describe the use of alignment as a design principle on this page. How effective is it?
3. Describe the use of repetition as a design principle on this page. How effective is it?
4. Describe the use of contrast as a design principle on this page. How effective is it?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 11 on <bedfordstmartins.com/techcomm>.

Source: U.S. Agency for International Development, 2010 <www.usaid.gov/locations/sub-saharan_africa/countries/sudan/docs/mar10_monthly_update.pdf>.

DESIGNING WEB SITES

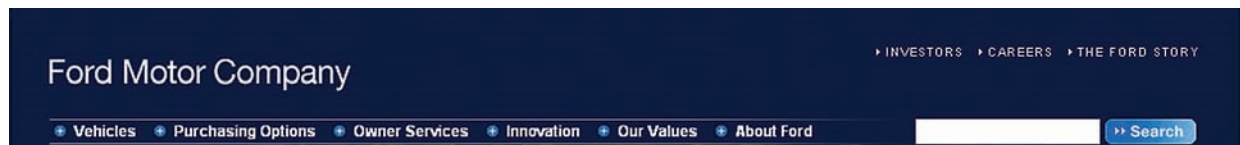
The discussion of designing printed documents focused on four components: size, paper, bindings, and accessing tools. Of these four components, only accessing tools are relevant to Web sites. But they are vitally important because if you can't figure out how to find the information you want on a Web site, you're out of luck. With a printed document, you can at least flip through the pages, hoping that you'll find what you're looking for.

The following discussion focuses on six principles that can help you make it easy for readers to find and understand the information you provide:

- Create informative headers and footers.
- Help readers navigate the site.
- Include extra features your readers might need.
- Help readers connect with others.
- Design for readers with disabilities.
- Design for multicultural readers.

Create Informative Headers and Footers

Headers and footers help readers understand and navigate your site, and they help establish your credibility. You want readers to know that they are visiting the official site of your organization and that it was created by professionals. Figure 11.22 shows a typical Web site header, and Figure 11.23 shows a typical Web site footer.



Notice that a header in a Web site provides much more accessing information than a header in a printed document. This header from Ford lets readers search the site or link directly to the major sections of the site.

Figure 11.22 Web Site Header

Source: Ford Motor Company, 2010 <www.ford.com>.



This simply designed footer presents all the links as text. Readers with impaired vision who use text-to-speech devices are able to understand these textual links; they would not be able to understand them if they were graphical links. The links to the left lead to a dealer directory, a site map, a contact page, and a feedback form. The links on the right lead to some of the site's legal and privacy information.

Figure 11.23 Web Site Footer

Source: Ford Motor Company, 2010 <www.ford.com>.

Help Readers Navigate the Site

Because readers of a Web site can view only the page that appears on the screen, each page should help them see where they are in the site and get where they want to go. One important way to help readers navigate is to create and sustain a consistent visual design on every page. Make the header, footer, background color or pattern, typography (typeface, type size, and color), and placement of the navigational links the same on every page. That way, readers will know where to look for these items.

Guidelines

Making Your Site Easy to Navigate

Follow these five suggestions to make it easy for readers to find what they want on the site.

- ▶ **Include a site map or index.** A site map, which lists the pages on the site, can be a graphic or a textual list of the pages, classified according to logical categories. An index is an alphabetized list of the pages. Figure 11.24 on page 294 is a portion of the genome.gov site map.
- ▶ **Use a table of contents at the top of long pages.** If your page extends for more than a couple of screens, include a table of contents—a set of links to the items on that page—so that your readers do not have to scroll down to find the topic they want. Tables of contents can link to information further down on the same page or to information on separate pages. Figure 11.25 on page 294 shows an excerpt from the table of contents at the top of a frequently asked questions (FAQ) page.
- ▶ **Help readers get back to the top of long pages.** If a page is long enough to justify a table of contents, include a “Back to top” link (a textual link or a button or icon) before the start of each new chunk of information.
- ▶ **Include a link to the home page on every page.** This link can be a simple “Back to home page” textual link, a button, or an icon.
- ▶ **Include textual navigational links at the bottom of the page.** If you are using buttons or icons for links, include textual versions of those links at the bottom of the page. Readers with impaired vision might be using special software that reads the information on the screen. This software interprets text only, not graphics.

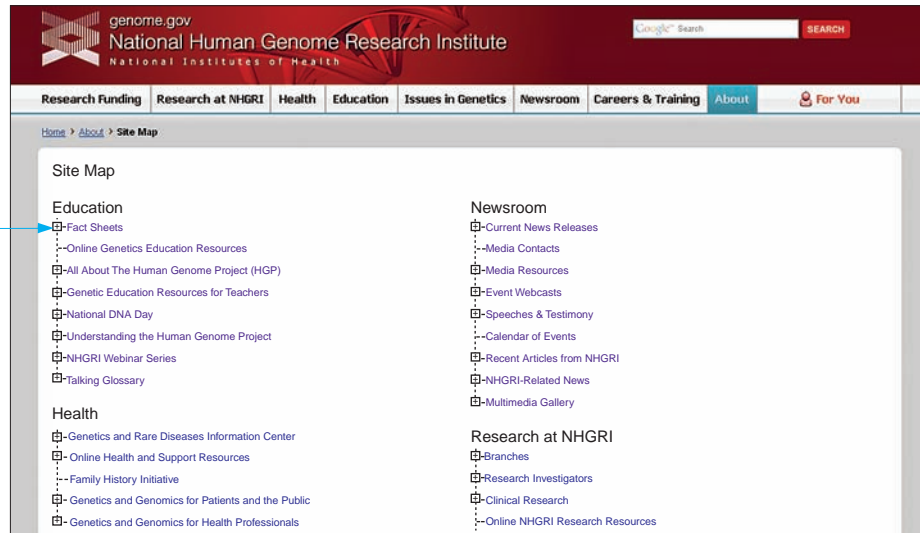
On TechComm Web

For advice on how to design an effective site map, see Jakob Nielsen's “Site Map Usability.” Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

Include Extra Features Your Readers Might Need

Because readers with a range of interests and needs will visit your site, consider adding some or all of the following five features:

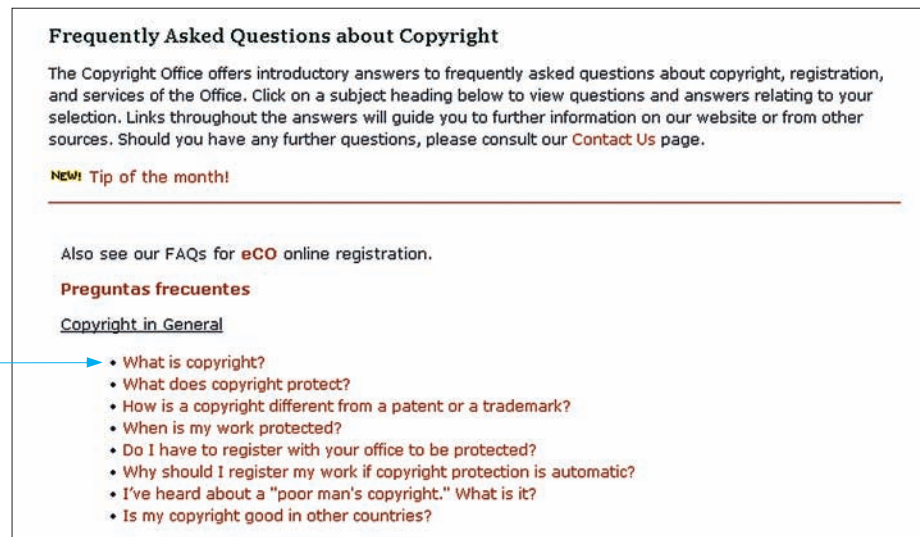
- **An FAQ.** A list of frequently asked questions helps new readers by providing basic information, explaining how to use the site, and directing them to more-detailed discussions.
- **A search page or engine.** A search page or search engine lets readers enter a keyword or phrase and find all the pages on the site that contain it.



In this site map, plus signs indicate pages that have subordinate pages.

Figure 11.24 Site Map

Source: National Institutes of Health, 2010 <www.genome.gov/sitemap.cfm>.



The reader clicks on a red question to go to its answer.

Figure 11.25 Table of Contents

Source: U.S. Copyright Office, 2010 <www.copyright.gov/help/faq>.

- *Resource links.* If one of the purposes of your site is to educate readers, provide links to other sites.
- *A printable version of your site.* A Web site is designed for a screen, not a page. A printable version of your site, with black text on a white back-

ground, and all the text and graphics consolidated into one big file, saves readers paper and toner.

- A *text-only version of your site*. Many readers with impaired vision rely on text because their specialized software cannot interpret graphics. Consider creating a text-only version of your site for these readers, and include a link to it on your home page.

Help Readers Connect with Others

An organization's Web site is the main way for clients, customers, suppliers, journalists, government agencies, and the general public to learn about and interact with the organization. For this reason, most organizations use their Web sites to connect with their various stakeholders through social media such as discussion boards and blogs.

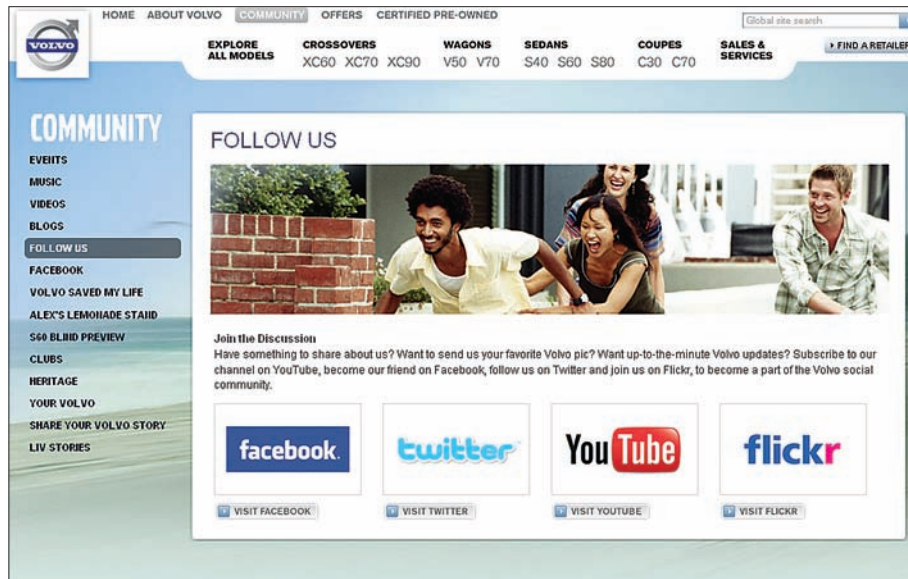
Use your Web site to direct readers to interactive features on your own site, as well as to your pages on social-media sites such as Facebook or Twitter. Figure 11.26 shows Volvo's "Community" page.

Design for Readers with Disabilities

The Internet has proved to be a terrific technology for people with disabilities because it brings a world of information to their computers, allowing them to work from home and participate in virtual communities. However,

On TechComm Web

For a detailed look at accessibility issues, see the Web Accessibility Initiative, from the World Wide Web Consortium. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.



Volvo's "Community" page directs readers to various events, videos, and blogs on the Volvo site, as well as to four external social-media sites.

Figure 11.26 Helping Readers Connect with Others

Source: Volvo Cars, 2010 <www.volvocars.com/us/top/community/pages/followus.aspx>.

most sites on the Internet are not designed to accommodate people with disabilities.

The following discussion highlights several ways to make your site easier to use for people with disabilities. Consider three main types of disabilities as you design your site:

- *Vision impairment.* People who cannot see, or cannot see well, rely on text-to-speech software. Provide either a text-only version of the site or textual equivalents of all your graphics. Use the “alt” (alternate) tag to create a textual label that appears when the reader holds the mouse over the graphic.

Do not rely on color or graphics alone to communicate information. For example, if you use a red icon to signal a warning, also use the word *warning*. If you use tables to create columns on the screen, label each column clearly using a text label rather than just an image.

Use 12-point type or larger throughout your site, and provide audio feedback—for example, having a button beep when the reader presses it.

- *Hearing impairment.* If you use video, provide captions and, if the video includes sound, a volume control. Also use visual feedback techniques; for example, make a button flash when the reader presses it.
- *Mobility impairment.* Some people with mobility impairments find it easier to use the keyboard than a mouse. Therefore, build in keyboard shortcuts wherever possible. If readers have to click on an area of the screen using a pointing device, make the area large so that it is easy to see and click.

Design for Multicultural Audiences

About 75 percent of the people using the Internet are nonnative speakers of English, and that percentage continues to grow as more people from developing nations go online (Internet World Stats, 2010). Therefore, it makes sense to plan your site as if many of your readers will not be proficient in English.

Planning for a multicultural Web site is similar to planning for a multicultural printed document:

- *Use common words and short sentences and paragraphs.*
- *Avoid idioms, both verbal and visual, that might be confusing.* For instance, don't use sports metaphors, such as *full-court press*, or a graphic of an American-style mailbox to suggest an e-mail link.
- *If a large percentage of your readers speak a language other than English, consider creating a version of your site in that language.* The expense can be considerable, but so can the benefits.

ETHICS NOTE

Designing Legal and Honest Web Sites

You know that the words and images that you see on the Internet are covered by copyright, even if you see no copyright symbol. The only exceptions are information that is in the public domain because it is not covered by copyright (such as information created by federal government sources), because copyright has expired (the author has been dead over 70 years), or because the creator of the information explicitly states that the information is in the public domain and you are free to copy it.

But what about the design of a Web site? Almost all Web designers readily admit to spending a lot of time looking at other sites and pages for inspiration. And they admit to looking at the code to see how that design was achieved. This is perfectly ethical. So is copying the code for routine elements such as tables. But is it ethical to download the code for a whole page, including the layout and the design, then plug in your own data? No. Your responsibility is to create your own information, then display it with your own design.

In This Book

For more about copyright law, see Ch. 2, p. 23.

DESIGNING WEB PAGES

Well-designed Web pages are simple, with only a few colors and nothing extraneous. In addition, the text is easy to read and chunked effectively, and the links are written carefully so readers know where they are being directed.

Aim for Simplicity

When you create a site, it doesn't cost anything to use all the colors in the rainbow, to add sound effects and animation, to make text blink on and off. Most of the time, however, these effects only slow the download and annoy the reader. If a special effect serves no useful function, avoid it.

Guidelines

Designing a Simple Site

Follow these four suggestions to make your design attractive and easy to use.

- ▶ **Use simple backgrounds.** A plain white background or a pale pastel is best. Avoid loud patterns that distract the reader from the words and graphics of the text. You don't want readers to notice the background.
- ▶ **Use conservative color combinations to increase text legibility.** The greater the contrast between the text color and the background color, the more legible the text. The most legible color combination is black text against a white background. Bad idea: black on purple.
- ▶ **Avoid decorative graphics.** Don't waste space using graphics that convey no useful information. Think twice before you use clip art.
- ▶ **Use thumbnail graphics.** Instead of a large graphic, which takes up space and requires a long time to download, use a thumbnail so that readers can click on it if they wish to open a larger version.

On TechComm Web

For an introduction to color theory as it applies to the Web, see Dmitry's Design Lab. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

Make the Text Easy to Read and Understand

Web pages are harder to read than paper documents because screen resolution is much less sharp: usually, 72 dots per inch (dpi) versus 1200 dpi on a basic laser printer and 2400 dpi in some books.

Guidelines

Designing Easy-to-Read Text

Follow these three suggestions to make the text on your sites easy to read.

- ▶ **Keep the text short.** Poor screen resolution makes reading long stretches of text difficult. In general, pages should contain no more than two or three screens of information.
- ▶ **Chunk information.** When you write for the screen, chunk information to make it easier to understand. Use frequent headings, brief paragraphs, and lists.
- ▶ **Make the text as simple as possible.** Use common words and short sentences to make the information as simple as the subject allows.

On TechComm Web

For more on writing for the Web, see “Concise, SCANNABLE, and Objective” by John Morke and Jakob Nielsen. Click on Links Library for Ch. 11 on <bedfordstmartins.com/techcomm>.

In This Book

For more about chunking, see p. 271.

Create Clear, Informative Links

Well-phrased links are easy to read and understand. By clearly telling readers what kind of information the linked site provides, links help readers decide whether to follow them. The following guidelines box is based on Sun Microsystems’ “Guide to Web Style” (Sun Microsystems, 1999).

Guidelines

Writing Clear, Informative Links

Links are critically important. Follow these three suggestions to make them easy to use.

- ▶ **Structure your sentences as if there were no links in your text.**
 - AWKWARD [Click here](#) to go to the Rehabilitation Center page, which links to research centers across the nation.
 - SMOOTH The [Rehabilitation Center](#) page links to research centers across the nation.
- ▶ **Indicate what information the linked page contains.** Readers get frustrated if they wait for a Web file to download and then discover that it doesn’t contain the information they expected.
 - UNINFORMATIVE See the [Rehabilitation Center](#).
 - INFORMATIVE See the Rehabilitation Center’s [hours of operation](#).
- ▶ **Use standard colors for text links.** Readers are used to two common colors: blue for links that have not yet been clicked and purple for links that have been clicked.

ANALYZING SOME WEB PAGE DESIGNS

The best way to learn about designing Web sites and their pages is to study them. Figures 11.27 to 11.29 offer examples of good Web page design.



Paris-based Web designer Olivier Gorzalka has created a simple but lively site using clear images and labels. Although the main text is French, Gorzalka uses English for his main links.

Figure 11.27 A Web Designer's Home Page

Source: Gorzalka, 2011 <<http://clearideaz.com>>.



The Tumblr About Us page conveys its message simply but effectively.

The header includes the company logo, five self-explanatory links, and a search box.

The statistics make the point that Tumblr is a popular blogging site.

The photo and the text at the bottom make the point that Tumblr focuses on making it easy for people with mobile devices to blog.

Figure 11.28 Tumblr's About Us Page

Source: Tumblr, 2011 <www.tumblr.com/about>.

This page is designed to contain a large number of links to tutorials and other reference information. Tutorials are presented in the left column, an explanation of how to use the site is presented in the middle column, and other reference material is presented in the right column.

Figure 11.29 The W3Schools Home Page

Source: W3Schools, 2010 <www.w3schools.com>.

Writer's Checklist

Did you

- analyze your audience: their knowledge of the subject, their attitudes, their reasons for reading, and the kinds of tasks they will be carrying out? (p. 265)
- consider the purpose or purposes you are trying to achieve? (p. 266)
- determine your resources in time, money, and equipment? (p. 266)

Designing Printed Documents and Pages

Did you

- consider the best size for the document? (p. 267)
- consider the best paper? (p. 267)
- consider the best binding? (p. 268)
- think about which accessing tools would be most appropriate, such as icons, color, dividers and tabs, and cross-reference tables? (p. 268)

- use color, if you have access to it, to highlight certain items, such as warnings? (p. 269)
- devise a style for headers and footers? (p. 270)
- devise a style for page numbers? (p. 270)
- draw thumbnail sketches and page grids that define columns and white space? (p. 273)
- choose typefaces that are appropriate for your subject? (p. 276)
- use appropriate styles from the type families? (p. 277)
- use type sizes that are appropriate for your subject and audience? (p. 278)
- choose a line length that is suitable for your subject and audience? (p. 279)
- choose line spacing that is suitable for your line length, subject, and audience? (p. 279)
- decide whether to use left-justified text or full-justified text? (p. 280)

- design your title for clarity and emphasis? (p. 283)
- devise a logical, consistent style for each heading level? (p. 283)
- use rules, boxes, screens, marginal glosses, and pull quotes where appropriate? (p. 284)


Designing Web Sites and Pages

Did you

- create informative headers and footers? (p. 292)
- help readers navigate the site by including a site map, a table of contents, back-to-top links, and textual navigation buttons? (p. 293)
- include extra features your readers might need, such as an FAQ, a search page or engine, resource links, a printable version of your site, or a text-only version? (p. 293)

- help readers connect with others through links to interactive portions of your site and to social-media sites? (p. 295)
- design for readers with vision, hearing, or mobility impairment? (p. 295)
- design for multicultural audiences? (p. 296)
- aim for simplicity in Web page design by using simple backgrounds and conservative color combinations and by avoiding decorative graphics? (p. 297)
- make the text easy to read and understand by keeping it short, chunking information, and writing simply? (p. 298)
- create clear, informative links? (p. 298)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Study the first and second pages of an article in a journal in your field. Describe ten design features you identify on these two pages. Which design features are most effective for the audience and purpose? Which are least effective?
2. **GROUP EXERCISE** Form small groups for this collaborative exercise in analyzing design. Photocopy or scan a page from a book or a magazine. Choose a page that does not contain advertisements. Each person works independently for the first part of this project:
 - One person describes the design elements.
 - One person evaluates the design. Which aspects of the design are effective, and which could be improved?
 - One person creates a new design using thumbnail sketches.

Then, meet as a group and compare notes. Do all members of the group agree with the first member's

description of the design? With the second member's evaluation of the design? Do all members like the third member's redesign? What have your discussions taught you about design? Write a memo to your instructor presenting your findings, and include the photocopied page with your memo.

3. Study the excerpt from the Micron data flyer on page 302 (2010, p. 9). Describe the designer's use of alignment as a design principle. How effective is it? How would you modify it? Present your analysis and recommendations in a brief memo to your instructor.
4. **INTERNET EXERCISE** Find the sites of three manufacturers within a single industry, such as personal watercraft, cars, computers, or medical equipment. Study the three sites, focusing on one of these aspects of site design:
 - use of color
 - quality of the writing
 - quality of the site map or index



CSN-16: Micron Component and Module Packaging Pin 1 Orientation for Tray and Tape-and-Reel Packaging

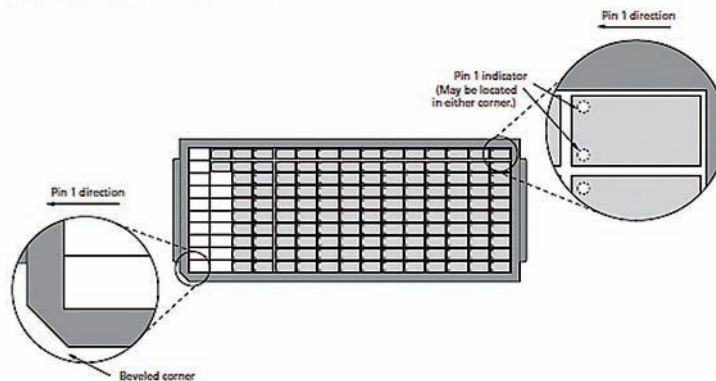
Pin 1 Orientation for Tray and Tape-and-Reel Packaging

Pin 1 refers to the location of the first lead or ball inside a semiconductor device and is used to determine how a part is attached to a circuit board. In a corner on the top side of each Micron device, pin 1 is indicated by an indentation, either a molded dot or a molded "MT," or it is indicated by a mark, specifically, a laser-etched dot or a laser-etched "MT." This section explains the locations of the pin 1 indicators on Micron's devices shipped in tray and tape-and-reel packaging.

Location of Pin 1 in Tray Packaging

Micron uses several different types of trays with varying colors for shipping products. However, each tray has a single beveled corner that indicates the direction pin 1 faces on each device. Depending on the package type and the design ID of the part, the pin 1 indicator will be located in one of the two corners of the device edge closest to the beveled corner of the tray. An example is shown in Figure 10.

Figure 10: Pin 1 Direction on Trays



Location of Pin 1 in Tape-and-Reel Packaging

Depending on their package type and design ID, devices shipped in tape-and-reel carriers are positioned so that the pin 1 indicator on each device is located in one of the two corners that faces the edge of the carrier tape with the round sprocket holes. Figure 11 on page 10 illustrates the position of the pin 1 indicators on Micron's tape-and-reel carriers.

PDF: 0900ae011179a180Source: 0900ae01110a21
CSN: Pin - Rev. 1/16 3/10/16

9


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- navigation, including the clarity and placement of links to other pages in the site
- accommodation of multicultural readers
- accommodation of people with disabilities
- phrasing of the links

Which of the three sites is most effective? Which is least effective? Why? Compare and contrast the three sites in terms of their effectiveness.

- 5. INTERNET EXERCISE** Using a search engine, find a site that serves the needs of people with a physical disability (for example, the Glaucoma Foundation, <www.glaucomafoundation.org>). What attempts have the designers made to accommodate the needs of visitors to the site? How effective do you think those attempts have been?

Case 11: Designing a Flyer

 **In This Book** For more about memos, see Ch. 14, p. 385.

Background

You work for the U.S. Network for Education Information (USNEI), an office in the U.S. Department of Education. The USNEI provides information for international students and professionals who want to study in the United States, as well as for U.S. students who want to study in other countries.

Your supervisor, Sonia Reynard, has asked you to help her with a project. “What I’d like you to do,” she says, “is to work up a design for a one-page flyer for international students who are interested in grad school in the United States. The subject is standardized tests they’ll have to take. I’ve got the information, but it’s in a word-processing document.” (See Document 11.1 on page 304.)

“Are these tests specific to international students or to the kind of grad school they want to go to?” you ask.

“Both,” Sonia says. “Some are required for people whose first language is not English. Some are subject-matter related, like for law school or dental school. Anybody who wants to apply to those schools, regardless of their nationality, has to take the subject-matter tests.”

“Okay, so the audience is international students considering grad school. Where are these students located now?”

“They could be here, finishing up in a U.S. undergraduate program, or they could be overseas,” Sonia replies.

“And we want to be able to post this flyer on a bulletin board.”

“Yes, that’s right. We’ll be sending this out to schools and government offices here and all over the world; they won’t have to print it themselves.”

“So, we’ll go with U.S. paper—8.5 × 11—right? What if all the info doesn’t fit?”

“If you need to edit it for length, try to shorten the descriptions, without eliminating any of the tests. Be sure to leave 1.5 inches at the top for our logo, and add at the bottom a note telling people to visit our site for more information” [www2.ed.gov/about/offices/list/ous/international/usnei/edlite-index.html].

Your Assignment

1. Review the concepts discussed in this chapter, including page layout, columns, typography, and the design of headings. Then review Document 11.1 and think about what the best organization might be for this information. Write a memo to Sonia Reynard describing the design you plan to use and explaining why you think the design would work well for this audience and purpose.
2. Revise Document 11.1 and implement the design you described. Be sure to set aside 1.5 inches at the top for the USNEI logo.

Structure of the U.S. Education System: Standardized Tests

Standardized tests are scientifically normed and machine-graded instruments administered to students and adults under controlled conditions to assess capabilities, including knowledge, cognitive skills and abilities, and aptitude. They are used extensively in the U.S. education system at all levels to assist with admissions, placement, and counseling decisions. Some of these tests include a written portion that is hand-graded.

Some of the more common standardized tests that international students may encounter are described below.

ENGLISH LANGUAGE PROFICIENCY TESTS

Test of English as a Foreign Language (TOEFL) is a proficiency test designed to measure knowledge and skill in understanding and using written English. It is required of international students whose native language or previous language of instruction was not English, and some U.S. institutions will accept TOEFL scores in lieu of other test scores.

FIRST PROFESSIONAL DEGREE APTITUDE TESTS

Dental Admission Test (DAT) is a knowledge and aptitude test administered to students seeking to enter accredited first professional degree programs in dentistry. The DAT measures knowledge and skills in biology, general and organic chemistry, and quantitative methods plus skills in reading and spatial perception and coordination.

Graduate Management Admission Test (GMAT) is an aptitude test administered to holders of a bachelor's degree seeking to enroll in accredited graduate programs in business administration and management. The GMAT measures analytical writing, verbal reasoning, and quantitative reasoning skills.

Law School Admission Test (LSAT) is an aptitude test administered to students seeking to enter accredited first professional degree programs in law. The LSAT measures reading and verbal reasoning skills.

Medical College Admission Test (MCAT) is a knowledge and aptitude test administered to students seeking to enter accredited first professional degree programs in allopathic medicine, osteopathic medicine, and podiatric medicine. The MCAT measures knowledge and skills in the biological sciences, physical sciences and verbal reasoning plus requires a writing sample.

Pharmacy College Admission Test (PCAT) is a knowledge and aptitude test administered to students seeking to enter accredited first professional degree programs in pharmacy. It measures verbal, written, and quantitative abilities plus knowledge of biology and chemistry. The PCAT can be required of secondary students, students enrolled in bachelor's degree programs, or bachelor's degree holders depending on the nature of the program and institutional requirements.

GRADUATE STUDIES APTITUDE TESTS

Graduate Record Examination (GRE) is an aptitude test administered to holders of the bachelor's degree to help determine capability for advanced study and research. It is divided into two parts, the GRE General Test measuring verbal and quantitative reasoning, critical thinking and analytical writing skills; and the GRE Subject Tests, which measure knowledge in selected subjects.

Miller Analogies Test (MAT) is an aptitude test consisting of a series of partial analogies that must be completed in a set time frame. The MAT measures idea relationships, English fluency, and content skills in the humanities, natural sciences, social sciences and mathematics. It is accepted in some programs as a substitute for the GRE.

Document 11.1 Information to Be Presented in a One-Page Flyer

Source: Based on U.S. Network for Education Information, 2008 <www.ed.gov/about/offices/list/ous/international/usnei/us/edlite-evaluation.html>.

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Creating Graphics



NTV/Landov.

Graphics offer benefits that words alone cannot.

The Functions of Graphics 306**The Characteristics of an Effective Graphic** 308**Understanding the Process of Creating Graphics** 310

Planning Graphics 310

Producing Graphics 312

Revising Graphics 313

Citing Graphics 313

Using Color Effectively 314**Choosing the Appropriate Kind of Graphic** 317

Illustrating Numerical Information 317

Illustrating Logical Relationships 333

Illustrating Process Descriptions and Instructions 333

Illustrating Visual and Spatial Characteristics 338

Creating Effective Graphics for Multicultural Readers 342

A typical commercial jet contains literally thousands of labeled graphics throughout the passenger compartment and the cockpit, but Kulula, a South African airline, was the first to label the exterior of some of its jets. Although the airline chose Flying 101 as a humorous theme, the graphics inside the aircraft, and on the laminated safety-information cards, help the crew operate the aircraft safely. In addition, graphics help passengers with everything from finding their seats to determining whether the restroom is occupied to understanding what to do in an emergency.

Graphics are the “pictures” in technical communication: drawings, maps, photographs, diagrams, charts, graphs, and tables. Graphics range from realistic, such as photographs, to highly abstract, such as organization charts. In terms of function, graphics range from the decorative, such as clip art that shows people seated at a conference table, to highly informative, such as a schematic diagram of an electronic device.

Graphics are important in technical communication because they do the following:

- catch readers’ attention and interest
- help writers communicate information that is difficult to communicate with words
- help writers clarify and emphasize information
- help nonnative speakers of English understand information
- help writers communicate information to multiple audiences with different interests, aptitudes, and reading habits

THE FUNCTIONS OF GRAPHICS

We have known for decades that graphics motivate people to study documents more closely. Some 83 percent of what we learn derives from what we see, whereas only 11 percent derives from what we hear (Gatlin, 1988). Because we are good at acquiring information through sight, a document that includes a visual element beyond words on the page is more effective than one that doesn’t. People studying a text with graphics learn about one-third more than people studying a text without graphics (Levie & Lentz, 1982). And people remember 43 percent more when a document includes graphics (Morrison & Jimmerson, 1989). In addition, readers like graphics. According to one survey,

readers of computer documentation consistently want more graphics and fewer words (Brockmann, 1990, p. 203).

Graphics offer benefits that words alone cannot:

- *Graphics are indispensable in demonstrating logical and numerical relationships.* For example, an organization chart effectively represents the lines of authority in an organization. And if you want to communicate the number of power plants built in each of the last 10 years, a bar graph works better than a paragraph.
- *Graphics can communicate spatial information more effectively than words alone.* If you want to show the details of a bicycle derailleur, a diagram of the bicycle with a close-up of the derailleur is more effective than a verbal description.
- *Graphics can communicate steps in a process more effectively than words alone.* A troubleshooter's guide, a common kind of table, explains what might be causing a problem in a process and how you might fix it. And a diagram can show clearly how acid rain forms.
- *Graphics can save space.* Consider the following paragraph:

In the Wilmington area, some 80 percent of the population aged 18 to 24 have watched streamed movies on their computers. They watch an average of 1.86 movies a week. Among 35- to 49-year-olds, the percentage is 62, and the average number of movies is 1.19. Among the 50 to 64 age group, the percentage is 47, and the number of movies watched averages 0.50. Finally, among those people 65 years old or older, the percentage is 28, and the average number of movies watched weekly is 0.31.

Presented as a paragraph, this information is uneconomical and hard to remember. Presented as a table, however, the information is more concise and more memorable.

Age	Percentage watching streaming movies	Number of movies watched per week
18–24	80	1.86
35–49	62	1.19
50–64	47	0.50
65+	28	0.31

- *Graphics can reduce the cost of documents intended for international readers.* Translation costs can reach 30 to 40 cents per word. Used effectively, graphics can reduce the number of words you have to translate (Corante, 2005).

As you plan and draft your document, look for opportunities to use graphics to clarify, emphasize, summarize, and organize information.

THE CHARACTERISTICS OF AN EFFECTIVE GRAPHIC

Effective graphics must be clear, understandable, and meaningfully related to the larger discussion. Follow these five principles:

- A graphic should serve a purpose. Don't include a graphic unless it will help readers understand or remember information. Avoid content-free clip art, such as drawings of businesspeople shaking hands.
- A graphic should be simple and uncluttered. Three-dimensional bar graphs are easy to make, but they are harder to understand than two-dimensional ones, as shown in Figure 12.1.
- A graphic should present a manageable amount of information. Presenting too much information can confuse readers. Consider audience and purpose: what kinds of graphics are readers familiar with, how much do they already know about the subject, and what do you want the document to do? Because readers learn best if you present information in small chunks, create several simple graphics rather than a single complicated one.
- A graphic should meet readers' format expectations. Through experience, readers learn how to read different kinds of graphics. Follow the conventions—for instance, use diamonds to represent decision points in a flowchart—unless you have a good reason not to.
- A graphic should be clearly labeled. Give every graphic (except a brief, informal one) a unique, clear, informative title. Fully label the columns and the axes and lines of a graph. Don't make readers guess whether you are using meters or yards, or whether you are also including statistics from the previous year.

Unnecessary 3-D is one example of chartjunk, a term used by Tufte (1983) to describe the ornamentation that clutters up a graphic, distracting readers from the message.

The two-dimensional bar graph is clean and uncluttered, whereas the three-dimensional graph is more difficult to understand because the additional dimension obscures the main data points. The number of uninsured emergency-room visits in February, for example, is very difficult to see in the three-dimensional graph.

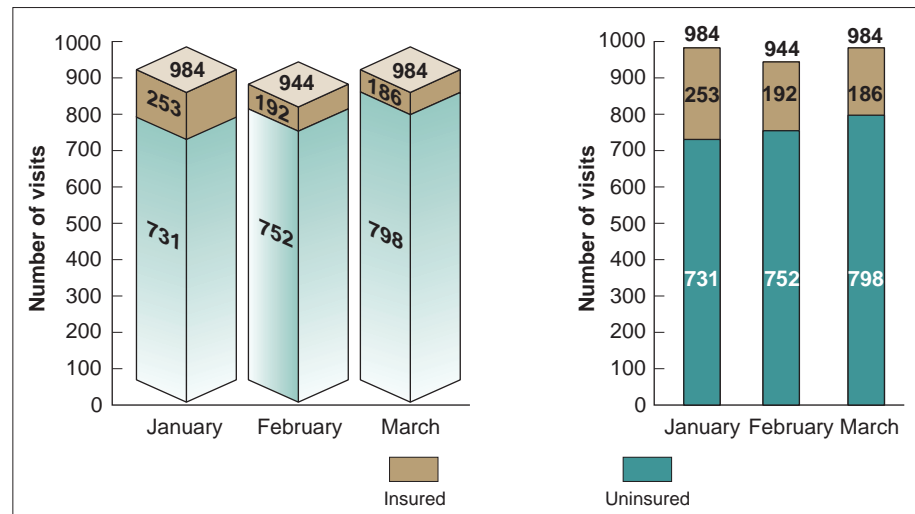


Figure 12.1 Chartjunk and Clear Art

ETHICS NOTE**Creating Honest Graphics**

Follow these six suggestions to ensure that you represent data honestly in your graphics.

- If you did not create the graphic or generate the data, cite your source and, if you want to publish it, obtain permission. For more on citing graphics, see page 313.
- Include all relevant data. For example, if you have a data point that you cannot explain, do not change the scale to eliminate it.
- Begin the axes in your graphs at zero—or mark them clearly—so that you represent quantities honestly.
- Do not use a table to hide a data point that would be obvious in a graph.
- Show items as they really are. Do not manipulate a photograph of a computer monitor to make the screen look bigger than it is, for example.
- Do not use color or shading to misrepresent an item's importance. A light-shaded bar in a bar graph, for example, appears larger and nearer than a dark-shaded bar of the same size.

Common problem areas are pointed out in the discussions of various kinds of graphics throughout this chapter.

Guidelines**Integrating Graphics and Text**

It is not enough to add graphics to your text; you have to integrate the two.

- ▶ **Place the graphic in an appropriate location.** If readers need the graphic to understand the discussion, put it directly after the relevant point in the discussion, or as soon after it as possible. If the graphic merely supports or elaborates a point, include it as an appendix.
- ▶ **Introduce the graphic in the text.** Whenever possible, refer to a graphic before it appears (ideally, on the same page). Refer to the graphic by number (such as “see Figure 7”). Do not refer to “the figure above” or “the figure below,” because the graphic might be moved during the production process. If the graphic is in an appendix, cross-reference it: “For complete details of the operating characteristics, see Appendix, Part B, page 19.”
- ▶ **Explain the graphic in the text.** State what you want readers to learn from it. Sometimes a simple paraphrase of the title is enough: “Figure 2 compares the costs of the three major types of coal gasification plants.” At other times, however, you might need to explain why the graphic is important or how to interpret it. If the graphic is intended to make a point, be explicit:



As Figure 2 shows, a high-sulfur bituminous coal gasification plant is more expensive than either a low-sulfur bituminous or anthracite plant, but more than half of its cost is cleanup equipment. If these expenses could be eliminated, high-sulfur bituminous would be the least expensive of the three types of plants.

Graphics often are accompanied by captions, explanations ranging from a sentence to several paragraphs.

- ▶ **Make the graphic clearly visible.** Distinguish the graphic from the surrounding text by adding white space or rules (lines), by putting a screen behind it, or by enclosing it in a box.
- ▶ **Make the graphic accessible.** If the document is more than a few pages long and contains more than four or five graphics, consider including a list of illustrations so that readers can find them easily.

In This Book

For more about white space, screens, boxes, and rules, see Ch. 11, pp. 273 and 284. For more about lists of illustrations, see Ch. 19, p. 526.

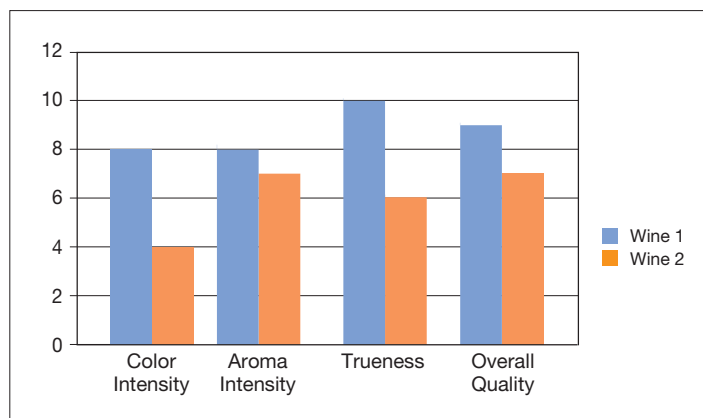
UNDERSTANDING THE PROCESS OF CREATING GRAPHICS

Creating graphics involves planning, producing, revising, and citing.

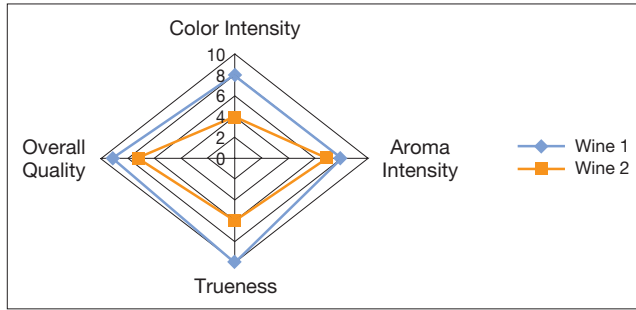
Planning Graphics

Whether you think first about the text or the graphics, consider the following four aspects of the document as you plan.

- **Audience.** Will readers understand the kinds of graphics you want to use? Will they know the standard icons in your field? Are they motivated to read your document, or do you need to enliven the text—for example, by adding color for emphasis—to hold their attention? General audiences know how to read common types of graphics, such as those that appear frequently in newspapers. A general audience, for example, could use this bar graph to compare two bottles of wine:



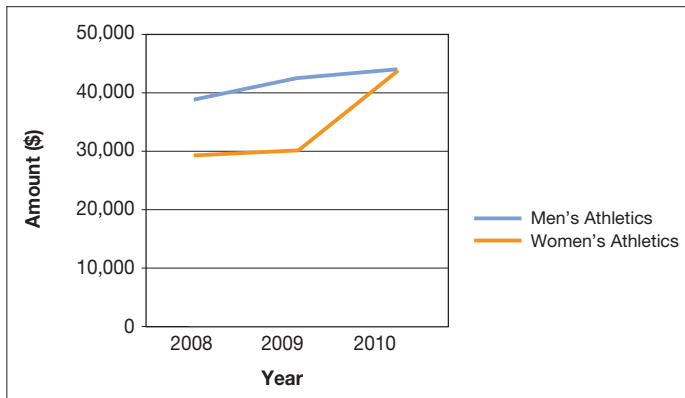
However, they would probably have trouble with the following radar graph:



- *Purpose.* What point are you trying to make with the graphic? Imagine what you want your readers to know and do with the information. For example, if you want readers to know the exact dollar amounts spent on athletics by a college, use a table:

Year	Men's athletics (\$)	Women's athletics (\$)
2008	38,990	29,305
2009	42,400	30,080
2010	44,567	44,213

If you want readers to know how spending on athletics is changing over time, use a line graph:



- *The kind of information you want to communicate.* Your subject will help you decide what type of graphic to include. For example, in writing about languages spoken by your state's citizens, you might use tables for the statistical data, maps for the patterns of language use, and graphs for statistical trends over time.

- *Physical conditions.* The physical conditions in which readers will use the document—amount of lighting, amount of surface space available, and so forth—will influence the type of graphic as well as its size and shape, the thickness of lines, the size of type, and the color.

As you plan how you are going to create the graphics, consider four important factors:

- *Time.* Because making a complicated graphic can take a lot of time, you need to establish a schedule.
- *Money.* A high-quality graphic can be expensive. How big is the project budget? How can you use that money effectively?
- *Equipment.* Determine what tools and software you will require, such as spreadsheets for tables and graphs or graphics software for diagrams.
- *Expertise.* How much do you know about creating graphics? Do you have access to the expertise of others?

In This Book

For more about planning and budgeting, see Ch. 3, p. 46.

Producing Graphics

Usually, you won't have all the resources you would like. You will have to choose one of the following four approaches:

- *Use existing graphics.* For a student paper that *will not be published*, some instructors allow the use of photocopies or scans of existing graphics; other instructors do not. For a document that *will be published*, whether written by a student or a professional, using an existing graphic is permissible if the graphic is in the public domain (that is, not under copyright), if it is the property of the writer's organization, or if the organization has obtained permission to use it. Be particularly careful about graphics you find on the Web. Many people mistakenly think that anything on the Web can be used without permission. The same copyright laws that apply to printed material apply to Web-based material, whether words or graphics. For more on citing graphics, see page 313.

Aside from the issue of copyright, think carefully before you use existing graphics. The style of the graphic might not match that of the others you want to use, and the graphic might lack some features you want or include some you don't. If you use an existing graphic, assign it your own number and title.

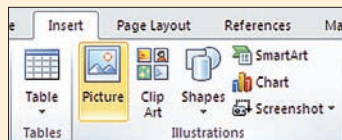
- *Modify existing graphics.* You can redraw an existing graphic or use a scanner to digitize the graphic and then modify it electronically with graphics software.
- *Create graphics on a computer.* You can create many kinds of graphics using your spreadsheet software and the drawing tools on your word processor. Consult the Selected Bibliography, page 765, for a list of books about computers and technical communication.

TECH TIP

How to Insert and Modify Graphics

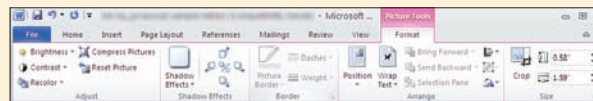
To highlight, clarify, summarize, and organize information, you can insert and modify graphics by using the **Picture** button and the **Format** tab.

To **insert a graphic** that you have on file—such as a photograph, drawing, chart, or graph—place your cursor where you want to insert the graphic and then select the **Picture** button in the **Illustrations** group on the **Insert** tab.



You can also insert clip art, shapes, charts, screenshots, and SmartArt.

To **modify an image** that is already in your document, double-click on it and then use the **Picture Tools Format** tab. This tab allows you to modify the appearance, size, and layout of a picture.



Buttons in the **Adjust** group allow you to modify many aspects of the picture's appearance.

Buttons in the **Arrange** group allow you to position your graphic and control how text wraps around it.

KEYWORDS: format tab, arrange group, picture style, size, adjust, insert picture, format picture, modify picture, picture style, picture toolbar

- *Have someone else create the graphics.* Professional-level graphics software can cost hundreds of dollars and require hundreds of hours of practice. Some companies have technical-publications departments with graphics experts, but others subcontract this work. Many print shops and service bureaus have graphics experts on staff or can direct you to them.

Revising Graphics

As with any other aspect of technical communication, build in enough time and budget enough money to revise the graphics. Create a checklist and evaluate each graphic for effectiveness. The Writer's Checklist at the end of this chapter is a good starting point. Show your graphics to people whose backgrounds are similar to your intended readers' and ask them for suggestions. Revise the graphics and solicit more reactions.

Citing Graphics

If you wish to publish a graphic that is protected by copyright (even if you have revised it), you need to obtain written permission from the copyright holder. Related to the issue of permission is the issue of citation. Of course, you do not have to cite a graphic if you created it yourself, from scratch, or if your organization owns the copyright.

In This Book

For more about work made for hire, see Ch. 2, p. 24.

In This Book

For more information about copyright, see Ch. 2, p. 23.

In all other cases, however, you should include a citation, even if the document is a course assignment and will not be published. Citing graphics, even those you have revised substantially, shows your instructor that you understand professional conventions and your ethical responsibilities.

If you are following a style manual, check to see whether it presents a format for citing graphics. In addition to citing a graphic in the reference list, most style manuals call for a source statement in the caption:

Print Source

Source: Verduijn, 2010, p. 14. Copyright 2010 by Tedopres International B.V.
Reprinted with permission.

Online Source

Source: Johnson Space Center Digital Image Collection. Copyright 2010 by NASA.
Reprinted with permission.

If your graphic is based on an existing graphic, the source statement should state that your graphic is “based on” or “adapted from” your source:

Source: Adapted from Jonklaas et al., 2008, p. 771. Copyright 2008 by American Medical Association. Reprinted with permission.

In This Book

For more about style manuals, see Appendix, Part B.

USING COLOR EFFECTIVELY

Color draws attention to information you want to emphasize, establishes visual patterns to promote understanding, and adds interest. But it is also easy to misuse. The following discussion is based on Jan V. White’s excellent text, *Color for the Electronic Age* (1990).

In using color in graphics and page design, keep these six principles in mind:

- *Don’t overdo it.* Readers can interpret only two or three colors at a time. Use colors for small items, such as portions of graphics and important words. And don’t use colors where black and white will work better.
- *Use color to emphasize particular items.* People interpret color before they interpret shape, size, or placement on the page. Color effectively draws readers’ attention to a particular item or group of items on a page. In Figure 12.2, for example, color adds emphasis to several different kinds of information.
- *Use color to create patterns.* The principle of repetition—readers learn to recognize patterns—applies in graphics as well as document design. In creating patterns, also consider shape. For instance, use red for safety comments but place them in octagons resembling a stop sign. This way, you give your readers two visual cues to help them recognize the pattern.

On TechComm Web

See the Tips section of the Xerox Small Business Resource Center for articles about color theory. Click on Links Library for Ch. 12 on <bedfordstmartins.com/techcomm>.

Additional post-retirement contributions – future contributions

As of Sept. 30 — thousands of dollars

2010	\$ 33,435
2011	33,560
2012	34,486
2013	35,641
2014	37,002
	\$ 174,124

a. Color used to set off a title and the totals row in a table

Source: Bonneville, 2009 <www.bpa.gov/corporate/Finance/A_Report/09/AR2009.pdf>.

b. Color used to emphasize one item among others

Source: Purves, Sadava, Orians, and Heller, 2004, p. 560.

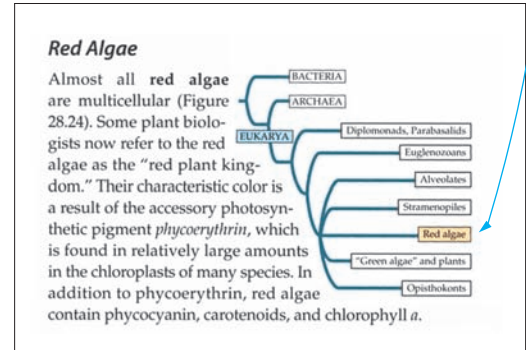


Figure 12.2 Color Used for Emphasis

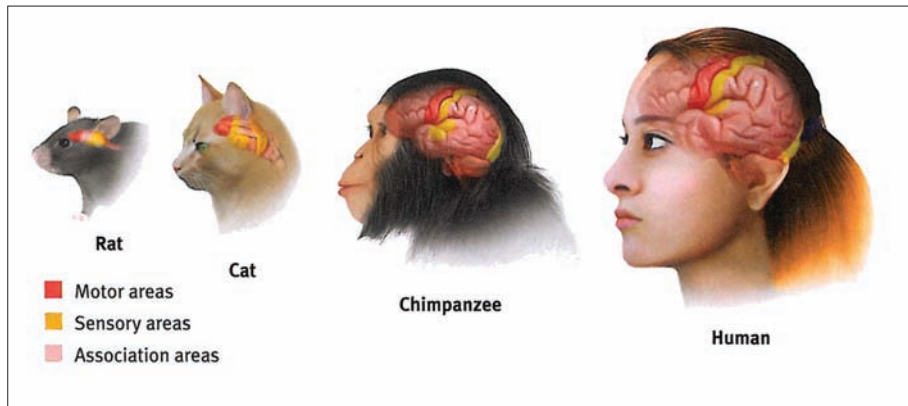


Figure 12.3 Color Used to Establish Patterns

Source: Myers, 2010, p. 72.

Figure 12.3 shows an illustration from a psychology textbook that uses color to establish patterns.

Color is also an effective way to emphasize design features such as text boxes, rules, screens, and headers and footers.

- *Use contrast effectively.* The visibility of a color is a function of the background against which it appears (see Figure 12.4). The strongest contrasts are between black and white and between black and yellow.

In This Book

For more about designing your document, see Ch. 11.

Notice that a color washes out if the background color is too similar.

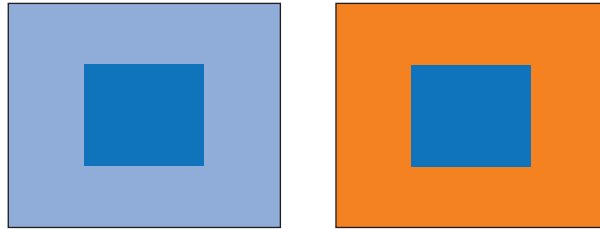


Figure 12.4 The Effect of Background in Creating Contrast

In This Book

For more about presentation graphics, see Ch. 21, p. 611.

The need for effective contrast also applies to graphics used in presentations, as shown here:

In graphic (a), the text is hard to read because of insufficient contrast. In graphic (b), the increased contrast makes the text easier to read.



a. Insufficient contrast

b. Effective contrast

In This Book

For more about cultural patterns, see Ch. 5, p. 95.

- Take advantage of any symbolic meanings colors may already have. In American culture, for example, red signals danger, heat, or electricity; yellow signals caution; and orange signals warning. Using these warm colors in ways that depart from these familiar meanings could be confusing. The

The batteries are red. The warm red contrasts effectively with the cool green of the car body.

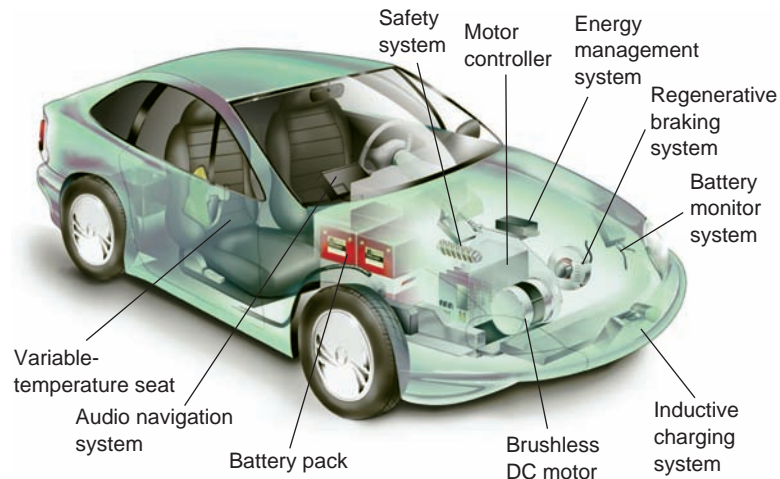
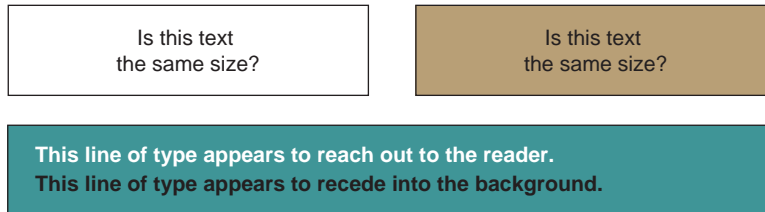


Figure 12.5 Colors Have Clear Associations for Readers

cooler colors—blues and greens—are more conservative and subtle. (Figure 12.5 illustrates these principles.) Keep in mind, however, that different cultures interpret colors differently.

- *Be aware that color can obscure or swallow up text.*



If you are using print against a colored background, you might need to make the type a little bigger, because color makes text look smaller.

Text printed against a white background looks bigger than the same size text printed against a colored background. White letters counteract this effect.

CHOOSING THE APPROPRIATE KIND OF GRAPHIC

As Figure 12.6 on page 318 shows, even a few simple facts can yield a number of different points. Your responsibility when creating a graphic is to determine what point you want to make and how best to make it. Don't rely on your software to do your thinking; it can't.

Graphics used in technical documents fall into two categories: tables and figures. Tables are lists of data, usually numbers, arranged in columns. Figures are everything else: graphs, charts, diagrams, photographs, and the like. Typically, tables and figures are numbered separately: the first table in a document is Table 1; the first figure is Figure 1. In documents of more than one chapter (like this book), the graphics are usually numbered within each chapter. That is, Figure 3.2 is the second figure in Chapter 3.

There is no simple system for choosing a graphic because in many situations several types would work. In general, however, graphics can be categorized according to the kind of information they contain. (Some kinds of graphics can convey several kinds of information. For instance, a table can include both numerical values and procedures.)

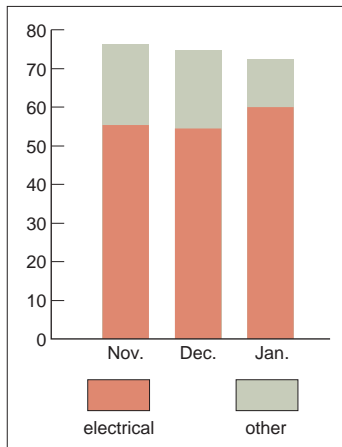
The discussion that follows is based on the classification system in William Horton's "Pictures Please—Presenting Information Visually," in *Techniques for Technical Communicators* (Barnum & Carliner, 1993). Table 12.1 on pages 319–20 presents an overview of the following discussion.

Illustrating Numerical Information

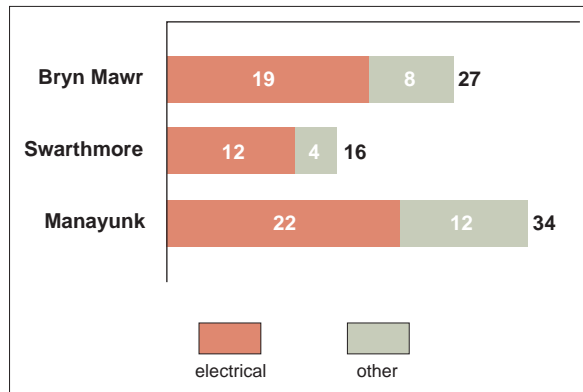
The kinds of graphics used most often to display numerical values are tables, bar graphs, pictographs, line graphs, and pie charts.

Tables Tables convey large amounts of numerical data easily, and they are often the only way to present several variables for a number of items. For

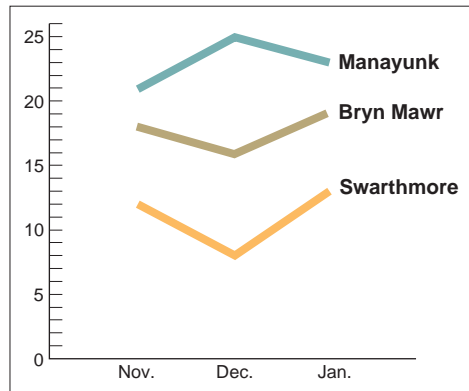
Rail Line	November		December		January	
	Disabled by electrical problems (%)	Total disabled	Disabled by electrical problems (%)	Total disabled	Disabled by electrical problems (%)	Total disabled
Bryn Mawr	19 (70)	27	17 (60)	28	20 (76)	26
Swarthmore	12 (75)	16	9 (52)	17	13 (81)	16
Manayunk	22 (64)	34	26 (83)	31	24 (72)	33



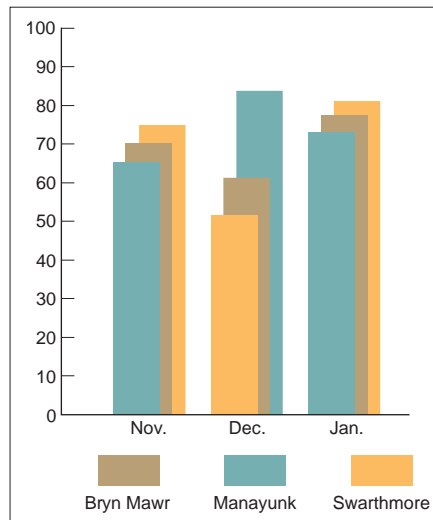
a. Number of railcars disabled, November–January



b. Number of railcars disabled in November



c. Number of railcars disabled by electrical problems, November–January



d. Range in percentage of railcars, by line, disabled by electrical problems, November–January

Figure 12.6 Different Graphics Emphasizing Different Points

Each of these four graphs emphasizes a different point derived from the data in the table. Graph (a) focuses on the total number of railcars disabled each month, classified by cause; graph (b) focuses on the three rail lines during one month; and so forth. For information on bar graphs, see pages 323 and 325–29; for information on line graphs, see pages 330–31.

TABLE 12.1 ▶ Choosing the Appropriate Kind of Graphic

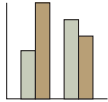



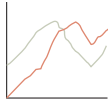

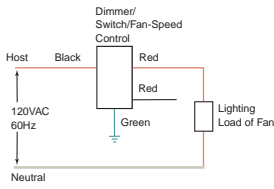



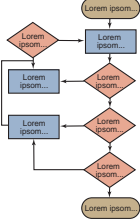
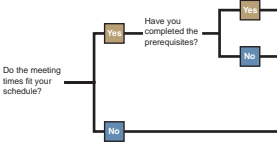


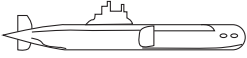

Purpose	Type of graphic	What the graphic does best																																								
Illustrating numerical information	<p>Table</p> <table border="1" data-bbox="662 292 787 363"> <thead> <tr> <th></th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>East</td> <td>14</td> <td>14</td> <td>10</td> <td>38</td> </tr> <tr> <td>West</td> <td>12</td> <td>8</td> <td>14</td> <td>34</td> </tr> <tr> <td>South</td> <td>9</td> <td>15</td> <td>18</td> <td>42</td> </tr> <tr> <td>Total</td> <td>35</td> <td>37</td> <td>42</td> <td>114</td> </tr> </tbody> </table>		Jan	Feb	Mar	Total	East	14	14	10	38	West	12	8	14	34	South	9	15	18	42	Total	35	37	42	114	Shows large amounts of numerical data, especially when there are several variables for a number of items															
		Jan	Feb	Mar	Total																																					
	East	14	14	10	38																																					
	West	12	8	14	34																																					
	South	9	15	18	42																																					
Total	35	37	42	114																																						
Bar graph		Shows the relative values of two or more items.																																								
Pictograph	<p>Number of Internet Hosts, 2009–2011</p> <p>2009 </p> <p>2010 </p> <p>2011 </p>	Enlivens statistical information for the general reader.																																								
Line graph		Shows how the quantity of an item changes over time. A line graph can accommodate much more data than a bar graph can.																																								
Pie chart		Shows the relative size of the parts of a whole. Pie charts are instantly familiar to most readers.																																								
Illustrating logical relationships	Diagram		Represents items or properties of items.																																							
	Organization chart	<p>Block-Diagram Version</p> <pre> graph TD DFC[DFC] --> ADM[ADM] DFC --> COT[COT] ADM --> P120[120 Protocol] ADM --> AC[ADM Control] COT --> TCG1[TCG Module] COT --> TCG2[TCG Module] </pre>	Shows the lines of authority and responsibility in an organization.																																							
Illustrating process descriptions and instructions	Checklist	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  	Lists or shows what equipment or materials to gather, or describes an action.																																							
	Table	<table border="1" data-bbox="662 1435 863 1554"> <thead> <tr> <th></th> <th colspan="4">Light Use</th> </tr> <tr> <th>PM (Months)</th> <th>3</th> <th>6</th> <th>9</th> <th>12</th> </tr> </thead> <tbody> <tr> <td>Clean Exterior/Interior</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Clean Heads</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Lubricate Transport</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Clean Rubber Parts</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Clean Battery</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Clean Connectors</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Light Use				PM (Months)	3	6	9	12	Clean Exterior/Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean Heads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lubricate Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean Rubber Parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean Battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean Connectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Light Use																																									
PM (Months)	3	6	9	12																																						
Clean Exterior/Interior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						
Clean Heads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						
Lubricate Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						
Clean Rubber Parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						
Clean Battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						
Clean Connectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																						



TABLE 12.1 ► Choosing the Appropriate Kind of Graphic *(continued)*

Purpose	Type of graphic	What the graphic does best	
Illustrating process descriptions and instructions <i>(continued)</i>	Flowchart	Shows the stages of a procedure or a process.	
			
Illustrating visual and spatial characteristics	Logic tree	Shows which of two or more paths to follow.	
			
	Photograph		Shows precisely the external surface of objects.
	Screen shot		Shows what appears on a computer screen.
Line drawing		Shows simplified representations of objects.	
Map		Shows geographic areas.	

Source: Based on Horton, 1993.

Table 1. Clean Energy Spending by Category

Appropriations ^a	Through the end of 2009:Q4		Through the end of 2010:Q1		
	Obligations ^b	Outlays ^b	Obligations ^c	Outlays ^c	
Millions of Dollars					
Energy Efficiency	19,935	11,903	1,152	15,559	2,203
Renewable Generation	26,598	2,028	1,994	2,970	2,934
Grid Modernization	10,453	2,666	72	3,283	101
Advanced Vehicles and Fuels Technologies	6,142	3,149	450	3,608	617
Traditional Transit and High-Speed Rail	18,113	8,834	1,804	10,056	2,733
Carbon Capture and Sequestration	3,400	425	4	963	13
Green Innovation and Job Training	3,549	2,197	123	3,015	428
Clean Energy Equipment Manufacturing	1,624	13	13	61	61
Other	408	148	12	239	36
Total^d	90,222	31,363	5,624	39,754	9,127

Sources: Appropriations estimates from the Office of Management and Budget (OMB); agency Financial and Activity Reports to OMB through March 31, 2010; simulations from the Department of the Treasury (Office of Tax Analysis) based on the FY2011 budget.
 Notes: a. Appropriations include estimated cost of tax provisions through 2010:Q3.
 b. Include estimated costs of tax provisions through December 31, 2009.
 c. Include estimated costs of tax provisions through March 31, 2010.
 d. Items may not add to total due to rounding.

The data in this table consist of numbers, but tables can also present textual information or a combination of numbers and text.

Tables are usually titled at the top because readers scan them from top to bottom.

Include a stub head. The stub—the left-hand column—lists the items for which data are displayed. The stub head in this table should be “Category.”

A screen behind every other data row would help the reader scan across the row.

Numerical data are right-aligned.

Note that tables often contain one or more source statements and footnotes.

Figure 12.7 Parts of a Table

Source: Council of Economic Advisers, 2010 <www.whitehouse.gov/sites/default/files/image/arra_%20and_clean_energy_transformation_3Q_supplement.pdf>.

example, if you want to show how many people are employed in six industries in 10 states, a table would probably be most effective. Although tables lack the visual appeal of other kinds of graphics, they can handle much more information.

Figure 12.7 illustrates the standard parts of a table. Tables are identified by number (“Table 1”) and an informative title that includes the items being compared and the basis (or bases) of comparison:

Table 3. Mallard Population in Rangeley, 2009–2011

Table 4.7. The Growth of the Robotics Industry in Japan and the United States, 2010

Guidelines

Creating Effective Tables

Follow these nine suggestions to make sure your tables are clear and professional.

- ▶ **Indicate the units of measure.** If all the data are expressed in the same unit, indicate that unit in the title:

Farm Size in the Midwestern States (in Hectares)

If the data in different columns are expressed in different units, indicate the units in the column heads:

Population (in Millions)	Per Capita Income (in Thousands of U.S. Dollars)
-----------------------------	---



If all the *data cells* in a column use the same unit, indicate that unit in the column head, not in each data cell:

Speed (in Knots)

15
18
14

You can express data in both real numbers and percentages. A column head and the first data cell under it might read as follows:

Number of Students (Percentage)

53 (83)

- ▶ **In the stub—the left-hand column—list the items being compared.** Arrange the items in a logical order: big to small, more important to less important, alphabetical, chronological, geographical, and so forth. If the items fall into several categories, include the names of the categories in the stub:

Snowbelt States

Connecticut

New York

Vermont

Sunbelt States

Arizona

California

New Mexico

If the items in the stub cannot be grouped in logical categories, skip a line after every five rows to help the reader follow the rows across the table. Or use a screen (a colored background) for every other set of five rows. Also useful are *dot leaders*: a row of dots that links the stub and the next column.

- ▶ **In the columns, arrange the data clearly and logically.** Use the decimal-tab feature to line up the decimal points:

3,147.4
365.7
46,803.5

In general, don't change units unless the quantities are so dissimilar that your readers would have a difficult time understanding them if expressed in the same units.

3.4 hr
12.7 min
4.3 sec

This list would probably be easier for most readers to understand than one in which all quantities were expressed in the same unit.

In This Book

For more about screens, see
Ch. 11, p. 285.

- ▶ **Do the math.** If your readers will need to know the totals for the columns or the rows, provide them. If your readers will need to know percentage changes from one column to the next, present them:

Number of Students (Percentage Change from Previous Year)		
2010	2011	2012
619	644 (+4.0)	614 (−4.7)

- ▶ **Use dot leaders if a column contains a “blank” spot—a place where there are no appropriate data:**

3,147
 . . .
 46,803

But don't substitute dot leaders for a quantity of zero.

- ▶ **Don't make the table wider than it needs to be.** The reader should be able to scan across a row easily. As White (1984) points out, there is no reason to make the table as wide as the text column in the document. If a column head is long—more than five or six words—stack the words:

Computers Sold Without
a Memory-Card Reader

- ▶ **Minimize the use of rules.** Grimstead (1987) recommends using rules only when necessary: to separate the title and the heads, the heads and the body, and the body and the notes. When you use rules, make them thin rather than thick.
- ▶ **Provide footnotes where necessary.** All the information your readers need to understand the table should accompany it.
- ▶ **If you did not generate the information yourself, indicate your source.** See the discussion of citing graphics on pages 313–14.

Bar Graphs Like tables, *bar graphs* can communicate numerical values, but they are better at showing the relative values of two or more items. Figure 12.8 on page 325 shows typical horizontal and vertical bar graphs that you can make easily using your spreadsheet software. Figure 12.9 on page 325 shows an effective bar graph that uses grid lines.

TECH TIP

How to Use Tab Stops

To control the placement of text on a page or in a table, you can align text by using the **tab stops** in the **horizontal ruler**. Select the **Ruler** checkbox in the **Show** group on the **View** tab to see the ruler.





For example, use the **decimal** tab to align numbers in a column:

Incorrectly Aligned	Correctly Aligned
213.76	213.76
3.17	3.17
46.13	46.13

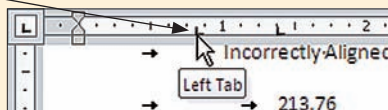
1. Click the **tab indicator** on the horizontal ruler to change the type of tab stop displayed.



The following table describes common tab stops.

Tab stop	Description
	Lines up text to the left
	Lines up text to the right
	Centers text at tab stop
	Aligns numbers on their decimal points

2. When the appropriate tab stop appears, click the **horizontal ruler** where you want to align text.



To remove a tab stop, drag it away from the ruler.

3. After you have set a tab stop, place the cursor to the left of the text you want to align and press the **Tab** key.

KEYWORDS: set tab stops, horizontal ruler, indent text or numbers in a table

TECH TIP

How to Create Tables

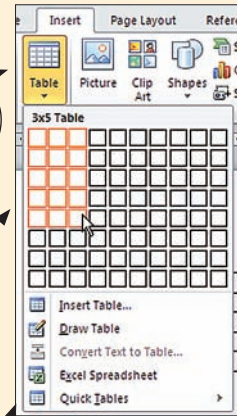
To create tables, use the **Table** feature.

To **create a table**, place your cursor where you want the table, and then click the **Table** button on the **Insert** tab.

You can create a table by dragging your cursor to specify the number of columns and rows.

You can also create a table by drawing the table grid, converting existing text into a table, importing data from Excel, or selecting a **Quick Tables** template and replacing the data with your own.

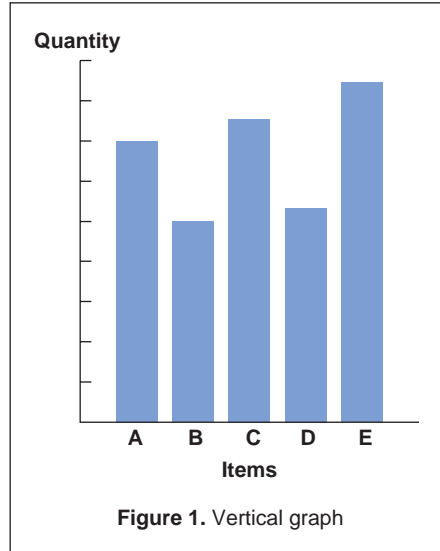
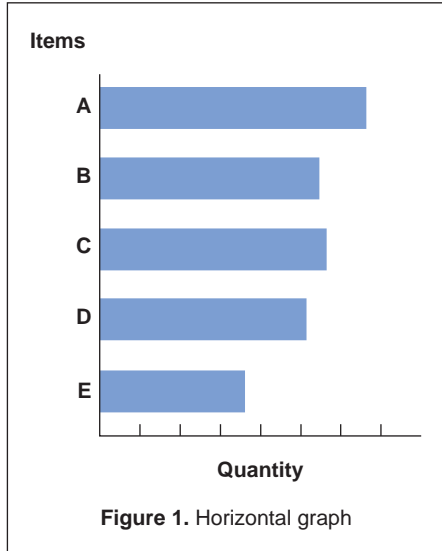
You can also select **Insert Table**, and then use the **Insert Table** dialog box to specify the number of columns and rows you want.



To **modify a table**, click in it, and then use the **Table Styles** group on the **Table Tools Design** tab.

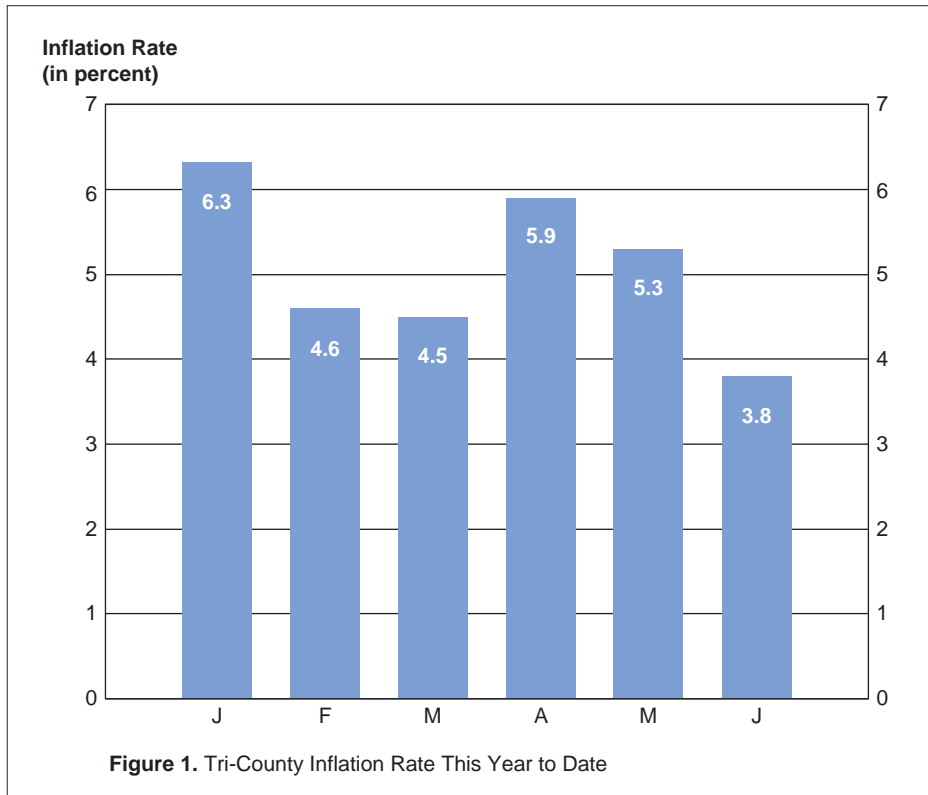


KEYWORDS: tables, tables and borders, insert table, insert tab, table styles



Horizontal bars are best for showing quantities such as speed and distance. Vertical bars are best for showing quantities such as height, size, and amount. However, these distinctions are not ironclad; as long as the axes are clearly labeled, readers should have no trouble understanding the graph.

Figure 12.8 Structures of Horizontal and Vertical Bar Graphs



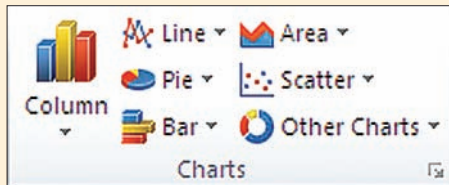
Figures 12.9 Effective Bar Graph with Grid Lines

TECH TIP

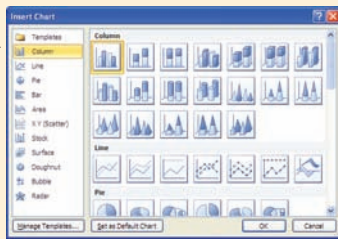
How to Create Graphics in Excel

You can create many types of graphics discussed in this chapter using a spreadsheet program such as Microsoft Excel. First you enter the data that the graphic will display; then you select the type of graphic to create.

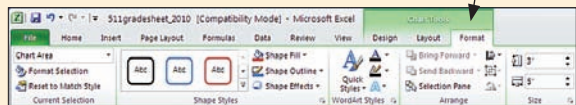
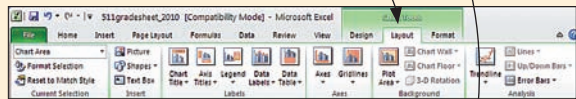
1. After you have entered your data in a spreadsheet, select the type of graphic by using the drop-down menus in the **Charts** group on the **Insert** tab.



You can also select the **Chart** dialog box launcher in the **Charts** group and then select the type of graphic using the **Insert Chart** dialog box.



2. After you have created your graphic, you can modify the data range included and add or modify elements such as a title, labels, a legend, and grid lines by using the **Design**, **Layout**, and **Format** tabs.



After creating a graphic, you can use the **Copy** and **Paste** commands to insert your graphic in your document.

On TechComm Web

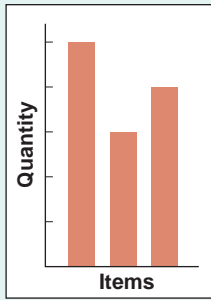
For more help with displaying data graphically, click on Tutorials on bedfordstmartins.com/techcomm.

KEYWORDS: chart wizard, chart type, data series, data range, data labels, legends

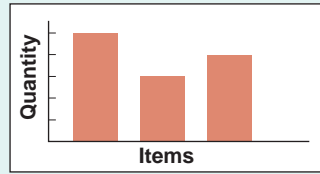
Guidelines

Creating Effective Bar Graphs

- ▶ **Make the proportions fair.** Make your vertical axis about 25 percent shorter than your horizontal axis. An excessively long vertical axis exaggerates the differences in quantities; an excessively long horizontal axis minimizes the differences. Make all the bars the same width, and make the space between them about half as wide as a bar. Here are two poorly proportioned graphs:

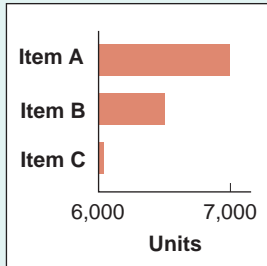


a. Excessively long vertical axis

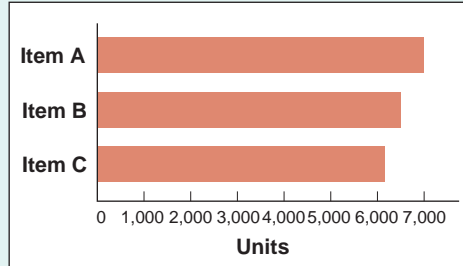


b. Excessively long horizontal axis

- ▶ **If possible, begin the quantity scale at zero.** Doing so ensures that the bars accurately represent the quantities. Notice how misleading a graph can be if the scale doesn't begin at zero.

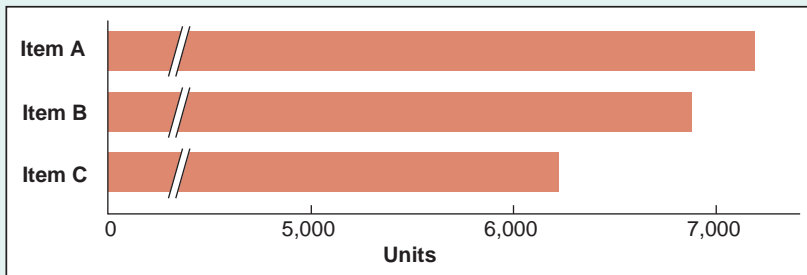


a. Misleading



b. Accurately representative

If it is not practical to start the quantity scale at zero, break the quantity axis clearly at a common point on all the bars.



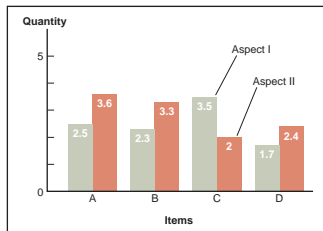
- ▶ **Use tick marks—marks along the axis—to signal the amounts.** Use grid lines—tick marks that extend through the bars—if the table has several bars, some of which are too far away from the tick marks to allow readers to gauge the quantities easily. (See Figure 12.9 on page 325.)



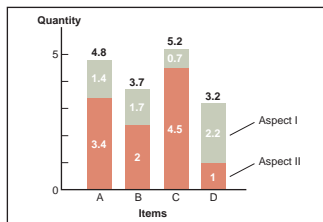
- ▶ **Arrange the bars in a logical sequence.** For a vertical bar graph, use chronology if possible. For a horizontal bar graph, arrange the bars in order of descending size, beginning at the top of the graph, unless some other logical sequence seems more appropriate.
- ▶ **Place the title below the figure.** Unlike tables, which are usually read from top to bottom, figures are usually read from the bottom up.
- ▶ **Indicate the source of your information if you did not generate it yourself.**

The five variations on the basic bar graph shown in Table 12.2 can help you accommodate different communication needs. You can make all these types using your spreadsheet software.

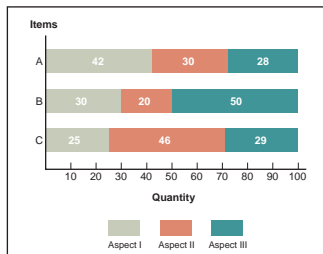
TABLE 12.2 ▶ Variations on the Basic Bar Graph



Grouped bar graph. The *grouped bar graph* lets you compare two or three quantities for each item. Grouped bar graphs would be useful, for example, for showing the numbers of full-time and part-time students at several universities. One bar could represent full-time students; the other, part-time students. To distinguish between the bars, use hatching (striping), shading, or color, and either label one set of bars or provide a key.

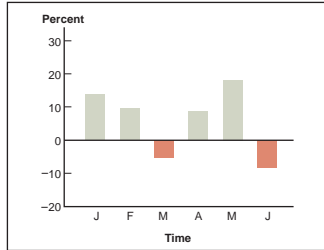


Subdivided bar graph. In the *subdivided bar graph*, Aspect I and Aspect II are stacked like wooden blocks placed on top of one another. Although totals are easy to compare in a subdivided bar graph, individual quantities are not.

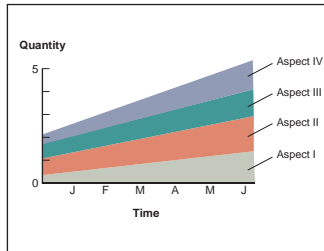


100-percent bar graph. The *100-percent bar graph*, which shows the relative proportions of the elements that make up several items, is useful in portraying, for example, the proportion of full-scholarship, partial-scholarship, and no-scholarship students at a number of colleges.

TABLE 12.2 ▶ Variations on the Basic Bar Graph (continued)



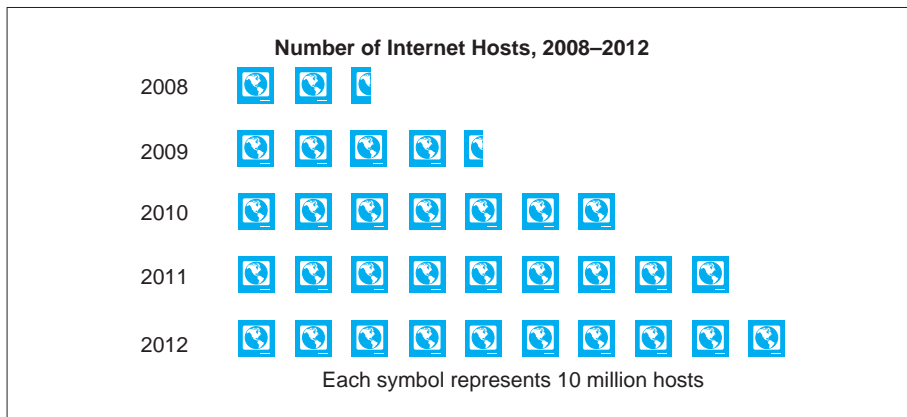
Deviation bar graph. The *deviation bar graph* shows how various quantities deviate from a norm. Deviation bar graphs are often used when the information contains both positive and negative values, such as profits and losses. Bars on the positive side of the norm line represent profits; bars on the negative side, losses.



Stratum graph. The *stratum graph*, also called an *area graph*, shows the change in quantities of several items over time. Although stratum graphs are used frequently in business and scientific fields, general readers sometimes have trouble understanding how to read them.

Pictographs Pictographs—bar graphs in which the bars are replaced by a series of symbols—are used primarily to present statistical information to the general reader. The quantity scale is usually replaced by a statement indicating the numerical value of each symbol. Thousands of clip-art symbols and pictures are available for use in pictographs. Figure 12.10 shows an example of a pictograph.

Represent quantities in a pictograph honestly. Figure 12.11 on page 330 shows an inherent problem: a picture drawn to scale can appear many times larger than it should.



Clip-art pictures and symbols are available online for use in pictographs. Arrange pictographs horizontally rather than vertically.

Figure 12.10 Pictograph

TECH TIP

How to Use Drawing Tools

Although you can make many types of graphics using a spreadsheet, some types, such as pictographs, call for drawing tools. Your word processor includes basic drawing tools.

To create **shapes** and **SmartArt**, use the **Illustrations** group on the **Insert** tab.

Use the **Shapes** drop-down menu to select a simple shape, such as a line, arrow, rectangle, or oval. Then drag your cursor to create the shape.



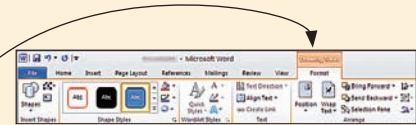
You can select complex shapes from the **SmartArt** drop-down menu in the **Illustrations** group.



Once you have created a shape, you can position the shape on your document by selecting and dragging it.

To **modify a shape**, select it and use the **Drawing Tools Format** tab.

Groups on the **Format** tab let you modify the appearance, size, and layout of a shape.



KEYWORDS: shapes, illustrations group, SmartArt, format tab

The reader sees the total area of the symbol rather than its height.

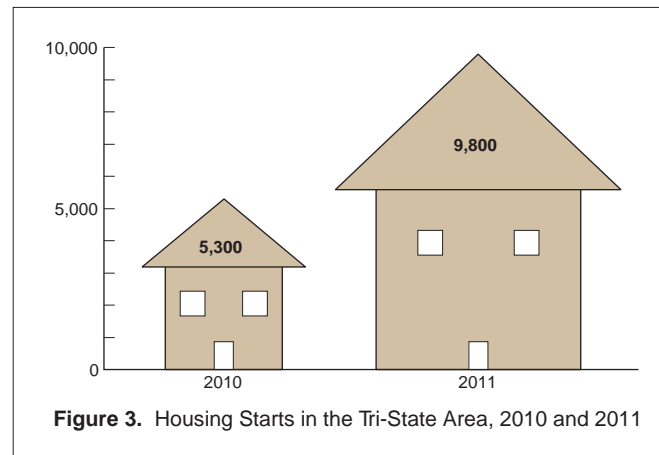
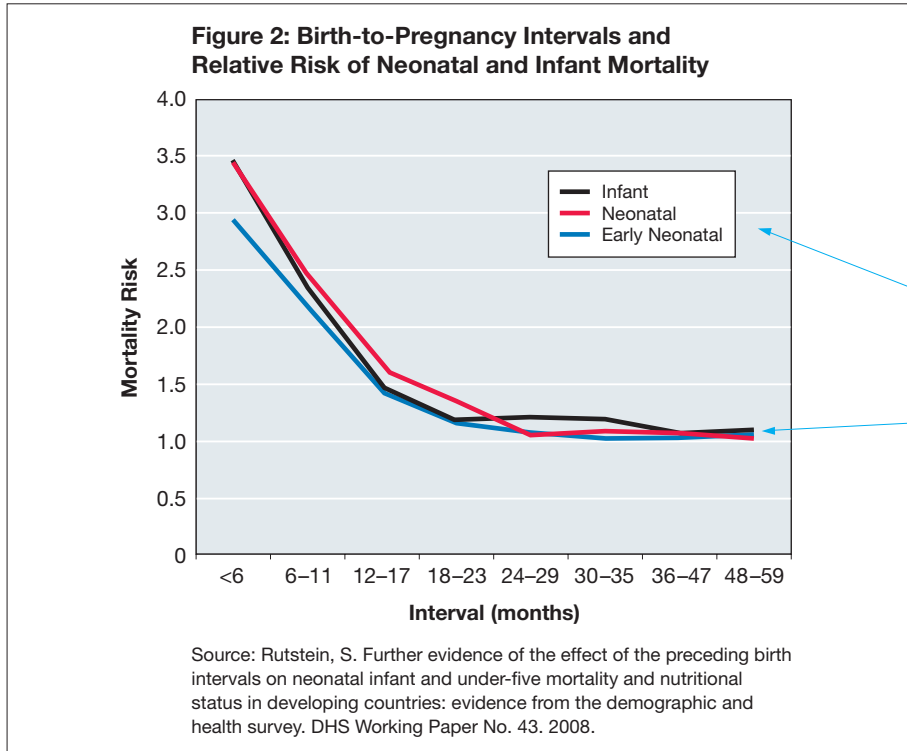


Figure 12.11 Misleading Pictograph

Line Graphs Line graphs are used almost exclusively to show changes in quantity over time, for example, the month-by-month production figures for a product. A line graph focuses readers' attention on the change in quantity, whereas a bar graph emphasizes the quantities themselves.



Because the three lines are so close to one another, the writer decided not to label each line but rather to create a legend.

Using different colors for the lines helps readers distinguish them.

Figure 12.12 Line Graph

Source: U.S. Agency for International Development, 2009 <http://pdf.usaid.gov/pdf_docs/PDACN515.pdf>.

You can plot three or four lines on a line graph. If the lines intersect, use different colors or patterns to distinguish them. If the lines intersect too often, however, the graph will be unclear; in this case, draw separate graphs. Figure 12.12 shows a line graph.

Guidelines

Creating Effective Line Graphs

Follow these three suggestions to create line graphs that are clear and easy to read.

- ▶ **If possible, begin the quantity scale at zero.** Doing so is the best way to portray the information honestly. If you cannot begin at zero, clearly indicate a break in the axis.
- ▶ **Use reasonable proportions for the vertical and horizontal axes.** As with bar graphs, make the vertical axis about 25 percent shorter than the horizontal axis.
- ▶ **Use grid lines—horizontal, vertical, or both—rather than tick marks when your readers need to read the quantities precisely.**

You can set your software so that the slices use different saturations of the same color. This way, the slices are easy to distinguish from each other—without any distractions or misrepresentations caused by a rainbow of colors.

You can set your software to emphasize one slice by separating it from the rest of the pie.

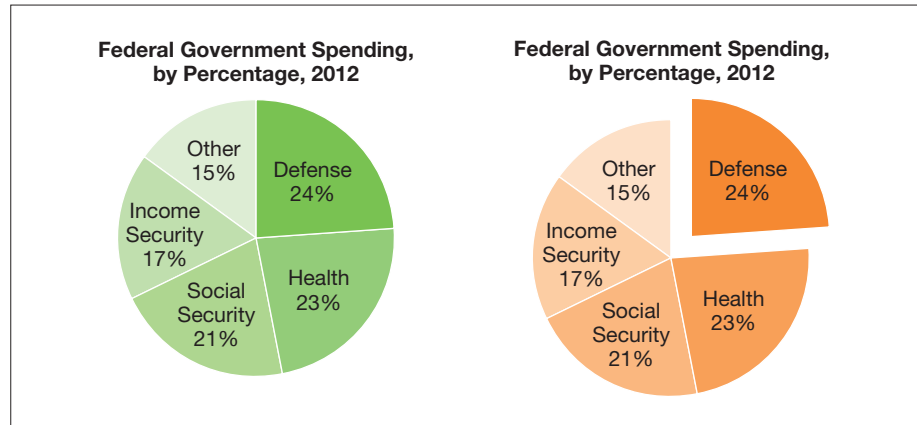


Figure 12.13 Pie Charts

Pie Charts The pie chart is a simple but limited design used for showing the relative size of the parts of a whole. You can make pie charts with your spreadsheet software. Figure 12.13 shows typical examples.

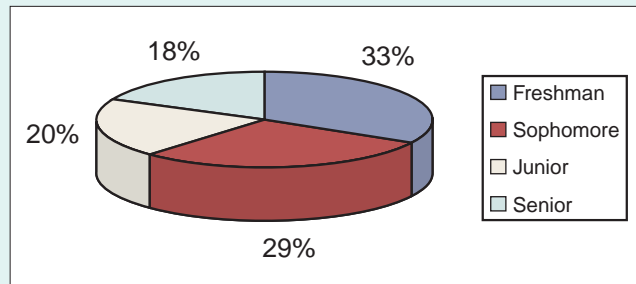
Guidelines

Creating Effective Pie Charts

Follow these eight suggestions to ensure that your pie charts are easy to understand and professional looking.

- ▶ **Restrict the number of slices to no more than seven.** As the slices get smaller, judging their relative sizes becomes more difficult.
- ▶ **Begin with the largest slice at the top and work clockwise in order of decreasing size, unless you have a good reason to arrange them otherwise.**
- ▶ **Include a miscellaneous slice for very small quantities that would make the chart unclear.** Explain its contents in a footnote. This slice, sometimes called “other,” follows the other slices.
- ▶ **Label the slices (horizontally, not radially) inside the slice, if space permits.** Include the percentage that each slice represents and, if appropriate, the raw numbers.
- ▶ **To emphasize one slice, use a bright, contrasting color or separate the slice from the pie.** Do this, for example, when you introduce a discussion of the item represented by that slice.
- ▶ **Check to see that your software follows the appropriate guidelines for pie charts.** Some spreadsheet programs add fancy visual effects that can impair comprehension. For instance, many programs portray the pie in three dimensions, as shown here.

In this three-dimensional pie chart about the percentages of a college's student body, by year, the sophomore slice looks bigger than the freshman slice, even though it isn't, because it appears closer to the reader. To communicate clearly, make the pies two-dimensional.



- ▶ **Don't overdo fill patterns.** Fill patterns are designs, shades, or colors that distinguish one slice from another. In general, use simple, understated patterns, or none at all.
- ▶ **Check that your percentages add up to 100.** If you are doing the calculations yourself, check your math.

Illustrating Logical Relationships

Graphics can help you present logical relationships among items. For instance, in describing a piece of hardware, you might want to show its major components. The two kinds of graphics that best show logical relationships are diagrams and organization charts.

Diagrams A *diagram* is a visual metaphor that uses symbols to represent items or their properties. In technical communication, common kinds of diagrams are blueprints, wiring diagrams, and schematics. Figure 12.14 on page 334 is a diagram.

Organization Charts A popular form of diagram is the *organization chart*, in which simple geometric shapes, usually rectangles, suggest logical relationships, as shown in Figure 12.15 on page 334. You can create organizational charts with your word processor.

Illustrating Process Descriptions and Instructions

Graphics often accompany process descriptions and instructions (see Chapter 20). The following discussion looks at some of the graphics used in writing about actions: checklists, flowcharts, and logic trees. It also discusses techniques for showing motion in graphics.

The purpose of this diagram is to help people understand how to connect the cables and use a TiVo box. The diagram itself is very simple—because it doesn't need to be complicated.

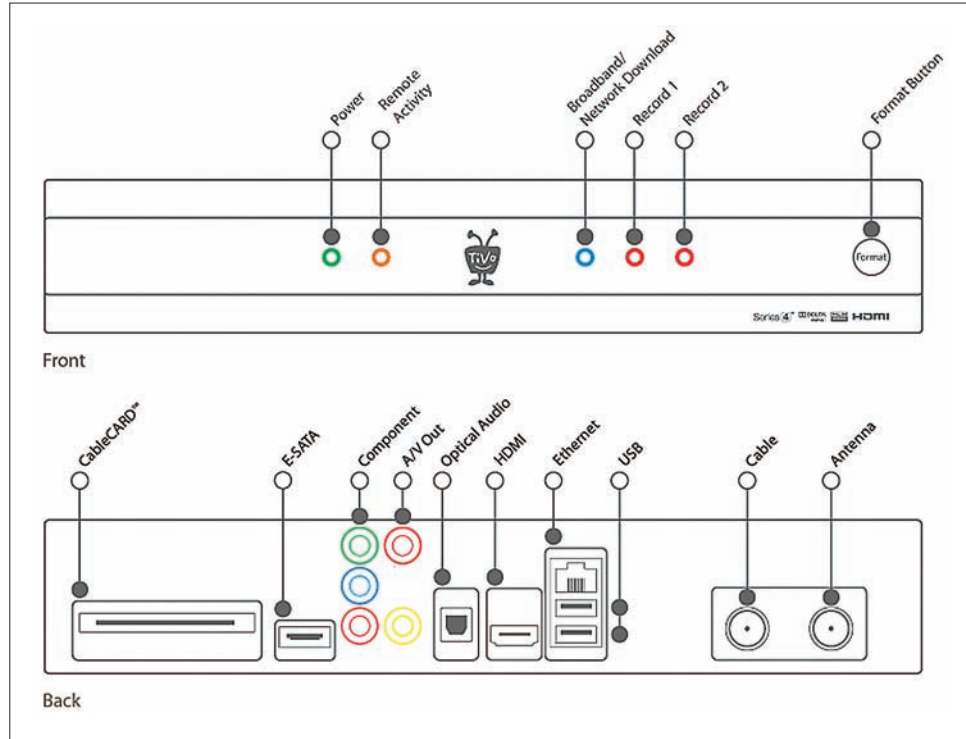


Figure 12.14 Diagram

Source: TiVo, 2010 <www.tivo.com/products/tivo-premiere/premiere-specs.html#tab>.

An organization chart is often used to show the hierarchy in an organization, with the president of a company, for example, in the box at the top.

Alternatively, as shown here, an organization chart can show the functional divisions of a system, such as the human nervous system.

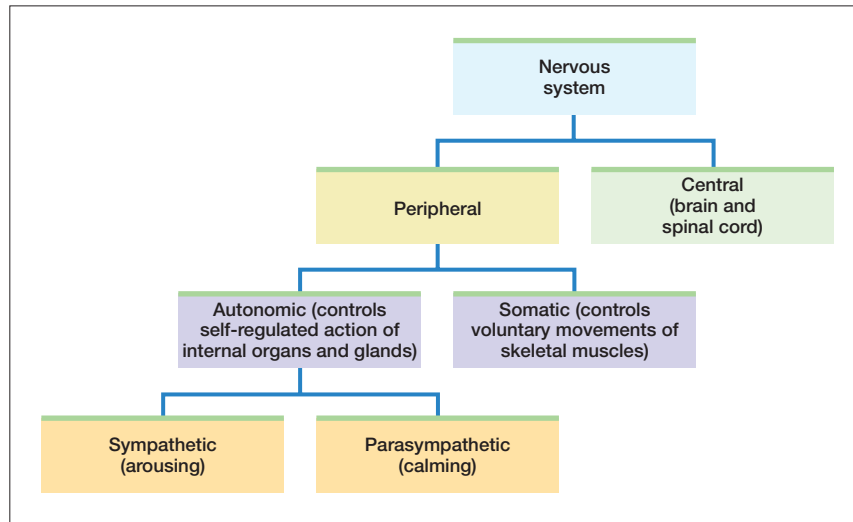


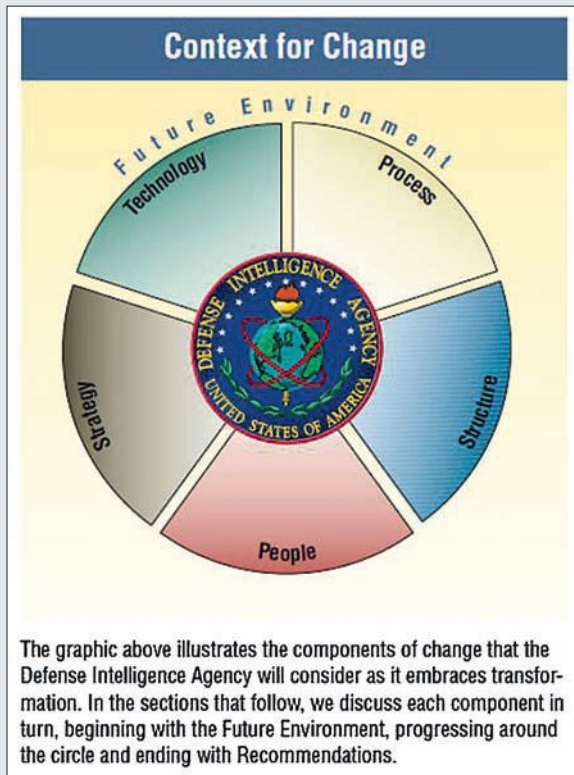
Figure 12.15 Organization Chart

Source: Myers, 2007, p. 61.

INTERACTIVE SAMPLE DOCUMENT

Analyzing a Graphic

The following diagram is from a government report (Defense Intelligence Agency, 2003, p. 16). The questions in the margin ask you to think about diagrams, as discussed on page 333.



Source: Defense Intelligence Agency, 2003 <www.dia.mil/thisisdia/DIA_Workforce_of_the_Future.pdf>.

1. This design resembles a pie chart, but it does not have the same function as a pie chart. What message does this design communicate? Is it effective?
2. Do the colors communicate any information, or are they merely decorative? If you think they are decorative, would you revise the design to change them in any way?
3. What does the phrase “Future Environment,” above the graphic, mean? Is it meant to refer only to the “Technology” and “Process” shapes?
4. Is the explanation below the graphic clear? Would you change it in any way?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 12 on <bedfordstmartins.com/techcomm>.

Checklists In explaining how to carry out a task, you often need to show the reader what equipment or materials to gather, or describe an action or a series of actions to take. A *checklist* is a list of items, each preceded by a check box. If readers might be unfamiliar with the items you are listing, include drawings of the items, as shown in Figure 12.16. You can use the list function in your word processor to create checklists.

Often you need to indicate that readers are to carry out certain tasks at certain intervals. A table is a useful graphic for this kind of information, as shown in Figure 12.17.

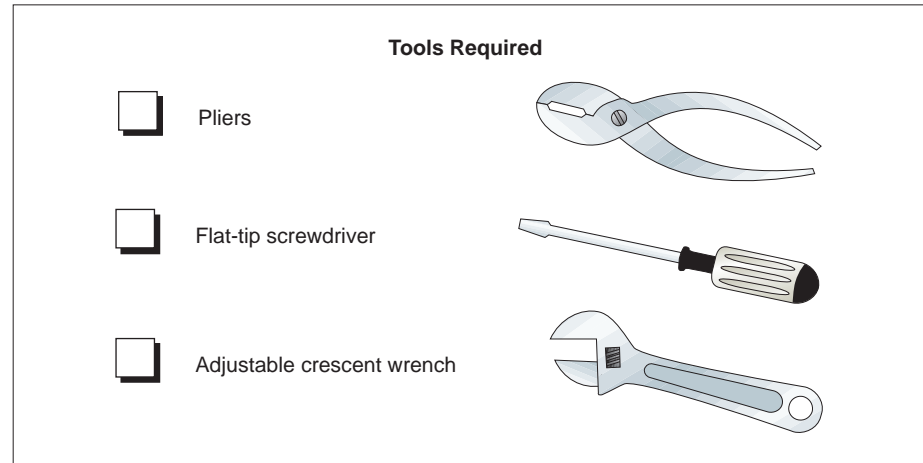


Figure 12.16 Checklist

Regular Maintenance, First 40,000 Miles

	<i>Mileage</i>							
	5,000	10,000	15,000	20,000	25,000	30,000	35,000	40,000
Change oil, replace filter	✓	✓	✓	✓	✓	✓	✓	✓
Rotate tires	✓	✓	✓	✓	✓	✓	✓	✓
Replace air filter				✓				✓
Replace spark plugs				✓				✓
Replace coolant fluid								✓
Replace ignition cables								✓
Replace timing belt								✓

Figure 12.17 A Table Used to Illustrate a Maintenance Schedule

Flowcharts A flowchart, as the name suggests, shows the various stages of a process or a procedure. Flowcharts are useful, too, for summarizing instructions. On a basic flowchart, stages are represented by labeled geometric shapes. Flowcharts can portray open systems (those that have a “start” and a “finish”) or closed systems (those that end where they began). Figure 12.18 shows an open-system flowchart and a closed-system flowchart. Figure 12.19

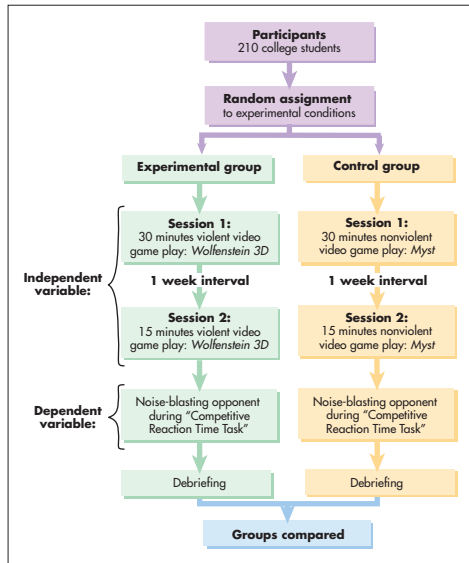
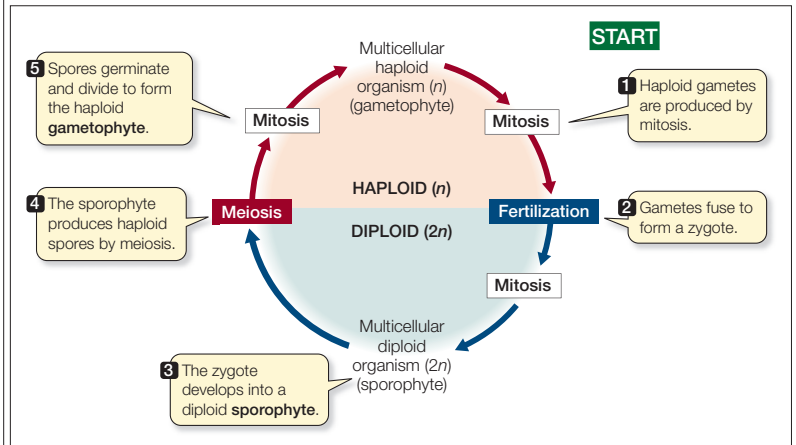


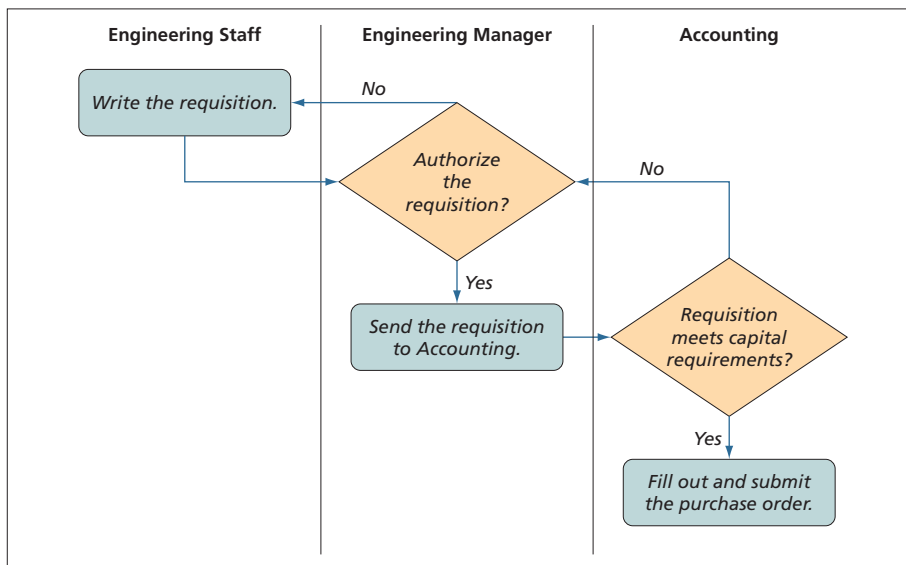
Figure 12.18 Flowcharts

Source: (left) Hockenbury and Hockenbury, 2007; (right) Purves, Sadava, Orians, and Heller, 2007.



a. Open-system flowchart

b. Closed-system flowchart



A deployment flowchart shows who is responsible for carrying out which tasks. Here the engineering staff writes the requisition, then sends it to the Engineering Manager.

Figure 12.19 Deployment Flowchart

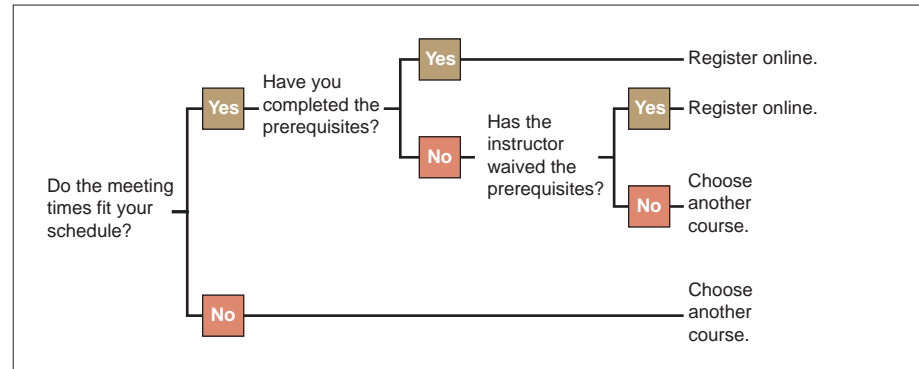


Figure 12.20 Logic Tree

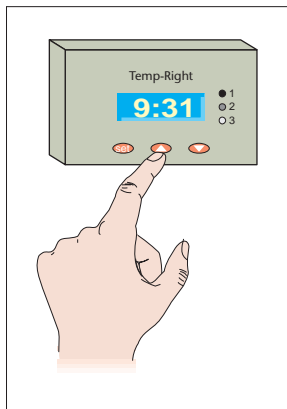


Figure 12.21 Showing Action from the Reader's Perspective

In many cases, you need to show only the person's hands, not the whole body.

shows a deployment flowchart, which you can make using the drawing tools in your word processor.

Logic Trees Logic trees use a branching metaphor. The logic tree shown in Figure 12.20 helps students think through the process of registering for a course.

Techniques for Showing Motion In some types of process descriptions and instructions, you will want to show motion. For instance, in an instruction manual for helicopter technicians, you might want to illustrate the process of removing an oil dipstick or tightening a bolt, or you might want to show a warning light flashing. Although document designers frequently use animation or video, printed graphics are still needed to communicate this kind of information.

If the reader is to perform the action, show the action from the reader's point of view, as in Figure 12.21.

Figure 12.22 illustrates four additional techniques for showing action. These techniques are conventional but not universal. If you are addressing readers from another culture, consult a qualified person from that culture to make sure your symbols are clear and inoffensive.

Illustrating Visual and Spatial Characteristics

To illustrate visual and spatial characteristics, use photographs, screen shots, line drawings, and maps.

Photographs Photographs are unmatched for reproducing visual detail. Sometimes, however, a photograph can provide too much information. In a sales brochure for an automobile, a glossy photograph of the dashboard might be very effective. But in an owner's manual, if you want to show how to use the trip odometer, use a diagram that focuses on that one item.

Sometimes a photograph can provide too little information; the item you want to highlight might be located inside the mechanism or obscured by another component.

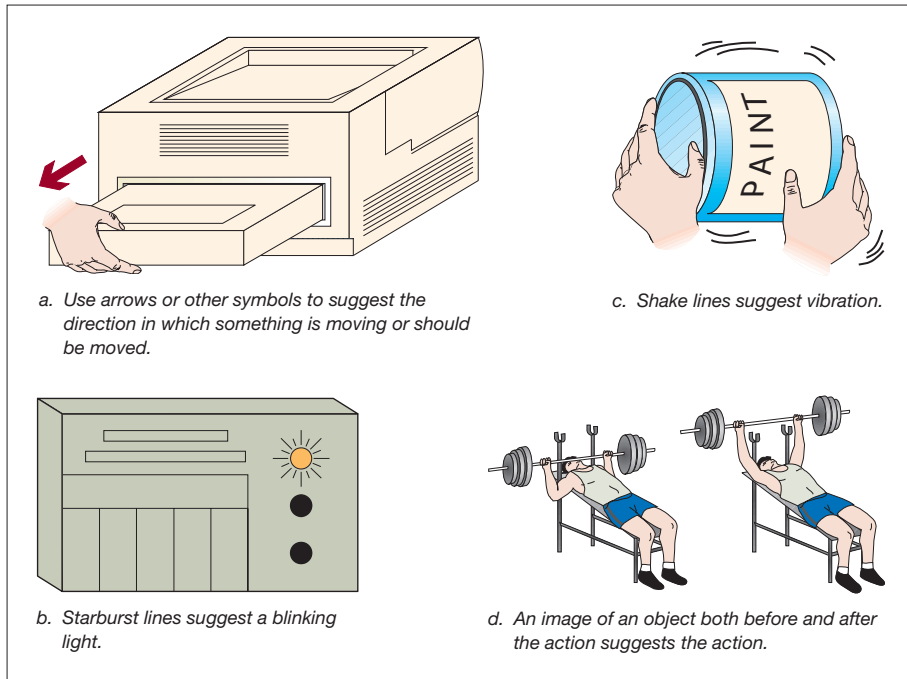


Figure 12.22 Showing Motion

Guidelines

Presenting Photographs Effectively

Follow these five suggestions to make sure your photographs are clear, honest, and easy to understand.

- ▶ **Eliminate extraneous background clutter that can distract readers.** Crop the photograph to delete unnecessary detail. Figure 12.23 on page 340 shows examples of cropped and uncropped photographs.
- ▶ **Do not electronically manipulate the photograph.** There is nothing unethical about removing blemishes or cropping a digital photograph. However, manipulating a photograph—for example, enlarging the size of the monitor that comes with a computer system—is unethical.
- ▶ **Help readers understand the perspective.** Most objects in magazines and journals are photographed at an angle to show the object's depth as well as its height and width.
- ▶ **If appropriate, include some common object, such as a coin or a ruler, in the photograph to give readers a sense of scale.**
- ▶ **If appropriate, label components or important features.**



Figure 12.23 Cropping a Photograph

Source: AP Photo/Samsung Electronics, HO.

Screen Shots Screen shots—images of what appears on a computer monitor—are often used in software manuals to show users what the screen looks like at various points during the use of a program. Figure 12.24 is an example of how a screen shot might be used.

PANDA3D

Information Gallery Download Documentation Community

Web Runtime SDK Snapshot Builds

Screenshot

Code3D (TM) by Sim Ops Studios.
Code3D is a toolset that is available to emergency responders for creating their own 3D virtual training scenarios. Code3D is realistic and engaging. Users can create their own training environment; add hazards and photos that can change over time. Users can then use the playback function to walk through the 3D environment and scenario in real-time. It utilizes Panda3D as the core 3D rendering engine and wxPython for the 2D user interface.

[Code3D Website.](#)

[Back to Gallery of Screenshots](#)

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This Web site from a university media lab uses a screen shot to show what the user of a 3-D simulation program will see.

Figure 12.24 Screen Shot

Source: Carnegie Mellon University, 2010 <www.panda3d.org/showss.php?shot=ssg-code3d/code3D01>.

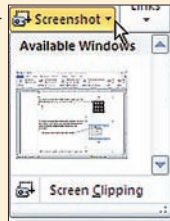
TECH TIP

How to Create and Insert Screen Shots

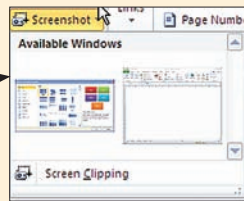
To show your reader what appears in a window on your computer monitor, you can insert a **screen shot**.

Select **Screenshot** from the **Illustrations** group on the **Insert** tab.

You will see a small version of each window you have open on your desktop. Click the screen you want to show your readers, and Word will insert the picture into your document.

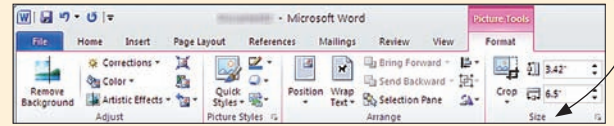


If your active screen has a dialog box open, you will see it pictured under **Available Windows**. Click on the picture of the dialog box to insert it.



To insert part of an active screen other than a dialog box, select **Screen Clipping**. You will see the active screen with a white shade over it. Use your cursor to draw a rectangular box around the part that you want in your screen shot.

You can modify screen shots by using the **Picture Tools Format** tab. For example, you can use the **Crop** tool in the **Size** group to hide unnecessary details.



If you plan to create many screen shots, consider using software designed to capture and edit screen images efficiently. Search the Internet for “screen capture software,” such as TechSmith’s Snagit.

KEYWORDS: screen shot, format tab, crop

Line Drawings *Line drawings* are simplified visual representations of objects. Line drawings offer three possible advantages over photographs:

- Line drawings can focus readers’ attention on desired information better than a photograph can.
- Line drawings can highlight information that might be obscured by bad lighting or a bad angle in a photograph.
- Line drawings are sometimes easier for readers to understand than photographs are.

Figure 12.25 on page 342 shows the effectiveness of line drawings.

You have probably seen the three variations on the basic line drawing shown in Figure 12.26.

This drawing, which accompanies a manual about the Americans with Disabilities Act, illustrates the idea that “wheelchair seating locations must provide lines of sight comparable to those provided to other spectators.” A photograph could not show this concept as clearly as this drawing does.

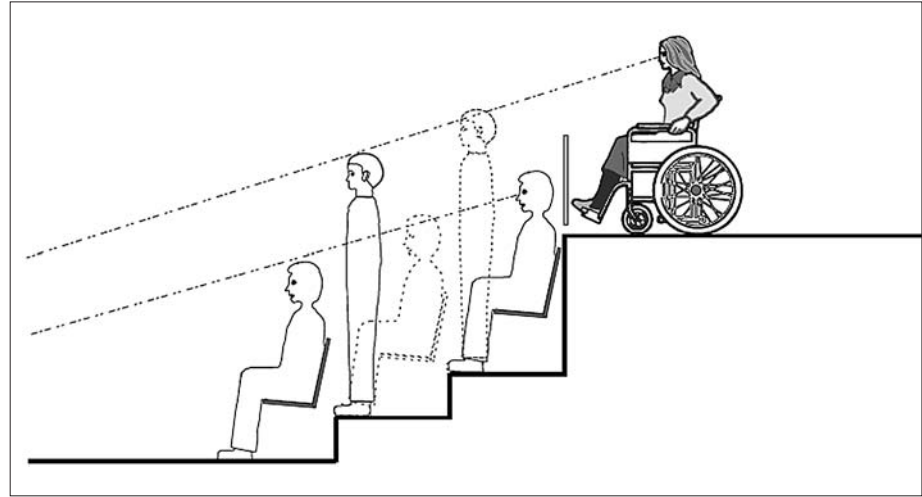


Figure 12.25 Line Drawing

Source: U.S. Department of Justice, 2010 <www.ada.gov/stadium.pdf>.

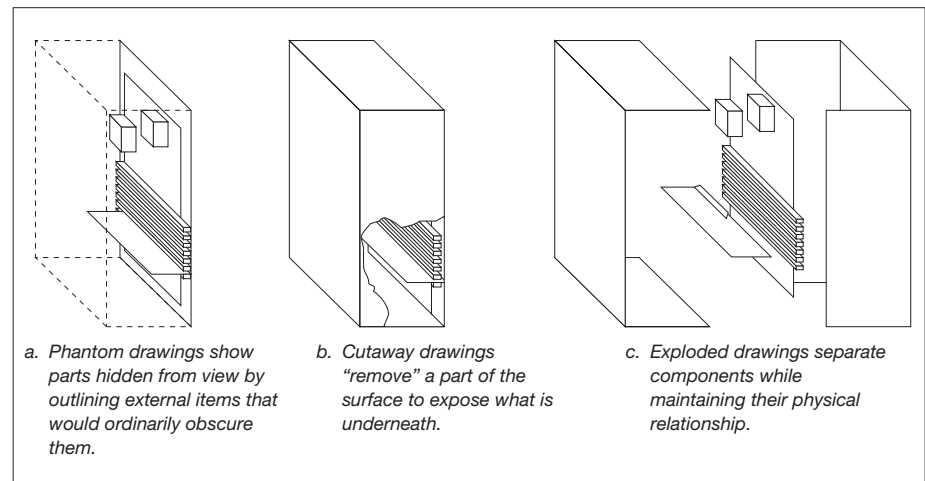


Figure 12.26 Phantom, Cutaway, and Exploded Views

Maps Maps are readily available as clip art that can be modified with a graphics program. Figure 12.27 shows a map derived from clip art.

CREATING EFFECTIVE GRAPHICS FOR MULTICULTURAL READERS

Whether you are writing for people within your organization or outside it, consider the needs of readers whose first language is different from your own. Like words, graphics have cultural meanings. If you are unaware of these

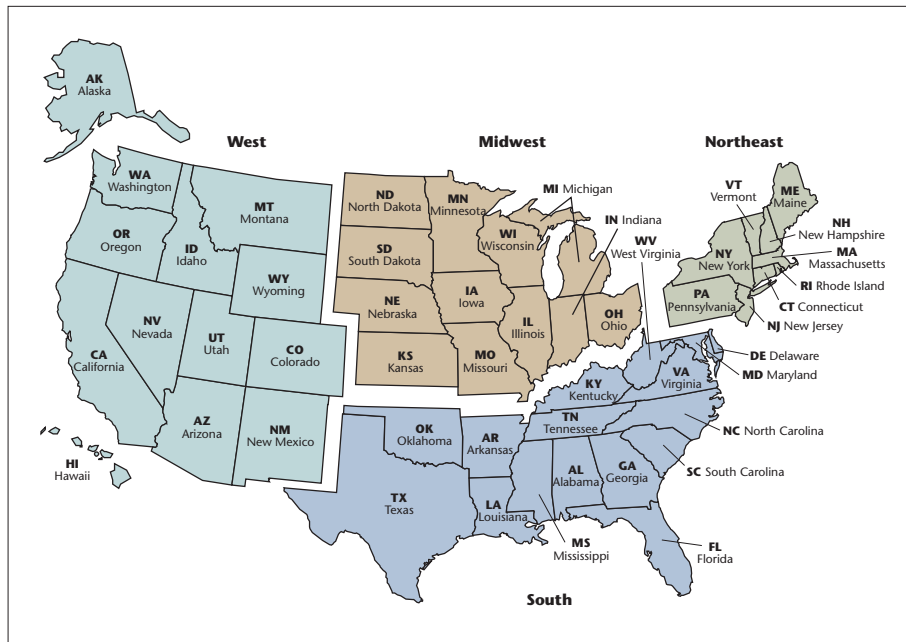


Figure 12.27 Map

Include a scale and a legend if the map is one that is not thoroughly familiar to your readers. Also, use conventional colors, such as blue for water.

meanings, you could communicate something very different from what you intend. The following guidelines are based on William Horton's (1993) article "The Almost Universal Language: Graphics for International Documents."

- *Be aware that reading patterns differ.* In some countries, people read from right to left or from top to bottom. In some cultures, direction signifies value: the right-hand side is superior to the left, or the reverse. You need to think about how to sequence graphics that show action, or where you put "before" and "after" graphics. If you want to show a direction, as in an informal flowchart, consider using arrows to indicate how to read the chart.
- *Be aware of varying cultural attitudes toward giving instruction.* Instructions for products made in Japan are highly polite and deferential: "Please attach the cable at this time." Some cultures favor spelling out general principles but leaving the reader to supply the details. For people in these cultures, instructions containing a detailed close-up of how to carry out a task might appear insulting.
- *Deemphasize trivial details.* Because common objects, such as plugs on the ends of power cords, come in different shapes around the world, draw them to look generic rather than specific to one country.
- *Avoid culture-specific language, symbols, and references.* Don't use a picture of a mouse to symbolize a computer mouse because the device is not known by that name everywhere. Avoid the casual use of national symbols (such as the maple leaf or national flags); any error in a detail might

offend your readers. Use colors carefully: red means danger to most people from Western cultures, but it is a celebratory color to the Chinese.


- *Portray people very carefully.* Every aspect of a person's appearance, from clothing to hairstyle to features, is culture- or race-specific. A photograph of a woman in casual Western attire seated at a workstation would be ineffective in an Islamic culture where only the hands and eyes of a woman may be shown. Horton (1993) recommends using stick figures or silhouettes that do not suggest any one culture, race, or sex.
- *Be particularly careful in portraying hand gestures.* Many Western hand gestures, such as the “okay” sign, are considered obscene in other cultures, and long red fingernails are inappropriate to some. Use hands in graphics only when necessary—for example, carrying out a task—and obscure the person's sex and race.

Cultural differences are many and subtle. Learn as much as possible about your readers and about their culture and outlook, and have the graphics reviewed by a native of the culture.

Writer's Checklist

- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Does the graphic have a purpose? (p. 308) <input type="checkbox"/> Is the graphic simple and uncluttered? (p. 308) <input type="checkbox"/> Does the graphic present a manageable amount of information? (p. 308) <input type="checkbox"/> Does the graphic meet readers' format expectations? (p. 308) <input type="checkbox"/> Is the graphic clearly labeled? (p. 308) <input type="checkbox"/> Is the graphic honest? (p. 309) <input type="checkbox"/> Does the graphic appear in a logical location in the document? (p. 309) | <ul style="list-style-type: none"> <input type="checkbox"/> Is the graphic introduced clearly in the text? (p. 309) <input type="checkbox"/> Is the graphic explained in the text? (p. 310) <input type="checkbox"/> Is the graphic clearly visible in the text? (p. 310) <input type="checkbox"/> Is the graphic easily accessible to your readers? (p. 310) <input type="checkbox"/> For an existing graphic, do you have the legal right to use it? (p. 312) If so, have you cited it appropriately? (p. 313) <input type="checkbox"/> Is the graphic inoffensive to your readers? (p. 343) |
|--|--|

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Find out from the admissions department at your college or university the number of students enrolled from the different states or from the different counties in your state. Present this information in four different kinds of graphics:
 - a. map
 - b. table
 - c. bar graph
 - d. pie chart
2. In three or four paragraphs, explain why each graphic is appropriate for a particular audience and purpose and how each emphasizes different aspects of the information.
 2. Design a flowchart for a process you are familiar with, such as applying for a summer job, studying for a test, preparing a paper, or performing some task at work. Your audience is someone who will be carrying out the process.

3. The following table provides statistics on injuries (U.S. Census Bureau, 2010, p. 197). Study the table, then perform the following tasks:
- Create two different graphics, each of which communicates information about the cost of lost wages and productivity.
 - Create two different graphics, each of which compares wage and productivity losses to the total of other losses due to unintentional injuries.

Table 197. Costs of Unintentional Injuries: 2007

[684.4 represents \$684,400,000,000. Covers costs of deaths or disabling injuries together with vehicle accidents and fires]

Cost	Amount (bil. dol.)					Percent distribution				
	Total ¹	Motor vehicle	Work	Home	Other	Total ¹	Motor vehicle	Work	Home	Other
Total	684.4	257.7	175.3	164.7	108.3	100.0	100.0	100.0	100.0	100.0
Wage and productivity losses ²	344.4	88.5	84.1	104.4	71.1	50.3	34.3	48.0	63.4	65.7
Medical expense	134.0	38.5	35.3	38.1	24.3	19.6	14.9	20.1	23.1	22.4
Administrative expenses ³	129.2	86.1	40.4	8.3	8.1	18.9	33.4	23.0	5.0	7.5
Motor vehicle damage .. ⁴	42.6	42.6	1.7	(NA)	(NA)	6.2	16.5	1.0	(NA)	(NA)
Employer uninsured cost ⁴	19.5	2.0	10.4	4.8	2.6	2.8	0.8	5.9	2.9	2.4
Fire loss	14.7	(NA)	3.4	9.1	2.2	2.1	(NA)	1.9	5.5	2.0

NA Not available. ¹ Excludes duplication between work and motor vehicle; \$21.6 billion in 2007. ² Actual loss of wages and household production, and the present value of future earnings lost. ³ Home and other costs may include costs of administering medical treatment claims for some motor-vehicle injuries filed through health insurance plans. ⁴ Estimate of the uninsured costs incurred by employers, representing the money value of time lost by noninjured workers.

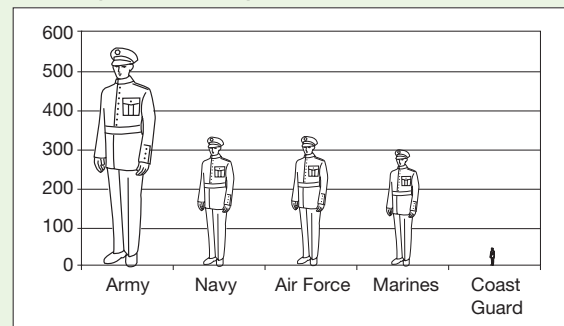
Source: National Safety Council, Itasca, IL, *Injury Facts, annual* (copyright); <<http://www.nsc.org/irs/statstop.aspx>>.

4. For each of the following four graphics, write a paragraph evaluating its effectiveness and describing how you would revise it.

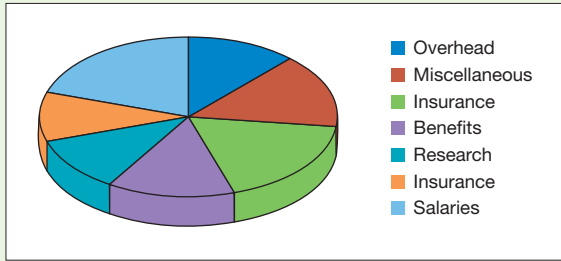
a. Majors

	2009	2010	2011
Civil Engineering	236	231	253
Chemical Engineering	126	134	142
Comparative Literature	97	86	74
Electrical Engineering	317	326	401
English	714	623	592
Fine Arts	112	96	72
Foreign Languages	608	584	566
Materials Engineering	213	227	241
Mechanical Engineering	196	203	201
Other	46	42	51
Philosophy	211	142	151
Religion	86	91	72

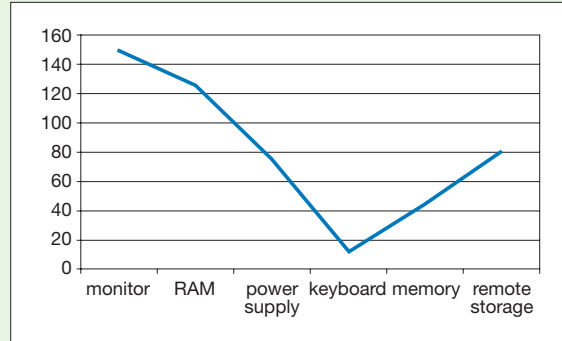
b. Number of Members of the U.S. Armed Forces in 2009 (in Thousands)



c. Expenses at Hillway Corporation



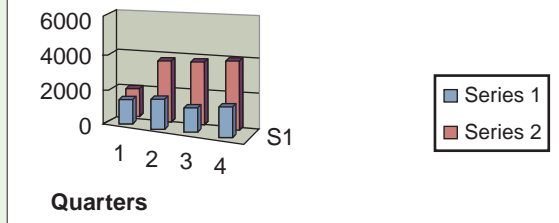
d. Costs of the Components of a PC



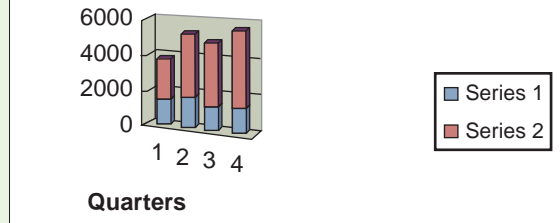
5. The following three graphs illustrate the sales of two products—Series 1 and Series 2—for each quarter of 2011. Which is the most effective in conveying the

information? Which is the least effective? What additional information would make the most effective graph better?

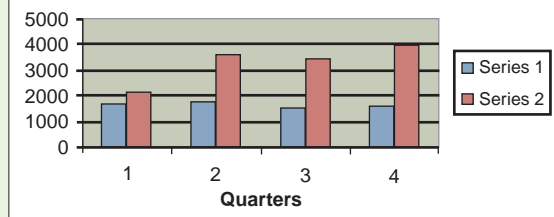
a. 2011 Sales of Series 1 and 2, by Quarters



b. 2011 Sales of Series 1 and 2, by Quarters



c. 2011 Sales of Series 1 and 2, by Quarters



6. The following table from a report on the federal response to Hurricane Katrina presents data on the damage done by five hurricanes (Townsend, 2006). After studying the table, write a paragraph in which

you explain the data to general readers interested in comparing the damage done by Hurricane Katrina with the damage done by other major hurricanes in U.S. history.

Table 1 Hurricane Katrina Compared to Hurricanes San Felipe, Camille, Andrew, and Ivan


<i>Hurricane (year)</i>	<i>Homes damaged or destroyed</i>	<i>Property damage (in billions of dollars)</i>	<i>Deaths</i>
San Felipe (1928)	*	<1	2,750
Camille (1969)	22,008	6	335
Andrew (1992)	79,663	33	61
Ivan (2004)	27,772	15	57
Katrina (2005)	300,000	96	1,330

*Data not available.

7. **INTERNET EXERCISE** Locate a graphic on the Web that you consider inappropriate for an international audience because it might be offensive or unclear in some cultures. Imagine an intended audience for the graphic,

such as people from the Middle East, and write a brief statement explaining the potential problem. Finally, revise the graphic so that it would be appropriate for its intended audience.

Case 12: Creating Appropriate Graphics to Accompany a Report

 **In This Book** For more about memos, see Ch. 14, p. 385.

Background

In the last year, three young drivers in your state have been killed in car crashes caused in part because they were using their cell phones. Two of the three were texting at the time of their collisions. The news of these three deaths has prompted Harold McInness, a member of the state legislature, to introduce legislation that would restrict cell-phone use while driving. Specifically, Rep. McInness wishes to ban texting for all drivers and to ban the use of handheld cell phones by all drivers who are not yet 21 years old.

You work as an assistant to the Insurance Commissioner of your state, Felicia Ortiz. The Insurance Commissioner has a number of responsibilities, including overseeing the insurance companies that operate in your state and advising the state legislature on legal matters related to the insurance industry. Ms. Ortiz received a call from Rep. McInness requesting research assistance for his draft legislation.

“Representative McInness called me because the insurance industry has been very active in conducting research into all aspects of traffic safety,” Ms. Ortiz tells you. “Would

you try to get some current data on how using cell phones while driving affects driving ability and relates to accident statistics? He wants to be able to use this data in a report to the Transportation Subcommittee, which he chairs.”

You spend an afternoon on the Web, searching for information. You find a lot of good information from federal government agencies, reputable polling organizations, and insurance researchers. You present this information to Ms. Ortiz (see Document 12.1 on page 348).

“Okay,” she tells you after she has had a chance to look at your draft. “Thanks very much for gathering these facts. Two things I want to point out right away. One, I think the top-ten list sends the wrong message. This is a serious subject, and we want to be sure to show that we take it very seriously. And two, you’ve got 11 facts here.”

“I understand,” you say. “I’ve got an extra one in case you want to drop one of them.”

“I want to make sure we’re giving Representative McInness the data he needs. It’s better to have good data than a lot of data. So we might want to pare this down to facts

that relate clearly and directly to whether using a cell phone while driving is dangerous. Second, I'd like to think about whether it would be easier to understand if some of the facts were communicated graphically rather than in words."

Your Assignment

1. Thoroughly revise and edit the list in Document 12.1. First, eliminate any facts that do not clearly relate to the specific topic. Second, arrange the items in a logical sequence by grouping them appropriately (see Chapter 7 for information on organizational patterns).
2. Present to the class your list of facts and the formats you proposed in Assignment 1. Your list should include at least seven items and recommend at least five types of graphics.

After each item in your new list, write a paragraph on whether the item should be communicated in words or in a graphic or graphics. If you propose that an item be communicated in a graphic or graphics, indicate the type of graphic (such as a pie chart, table, or line graph), and justify your decision.

Top Ten Facts About Cell Phones and Driving

1. Of all adult drivers who own a cell phone, 10 percent say they talk on the phone while driving "all the time," 62 percent say "sometimes," and 28 percent say "never."
2. An Australian study showed that cell phone use while driving was associated with slightly more than a fourfold increase in crash risk (odds ratio 4:1).
3. Talking on the phone while driving differs depending on the age of the driver. Of the Echo Boomers (age 18–32), 83 percent report that they at least sometimes talk on the phone while driving. Of the Gen X (age 33–44), 85 percent. Of the Baby Boomers (age 45–63), 70 percent. Of the Matures (64+), 42 percent.
4. Sending and receiving text messages while driving is relatively rare: only 5 percent of all drivers who have a cell phone report that they do so "all the time," 22 percent report "sometimes," and 74 percent report "never."
5. A review of 84 studies of the impact of cell phone use on driving performance concluded that whereas cell phone use has only a small or moderate impact on driving performance measures such as driving speed, lane position, and various other measures of vehicle control, it significantly slows the driver's speed of reaction to critical events 0.23 seconds.
6. In 1990, there were 5 million wireless subscribers. Today, there are more than 270 million wireless subscribers in the United States.
7. Of those drivers who use cell phones while driving, most think that doing so is dangerous (26 percent "very dangerous," 24 percent "dangerous," 33 percent "somewhat dangerous," 16 percent "slightly dangerous"). Only 2 percent think it is "not dangerous at all."
8. The #1 outlandish multitasking episode reported by a driver (a Gen Y female from Texas): she reported that she had shaved her legs, eaten a taco, put on makeup, and drunk alcohol at the same time while driving.
9. According to an insurance poll, 78.8 percent of people said they have been a passenger in a car that was being driven by a driver who was not giving his or her full attention to driving.
10. The states of California, Connecticut, New Jersey, New York, and Washington, plus the District of Columbia, outlaw the use of handheld phones while driving. Alaska, Louisiana, Minnesota, New Jersey, Washington, and the District of Columbia prohibit all drivers from text messaging while driving. Seventeen states also have laws that prohibit young drivers—drivers under the age of 18 in some cases, drivers with learner's permits or provisional licenses in other cases—from using any kind of cell phone (whether handheld or hands-free) while driving.
11. The National Highway Traffic Safety Administration (NHTSA) estimated that at any given time, 6 percent of drivers nationwide were holding a cell phone to their ear.

Document 12.1 Top Ten Facts About Cell Phones and Driving

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedford-stmartins.com/techcomm>.

Reviewing, Evaluating, and Testing Documents and Web Sites



frog design.

Take steps to test your ideas before people see them.

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a Usability Test 362

The idea behind the Dattoo (DNA Tattoo), a concept from Frog Design, “is to use the body itself as hardware and interaction platform, through the use of minimally-invasive, recyclable materials.” Using the body’s electricity to power the device, the wearer would be able to take pictures, make calls, and perform other digital activities. To determine whether anyone would want to buy and wear a Dattoo, a manufacturer would test the usability of the design with a prototype. There’s no sense in carrying out all the research and development needed to make this product if people think it’s creepy.

This chapter focuses on techniques for improving the usability of documents and Web sites. In technical communication, *usability* refers to how easily a person can use a document, site, or software program to carry out a task. More specifically, *usability* refers to five factors related to a person’s use of the item (“What Is Usability?,” 2008):

- *Ease of learning*: the time it takes a person to learn to use the item
- *Efficiency of use*: the time it takes a person to carry out a task after learning how to do it
- *Memorability*: a person’s ability to remember how to carry out a task
- *Error frequency, severity, and recovery*: the number and severity of errors a person makes in carrying out a task, and the ease with which a person recovers from these errors
- *Subjective satisfaction*: how much a person likes (or dislikes) carrying out the task

UNDERSTANDING REVIEWING, EVALUATING, AND TESTING

As a writer, you can improve the usability of documents and Web sites by reviewing, evaluating, and testing them.

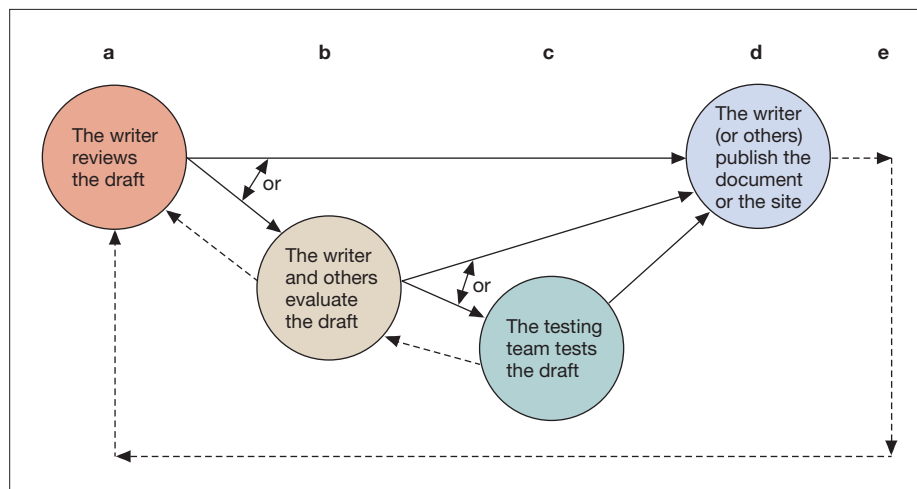
- *Reviewing* refers to three techniques—revising, editing, and proofreading—that you use to study your draft and change it, making it easier to use. You have used these techniques in this writing course and in previous courses.

- *Evaluating* refers to having other people help you by reading the draft and communicating with you about its strengths and weaknesses. You probably have had people help you evaluate some of your drafts in the past.
- *Testing* refers to formal techniques of observing people and analyzing their actions as they try to use your draft to carry out tasks. You likely have not used testing before.

Figure 13.1 shows the relationships among reviewing, evaluating, and testing.

How do you know whether you should go straight from reviewing to publication or whether you need to have the draft evaluated and perhaps tested? Typically, you consider three factors:

- *Importance.* If a document or site is important, evaluate and test as much as you can. For instance, an annual report is so important that you do everything you can to make it perfect. Your company's Web site also is crucial. You try to make it perfect, and you keep evaluating and testing it even after it is launched. A routine memo describing a work-around for a technical problem is not as important. Review it yourself, then send it out.
- *Time.* Almost everything in technical communication has a deadline, and almost every deadline comes too quickly. If the document is even moderately important and you have the hours, days, or weeks to evaluate and test it, do so.
- *Money.* It costs money to evaluate and test drafts, including employee time and fees for test participants. If there is no good reason to spend the money, don't.



The solid lines represent the publication process. At point (a), the writer reviews the draft and then decides either to publish it as is (d) or to have it evaluated (b). If the draft is evaluated (b), it is next either published (d) or tested (c). After the draft is tested, it is published (d). The broken lines represent instances in which the draft might be sent back for further work. At point (e), a published document or Web site might be reviewed (a) and revised—partially, or completely—to make it more usable.

Figure 13.1 Relationships Among Reviewing, Evaluating, and Testing

REVIEWING DOCUMENTS AND WEB SITES

Reviewing a document or Web site is the process of studying a draft and making it easier to use. Reviewing a document consists of three tasks: revising, editing, and proofreading. In carrying out these tasks, you will likely work from larger issues to smaller issues. You will review the document as a whole (for scope, organization, and development) and save the smaller issues (such as sentence-level concerns) for later. That way, you don't waste time on awkward paragraphs or sentences that you might eventually throw out.

Revising

Revising is the process of looking again at your draft to see if your initial assumptions about your audience, purpose, and subject still pertain, and then making any necessary changes. These changes can range from minor, such as adding one or two minor topics, to major, such as adding whole new sections and deleting others.

For example, imagine you are revising a set of instructions to help new sales associates at your company understand how to return unsold merchandise to the supplier for credit. Since you started working on the instructions last month, your company has instituted a new policy: sales associates must write statements to management analyzing the costs and benefits of returning the unsold merchandise versus discounting it heavily and trying to sell it. Now you need to do some additional research to be sure you understand the new policy, gather or create some examples of these new statements, write new instructions, and integrate them into your draft. You thought you were almost done, but you aren't. It happens.

Editing

Having revised the draft, you think it is in good shape. It meets the needs of its readers, it fulfills your purpose or purposes, and it covers the subject effectively, presenting the right information. Now it's time for editing: going a little deeper into the draft.

Guidelines

Editing the Draft

After you finish your draft, look through it to make sure the writing is clear and effective. Start with the big picture by answering these four questions:

- ▶ **Is the design effective?** Documents and sites should look professional and attractive, and they should be easy to navigate. Will your readers find it easy to locate the information they want? For more on design, see Chapter 11.

In This Book

For more about audience and purpose, see Ch. 5.

In This Book

For more about revising, see Ch. 3, pp. 50–52.

On TechComm Web

For more advice on editing, see Purdue University's Online Writing Lab handouts on revising. Click on Links Library for Ch. 13 on <bedfordsmartins.com/techcomm>.

- ▶ **Does your draft meet your readers' expectations?** If, for instance, the readers of a report expect a transmittal letter, they might be distracted if they don't see one. Check to make sure that your draft includes the information they expect and looks the way they expect. Be especially careful if your document or site will be used by people from other cultures, who might have different expectations. For more on writing for multicultural readers, see Chapter 5, page 101.
- ▶ **Is your draft honest, and does it adhere to appropriate legal standards?** Have you presented your information honestly, without being misleading and without omitting information that might counter your argument? Have you adhered to appropriate legal standards of intellectual property, such as copyright law? For more on ethical and legal issues, see Chapter 2.
- ▶ **Do you come across as reliable, honest, and helpful?** Check to see that your persona is fully professional: modest, understated, and cooperative. For more on persona, see Chapter 8, page 194.

Next, answer these four questions related to the organization and development of the draft:

- ▶ **Have you left out anything in turning your outline into a draft?** Check your outline to see that all the topics are included in the document itself. Or switch to the outline view in your word processor so you can focus on the headings. Is anything missing? For more on the outline view, see Chapter 3, page 45.
- ▶ **Is the organization logical?** Your draft is likely to reflect several different organizational patterns. For instance, the overall pattern might be chronological. Within that pattern, sections might be organized from more important to less important. Looking at the headings in the outline view, can you see the patterns you used, and do those patterns seem to work well? For more on organizational patterns, see Chapter 7.
- ▶ **Is the emphasis appropriate throughout the draft?** If a major point is treated only briefly, mark it for possible expansion. If a minor topic is treated at great length, mark it for possible condensing.
- ▶ **Are your arguments well developed?** Have you presented your claims clearly and emphatically? Have you done sufficient and appropriate research to gather the right evidence to support your claims effectively? Is your reasoning valid and persuasive? For more on conducting research, see Chapter 6. For more on using evidence effectively, see Chapter 8, page 188.

Finally, answer these four questions related to the verbal and visual elements of the draft:

- ▶ **Are all the elements presented consistently?** Check to see that parallel items are presented consistently. For example, are all your headings on the same level structured the same way (for example, as noun phrases or as *-ing* gerunds)? And check for grammatical parallelism, particularly in lists, but also in traditional sentences. For more on parallelism, see Chapter 10, page 236.
- ▶ **Are your paragraphs well developed?** Does each paragraph begin with a clear topic sentence that previews or summarizes the main point? Have you included appropriate and sufficient support to validate your claims? For more on paragraph development, see Chapter 9.



- ▶ **Are your sentences clear, emphatic, and correct?** Review the draft to make sure each sentence is easy to understand, is structured to emphasize the appropriate information, and is grammatically correct. For more on writing effective sentences, see Chapter 10.
- ▶ **Have you used graphics appropriately?** Do you see more opportunities to translate verbal information into graphics to make your communication easier to understand and more emphatic? Have you chosen the proper types of graphics, created them effectively, and linked them to your text? For more on graphics, see Chapter 12.

Editing your draft thoroughly requires a lot of work. Naturally, you hope that once you're done editing, you will never need to go back and retrieve that earlier draft. But experienced writers know that things don't always go that smoothly. Half the time, when you throw out a sentence, paragraph, or section that you absolutely *know* you will never need again—you soon realize you need it again. For this reason, it's smart to archive all the drafts of everything you write. The easiest way to do this is to use a version number at the end of the file name. For example, the first draft of the Lab Renovation proposal is LabRenPropV1. When it comes time to edit that draft, open that file and immediately rename it LabRenPropV2.

Proofreading

Proofreading is the long, slow process of reading through your draft one last time to make sure you have written what you intended to write. You are looking for small problems caused by carelessness or haste. For instance, have you written *filename* on one page and *file name* on another? Have you been consistent in expressing quantities as numerals and as words? Have you been consistent in punctuating citations in your list of works cited? Although your software can help you with some of these chores, it isn't sophisticated enough to do it all. You need time—and willpower.

Look particularly for problems in word endings. For instance, a phrase such as “we studying the records from the last quarter” is a careless error left over from an earlier draft of the sentence. Change it to “we studied the records from the last quarter.” Also look for missing and repeated words: “We studied the from the last quarter”; “We studied the the records from the last quarter.”

How do you reduce your chances of missing these slips? Read the draft slowly, out loud, listening to what you have written, marking things that look wrong. After you fix those problems, go through the draft one more time, one line at a time, looking for more problems. Some instructors suggest reading the document backward—last page first, last line first, right to left—so you can focus on the individual words. If you can stand doing it, do it.

CONDUCTING USABILITY EVALUATIONS

What is a *usability evaluation*? When you evaluate the usability of a draft, you are asking someone to study the draft, looking for ways to improve its usability. That person then communicates his or her impressions and suggestions, either in writing or through an interview.

You can perform usability evaluations of existing or prototype documents or sites. A *prototype* is a model that is built to simulate the look and feel of an item before it is produced commercially. In technical communication, a prototype is typically an early draft of a document, Web site, or software program. A prototype can range in sophistication from a simple drawing of a computer screen to a fully functioning system that looks exactly like a commercial product. Figure 13.2 shows an array of free templates that can be revised and used to create a home page of a Web site. The user selects a category, browses through hundreds of sample templates, downloads the code, and revises the text to create a working prototype. With this prototype, the user can then evaluate how well the design works.

In most types of usability evaluations, five categories of people participate:

- **Writer.** Although writers might not participate actively in the evaluation of their own drafts, they are important to the process.
- **User.** In technical communication, users are people who use a document, site, or program, usually as part of their jobs. They can be current or future users; they can be novice, experienced, or expert users. They are probably not people who work with you for the company that makes the

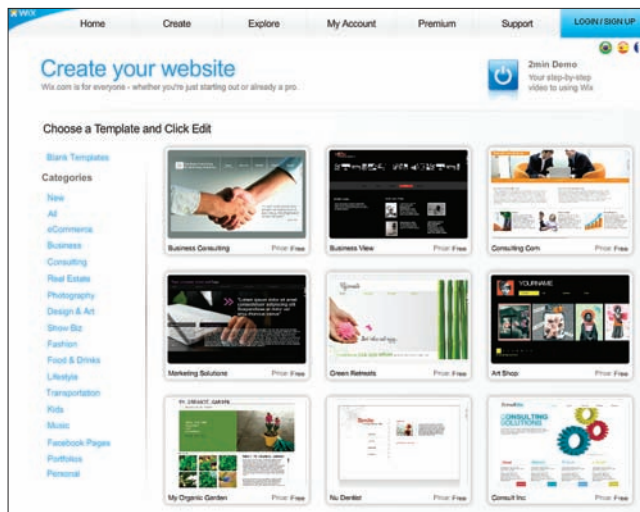


Figure 13.2 A Web Site Showing Sample Templates

Source: Wix.com, 2011 <www.wix.com/create/website>.

product. Such people are likely to have specialized knowledge that would make them atypical.

- *Subject-matter expert (SME)*. An expert in the subject of the document, Web site, or software can be very useful in evaluating a draft. For instance, a database engineer is presumably an SME in database software programs. This person probably could see more—and different—potential problems in a new database program than a typical user could.
- *Usability expert*. A usability expert—an SME in ergonomics, human-computer interaction, usability engineering, or cognitive psychology—typically designs the usability evaluation. That is, he or she determines which questions about the draft need to be answered and decides how to answer them most effectively and efficiently. He or she might also carry out the evaluation.
- *Evaluator*. An evaluator is the person who carries out the evaluation. He or she is likely to be either an SME or a usability expert.

Although there are many varieties of usability evaluations, five major forms are used most often:

- *Surveying or interviewing users*. Evaluators survey or interview users to learn about the strengths and weaknesses of a document or site. These techniques can sometimes reveal problems that can be fixed; for instance, you might learn that your users would really like to have a printed list of keyboard shortcuts to tape to the office wall. More often, however, these techniques provide attitudinal information; that is, they reveal users' attitudes about aspects of using the draft.
- *Observing users*. To understand how people use an existing document or site, evaluators go to their workplaces and observe them as they work. Observations can reveal, for example, that typical users are unaware of a feature that you assumed they used. This insight can help you see that you need to make that feature easier to find and use. Arrange the visit beforehand, and bring food.
- *Interviewing SMEs and usability experts*. The evaluator can ask the expert to study the draft for usability and then interview that person. In the interview, the evaluator can ask general questions about the strengths and weaknesses of the draft or focused questions about particular aspects of the draft. One well-known version of an expert evaluation is called a *cognitive walk-through*, in which the evaluator asks an expert to carry out a set of tasks (such as signing up for automatic updates from a blog) on a prototype or existing site. The evaluator watches and notes the expert's actions and comments. Another version of an expert evaluation is called a *heuristic evaluation*. A *heuristic* is a guideline or desirable characteristic, such as that every page of a Web site should include an easy-to-find link to the home page. A heuristic evaluation, then, is an assessment of how well a draft adheres to a set of guidelines. After a cognitive walk-through or a heuristic evaluation, the evaluator interviews the expert.

In This Book

For more about interviewing and about writing questionnaires, see Ch. 6, pp. 140 and 142.

On TechComm Web

For Jakob Nielsen's well-known set of heuristics for Web sites, click on Links Library for Ch. 13 on <bedfordstmartins.com/techcomm>.

- *Conducting focus groups.* A *focus group* is a meeting at which a group of people discusses an idea or product. Typically, the people are real or prospective users. Let's say your company sells a software program called FloorTraxx, which helps people design custom floors. A focus group might consist of FloorTraxx customers and perhaps other people who have indicated an interest in designing custom floors for their houses. The moderator would lead a discussion that focused on what the customers liked or disliked about the product, whether they are satisfied with the results, and what changes they would recommend in an updated version. The moderator would also seek to learn what information the prospective customers would need before deciding to purchase the product.
- *Using a commercial usability service.* Companies such as UserTesting.com offer usability testing of Web sites. You specify how many "users" you wish to evaluate your site, their demographics (such as age, sex, Web experience, and nationality), the context in which they would be using the site, a set of simple tasks they are to carry out, and a set of questions (such as "What do you like best about the site?"). You then receive, from each person who evaluated your site, a brief report and a video of the person thinking aloud while trying to carry out the tasks. Although such usability services claim that they are performing usability testing, in fact they are performing basic evaluations; real usability testing always involves real users. During usability testing, as described in the next section, the testing team can gather more detailed information because they conduct the test in a controlled laboratory environment and can interact with the test participant more extensively.

If your users include people from other cultures, be sure to include people from these cultures in your interviews and focus groups. If possible, use interviewers from the culture of the people you are interviewing. Vatrapu and Pérez-Quñones (2006) have shown that people from other cultures are sometimes reluctant to criticize a draft for fear of embarrassing the interviewer. When the interviewer is from the same culture, however, people are more forthcoming.

After completing any usability evaluation, you need to gather the important information that you learned and share it with others in your company through a presentation, a Web site, or a collection of documents on the company intranet.

CONDUCTING USABILITY TESTS

Usability testing draws on many of the same principles as usability evaluations. For example, in a test, you start by determining what you want to learn. You choose test participants carefully, and you repeat the test with many participants. You change the draft and retest with still more participants. You record what you have learned.

The big differences between usability testing and usability evaluation are that testing always involves real users (or people who match the characteristics of real users) carrying out real tasks, often takes place in a specialized lab, is recorded using more sophisticated media, and is documented in more formal reports that are distributed to more people.

This section covers four topics:

- the basic principles of usability testing
- preparing for a usability test
- conducting a usability test
- interpreting and reporting the data from a usability test

The Basic Principles of Usability Testing

There are three basic principles of usability testing:

- *Usability testing permeates product development.* Usability testing involves testing the document, site, or software rigorously and often to make sure it works and is easy to use. Prototypes, newly completed products, and products that have been in use for a while are all tested.
- *Usability testing involves studying real users as they use the product.* Unlike most types of usability evaluations, which involve experts, testing involves real users, who can provide important information that experts cannot. Real users make mistakes that experts don't make. One well-known example was the computer software that included an error-recovery message that said, "Press Any Key to Continue." The manufacturer received hundreds of calls from users who couldn't find the "Any" key.
- *Usability testing involves setting measurable goals and determining whether the product meets them.* Usability testing involves determining, first, what the user is supposed to be able to do. For instance, in testing a help system for a word-processing program, the testers might decide that the user should be able to find the section on saving a file and perform that task successfully in less than two minutes.

Preparing for a Usability Test

Usability testing requires careful planning. According to usability specialist Laurie Kantner (1994), planning accounts for one-half to three-quarters of the time devoted to testing. In planning a usability test, you must complete eight main tasks:

- *Understand users' needs.* As discussed in the section on usability evaluations, companies use focus groups to discuss a product or an issue. In addition, they test existing products, have experts review the product, and conduct on-site interviews and observations of real users in the workplace.

On TechComm Web

For an article describing OCLC's usability testing program, click on Links Library for Ch. 13 on <bedfordstmartins.com/techcomm>.

- *Determine the purpose of the test.* Testers can test an idea even before the product is designed, to see if people understand it and like it. Or they can test a prototype to see if it is easy to use, or a finished product to see if it needs any last-minute improvements.
- *Staff the test team.* Extensive programs in usability testing involve many specialists, each doing one job. Smaller programs involve only a handful of people, each doing many jobs. For instance, a testing team might include an SME on the product, who can suggest workarounds if necessary; a test administrator, who administers the test to the participant; a note taker, who fills out the evaluation forms and records important comments the user makes; and a videographer, who operates the recording equipment.
- *Set up the test environment.* A basic environment includes a room for the test participant and another room for the test observers. Figure 13.3 on page 360 presents a diagram and a photograph of a usability lab.
- *Develop a test plan.* A test plan is a proposal requesting resources; it describes and justifies what the testers plan to do.
- *Select participants.* Testers recruit participants who match the profile of the intended users. Generally, it is best not to use company employees, who might know more about the product than a real user would.
- *Prepare the test materials.* Most tests require legal forms, an orientation script to help the participant understand the purpose of the test, background questionnaires, instructions for the participant to follow, and a log for the testers to record data during the test.
- *Conduct a pilot test.* A pilot test is a usability test for the usability test. A pilot test can uncover problems with the equipment, the document being tested, the test materials, and the test design.

 **In This Book**

For information about proposals, see Ch. 16.

Conducting a Usability Test

The testing team has to plan the test carefully and stay organized. Typically, the team creates a checklist and a schedule for the test day, including every task that every person, including the test participant, is to carry out. Conducting the test includes interacting with the test participant both during the formal test and later, during a debriefing session.

Interacting with the Test Participant Among the most popular techniques for eliciting information from the test participant is the *think-aloud test*, in which the participant says aloud what he or she is thinking. In the earlier example of FloorTraxx software for designing custom floors, you would first create a set of tasks for the participant to carry out:

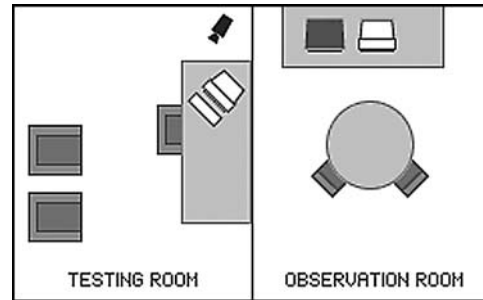


Figure 13.3 A Usability Lab

The photograph shows the testing room, with the man administering the test to the woman. Note the camera on the computer screen that is recording her as she carries out the tasks. Behind the large one-way mirror is the observation room, where the other members of the test team sit and monitor the test.

Source: Xperience Consulting, 2008 <www.xperienceconsulting.com/eng/servicios.asp?ap=25#3>.

- Calculate the area of a floor.
- Calculate the number of tiles needed for a project.
- Estimate the amount of adhesive needed for a project.
- Generate the bill of materials needed for a project.
- Calculate the cost of materials and labor for a project.

As the participant carries out each task, he or she “thinks aloud” about the process. Because this process might make the test participant feel awkward, the test administrator might demonstrate the process at the beginning of the session by thinking aloud while using one of the features on a cell phone or locating a particular song on a digital music player.

ETHICS NOTE**Understanding the Ethics of Informed Consent**

For legal and ethical reasons, organizations that conduct usability testing—especially tests that involve recording the test participant’s behavior—abide by the principle of informed consent. *Informed consent* means that the organization fully informs the participant of the conditions under which the test will be held, as well as how the results of the test will be used. Only if the participant gives his or her consent, in writing, will the test occur.

When you obtain informed consent for tests that involve recording, be sure to do the following six things:

- Explain that the test participant can leave at any time and can report any discomfort to the testing team at any time, at which point the team will stop the test.
- Explain that a camera will be used, and ask for permission before the recording begins.
- Explain the purpose of the recording and the uses to which it will be put. If, for example, the recording might be used later in advertising, the test participant must be informed of this.
- Explain who will have access to the recording and where it might be shown. A participant might object to having the recording shown at a professional conference, for example.
- Explain how the test participant’s identity will be disguised—if at all—if the recording is shown publicly.
- Explain that the test participant will have the opportunity to hear or view the recording and then change his or her mind about how it might be used.

While the test participant thinks aloud, a note taker records anything that is confusing and any point at which the test participant is not sure about what to do. If the test participant gets stuck, the administrator asks a leading question, such as “Where do you think that function might be located?” or “What did you expect to see when you clicked that link?” Questions should not take the user’s knowledge for granted or embarrass the test participant for failing a task. For example, “Why didn’t you click the Calculate button?” assumes both that the user saw the button and that the user knew how to use it.

In addition, questions should not bias the test participant. When testers ask a participant a question, they should try not to reveal the answer they want. They should not say, “Well, that part of the test was pretty easy, wasn’t it?” Regardless of whether the participant thought it was simple or difficult, his or her impulse will be to answer yes. Usability specialists Joseph S. Dumas and Janice Redish recommend using neutral phrasing, such as “How was it

 **On TechComm Web**

For more information on informed consent, see Wendy Mackey’s “Ethics, Lies and Videotape.” Click on Links Library for Ch. 13 on <bedfordstmartins.com/techcomm>.

performing that procedure?” or “Did you find that procedure easy or difficult?” (1993, p. 298). In responding to questions, testers should be indirect. If the participant asks, “Should I press ENTER now?” they might respond, “Do you think you should?” or “I’d like to see you decide.”

To ensure that the test stays on schedule and is completed on time, the test administrators should set a time limit for each task. If the test participant cannot complete the task in the allotted time, the administrator should move on to the next task.

Debriefing the Test Participant After the test, testers usually have questions about the test participant’s actions. For this reason, they debrief—that is, interview—the participant. The debriefing is critically important, for once the participant walks out the door, it is difficult and expensive to ask any questions, and the participant likely will have forgotten the details. Consequently, the debriefing can take as long as the test itself did.

While the participant fills out a posttest questionnaire, the test team quickly looks through the data log and notes the most important areas to investigate. Their purpose in debriefing is to obtain as much information as possible about what occurred during the test; their purpose is not to think of ways of redesigning the product to prevent future problems. Usability specialist Jeffrey Rubin suggests beginning the debriefing with a neutral question, such as “So, what did you think?” (1994, p. 246). This kind of question encourages the participant to start off with an important suggestion or impression. During the debriefing session, testers probe high-level concerns before getting to the smaller details. They try not to get sidetracked by a minor problem.

Interpreting and Reporting the Data from a Usability Test

After a usability test, testers have a great deal of data, including notes, questionnaires, and videos. Turning that data into useful information involves three steps:

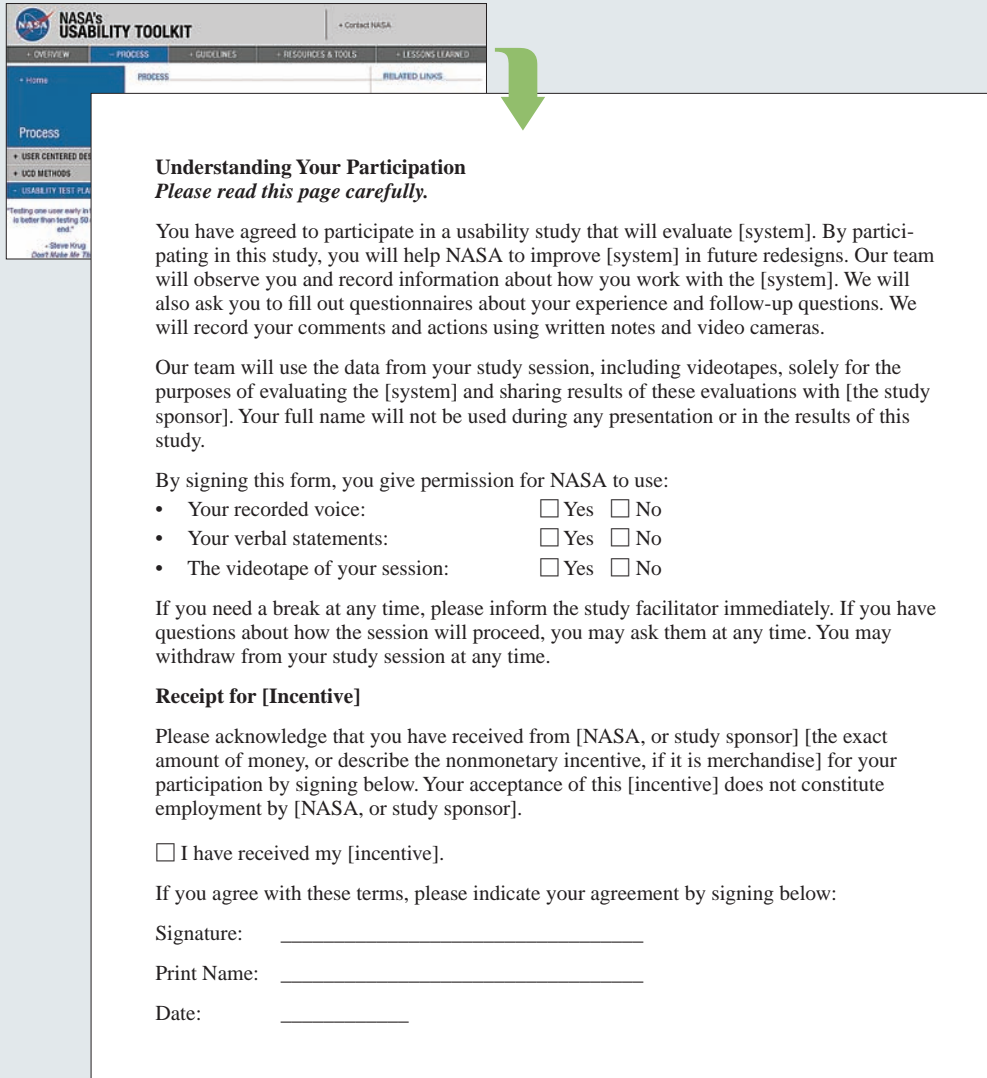
- *Tabulate the information.* Testers gather all the information from the test, including *performance* measures, such as how long it took a participant to complete a task, and *attitude* measures, such as how easy the participant found it to perform the task.
- *Analyze the information.* Testers analyze the information, concentrating on the most important problems revealed in the test and trying to determine the severity and the frequency of each one.
- *Report the information.* Writing a clear, comprehensive report often leads the testers to insights they might not have achieved otherwise.

Although usability testing might seem extremely expensive and difficult, testers who are methodical, open-minded, and curious about how people use their documents or Web sites find that it is the least expensive and most effective way to improve quality.

INTERACTIVE SAMPLE DOCUMENT

Obtaining Informed Consent

NASA, the U.S. space agency, uses the following consent form in its usability testing. The questions in the margin ask you to examine this document in light of the guidelines for informed consent (p. 361).



NASA's USABILITY TOOLKIT [Contact NASA](#)

OVERVIEW | PROCESS | GUIDELINES | RESOURCES & TOOLS | LESSONS LEARNED

Home | PROCESS | RELATED LINKS

Process

USER CENTERED DESIGN | UCD METHODS | USABILITY TEST PLANS

"Testing your user early is better than testing 50 and"

Steve Kling, Chief Usability Officer

Understanding Your Participation

Please read this page carefully.

You have agreed to participate in a usability study that will evaluate [system]. By participating in this study, you will help NASA to improve [system] in future redesigns. Our team will observe you and record information about how you work with the [system]. We will also ask you to fill out questionnaires about your experience and follow-up questions. We will record your comments and actions using written notes and video cameras.

Our team will use the data from your study session, including videotapes, solely for the purposes of evaluating the [system] and sharing results of these evaluations with [the study sponsor]. Your full name will not be used during any presentation or in the results of this study.

By signing this form, you give permission for NASA to use:

- Your recorded voice: Yes No
- Your verbal statements: Yes No
- The videotape of your session: Yes No

If you need a break at any time, please inform the study facilitator immediately. If you have questions about how the session will proceed, you may ask them at any time. You may withdraw from your study session at any time.

Receipt for [Incentive]

Please acknowledge that you have received from [NASA, or study sponsor] [the exact amount of money, or describe the nonmonetary incentive, if it is merchandise] for your participation by signing below. Your acceptance of this [incentive] does not constitute employment by [NASA, or study sponsor].

I have received my [incentive].

If you agree with these terms, please indicate your agreement by signing below:

Signature: _____

Print Name: _____

Date: _____

1. Which concepts of an effective informed-consent form, as described in the Ethics Note on page 361, does this form include?
2. Which concepts of an effective informed-consent form does this form *not* include?
3. Are any provisions in this form potentially unclear?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 13 on bedfordstmartins.com/techcomm.

Source: National Aeronautics and Space Administration, 2010 <www.hq.nasa.gov/pao/portal/usability/process/utPlanning.htm>.

Writer's Checklist

Revising, Editing, and Proofreading

- Did you think about how your audience, purpose, and subject might have changed since you planned and drafted your document or site? (p. 352)

In editing your draft, did you check to see that

- the design is effective? (p. 352)
- the draft meets your readers' expectations? (p. 353)
- the draft is honest and adheres to appropriate legal standards? (p. 353)
- you come across as reliable, honest, and helpful? (p. 353)
- you have not omitted anything from your outline? (p. 353)
- the organization of the draft is logical? (p. 353)
- the emphasis is appropriate throughout the draft? (p. 353)
- the arguments are well developed? (p. 353)
- the elements of the draft are presented consistently? (p. 353)
- the paragraphs are well developed? (p. 353)
- the sentences are clear, emphatic, and correct? (p. 354)
- the graphics are used appropriately? (p. 354)
- you have archived earlier drafts using a logical file-naming system? (p. 354)

Did you proofread your draft carefully, looking for small problems such as

- inconsistent spelling and punctuation? (p. 354)
- incorrect word endings? (p. 354)
- repeated or missing words? (p. 354)

Usability Evaluations

Did you, if appropriate,

- survey or interview users? (p. 356)
- observe users using your existing document or site? (p. 356)
- interview SMEs and usability experts? (p. 356)
- conduct focus groups? (p. 357)
- use a commercial usability service? (p. 357)

Usability Tests

Did you prepare for the usability test by

- understanding your users' needs? (p. 358)
- determining the purpose of the test? (p. 359)
- staffing the test team? (p. 359)
- setting up the test environment? (p. 359)
- developing a test plan? (p. 359)
- selecting participants? (p. 359)
- preparing the test materials? (p. 359)
- conducting a pilot test? (p. 359)


Did you conduct the usability test effectively by

- interacting appropriately with the participant? (p. 359)
- obtaining informed consent? (p. 361)
- debriefing the participant? (p. 362)

Did you interpret and report the test data by

- tabulating the information? (p. 362)
- analyzing the information? (p. 362)
- reporting the information? (p. 362)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Edit and proofread the following passage. Be prepared to share your work with the class.

Here are a list of the questions you shouldn't be asked by a perspective employer: What is or was your spouse's name or job? Has a Workers Compensation claim been filed on your behalf? Were you ever injured on the job. Do you have any physical empairments that prevents you from performing the job for which you applying? Have you ever been arrested?

If yes, what for? What is your hair/eye color? Your height/weight? Have you ever been hospitalized? If so, why. Have you ever been treated by a psyhiatrist or psychologist? If so, for what condition? Is there any health-related reasons you may not be able to preform the job for which you're applying? How many days were you absent from work because of illness? Are you now taking any drugs? Have you ever had a problem with for drug adiction or alcoholism?

2. Contact local manufacturing companies and computer hardware and software companies to see whether any of them perform usability testing. Interview a person who performs usability testing at one of these organizations. Then write a 1,000-word memo to your instructor describing how the process of conducting usability testing at this organization differs from that described in this chapter.
3. If a local company conducts usability testing, see whether you can become a test participant. After the test, write a 1,000-word memo to your instructor describing the experience, focusing on what you learned about usability testing.
4. **GROUP EXERCISE** Form a group of four or five students, and conduct an informal usability test for assembling or using one of the following products:
 - a. a piece of computer hardware, such as a printer
 - b. a piece of software (or a portion of a piece of software)
 - c. a document that accompanies a piece of software (or a portion of one)
 - d. a piece of equipment used in your major field of study
 - e. a smartphone, Bluetooth headset, or similar productSubmit a brief usability report to your instructor.

Case 13: Revising a Document for a New Audience

Background

You are a Nutrition and Health major, interning with your university's Health Center. Your supervisor is Dr. Lauren Chakraparti, the Director of the Health Center. You and Dr. C, as she likes to be called, are reviewing the statistics about the conditions that students report when they come to the Health Center.

"As you know," Dr. C says to you, "the number of students inquiring about obesity is up over two hundred percent in the last three years. Students are asking about nutrition programs, exercise programs, and various weight-loss surgeries. One of the therapies I'm getting questions about now is very low-calorie diets—VLCDs."

"I'm not even sure what they are."

"They're a kind of diet where you completely substitute synthetic nutrition sources—things like special shakes—for all the food you usually eat. You stay on that diet for weeks or months, and you lose a lot of weight. The fact that you haven't heard about it is why I need your help."

Dr. C hands you a fact sheet (see Document 13.1 on pages 366–67). "This is a fact sheet from the National Institutes of Health about VLCDs. It's written at a pretty high level, and it's not addressed to our audiences. Do you want to help me turn it into something we can give to students?"

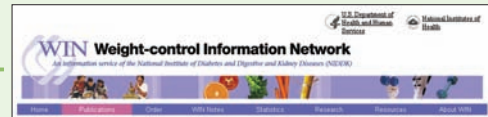
"Absolutely," you say.

Your Assignment

1. Study Document 13.1. What information should be deleted because it is not addressed to a college-age audience? What information should be added? What information should be "translated" to more directly meet the needs of college students? Should graphics be added to make the document more effective? If so, what types of graphics? Present your findings in a memo to Dr. C.
2. Revise Document 13.1 according to the memo you wrote for Assignment 1. Perform any secondary research necessary to discover technical information that you need to make the necessary revision. If you recommended adding graphics, either describe them in words, create your own, or use existing graphics that you found on the Internet to help Dr. C visualize your ideas. (Be sure to record source information for any graphics you download from the Internet.)

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on bedfordstmartins.com/techcomm.

**Document 13.1 Original
Fact Sheet About VLCDs****Very Low-Calorie Diets****What is a very low-calorie diet?**

A very low-calorie diet (VLCD) is a doctor-supervised diet that typically uses commercially prepared formulas to promote rapid weight loss in patients who are obese. These formulas, usually liquid shakes or bars, replace all food intake for several weeks or months. VLCD formulas need to contain appropriate levels of vitamins and micronutrients to ensure that patients meet their nutritional requirements. Some physicians also prescribe VLCDs made up almost entirely of lean protein foods, such as fish and chicken. People on a VLCD consume about 800 calories per day or less.

VLCD formulas are not the same as the meal replacements you can find at grocery stores or pharmacies, which are meant to substitute for one or two meals a day. Over-the-counter meal replacements, such as bars, entrees, or shakes, should account for only part of one's daily calories.

When used under proper medical supervision, VLCDs may produce significant short-term weight loss in patients who are moderately to extremely obese. VLCDs should be part of comprehensive weight-loss treatment programs that include behavioral therapy, nutrition counseling, physical activity, and/or drug treatment.

Who should use a VLCD?

VLCDs are designed to produce rapid weight loss at the start of a weight-loss program in patients with a body mass index (BMI) greater than 30 and significant comorbidities. BMI correlates significantly with total body fat content. It is calculated by dividing a person's weight in pounds by height in inches squared and multiplied by 703.

Use of VLCDs in patients with a BMI of 27 to 30 should be reserved for those who have medical conditions due to overweight, such as high blood pressure. In fact, all candidates for VLCDs undergo a thorough examination by their health care provider to make sure the diet will not worsen preexisting medical conditions. Lastly, these diets are not appropriate for children or adolescents, except in specialized treatment programs.

Very little information exists regarding the use of VLCDs in older adults. Because adults over age 50 already experience depletion of lean body mass, use of a VLCD may not be warranted. Also, people over 50 may not tolerate the side effects associated with VLCDs because of preexisting medical conditions or the need for other medicines. Doctors must evaluate on a case-by-case basis the potential risks and benefits of rapid weight loss in older adults, as well as in patients who have significant medical problems or are on medications. Furthermore, doctors must monitor all VLCD patients regularly—ideally every 2 weeks in the initial period of rapid weight loss—to be sure patients are not experiencing serious side effects.

Health Benefits of a VLCD

A VLCD may allow a patient who is moderately to extremely obese to lose about 3 to 5 pounds per week, for an average total weight loss of 44 pounds over 12 weeks. Such a weight loss can rapidly improve obesity-related medical conditions, including diabetes, high blood pressure, and high cholesterol.

The rapid weight loss experienced by most people on a VLCD can be very motivating. Patients who participate in a VLCD program that includes lifestyle treatment typically lose about 15 to 25 percent of their initial weight during the first 3 to 6 months. They may maintain a 5-percent weight loss after 4 years if they adopt a healthy eating plan and physical activity habits.

Adverse Effects of a VLCD

Many patients on a VLCD for 4 to 16 weeks report minor side effects such as fatigue, constipation, nausea, or diarrhea. These conditions usually improve within a few weeks and rarely prevent patients from completing the program. The most common serious side effect is gallstone formation. Gallstones, which often develop in people who are obese, especially women, are even more common during rapid weight loss. Research indicates that rapid weight loss may increase cholesterol levels in the gallbladder and decrease its ability to contract and expel bile. Some medicines can prevent gallstone formation during rapid weight loss. Your health care provider can determine if these medicines are appropriate for you.

Maintaining Weight Loss

Studies show that the long-term results of VLCDs vary widely, but weight regain is common. Combining a VLCD with behavior therapy, physical activity, and active follow-up treatment may help increase weight loss and prevent weight regain.

In addition, VLCDs may be no more effective than less severe dietary restrictions in the long run. Studies have shown that following a diet of approximately 800 to 1,000 calories produces weight loss similar to that seen with VLCDs. This is probably due to participants' better compliance with a less restrictive diet.

For most people who are obese, their condition is long-term and requires a lifetime of attention even after formal weight-loss treatment ends. Therefore, health care providers should encourage patients who are obese to commit to permanent changes of healthier eating, regular physical activity, and an improved outlook about food.

Source: U.S. Department of Health and Human Services, 2008 <http://win.niddk.nih.gov/publications/low_calorie.htm>.

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PART 4

Learning Important Applications

CHAPTER 14

Writing Correspondence



AP Photo/Paul Sakuma.

You will communicate every day on the job.

As this photograph shows, new media make it simple and inexpensive to add a visual dimension to business correspondence. Here, two people are using a videoconferencing product to confirm information that they will put into writing using the product's instant-messaging feature.

Regardless of whether you use microblogs, instant messaging, text messaging, or more traditional applications, you will communicate in writing every day on the job. This chapter discusses the four major formats used for producing workplace correspondence: letters, memos, e-mails, and microblogs. Throughout this chapter, the word *correspondence* refers to all these forms.

UNDERSTANDING THE PROCESS OF WRITING CORRESPONDENCE

The process of writing correspondence is essentially like that of writing any other kind of workplace document. Figure 14.1 presents an overview of this process, focusing on letters, memos, and e-mails. The more formal the correspondence, the more time you are likely to spend on each of these steps.

SELECTING A TYPE OF CORRESPONDENCE

When you need to correspond with others in the workplace, your first task is to decide on the appropriate application. Here are the major characteristics of each type:

- **Letters.** Because letters still use centuries-old conventions such as the salutation and complimentary close, they are the most formal of the four types of correspondence and are therefore most appropriate for communicating with people outside your organization or, in some formal situations, with people within your organization.
- **Memos.** This type of correspondence is moderately formal and therefore appropriate for people in your own organization.
- **E-mail.** This type is best for quick, relatively informal communication with one or many recipients. Recipients can store and forward an e-mail easily, as well as capture the text and reuse it in other documents. In addition, the writer can attach other files to an e-mail.
- **Microblogs.** Microblog posts such as Twitter tweets or Facebook status updates can be useful for quick questions addressed to a group. This is the most informal type of correspondence.

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Writing Memos 385

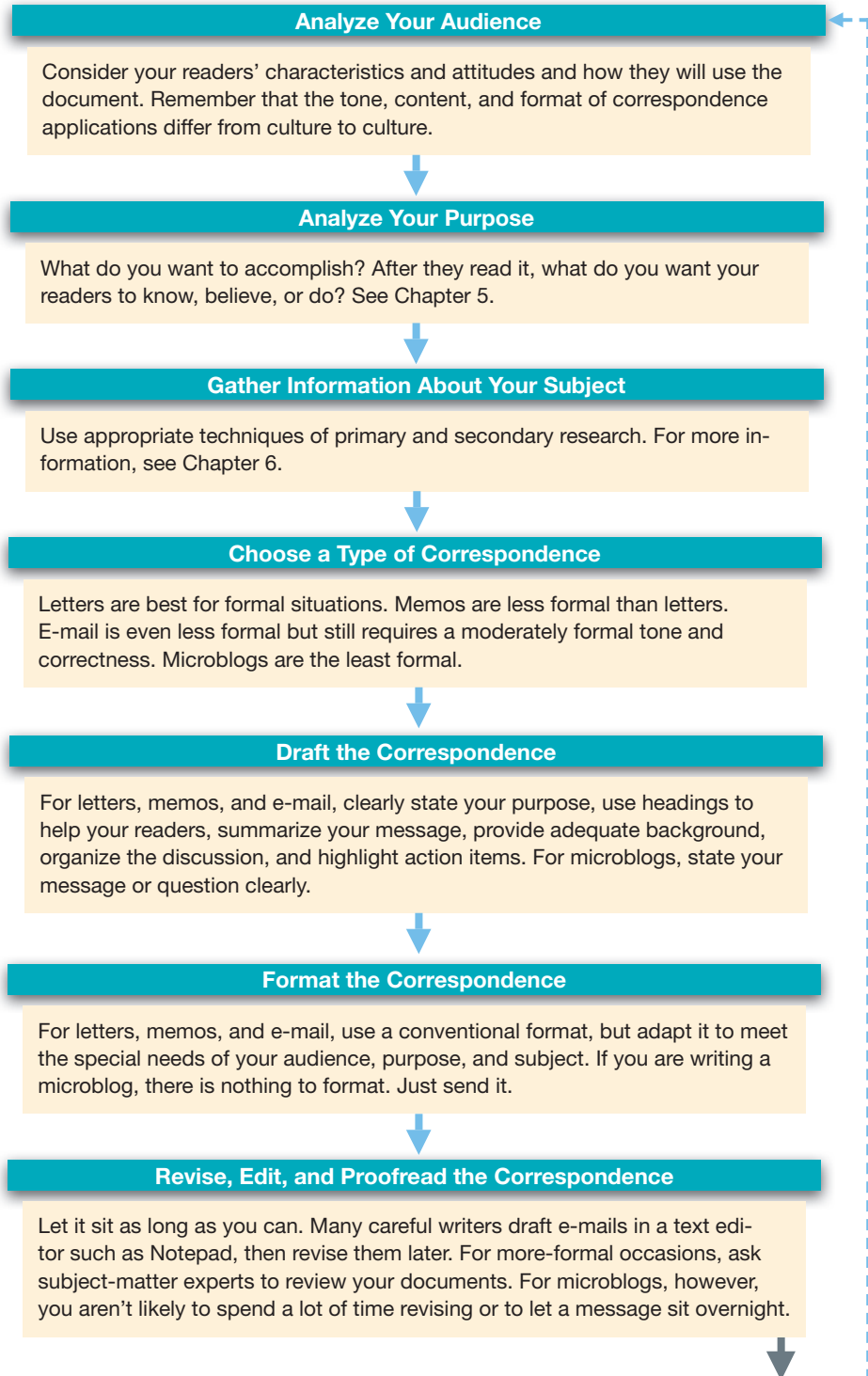
Writing E-mails 387

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Writing Correspondence to Intercultural Readers 392

Figure 14.1 The Process of Writing Correspondence

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your subject, audience, and purpose.



Send the Correspondence

Go on to the next task.

PRESENTING YOURSELF EFFECTIVELY IN CORRESPONDENCE

When you write business correspondence, follow these five suggestions for presenting yourself as a professional:

- Use the appropriate level of formality.
- Communicate correctly.
- Project the “you attitude.”
- Avoid correspondence clichés.
- Communicate honestly.

Use the Appropriate Level of Formality

People are sometimes tempted to use informal writing in informal digital applications such as e-mail and microblogs. Don't. Remember that everything you write on the job is legally the property of the organization for which you work, and messages are almost always archived digitally, even after recipients have deleted them. Remember, too, that they might be read by the company president, or they might appear in a newspaper or in a court of law. Therefore, use a moderately formal tone to avoid potential embarrassment.

TOO INFORMAL Our meeting with United went south right away when they threw a hissy fit, saying that we blew off the deadline for the progress report.

MODERATELY FORMAL In our meeting, the United representative expressed concern that we had missed the deadline for the progress report.

However, you don't want to sound like a dictionary.

TOO FORMAL It was indubitably the case that our team was successful in presenting a proposal that was characterized by quality of the highest order. My appreciation for your industriousness is herewith extended.

MODERATELY FORMAL I think we put together an excellent proposal. Thank you very much for your hard work.

Communicate Correctly

One issue closely related to formality is correctness. As discussed in Chapter 1, correct writing is free of grammar, punctuation, style, usage, and spelling errors. The most problems with correctness arise when people use e-mail and microblogs.

In This Book

For more about editing and proofreading, see Ch. 13, pp. 352–54.

Some writers mistakenly think that because these digital applications are meant for quick communication, they need not worry about correctness. They are wrong. You have to plan your digital correspondence just as you plan any other written communication, and you should revise, edit, and proofread it. Sending correspondence that contains errors of correctness is unprofessional because it suggests a lack of respect for your reader—and for yourself. It also causes your reader to think that you are careless about your job.

Project the “You Attitude”

Correspondence must convey a courteous, positive tone. The key to accomplishing this task is using the “you attitude”—that is, looking at the situation from the reader’s point of view and adjusting the content, structure, and tone to meet his or her needs. For example, if you are writing to a supplier who has failed to deliver some merchandise on the agreed-upon date, the “you attitude” dictates that you not discuss problems you are having with other suppliers; those problems don’t concern your reader. Instead, concentrate on explaining clearly and politely that the reader has violated your agreement and that not having the merchandise is costing you money. Then propose ways to expedite the shipment.

Following are two examples of thoughtless sentences, each followed by an improved version that shows the “you attitude.”

ACCUSING	You must have dropped the engine. The housing is badly cracked.
BETTER	The badly cracked housing suggests that your engine must have fallen onto a hard surface from some height.
SARCASTIC	You’ll need two months to deliver these parts? Who do you think you are, the post office?
BETTER	Surely you would find a two-month delay for the delivery of parts unacceptable in your business. That’s how I feel, too.

A calm, respectful tone makes the best impression and increases the chances that you will achieve your goal.

Avoid Correspondence Clichés

Over the centuries, a set of words and phrases has come to be associated with business correspondence; one common example is *as per your request*. These phrases sound stilted and insincere. Don’t use them.

Figure 14.2 is a list of common clichés and their more natural equivalents. Figure 14.3 shows two versions of the same letter: one written in clichés, the other in plain language.

In This Book

For more about choosing the right words and phrases, see Ch. 10, p. 240.

<i>Letter clichés</i>	<i>Natural equivalents</i>
attached please find	attached is
enclosed please find	enclosed is
pursuant to our agreement	as we agreed
referring to your (“Referring to your letter of March 19, the shipment of pianos . . .”)	“As you wrote in your letter of March 19, the . . .” (or subordinate the reference at the end of your sentence)
wish to advise (“We wish to advise that . . .”)	(The phrase doesn’t say anything. Just say what you want to say.)
the writer (“The writer believes that . . .”)	“I believe . . .”

Figure 14.2 Letter Clichés and Natural Equivalents

<i>Letter containing clichés</i>	<i>Letter in natural language</i>
<p>Dear Mr. Smith:</p> <p>Referring to your letter regarding the problem encountered with your new Trailrider Snowmobile, our Customer Service Department has just submitted its report.</p> <p>It is their conclusion that the malfunction is caused by water being present in the fuel line. It is our conclusion that you must have purchased some bad gasoline. We trust you are cognizant of the fact that while we guarantee our snowmobiles for a period of not less than one year against defects in workmanship and materials, responsibility cannot be assumed for inadequate care. We wish to advise, for the reason mentioned hereinabove, that we cannot grant your request to repair the snowmobile free of charge.</p> <p>Permit me to say, however, that the writer would be pleased to see that the fuel line is flushed at cost, \$30. Your Trailrider would then give you many years of trouble-free service.</p> <p>Enclosed please find an authorization card. Should we receive it, we shall perform the above-mentioned repair and deliver your snowmobile forthwith.</p> <p>Sincerely yours,</p>	<p>Dear Mr. Smith:</p> <p>Thank you for writing to us about the problem with your new Trailrider Snowmobile.</p> <p>Our Customer Service Department has found water in the fuel line. Apparently some of the gasoline was bad. While we guarantee our snowmobiles for one year against defects in workmanship and materials, we cannot assume responsibility for problems caused by bad gasoline. We cannot, therefore, grant your request to repair the snowmobile free of charge.</p> <p>However, no serious harm was done to the snowmobile. We would be happy to flush the fuel line at cost, \$30. Your Trailrider would then give you many years of trouble-free service. If you will authorize us to do this work, we will have your snowmobile back to you within four working days. Just fill out the enclosed authorization card and drop it in the mail.</p> <p>Sincerely yours,</p>

Figure 14.3 Sample Letters with and Without Clichés

The letter on the right side avoids clichés and shows an understanding of the “you attitude.” Instead of focusing on the violation of the warranty, it presents the conclusion as good news: the snowmobile is not ruined, and it can be repaired and returned in less than a week for a small charge.

Communicate Honestly

You should communicate honestly when you write any kind of document, and business correspondence is no exception. Communicating honestly shows respect for your reader and for yourself.

ETHICS NOTE

Writing Honest Business Correspondence

Why is dishonesty a big problem in correspondence? Perhaps because the topics discussed in business correspondence often relate to the writer's professionalism and the quality of his or her work. For instance, when a salesperson working for a supplier writes to a customer explaining why the product did not arrive on time, he is tempted to make it seem as if his company—and he personally—is blameless. Similarly, when a manager has to announce a new policy that employees will dislike, she might be tempted to distance herself from the policy.

The most professional thing to do is tell the truth. If you mislead a reader in explaining why the shipment didn't arrive on time, the reader will likely double-check the facts, conclude that you are trying to avoid responsibility, and end your business relationship. If you try to convince readers that you had nothing to do with a new, unpopular policy, some of them will know if you are being misleading, and you will lose your most important credential: your credibility.

WRITING LETTERS


Letters are still a basic means of communication between organizations, with millions written each day. To write effective letters, you need to understand the elements of a letter, its format, and the common types of letters sent in the business world.

Elements of a Letter

Most letters include a heading, inside address, salutation, body, complimentary close, and signature. Some letters also include one or more of the following: attention line, subject line, enclosure line, and copy line. Figure 14.4 shows the elements of a letter.

Format of a Letter

Two typical formats are used for letters: modified block and full block. Figure 14.5 on page 379 illustrates these two formats.

 **On TechComm Web**
For more about letter writing, search for “business letters” at Purdue University’s OWL. Click on Links Library for Ch. 14 on <bedfordstmartins.com/techcomm>.

DAVIS TREE CARE
1300 Lancaster Avenue
Berwyn, PA 19092
www.davisfortrees.com

May 11, 2012

Fairlawn Industrial Park
1910 Ridgeway Drive
Rollins, MO 84639

Attention: Director of Maintenance

Subject: Fall pruning

Dear Director of Maintenance:

Do you know how much your trees are worth? That's right—your trees. As a maintenance director, you know how much of an investment your organization has in its physical plant. And the landscaping is a big part of your total investment.

Most people don't know that even the hardest trees need periodic care. Like shrubs, trees should be fertilized and pruned. And they should be protected against the many kinds of diseases and pests that are common in this area.

At Davis Tree Care, we have the skills and experience to keep your trees healthy and beautiful. Our diagnostic staff is made up of graduates of major agricultural and forestry universities, and all of our crews attend special workshops to keep current with the latest information on tree maintenance. Add to this our proven record of 43 years of continuous service in the Berwyn area, and you have a company you can trust.

Heading. Most organizations use letterhead stationery with their heading printed at the top. This preprinted information and the date the letter is sent make up the heading. If you are using blank paper rather than letterhead, your address (without your name) and the date form the heading. Use letterhead for the first page and do not number it. Use blank paper for the second and all subsequent pages.

Inside Address. If you are writing to an individual who has a professional title—such as Professor, Dr., or, for public officials, Honorable—use it. If not, use Mr. or Ms. (unless you know the recipient prefers Mrs. or Miss). If the reader's position fits on the same line as the name, add it after a comma; otherwise, drop it to the line below. Spell the name of the organization the way the organization itself does: for example, International Business Machines calls itself IBM. Include the complete mailing address: street number and name, city, state, and zip code.

Attention Line. Sometimes you will be unable to address a letter to a particular person because you don't know (and cannot easily find out) the name of the individual who holds that position in the company.

Subject Line. The subject line is an optional element in a letter. Use either a project number (for example, "Subject: Project 31402") or a brief phrase defining the subject (for example, "Subject: Price quotation for the R13 submersible pump").

Salutation. If you decide not to use an attention line or a subject line, put the salutation, or greeting, two lines below the inside address. The traditional salutation is Dear, followed by the reader's courtesy title and last name, followed by a colon (not a comma):
Dear Ms. Hawkins:

Figure 14.4 Elements of a Letter

Header for second page. Letter to Fairlawn Industrial Park
Page 2
May 11, 2012

Body. *In most cases, the body contains at least three paragraphs: an introductory paragraph, a concluding paragraph, and one or more body paragraphs.* May we stop by to give you an analysis of your trees—absolutely without cost or obligation? A few minutes with one of our diagnosticians could prove to be one of the wisest moves you’ve ever made. Just give us a call at 555-9187, and we’ll be happy to arrange an appointment at your convenience.

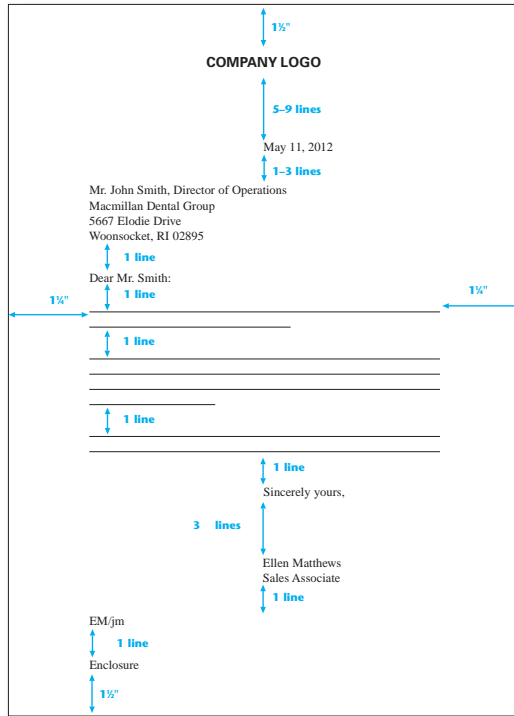
Complimentary Close. *The conventional phrases Sincerely, Sincerely yours, Yours sincerely, Yours very truly, and Very truly yours are interchangeable.* Sincerely yours,

Signature. *Type your full name on the fourth line below the complimentary close. Sign the letter, in ink, above the typewritten name. Most organizations prefer that you include your position under your typed name.* *Jasmine Brown*
Jasmine Brown
President

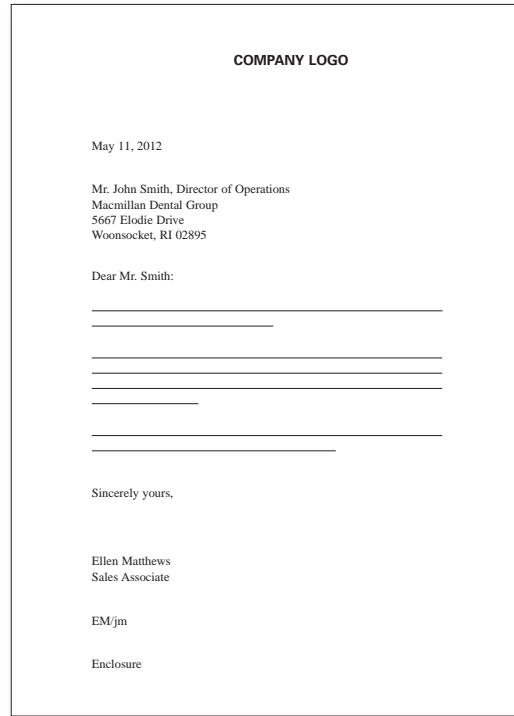
Copy Line. *If you want the primary recipient to know that other people are receiving a copy of the letter, include a copy line. Use the symbol c (for “copy”) followed by the names of the other recipients (listed either alphabetically or according to organizational rank). If appropriate, use the symbol cc (for “courtesy copy”) followed by the names of recipients who are less directly affected by the letter.* Enclosure: Davis Tree Care brochure
c: Darrell Davis, Vice President

Enclosure Line. *If the envelope contains documents other than the letter, include an enclosure line that indicates the number of enclosures. For more than one enclosure, add the number: “Enclosures (2).” In determining the number of enclosures, count only separate items, not pages. A three-page memo and a 10-page report constitute only two enclosures. Some writers like to identify the enclosures:*
Enclosure: 2011 Placement Bulletin
Enclosures (2): “This Year at Ammex”
2011 Annual Report

Figure 14.4 (continued)



a. Modified block format



b. Full block format—everything aligned along the left margin

Figure 14.5 Typical Letter Formats

The dimensions and spacing shown for the modified block format also apply to the full block format.

Common Types of Letters

Organizations send out many different kinds of letters. This section focuses on four types of letters written frequently in the workplace: inquiry, response to an inquiry, claim, and adjustment.

Inquiry Letter Figure 14.6 on page 380 shows an inquiry letter, in which you ask questions.

Response to an Inquiry Figure 14.7 on page 381 shows a response to the inquiry letter in Figure 14.6.

Claim Letter Figure 14.8 on page 382 is an example of a claim letter that the writer faxed to the reader.

In This Book

Two other types of letters are discussed in this book: the transmittal letter in Ch. 19, p. 523, and the job-application letter in Ch. 15, p. 424.

You write an inquiry letter to acquire information. Explain who you are and why you are writing. Make your questions precise and clear, and therefore easy to answer. Explain what you plan to do with the information and how you can compensate the reader for answering your questions.

This writer's task is to motivate the reader to provide some information. That information is not likely to lead to a sale because the writer is a graduate student doing research, not a potential customer.

Notice the flattery in the first sentence.

The writer presents specific questions in a list format, making the questions easy to read and understand.

In the final paragraph, the writer politely indicates his schedule and requests the reader's response. Note that he offers to send the reader a copy of his report.

If the reader provides information, the writer should send a thank-you letter.

14 Hawthorne Ave.
Belleview, TX 75234

November 2, 2012

Dr. Andrea Shakir
Director of Technical Services
Orion Corporation
721 West Douglas Avenue
Maryville, TN 31409

Dear Dr. Shakir:

I am writing to you because of Orion's reputation as a leader in the manufacture of adjustable x-ray tables. I am a graduate student in biomedical engineering at the University of Texas, and I am working on an analysis of diagnostic equipment for a seminar paper. Would you be able to answer a few questions about your Microspot 311?

1. Can the Microspot 311 be used with lead oxide cassettes, or does it accept only lead-free cassettes?
2. Are standard generators compatible with the Microspot 311?
3. What would you say is the greatest advantage, for the operator, of using the Microspot 311? For the patient?

Because my project is due on January 15, I would greatly appreciate your assistance in answering these questions by January 10. Of course, I would be happy to send you a copy of my report when it is completed.


Yours very truly,

Albert K. Stern

Albert K. Stern

Figure 14.6 Inquiry Letter

**721 WEST DOUGLAS AVE.
MARYVILLE, TN 31409**



**(615) 619-8132
www.orioninstruments.com**

November 7, 2012

Mr. Albert K. Stern
14 Hawthorne Ave.
Bellevue, TX 75234

Dear Mr. Stern:

I would be pleased to answer your questions about the Microspot 311. We think it is the best unit of its type on the market today.

1. The 311 can handle lead oxide or lead-free cassettes.
2. At the moment, the 311 is fully compatible only with our Duramatic generator. However, special wiring kits are available to make the 311 compatible with our earlier generator models — the Olympus and the Saturn. We are currently working on other wiring kits.
3. For the operator, the 311 increases the effectiveness of the radiological procedure while at the same time cutting down the amount of film used. For the patient, it reduces the number of repeat exposures and therefore reduces the total dose.

I am enclosing a copy of our brochure on the Microspot 311. If you would like additional information, please visit our Web site at www.orioninstruments.com/products/microspot311. I would be happy to receive a copy of your analysis when it is complete. Good luck!

Sincerely yours,

Andrea Shakir, M.D.

Andrea Shakir, M.D.
Director of Technical Services

Enclosure

c: Robert Anderson, Executive Vice President

In responding to an inquiry letter, answer the questions if you can. If you cannot, either because you don't know the answers or because you cannot divulge proprietary information, explain the reasons and offer to assist with other requests.

← *The writer responds graciously.*

← *The writer answers the three questions posed in the inquiry letter.*

← *The writer encloses other information to give the reader a fuller understanding of the product.*

← *The writer uses the enclosure notation to signal that she is attaching an item to the letter.*

← *The writer indicates that she is forwarding a copy to her supervisor.*

Figure 14.7 Response to an Inquiry

A claim letter is a polite, reasonable complaint. If you purchase a defective or falsely advertised product or receive inadequate service, you write a claim letter. If the letter is convincing, your chances of receiving an equitable settlement are good because most organizations realize that unhappy customers are bad for business. In addition, claim letters help companies identify weak points in their product or service.

The writer indicates clearly in the first paragraph that he is writing about an unsatisfactory product. Note that he identifies the product by model name.

The writer presents the background, filling in specific details about the problem. Notice how he supports his earlier claim that the problem embarrassed him professionally.

The writer states that he thinks the reader will agree that there was a problem with the equipment.

Then the writer suggests that the reader's colleague did not respond satisfactorily.

The writer proposes a solution: that the reader take appropriate action. The writer's clear, specific account of the problem and his professional tone increase his chances of receiving the solution he proposes.



255 Robbins Place, Centerville, MO 65101 | [417] 555-1850 | www.robbinsconstruction.com

August 17, 2012

Mr. David Larsyn
Larsyn Supply Company
311 Elmerine Avenue
Anderson, MO 63501

Dear Mr. Larsyn:

As steady customers of yours for over 15 years, we came to you first when we needed a quiet pile driver for a job near a residential area. On your recommendation, we bought your Vista 500 Quiet Driver, at \$14,900. We have since found, much to our embarrassment, that it is not substantially quieter than a regular pile driver.

We received the contract to do the bridge repair here in Centerville after promising to keep the noise to under 90 dB during the day. The Vista 500 (see enclosed copy of bill of sale for particulars) is rated at 85 dB, maximum. We began our work and, although one of our workers said the driver didn't seem sufficiently quiet to him, assured the people living near the job site that we were well within the agreed sound limit. One of them, an acoustical engineer, marched out the next day and demonstrated that we were putting out 104 dB. Obviously, something is wrong with the pile driver.

I think you will agree that we have a problem. We were able to secure other equipment, at considerable inconvenience, to finish the job on schedule. When I telephoned your company that humiliating day, however, a Mr. Meredith informed me that I should have done an acoustical reading on the driver before I accepted delivery.

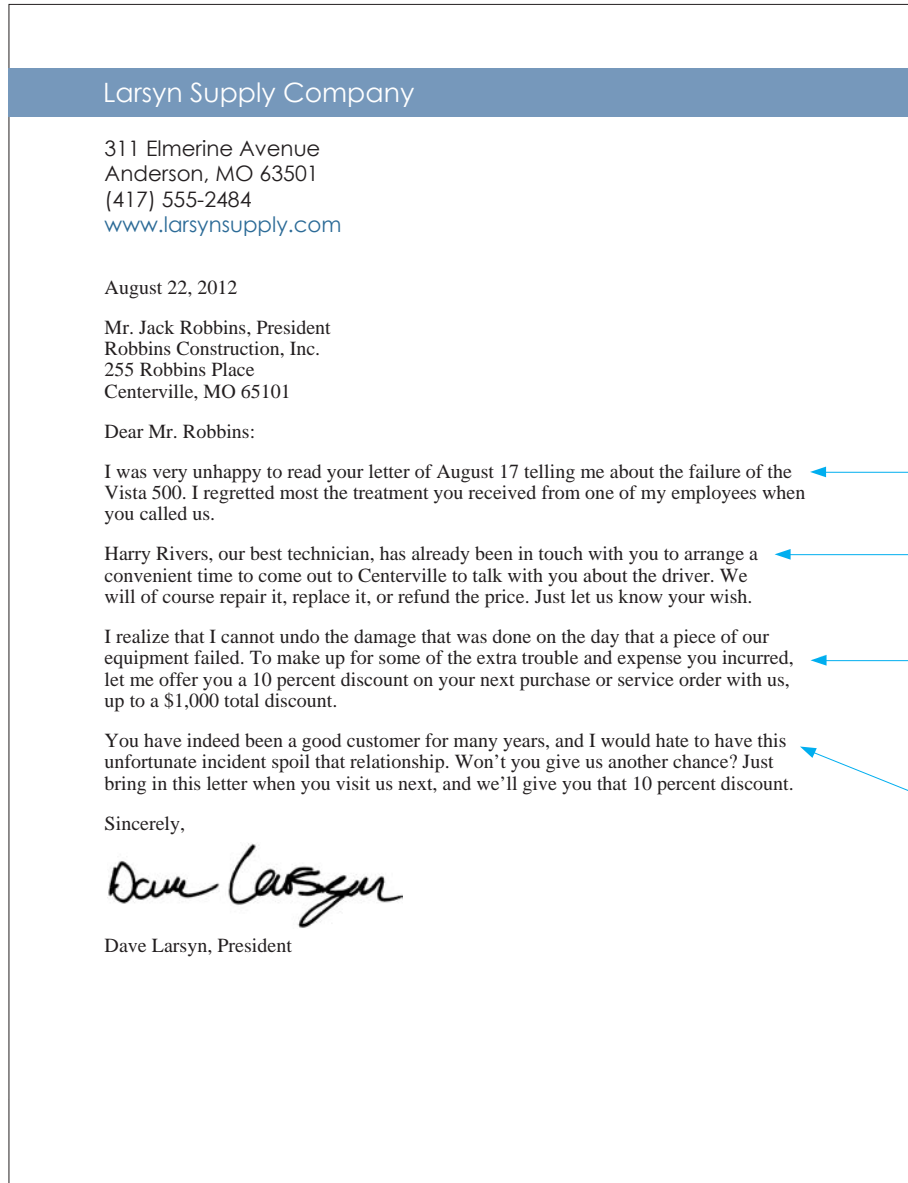
I would like you to send out a technician—as soon as possible—either to repair the driver so that it performs according to specifications or to take it back for a full refund.

Yours truly,

Jack Robbins, President

Enclosure

Figure 14.8 Claim Letter



An adjustment letter, a response to a claim letter, tells the customer how you plan to handle the situation. Your purpose is to show that your organization is fair and reasonable and that you value the customer's business.

If you can grant the request, the letter is easy to write. Express your regret, state the adjustment you are going to make, and end on a positive note by encouraging the customer to continue doing business with you.

The writer wisely expresses regret about the two problems cited in the claim letter.

The writer describes the actions he has already taken and formally states that he will do whatever the reader wishes.

The writer expresses empathy in making the offer of adjustment. Doing so helps to create a bond: you and I are both professionals who rely on our good reputations.

This polite conclusion appeals to the reader's sense of fairness and good business practice.

On TechComm Web

For excellent advice on adjustment letters, see Business Communication: Managing Information and Relationships. Click on Links Library for Ch. 14 on <bedfordstmartins.com/techcomm>.

Figure 14.9 “Good News” Adjustment Letter

Adjustment Letter Figures 14.9 and 14.10 show “good news” and “bad news” adjustment letters. The first is a reply to the claim letter shown in Figure 14.8.

If you are writing a “bad news” adjustment letter, salvage as much goodwill as you can by showing that you have acted reasonably. In denying a request, explain your side of the matter, thus educating the customer about how the problem occurred and how to prevent it in the future.

The writer does not begin by stating that he is denying the reader’s request. Instead, he begins politely by trying to form a bond with the reader. In trying to meet the customer on neutral ground, be careful about admitting that the customer is right. If you say “We are sorry that the engine you purchased from us is defective,” it will bolster the customer’s claim if the dispute ends up in court.

The writer summarizes the facts of the incident, as he sees them.

The writer explains that he is unable to fulfill the reader’s request. Notice that the writer never explicitly denies the request. It is more effective to explain why granting the request is not appropriate. Also notice that the writer does not explicitly say that the reader failed to make a backup copy of the plan and therefore the problem is her fault.

The writer shifts from the bad news to the good news. The writer explains that he has already responded appropriately to the reader’s request.

The writer ends with a polite conclusion. A common technique is to offer the reader a special discount on another, similar product.

Quality Storage Media



2077 Highland, Burley, ID 84765
208 · 555 · 1613
www.qualstorage.com

February 3, 2012

Ms. Dale Devlin
1903 Highland Avenue
Glenn Mills, NE 69032

Dear Ms. Devlin:

Thank you for writing us about the external hard drive you purchased on January 11, 2012. I know from personal experience how frustrating it is when a drive fails.

According to your letter, you used the drive to store the business plan for your new consulting business. When you attempted to copy that file to your internal hard drive, the external drive failed, and the business plan was lost. You have no other copy of that file. You are asking us to reimburse you \$1,500 for the cost of re-creating that business plan from notes and rough drafts.

As you know, our drives carry a lifetime guarantee covering parts and workmanship. We will gladly replace the defective external drive. However, the guarantee states that the manufacturer and the retailer will not assume any incidental liability. Thus we are responsible only for the retail value of the external drive, not for the cost of duplicating the work that went into making the files stored on the drive.

However, your file might still be recoverable. A reputable data-recovery firm might be able to restore the data from the file at a very reasonable cost. To prevent such problems in the future, we always recommend that you back up all valuable files periodically.

We have already sent out your new external drive by overnight delivery. It should arrive within the next two days.

Please contact us if we can be of any further assistance.

Sincerely yours,

Paul R. Blackwood

Paul R. Blackwood, Manager
Customer Relations

Figure 14.10 “Bad News” Adjustment Letter

WRITING MEMOS

Even in the age of e-mail and microblogs, memos are likely to survive because sometimes writers want a slightly more formal document. Like letters, memos have a characteristic format, which consists of the elements shown in Figure 14.11.

Print the second and all subsequent pages of a memo on plain paper rather than on letterhead. Include three items in the upper right-hand or left-hand corner of each page: the name of the recipient, the date of the memo, and the page number. See the header in Figure 14.4 on page 378.

AMRO MEMO

To: B. Pabst
 From: J. Alonso *J. A.*
 Subject: MIXER RECOMMENDATION FOR PHILLIPS
 Date: 12 June 2012

Write out the month instead of using the all-numeral format (6/12/12); multicultural readers might use a different notation for dates and could be confused.

INTEROFFICE

To: C. Cleveland
 From: H. Rainbow *H. R.*
 Subject: Shipment Date of Blueprints to Collier
 Date: 2 October 2012

c: B. Aaron
 K. Lau
 J. Manuputra
 W. Williams

List the names of persons receiving copies of the memo, either alphabetically or in descending order of organizational rank.

**NORTHERN PETROLEUM COMPANY
 INTERNAL CORRESPONDENCE**

Date: January 3, 2012
 To: William Weeks, Director of Operations
 From: Helen Cho, Chemical Engineering Dept. *H. C.*
 Subject: Trip Report—Conference on Improved Procedures for Chemical Analysis Laboratory

Most writers put their initials or signature next to the typed name (or at the end of the memo) to show that they have reviewed the memo and accept responsibility for it.

Figure 14.11 Identifying Information in a Memo

Some organizations prefer the full names of the writer and reader; others want only the first initials and last names. Some prefer job titles; others do not. If your organization does not object, include your job title and your reader's. The memo will then be informative for anyone who refers to it after either of you has moved on to a new position, as well as for others in the organization who might not know you.

The subject line is specific: the reader can tell at a glance that the memo reports on a trip to Computer Dynamics, Inc. If the subject line read only “Computer Dynamics, Inc.,” the reader would not know what the writer is going to discuss about that company.


The memo begins with a clear statement of purpose, as discussed in Ch. 5, p. 109.

Note that the writer has provided a summary, even though the memo is less than a page. The summary gives the writer an opportunity to convey his main request: he would like to meet with the reader.

The main section of the memo is the discussion, which conveys the detailed version of the writer’s message. Often the discussion begins with the background: the facts that readers will need to know to understand the memo. In this case, the background consists of a two-paragraph discussion of the two models in the company’s 500 series. Presumably, the reader already knows why the writer went on the trip.

Note that the writer ends this discussion with a conclusion, or statement of the meaning of the facts. In this case, the writer’s conclusion is that the company should consider only the external drive.

A recommendation is the writer’s statement of what he would like the reader to do next. In this case, the writer would like to sit down with the reader to discuss how to proceed.



Dynacol Corporation

INTEROFFICE COMMUNICATION

To: G. Granby, R&D
 From: P. Rabin, Technical Services *P.R.*
 Subject: Trip Report—Computer Dynamics, Inc.
 Date: September 21, 2012

The purpose of this memo is to present my impressions of the Computer Dynamics technical seminar of September 19. The goal of the seminar was to introduce their new PQ-500 line of high-capacity storage drives.

Summary
 In general, I was impressed with the technical capabilities and interface of the drives. Of the two models in the 500 series, I think we ought to consider the external drives, not the internal ones. I’d like to talk to you about this issue when you have a chance.

Discussion
 Computer Dynamics offers two models in its 500 series: an internal drive and an external drive. Both models have the same capacity (100 G of storage), and they both work the same way: they extend the storage capacity of a server by integrating an optical disk library into the file system. The concept is that they move files between the server’s faster, but limited-capacity, storage devices (hard disks) and its slower, high-capacity storage devices (magneto-optical disks). This process, which they call data migration and demigration, is transparent to the user.

For the system administrator, integrating either of the models would require no more than one hour. The external model would be truly portable; the user would not need to install any drivers, as long as his or her device is docked on our network. The system administrator would push the necessary drivers onto all the networked devices without the user having to do anything.

Although the internal drive is convenient—it is already configured for the computer—I think we should consider only the external drive. Because so many of our employees do teleconferencing, the advantage of portability outweighs the disadvantage of inconvenience. The tech rep from Computer Dynamics walked me through the process of configuring both models. A second advantage of the external drive is that it can be salvaged easily when we take a computer out of service.

Recommendation
 I’d like to talk to you, when you get a chance, about negotiating with Computer Dynamics for a quantity discount. I think we should ask McKinley and Rossiter to participate in the discussion. Give me a call (x3442) and we’ll talk.

Figure 14.12 Sample Memo

Figure 14.12, a sample memo, is a trip report, a record of a business trip written after the employee returned to the office. Readers are less interested in an hour-by-hour narrative of what happened than in a carefully structured discussion of what was important. Although writer and reader appear to be

relatively equal in rank, the writer goes to the trouble of organizing the memo to make it easy to read and refer to later.

Guidelines

Organizing a Memo

When you write a memo, organize it so that it is easy to follow. Consider these five important organizational elements.

- ▶ **A specific subject line.** “Breast Cancer Walk” is too general. “Breast Cancer Walk Rescheduled to May 14” is better.
- ▶ **A clear statement of purpose.** As discussed in Chapter 5 (p. 110), the purpose statement is built around an infinitive verb that clearly states what you want the readers to know, believe, or do.
- ▶ **A brief summary.** Even if a memo fits on one page, consider including a summary. For readers who want to read the whole memo, the summary is an advance organizer; for readers in a hurry, reading the summary substitutes for reading the whole memo.
- ▶ **Informative headings.** Headings make the memo easier to read by enabling readers to skip sections they don’t need and by helping them understand what each section is about. In addition, headings make the memo easier to write because they prompt the writer to provide the kind of information readers need.
- ▶ **A prominent recommendation.** Many memos end with one or more recommendations. Sometimes these recommendations take the form of action steps: bulleted or numbered lists of what the writer will do, or what the writer would like others to do. Here is an example:

Action Items:

I would appreciate it if you would work on the following tasks and have your results ready for the meeting on Monday, June 9.

- Henderson: recalculate the flow rate.
- Smith: set up meeting with the regional EPA representative for some-time during the week of May 13.
- Falvey: ask Armitra in Houston for his advice.

WRITING E-MAILS

Before you write an e-mail in the workplace, find out your organization’s e-mail policies. Most companies have written policies that discuss circumstances under which you may and may not use e-mail, principles you should use in writing e-mails, and the monitoring of employee e-mail. Figure 14.13 on page 388 shows the basic elements of an e-mail.

“CC” stands for courtesy copy. All of your recipients will know that you are sending a copy to this person or group.

“BC” or “Bcc” stands for blind copy or blind courtesy copy. None of your readers will know that you are sending a copy to this person or group.

You can create a “group” for people whom you e-mail frequently.

Like a memo, an e-mail should have a specific subject line.

By naming her readers at the start, the writer is showing respect for them.

The first paragraph of the e-mail clarifies the writer’s purpose.

The second paragraph describes the idea. You want to be sure your readers understand the context.

Notice that paragraphs are relatively brief and that the writer skips a line between paragraphs.

The writer explains what she would like her readers to do, and she states a deadline.

The writer ends politely.

The writer has created a signature, which includes her contact information. This signature is attached automatically to her e-mails.

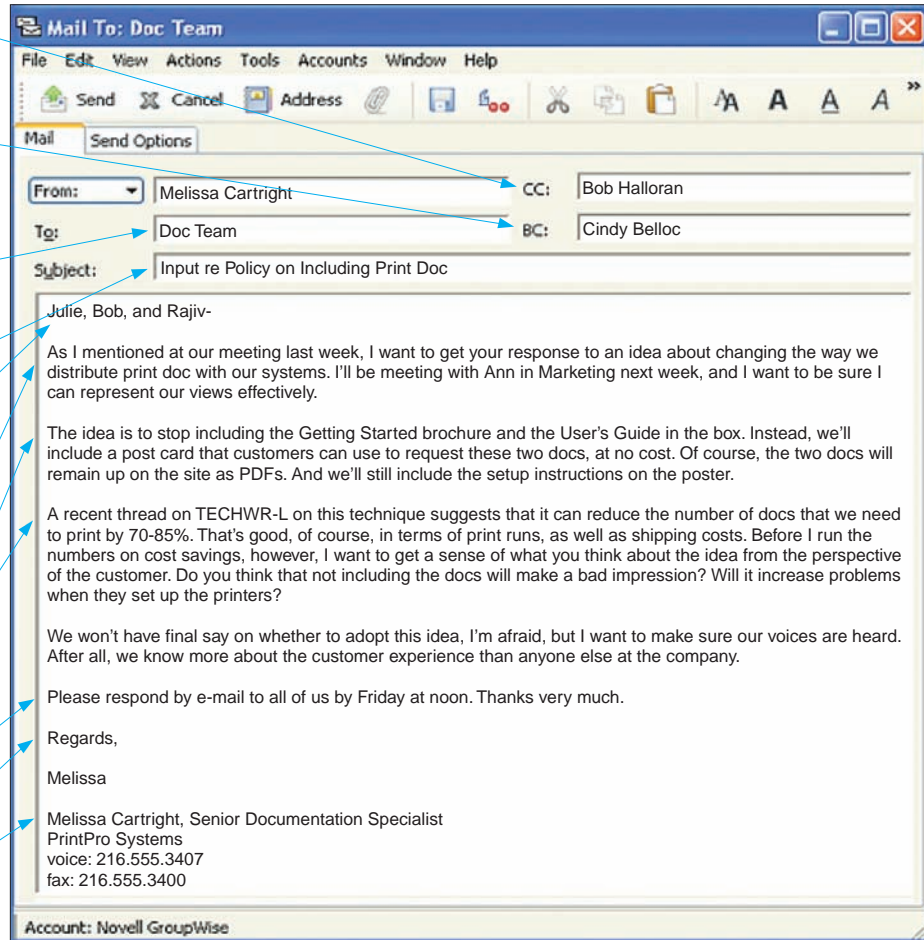


Figure 14.13 Elements of an E-mail

Guidelines

Following Netiquette

When you write e-mail in the workplace, adhere to the following netiquette guidelines. *Netiquette* refers to etiquette on a network.

- ▶ **Stick to business.** Don’t send jokes or other nonbusiness messages.
- ▶ **Don’t waste bandwidth.** Keep the message brief. When you reply to another e-mail, don’t quote long passages from it. Instead, establish the context of the original e-mail by paraphrasing it briefly or by including a short quotation from it.

When you quote, delete the routing information from the top as well as the signature block from the bottom. And make sure to send the e-mail only to people who need to read it.

- ▶ **Use appropriate formality.** As discussed on page 373, avoid informal writing.
- ▶ **Write correctly.** As discussed on pages 373–74, remember to revise, edit, and proofread your e-mails before sending them.
- ▶ **Don't flame.** To *flame* is to scorch a reader with scathing criticism, usually in response to something that person wrote in a previous message. When you are angry, keep your hands away from the keyboard.
- ▶ **Make your message easy on the eyes.** Use uppercase and lowercase letters, and skip lines between paragraphs. Use uppercase letters (sparingly) for emphasis. Keep the line length under 65 characters so that lines are not broken awkwardly if the recipient's monitor has a small screen.
- ▶ **Don't forward a message to an online discussion forum without the writer's permission.** Doing so is unethical and illegal; the e-mail is the intellectual property of the writer or (if it was written as part of the writer's work responsibilities) the writer's company.
- ▶ **Don't send a message unless you have something to say.** If you can add something new, do so, but don't send a message just to be part of the conversation.

On TechComm Web

See Albion.com's discussion of netiquette. Click on Links Library for Ch. 14 on <bedfordstmartins.com/techcomm>.

Figure 14.14a shows an e-mail that violates netiquette guidelines. The writer is a technical professional working for a microchip manufacturer. Figure 14.14b shows a revised version of this e-mail message.

To: Supers and Leads
Subject:

LATELY, WE HAVE BEEN MISSING LASER REPAIR FILES FOR OUR 16MEG WAFERS. AFTER BRIEF INVESTIGATION, I HAVE FOUND THE MAIN REASON FOR THE MISSING DATA.

OCCASIONALLY, SOME OF YOU HAVE WRONGLY PROBED THE WAFERS UNDER THE CORRELATE STEP AND THE DATA IS THEN COPIED INTO THE NONPROD STEP USING THE QTR PROGRAM. THIS IS REALLY STUPID. WHEN DATE IS COPIED THIS WAY THE REPAIR DATA IS NOT COPIED. IT REMAINS UNDER THE CORRELATE STEP.

TO AVOID THIS PROBLEM, FIRST PROBE THE WAFERS THE RIGHT WAY. IF A WAFER MUST BE PROBED UNDER A DIFFERENT STEP, THE WAFER IN THE CHANGE FILE MUST BE RENAMED TO THE ** FORMAT.

EDITING THE WAFER DATA FILE SHOULD BE USED ONLY AS A LAST RESORT, IF THIS BECOMES A COMMON PROBLEM, WE COULD HAVE MORE PROBLEMS WITH INVALID DATA THAT THERE ARE NOW.

SUPERS AND LEADS: PLEASE PASS THIS INFORMATION ALONG TO THOSE WHO NEED TO KNOW.

ROGER VANDENHEUVAL

The writer does not clearly state his purpose in the subject line and the first paragraph.

Using all uppercase letters gives the impression that the writer is yelling at his readers.

The writer has not proofread.

The writer's tone is hostile.

With long lines and no spaces between paragraphs, this e-mail is difficult to read.

a. E-mail that violates netiquette guidelines

Figure 14.14 Netiquette

The writer has edited and proofread the e-mail.

The subject line and first paragraph clearly state the writer's purpose.

Double-spacing between paragraphs and using short lines make the e-mail easier to read.

The writer concludes politely.

To: Supers and Leads
Subject: Fix for Missing Laser Repair Files for 16MB Wafers

Supers and Leads:

Lately, we have been missing laser repair files for our 16MB wafers. In this e-mail I want to briefly describe the problem and recommend a method for solving it.

Here is what I think is happening. Some of the wafers have been probed under the correlate step; this method copies the data into the nonprod step and leaves the repair data uncopied. It remains under the correlate step.

To prevent this problem, please use the probing method outlined in Spec 344-012. If a wafer must be probed using a different method, rename the wafer in the CHANGE file to the *.* format. Edit the wafer data file only as a last resort.

I'm sending along copies of Spec 344-012. Would you please pass along this e-mail and the spec to all of your operators.

Thanks. Please get in touch with me if you have any questions.

Roger Vandeneuval

b. E-mail that adheres to netiquette guidelines

Figure 14.14 (continued)

WRITING MICROBLOGS

As discussed earlier in this chapter, microblogs are different from letters, memos, and e-mail in that they are often extremely brief and quite informal in tone. Usually, you do not revise microblogs extensively. You just proofread and send them.

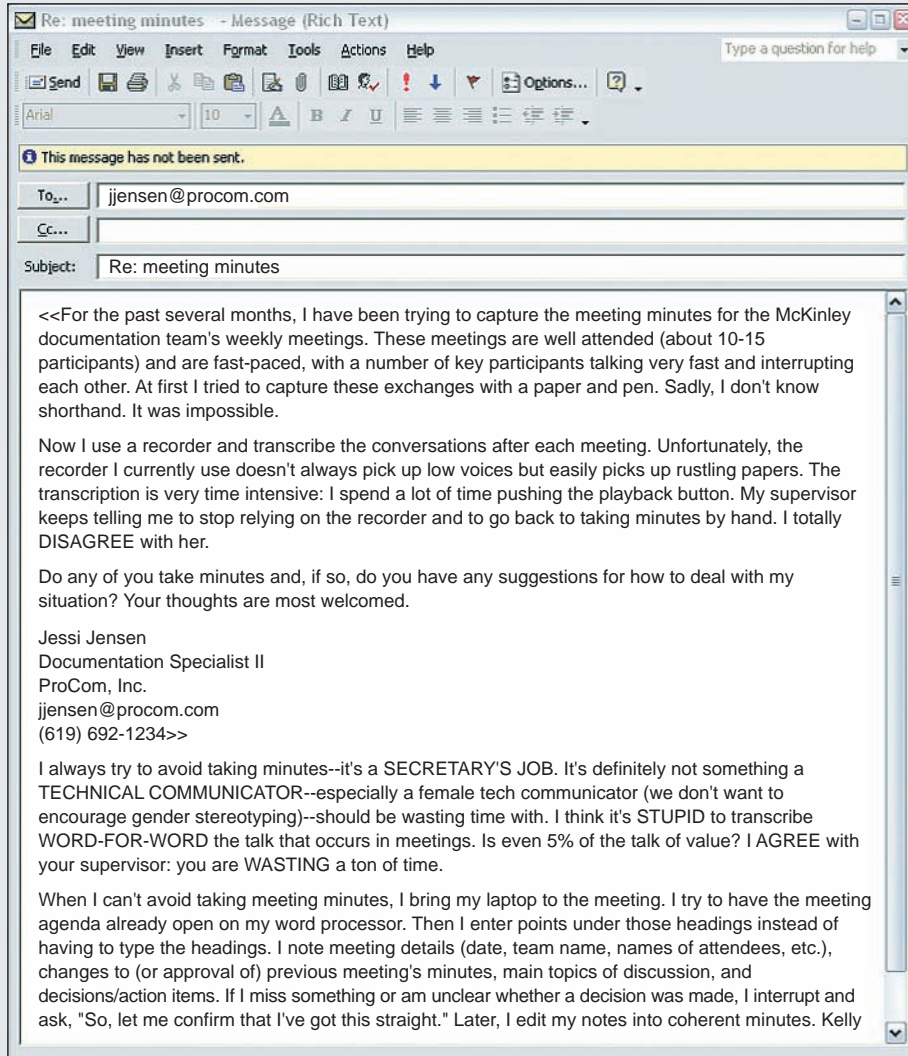
However, the speed and informality of microblogs do not mean that anything goes. When you write microblogs, you are creating an archived communication that reflects on you and your organization. In addition, anything you write is subject to the same laws and regulations that pertain to all other kinds of documents. Many of the guidelines for following netiquette (see page 388) apply to microblogs as well as e-mail. Take care, especially, not to flame. Become familiar with your microblog's privacy settings, and be aware of which groups of readers may view and share your posts.

The best way to understand your responsibilities when you write a microblog at work is to study your organization's guidelines. Sometimes, these guidelines are part of the organization's guidelines for all business practices or all digital communication. Sometimes, they are treated separately. Figure 14.15 on page 392 shows one company's microblogging guidelines.

INTERACTIVE SAMPLE DOCUMENT

Following Netiquette in an E-mail Message

This message was written in response to a question e-mailed to several colleagues by a technical communicator seeking advice on how to write meeting minutes effectively. A response to an e-mail message should adhere to the principles of effective e-mails and proper netiquette. The questions in the margin ask you to think about these principles (explained on pages 388–90).



1. How effectively has the writer conserved bandwidth?
2. How effectively has the writer stated her purpose?
3. How effectively has the writer projected a "you attitude" (explained on page 374)?
4. How effectively has the writer made her message easy to read?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 14 on <bedfordstmartins.com/techcomm>.

Microblogging Guidelines

Definition

Microblogging is social networking combined with short-message blogging. Author-owned content “updates” are delivered in short messages (typically 140 characters or less in length) distributed through online and mobile networks to the author’s “followers.”

The leading microblog is Twitter; however, there are additional microblogs such as Jaiku. Twitter interactions can be made via the Twitter website, or via mobile text messages, Instant Messaging, or desktop applications such as Twitterific, Twhirl, and others. Flexibility is further enhanced by the ability to subscribe to updates via RSS.

Best Practices

- Remember, Twitter is a public platform and can be indexed by search engines. This means that what is written can become part of your and Xerox’s “permanent record.”
- Be yourself. Losing the trust of your followers can damage a reputation.
- Don’t create an account and have someone else post on your behalf.
- Know that what you Tweet can be ReTweeted by others and referenced on other sites. Give credit to others whose message you are ReTweeting.
- Respond in a timely fashion and be sure to always contact those reaching out to you.
- Too much pro-brand messaging or marketing hype will negatively impact the number of followers you attract and/or keep.
- If you decide to open an account, take the time to actively monitor your account and facilitate two-way conversation.
- Don’t make a professional account too personal, but don’t lack personal touch either.
- Avoid making your followers feel that “Big Brother” is watching. It is good to interact, but don’t comment on every single post they make.

Note that some of these “best practices” apply only to the use of a public microblogging site such as Twitter, whereas others refer to all sites, public or private.

Figure 14.15 Guidelines for Microblogging

Source: Xerox, 2010 <www.xerox.com/downloads/usa/en/s/Social_Media_Guidelines.pdf>.

WRITING CORRESPONDENCE TO INTERCULTURAL READERS

The four applications of business correspondence discussed in this chapter are used in all countries around the world. The ways they are used, however, can differ significantly from the ways they are used in the United States. These differences fall into three categories:

- *Cultural practices.* As discussed in Chapter 5, cultures differ in a number of ways, such as the focus on individuals or groups, the distance between power ranks, and attitudes toward uncertainty. Typically, a culture’s attitudes are reflected in its business communication. For example, in Japan, which has a high power distance—that is, people in top positions are treated with great respect by their subordinates—the reader might be addressed as “Most Esteemed Mr. Director.” Some cultural practices, however, are not intuitively obvious even if you understand the culture. For example, in Japanese business culture, it is considered rude to reply to an e-mail by using the reply function in the e-mail software; it is polite to begin a new e-mail (Sasaki, 2010).

In This Book

For more about cultural variables, see Ch. 5, p. 99.

- *Language use and tone.* In the United States, writers tend to use contractions, the first names of their readers, and other instances of informal language. In many other countries, this informality is potentially offensive. Also potentially offensive is U.S. directness. A writer from the United States might write, for example, that “14 percent of the products we received from you failed to meet the specifications.” A Korean would more likely write, “We were pleased to note that 86 percent of the products we received met the specifications.” The writer either would not refer to the other 14 percent (assuming that the reader would get the point and replace the defective products quickly) or would write, “We would appreciate replacement of the remaining products.” Many other aspects of business correspondence differ from culture to culture, such as preferred length, specificity, and the use of seasonal references in the correspondence.
- *Application choice and use.* In cultures in which documents tend to be formal, letters might be preferred to memos, or face-to-face meetings to phone calls or e-mail. In Asia, for instance, a person is more likely to walk down the hall to deliver a brief message in person because doing so shows more respect. In addition, the formal characteristics of letters, memos, and e-mails are different in different cultures. The French, for instance, use indented paragraphs in their letters, whereas in the United States, paragraphs are typically left-justified. The ordering of the information in the inside address and complimentary close of letters varies widely. In many countries, e-mails are structured like memos, with the “to,” “from,” “subject,” and “date” information added at the top, even though this information is already present in the routing information.

Try to study business correspondence written by people from the culture you will be addressing. When possible, have important documents reviewed by a person from that culture before you send them.

Writer's Checklist

Letter Format

- Is the first page typed on letterhead stationery? (p. 377)
- Is the date included? (p. 377)
- Is the inside address complete and correct? (p. 377)
- Is the appropriate courtesy title used? (p. 377)
- If appropriate, is an attention line included? (p. 377)
- If appropriate, is a subject line included? (p. 377)
- Is the salutation appropriate? (p. 377)
- Is the complimentary close typed with only the first word capitalized? (p. 378)
- Is the signature legible, and is the writer's name typed beneath the signature? (p. 378)

- If appropriate, is an enclosure line included? (p. 378)
- If appropriate, is a copy and/or courtesy-copy line included? (p. 378)
- Is the letter typed in one of the standard formats? (p. 379)

Types of Letters

Does the inquiry letter

- explain why you chose the reader to receive the inquiry? (p. 380)
- explain why you are requesting the information and to what use you will put it? (p. 380)
- specify by what date you need the information? (p. 380)

- list the questions clearly and, if appropriate, provide room for the reader's responses? (p. 380)
- offer, if appropriate, the product of your research? (p. 380)
- Does the response to an inquiry letter answer the reader's questions or explain why they cannot be answered? (p. 381)

Does the claim letter

- identify specifically the unsatisfactory product or service? (p. 382)
- explain the problem(s) clearly? (p. 382)
- propose an adjustment? (p. 382)
- conclude courteously? (p. 382)

Does the "good news" adjustment letter

- express your regret? (p. 383)
- explain the adjustment you will make? (p. 383)
- conclude on a positive note? (p. 383)

Does the "bad news" adjustment letter

- meet the reader on neutral ground, expressing regret but not apologizing? (p. 384)
- explain why the company is not at fault? (p. 384)
- clearly imply that the reader's request is denied? (p. 384)
- attempt to create goodwill? (p. 384)

Memos

- Does the identifying information adhere to your organization's standards? (p. 385)

- Did you include a specific subject line? (p. 387)
- Did you clearly state your purpose at the start of the memo? (p. 387)
- Did you include informative headings to help your readers? (p. 387)
- If appropriate, did you summarize your message? (p. 387)
- Did you provide appropriate background for the discussion? (p. 387)
- Did you organize the discussion clearly? (p. 387)
- Did you highlight items requiring action? (p. 387)

E-mail

- Did you refrain from discussing nonbusiness subjects? (p. 388)
- Did you keep the e-mail as brief as possible and send it only to appropriate people? (p. 388)
- Did you use appropriate formality? (p. 389)
- Did you write correctly? (p. 389)
- Did you avoid flaming? (p. 389)
- Did you write a specific, accurate subject line? (p. 389)
- Did you use uppercase and lowercase letters? (p. 389)
- Did you skip lines between paragraphs? (p. 389)
- Did you keep the line length under 65 characters? (p. 389)
- Did you check with the writer before forwarding his or her message? (p. 389)

Microblogs

- Did you study your organization's policy on which microblog sites you may use and how you should use them? (p. 390)

Exercises

1. As the head of research for a biological research organization, you recently purchased a \$2,000 commercial refrigerator for storing research samples. Recently, you suffered a loss of more than \$600 in samples when the thermostat failed and the temperature in the refrigerator rose to more than 48 degrees over the weekend. Inventing any reasonable details, write a claim letter to the manufacturer of the container.
2. As the recipient of the claim letter described in Exercise 1, write an adjustment letter granting the customer's request.
3. You are the manager of a private swimming club. A member has written saying that she lost a contact lens (value \$75) in your pool and she wants you to pay for a replacement. The contract that all members sign explicitly states that the management is not responsible for the loss of personal possessions. Write an adjustment letter denying the request. Invent any reasonable details.
4. As the manager of an electronics retail store, you guarantee that you will not be undersold. If a customer finds another retailer selling the same equipment at a

lower price within one month of his or her purchase, you will refund the difference. A customer has written to you and enclosed an ad from another store showing that it is selling a router for \$26.50 less than he paid at your store. The advertised price at the other store was a one-week sale that began five weeks after the date of his purchase. He wants a \$26.50 refund. Inventing any reasonable details, write an adjustment letter denying his request. You are willing, however, to offer him a 4GB USB drive worth \$9.95 if he would like to come pick it up.

- 5. GROUP EXERCISE** Form small groups for this exercise on claim and adjustment letters. Have each member of your group study the following two letters. Meet and discuss your reactions to the two letters. How effectively does the writer of the claim letter present his case? How effective is the adjustment letter? Does its writer succeed in showing that the company's procedures for ensuring hygiene are effective? Does its writer succeed in projecting a professional tone? Write a memo to your instructor discussing the two letters. Attach a revision of the adjustment letter to the memo.

Seth Reeves
19 Lowry's Lane
Morgan, TN 30610
April 13, 2012

Sea-Tasty Tuna
Route 113
Lynchburg, TN 30563

Gentlemen:

I've been buying your tuna fish for years, and up to now it's been OK.

But this morning I opened a can to make myself a sandwich. What do you think was staring me in the face? A fly. That's right, a housefly. That's him you see taped to the bottom of this letter.

What are you going to do about this?

Yours very truly,



SEA-TASTY TUNA
Route 113
Lynchburg, TN 30563
www.seatastytuna.com

April 20, 2012

Mr. Seth Reeves
19 Lowry's Lane
Morgan, TN 30610

Dear Mr. Reeves:

We were very sorry to learn that you found a fly in your tuna fish.

Here at Sea-Tasty we are very careful about the hygiene of our plant. The tuna are scrubbed thoroughly as soon as we receive them. After they are processed, they are inspected visually at three different points. Before we pack them, we rinse and sterilize the cans to ensure that no foreign material is sealed in them.

Because of these stringent controls, we really don't see how you could have found a fly in the can. Nevertheless, we are enclosing coupons good for two cans of Sea-Tasty tuna.

We hope this letter restores your confidence in us.

Truly yours,

- 6.** Louise and Paul work for the same manufacturing company. Louise, a senior engineer, is chairing a committee to investigate ways to improve the hiring process at the company. Paul, a technical editor, also serves on the committee. The excerpts quoted in Louise's e-mail are from an e-mail written by Paul to all members of the committee in response to Louise's request that members describe their approach to evaluating job-application materials. How would you revise Louise's e-mail to make it more effective?

To: Paul

From: Louise

Sometimes I just have to wonder what you're thinking, Paul.

>Of course, it's not possible to expect perfect
>resumes. But I have to screen them, and
>last year I had to read over 200. I'm not looking for
>perfection, but as soon as I spot an error I make
>a mental note of it and, when I hit a second and
>then a third error I can't really concentrate on the
>writer's credentials.

Listen, Paul, you might be a sharp editor, but the rest of us have a different responsibility: to make the products and move them out as soon as possible. We don't have the luxury of studying documents to see if we can find errors. I suggest you concentrate on what you were hired to do, without imposing your "standards" on the rest of us.

>From my point of view, an error can include a
>misused trademark.

Misusing a "trademark," Paul? Is that Error Number 1?

7. INTERNET EXERCISE Because students use e-mail to communicate with other group members when they write collaboratively, your college or university would like to create a one-page handout on how to use e-mail responsibly. Using a search engine, find three or four netiquette guides on the Internet that focus on using e-mail. Study these guides and write a one-page student guide to using e-mail to communicate with other students. Somewhere in the guide, be sure to list the sites you studied, so that students can visit them for further information about netiquette.

Case 14: Employing the "You Attitude" in a "Bad News" Letter

Background

You are the student member of the Steering Committee of your major department. This committee consists of the department chair and associate chair, as well as five senior professors who serve three-year terms. You became the student member by winning an election held by the Majors Committee, consisting of all interested students in your major department. Your main responsibility as student member is to attend the Steering Committee's monthly meeting and then report back to the Majors Committee on the Steering Committee's plans and actions on curriculum, hiring, and other policies that affect students. In addition, you are invited to participate in the Steering Committee's meetings by offering your comments on any business it conducts.

You know that the meeting to be held later this afternoon is going to be a tough one. Your university receives most of its funding from the state, and state revenues are way down. Like all other state agencies, your university is likely to have its budget for the next year cut by some 6 percent. Articles in the student newspaper have made clear that each department will be asked to prepare a budget that is 4 or 5 percent lower than last year's. The agenda for today's Steering Committee meeting indicates that the committee will be discussing ways to respond to a policy memo that the department chair, Stuart Freeman, received earlier in the week from the university president about strategies for cutting the department budget (see Document 14.1).

You can tell by the look on the department chair's face as he enters the room that he is very concerned. He starts by distributing the memo he received from the uni-

versity president. After giving everyone a minute to read the memo, he explains that he has discussed the budget situation with the college dean and the university president. They both believe that the best way to avoid further cuts is to follow the State Board's suggestion to eliminate under-enrolled majors to reduce the instructional budget.

After giving everyone a minute to read the memo from the university president, Dr. Freeman distributes a draft of a letter (see Document 14.2) that he is considering sending to the 18 students (ranging from first-year students to seniors) who are members of the department's only vulnerable major. He turns to you. "I think I speak for all the members of this committee when I say that I am particularly interested in your thoughts about this draft. It's bad news, of course, but it's important that we address this matter appropriately. Could you get back to me by Thursday with a memo letting me know what you think? And please don't share the draft with any other students at this point; I want to make sure we get this right before communicating with the students."

Your Assignment

1. Prepare the memo to Dr. Freeman presenting your response to his request that you present your thoughts about the draft of his letter to affected students. From the perspective of the "you attitude," discuss the effectiveness of the letter and its timing. Remember to employ the "you attitude" in your memo to Dr. Freeman.
2. Revise Dr. Freeman's draft so that it effectively employs the "you attitude." If you choose, invent any reasonable details about the recipient's options in dealing with the impending cancellation of the major.

To: All Chairs
From: Arlen Chambliss, President
Subject: Strategies for Curricular Streamlining
Date: March 22, 2012

As you know, I have been meeting, along with my counterparts in the other state-supported universities, with the State Board of Education to discuss the implications of the cutbacks, which are now projected to be 6 percent of our annual budget. As I have discussed with all the deans, the administration is committed to finding savings to total 2 percent, leaving the departments to find the remaining 4 percent.

Although the State Board left it to our discretion how to achieve the 6 percent reductions, they made it clear that they believe that we can achieve economies most easily by examining what they called the “productivity declines” caused by the “rampant expansion” in the number of majors offered throughout all the state universities. They cited the fact that in 1990, each department in the four state universities offered an average of 2.6 different majors. By 2000, that figure had risen to 4.1. By 2010, that number was 6.3. By contrast, the number of students earning degrees in each major each year fell, from an average of 42 in 1990 to 29 in 2000 and 18 in 2010.

Along with my counterparts at the other state universities, I agreed to look seriously at the proliferation of majors and the related decrease in the number of students enrolled in each major. After studying the problem carefully with the Provost, the Registrar, the Dean of Students, and the six academic deans, I have regretfully concluded that effective August 30 of this year, each department will be asked to permit no new students to enroll in any major that has graduated fewer than 10 students per year, averaged over the last five years.

Please get back to me with any questions or concerns.

Dear [student name here]:

As you know, the university is in the midst of planning budget reductions, in accord with the State Board of Education’s directive that we reduce our budget by 4 percent. At the direction of President Chambliss, it has been decided that your major will no longer be permitted to enroll new students, effective August 30.

Over the next month, the department will be meeting to map out strategies to accommodate your needs. You will hear from us, before the end of the semester, about your options.

We regret that this action is necessary, and we ask for your cooperation as we go through this difficult period.

Sincerely,

**Document 14.1 Memo
from the University
President**

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on bedfordstmartins.com/techcomm.

**Document 14.2 Draft
of Letter from the
Department Chair to
Students in the Affected
Major**

CHAPTER **15**

Writing Job-Application Materials



Winston Davidian/Getty Images.

Getting hired always involves writing.

Getting hired has always involved writing. Whether you send a formal letter and résumé through the mail, apply online through a company's Web site, or reply to a posting on Craigslist, you will use words to make the case that the organization should offer you a position.

During your career, you will use your writing skills to apply for a job many times. According to the U.S. Department of Labor (2006), the typical American worker holds more than 10 different jobs while he or she is between the ages of 18 and 38. Obviously, these jobs don't last long. Even when American workers begin a job between the ages of 33 and 38, nearly 40 percent of them will no longer be with that company at the end of one year. And 70 percent of them will no longer be with that company in five years. Every time you apply for a job you will need to change your résumé and your other job-application materials.

For most of you, the first nonacademic test of your technical-communication skills comes when you prepare job-application materials. And it's an important test. A survey of 120 major U.S. corporations concluded that writing ability is related to workplace success: "People who cannot write and communicate clearly will not be hired, and if already working, are unlikely to last long enough to be considered for promotion" (College Entrance, 2004).

UNDERSTANDING THE JOB-APPLICATION PROCESS

Preparing job-application materials requires weeks and months, not days, and there is no way to cut corners. Figure 15.1 on page 400 presents an overview of the process.

PLANNING THE JOB SEARCH

In planning a job search, you have four main tasks:

- *Do a self-inventory.* Before you can start thinking of where you want to work, you need to answer some questions about yourself:
 - *What are your strengths and weaknesses?* Are your skills primarily technical? Do you work best with others or on your own?

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Selectivity and Development 425

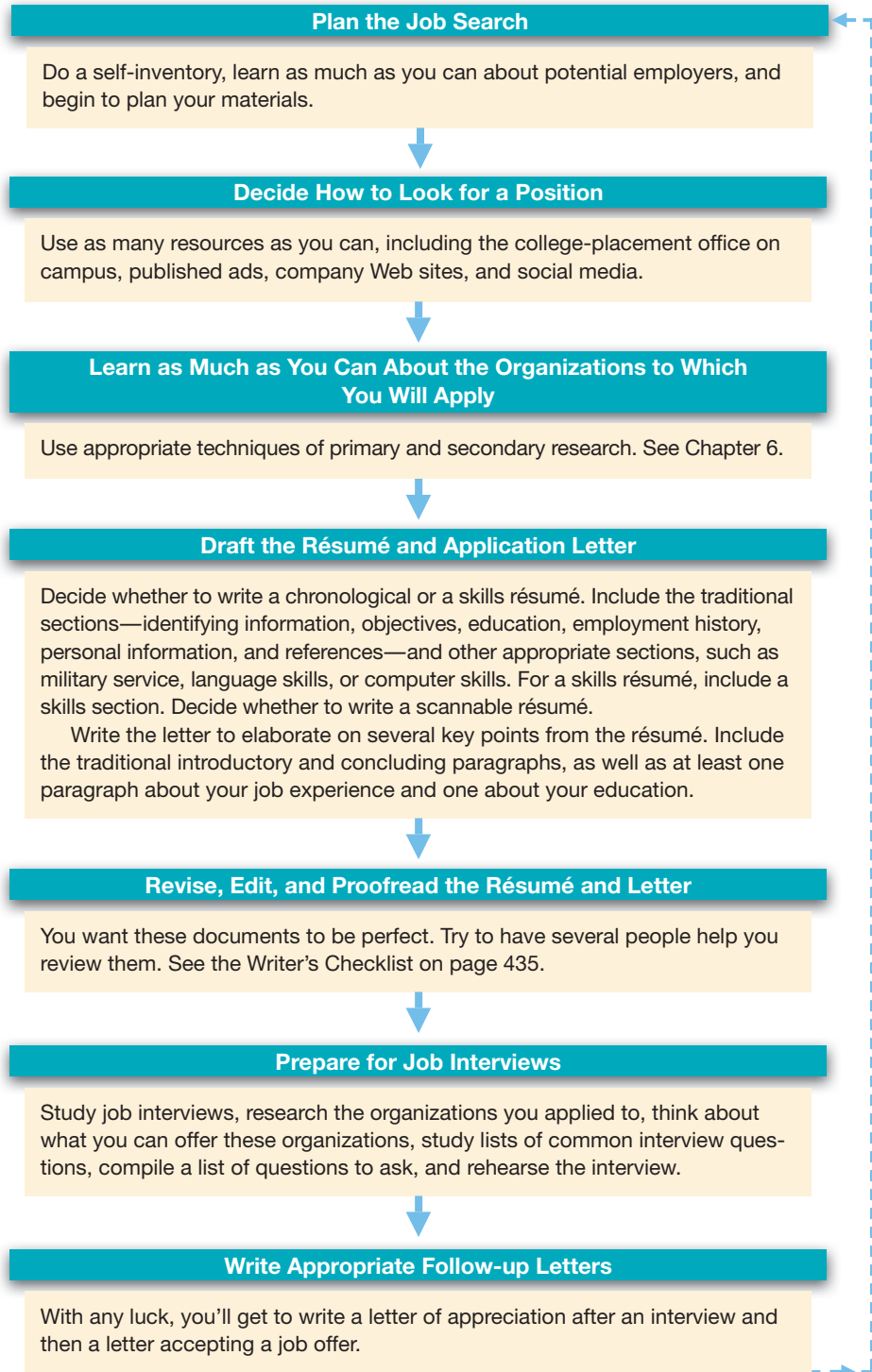
Elements of the Job-Application Letter 426

Preparing for a Job Interview 431

Writing Follow-up Letters or E-mails After an Interview 433

Figure 15.1 An Overview of the Process of Preparing Job-Application Materials

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your audience, purpose, and subject.



- *What subjects do you like?* Think about what you have liked or disliked about your jobs and college courses.
- *What kind of organization would you like to work for?* Profit or nonprofit? Government or private industry? Small or large?
- *What are your geographical preferences?* If you are free to relocate, where would you like to live? How do you feel about commuting?
- *Learn about the employers.* Don't base your job search exclusively on information in an ad. Learn about the organization through other means as well:
 - *Attend job fairs.* Your college and your community probably hold job fairs, where employers provide information about their organizations. Sometimes, a single organization will hold a job fair to find qualified candidates for a wide variety of jobs.
 - *Find out about trends in your field.* Read the *Occupational Outlook Handbook*, published by the U.S. Department of Labor, for information about your field and related fields. Talk with professors and with the staff at your job-placement office.
 - *Research the companies that interest you.* Visit their Web sites, and search for information about them on the Internet.
- *Prepare a résumé and job-application letter (a cover letter).* Whether you apply online or send paper documents, you will need a résumé and a letter. Start planning early by obtaining materials from the career-placement office. Talk with friends who have gone through the process successfully; study their application materials. Read books and visit Web sites about different aspects of the job search.
- *Prepare a portfolio.* A *portfolio* is a collection of your best work. You'll want to give a prospective employer a copy of the portfolio to showcase your skills. For technical communicators, the portfolio will include a variety of documents made in courses and in previous positions. For technical professionals, it might include proposals and reports as well as computer simulations, Web sites, or presentation graphics. A portfolio can be presented in a loose-leaf notebook, with each item preceded by a statement that describes the item, explains the context in which it was written, and evaluates it.

Often, a portfolio is digital, presented on a CD or on a Web site. Items typically presented in an electronic portfolio include a résumé, letters of recommendation, transcripts and professional certifications, and reports, papers, Web sites, slides of oral presentations, and other types of documents you have written or created as a student or an employee.

Because the portfolio is electronic, it can include all kinds of media, from simple word-processed documents to HTML files, video, audio, and animation. And it's relatively easy to update an electronic portfolio: just add the new items as you create them. One important point that comes

On TechComm Web

To find the *Occupational Outlook Handbook*, click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

On TechComm Web

For more on online portfolios, see "Developing Your Online Portfolio" by Kevin M. Barry and Jill C. Wesolowski. Click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

across clearly in a carefully prepared electronic portfolio: you know how to create a Web site.

If you wish to apply for a position in another country, keep in mind that the conventions of the process vary—sometimes quite a bit. You will need to adapt your résumé and letter to the expectations of the country in which you would like to work. For instance, résumés in the United States do not include information such as the writer’s height, weight, date of birth, and marital status; federal legislation prohibits organizations from requiring this information. In some other countries, however, personal information is expected on a résumé. Consult one of the following sources for advice on drafting résumés when applying for international positions:

- [Goinglobal.com](http://www.goinglobal.com) <www.goinglobal.com>
- [Monster Global Gateway](http://www.monster.com/geo/siteselection.aspx) <www.monster.com/geo/siteselection.aspx>
- [OverseasJobs.com](http://www.overseasjobs.com) <www.overseasjobs.com>
- [The Riley Guide: International Job Opportunities: Resources Covering Multiple Countries and/or Regions](http://www.rileyguide.com/internat.html) <www.rileyguide.com/internat.html>

UNDERSTANDING EIGHT WAYS TO LOOK FOR A POSITION

Once you have done your planning, you can start to look for a position. There are eight major ways to find a job.

- *Through a college or university placement office.* Placement offices bring companies and students together. Student résumés are made available to representatives of business, government, and industry, who arrange on-campus interviews. Students who do best in the campus interviews are then invited by the representatives to visit the organization for a tour and another interview.
- *Through a professional placement bureau.* A professional placement bureau offers essentially the same service as a college placement office but charges a fee to either the employer or the new employee. Placement bureaus cater primarily to more-advanced professionals who are changing jobs.
- *Through a published job ad.* Organizations publish ads in public-relations catalogs (such as *College Placement Annual*), technical journals, magazines, and newspapers. Be sure to check the online versions of journals in your field, as well as large metropolitan newspapers. And do not overlook bulletin-board sites such as Craigslist. In responding to an ad, you most likely will send a résumé and a job-application letter.
- *Through an organization’s Web site.* Most organizations list their job offerings on their Web sites and explain how to apply.

In This Book

For more about job-application letters, see p. 424. For more about electronic résumés, see p. 417.

- *Through a job board on the Internet.* Job boards are sites sponsored by federal agencies, Internet service providers, and private organizations. Some sites merely list positions, to which you respond by regular mail or by e-mail; others let you submit your résumé electronically, so that employers can get in touch with you. Use a search engine to search for “employment,” “careers,” and “jobs.” Or combine one of these terms with the name of your field, as in “careers forestry.” Among the biggest job boards are the following:
 - AfterCollege
 - CareerBuilder
 - CareerMag
 - CareerOneStop (sponsored by the U.S. Department of Labor)
 - Indeed.com (a metasearch engine for job seekers)
 - Monster

Many of these sites contain articles about searching for jobs electronically, including how to research companies, how to write electronic résumés, and how to prepare for interviews.

One caution about using job boards: once you post something to an Internet site, you probably have lost control of it. Here are four questions to ask before you post to a job board:

- Who has access to your résumé? You might want to remove your home address and phone number from it if everyone can view it.
 - How will you know if an employer requests your résumé? Will you be notified by the job board?
 - Can your current employer see your résumé? If your employer discovers that you are looking for a new job, your current position could be jeopardized.
 - Can you update your résumé at no cost? Some job boards charge you each time you update your résumé.
- *Through your connections on social media.* Many people use Twitter, Facebook, and LinkedIn as part of their job-search strategy. You probably already use sites such as these to connect with friends and associates. When you look for work, update your profile to alert people that you are seeking employment, and see whether the site has features that help you connect with potential employers. For instance, LinkedIn has a Jobs feature that employers use to search for applicants by posting openings and contacting people whose profiles match the qualifications the jobs require. LinkedIn Jobs also sends out notices of openings to Twitter, thereby increasing the likelihood that you will find out about an opening.

 **On TechComm Web**

To find these sites and additional job-related resources on the Web, click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

 **On TechComm Web**

For advice on how to use LinkedIn in your job search, see Lewis Howes's article. Click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

- *Through personal connections.* A relative or an acquaintance can exert influence to help you get a job, or at least point out a new position. Other good contacts include past employers and professors. Also consider becoming active in the student chapter of your field's professional organization, through which you can meet professionals in your area.
- *Through an unsolicited letter to an organization.* Instead of waiting for an ad or a notice on a Web site, consider sending an unsolicited application. The disadvantage is obvious: there might not be an opening. Yet many professionals favor this technique, because there are fewer competitors for those jobs that do exist, and organizations do not advertise all available positions. And sometimes an impressive unsolicited application can prompt an organization to create a position.

Before you write an unsolicited application, learn as much as you can about the organization: current and anticipated major projects, hiring plans, and so forth. The business librarian at your college or university will be able to point out additional sources of information, such as the Dun and Bradstreet guides, the *F&S Index of Corporations*, and indexed newspapers such as the *New York Times*, the *Washington Post*, and the *Wall Street Journal*. You should also study the organization's Web site.

UNDERSTANDING THE RISKS AND BENEFITS OF SOCIAL MEDIA AND THE JOB SEARCH

Long before you plan to begin a job search, you should carefully consider how you currently appear online. Employers regularly search the Internet while screening job applicants. They are sure to visit sites such as MySpace and Facebook. Employers also search for blog and online-forum postings written by job applicants. Pictures of you at a raucous party, a blog critical of your current boss, or an unflattering YouTube video can jeopardize a job search or even a person's current employment.

You should closely monitor the content and images posted on your own sites and periodically search your own name to see what prospective employers are likely to find. When searching for a job, use your accounts on social-media sites to make a good first impression before you are even invited for an interview. Assume that prospective employers will visit your personal sites. Use their visits as opportunities to market yourself: display text and images that demonstrate your best qualities.

Expand your networking activities online by using sites to connect with people who share your professional interests and to hear about job openings. Create a profile tailored to the type of job you seek, project a professional persona, follow through with what you say you will do, and help others make career connections (networking works in both direc-

On TechComm Web

For advice on how to use networking sites to your advantage, see Alison Doyle's "Your Professional Brand." Click on Links Library for Ch. 15 on <bedfordsmartins.com/techcomm>.

tions). Used appropriately, social-media sites are another tool to help you land your next job.

WRITING PAPER RÉSUMÉS

For a successful job search, you will likely need to present your credentials both on paper and online. This section discusses the fundamentals for preparing paper résumés. The next section discusses electronic résumés.

Many students wonder whether to write their résumé themselves or use a résumé-preparation agency. It is best to write your own résumé, for three reasons:

- *You know yourself better than anyone else does.* No matter how professional the work of a résumé-preparation agency, you can do a better job communicating important information about yourself.
- *Employment officers know the style of the local agencies.* Readers who recognize that you did not write your own résumé might wonder whether you are hiding any deficiencies.
- *If you write your own résumé, you will be more likely to adapt it to different situations.* You are unlikely to return to a résumé-preparation agency and pay an additional fee to make a minor revision.

A résumé communicates in two ways: through its appearance and through its content.

Appearance of the Résumé

Your résumé has to look professional. When employers look at a résumé, they see the documents they will be reading if they hire you. Résumés should appear neat and professional. They should have

- *Generous margins.* Leave a one-inch margin on all four sides.
- *Clear type.* Use a good-quality laser printer.
- *Balance.* Arrange the information so that the page has a balanced appearance.
- *Clear organization.* Use adequate white space. The line spacing between items should be greater than the line spacing within an item. That is, there should be more space between your education section and your employment section than between items within either of those sections. You should be able to see the different sections clearly if you view it at 50 percent on your monitor or if you stand and look down at the printed résumé on the floor by your feet.

Indent appropriately. When you arrange items in a vertical list, indent *turnovers*, the second and subsequent lines of any item, a few spaces. The following list, from the computer-skills section of a résumé, could be confusing:

Computer Experience

Systems: PC, Macintosh, Linux, Andover AC-256, Prime 360

Software: Dreamweaver, XMetal, Flash, Visual dBASE 7.5, PlanPerfect, Micrografx Designer, Adobe InDesign, Microsoft Office

Languages: C#, C++, Java, HTML, XHTML

When the second line of the long entry is indented, the arrangement is much easier to understand:

Computer Experience

Systems: PC, Macintosh, Linux, Andover AC-256, Prime 360

Software: Dreamweaver, XMetal, Flash, Visual dBASE 7.5, PlanPerfect, Micrografx Designer, Adobe InDesign, Microsoft Office

Languages: C#, C++, Java, HTML, XHTML

Figure 15.2 shows how an unattractive résumé creates a negative impression, whereas an attractive one creates a positive impression.

Content of the Résumé

Although experts advocate different approaches to résumé writing, they all agree that résumés must be informative and attractive.

- *The résumé must provide clear, specific information, without generalizations or self-congratulation.* Your résumé is a sales document, but you are both the salesperson and the product. You cannot gracefully say, “I am a terrific job candidate.” Instead, you have to show the reader by providing the details that will lead the reader to conclude that you are a terrific job candidate.
- *The résumé must be free of errors.* Writing errors cast doubt on the accuracy of the information in the résumé. Ask for assistance after you have written the draft and proofread the finished product at least twice. Then have someone else proofread it, too.

A résumé should be long enough to include all pertinent information but not so long that it bores or irritates the reader. A survey from CareerBuilder.com found that 52 percent of executives prefer one-page résumés for the typical applicant, whereas 44 percent prefer two pages (“Résumés Redefined,” 2008). If you have more experience, your résumé will be longer; if you have less experience, it will be shorter. If the information comes to just over a page, either eliminate or condense some of the material to make it fit onto one page, or modify the layout so that it fills a substantial part of a second page.

In This Book

For more about page design, see Ch. 11, p. 271.

In This Book

For more about proofreading, see Ch. 13, p. 354.

James K. Wislo	1628 Rossi Street Boise, ID 83706 (208) 555 2697 jameswislo@mail.boisestate.edu
Objective	Entry-level position as a general assistant
Education	Boise State University, Boise, ID BS in Biomechanical Engineering Current GPA: 3.1 Expected date of graduation: August 2014 <i>Related course work</i> Basic Mechanics I Skeletal Development and Evolution Biomechanics of Movement Technical Communication
Employment	1/2010–present (20 hours per week): Custodial and maintenance <i>Boise State University, recreation center, Boise, ID</i> Install and maintain soap dispenser machines. Treat all floors (wooden and linoleum) with appropriate chemicals. Pressure-wash showers and sauna using TENNANT 750 machine. Report damaged equipment in the building. Report any shortage or lack of cleaning detergent and equipment. Organize daily and weekly cleaning schedule. 10/2009–1/2010: Food server <i>Aramark Food Service, Boise, ID</i> Serve food across counter. Prepare all condiments to be served. Clean kitchen and eating area after regular open hours. Act as a liaison between students and chef: report on likes and dislikes of students.
Honors	National Dean's List, 2009–2010 Awarded \$4,500 GEM scholarship from Boise State University
Activities	Member, Boise State University international student organization Certified CPR Instructor, American Red Cross
References	Available upon request

Figure 15.2 Unattractive and Attractive Résumés

The unattractive résumé, with its inadequate margins, poor balance, and poor line spacing, is a chore to read. The attractive résumé is much easier to read and makes a much better impression on readers.

a. Unattractively designed résumé

Figure 15.2 (continued)

James K. Wislo	1628 Rossi Street Boise, ID 83706	(208) 555-2697 jameswislo@mail.boisestate.edu
Objective	Entry-level position as a general assistant	
Education	Boise State University, Boise, ID BS in Biomechanical Engineering Current GPA: 3.1 Expected date of graduation: August 2014	
	<i>Related course work</i> Skeletal Development and Evolution Biomechanics of Movement Basic Mechanics I Technical Communication	
Employment	1/2010–present (20 hours per week): Custodial and maintenance <i>Boise State University, recreation center, Boise, ID</i> <ul style="list-style-type: none"> • Install and maintain soap dispenser machines. • Treat all floors (wooden and linoleum) with appropriate chemicals. • Pressure-wash showers and sauna using TENNANT 750 machine. • Report damaged equipment in the building. • Report any shortage or lack of cleaning detergent and equipment. • Organize daily and weekly cleaning schedule. 10/2009–1/2010: Food server <i>Aramark Food Service, Boise, ID</i> <ul style="list-style-type: none"> • Serve food across counter. • Prepare all condiments to be served. • Clean kitchen and eating area after regular open hours. • Act as a liaison between students and chef: report on likes and dislikes of students. 	
Honors	<ul style="list-style-type: none"> • National Dean’s List, 2009–2010 • Awarded \$4,500 GEM scholarship from Boise State University 	
Activities	<ul style="list-style-type: none"> • Member, Boise State University international student organization • Certified CPR Instructor, American Red Cross 	
References	Available upon request	

b. Attractively designed résumé

ETHICS NOTE**Writing Honest Job-Application Materials**

Many résumés contain lies or exaggerations. Job applicants say they attended colleges they didn't and were awarded degrees they weren't, give themselves inflated job titles, say they were laid off when they were really fired for poor performance, and inflate their accomplishments. Companies take this problem seriously. Career-guidance specialist Michelle Goodman (2010) reports that, according to the Society for Human Resource Management, most employers run background checks on applicants, and about a third of these checks reveal significant lies. Employers hire agencies that verify the applicant's education and employment history and check for a criminal record. If the company finds any discrepancies, it does not offer the candidate a position. If the person is already working for the company, he or she is fired.

Two common résumé styles are *chronological* and *skills*. In a *chronological résumé*, you use time as the organizing pattern for each section, including education and experience, and discuss your responsibilities for each job you have held. In a *skills résumé*, you merely list your previous jobs but include a skills section in which you describe your talents and achievements.

Recent graduates usually use the chronological résumé because in most cases they lack the record of skills and accomplishments needed for a skills résumé. However, if you have a lot of professional work experience, consider the skills style.

Elements of the Chronological Résumé

Most chronological résumés have six basic elements: identifying information, objectives or summary of qualifications, education, employment history, interests and activities, and references.

Identifying Information Include your full name, address, phone number, and e-mail address. Use your complete address, including the zip code. If your address during the academic year differs from your home address, list both and identify them clearly. An employer might call during an academic holiday to arrange an interview.

Objectives or Summary of Qualifications After the identifying information, add a statement of objectives or a summary of qualifications.

A *statement of objectives*, used most often by candidates new to the field, is a brief phrase or sentence—for example, “Objective: Entry-level position as a hospital dietitian,” or “A summer internship in manufacturing processes.”

When drafting your statement, follow these three suggestions:

- State only the goals or duties explicitly mentioned, or clearly implied, in the job advertisement. If you unintentionally suggest that your goals are

substantially different from the job responsibilities, the reader might infer that you would not be happy working there and might not consider you further.

- *Focus on the reader's needs, not on your goals.* Instead of stating that you are looking for a position “with opportunities for advancement” or that “offers a high salary,” find out what the company needs: for example, “Position in Software Engineering specializing in database-applications development that enables me to use my four years of experience developing large enterprise-database solutions based on a normalized relational design.”
- *Be specific.* You accomplish little by writing, “Position offering opportunities in the field of health science, where I can use my communication and analytical skills.” Specify what kind of position you want—nurse, physician, hospital administrator, pharmaceutical researcher.

Job candidates with more experience tend to write a *summary of qualifications*. This statement is usually a brief paragraph that highlights three or four important skills or accomplishments. For example:

Summary of Qualifications

Six years' experience creating testing documentation to qualify production programs that run on Automated Test and Handling Equipment. Four years' experience running QA tests on software, hardware, and semiconductor products. Bilingual English and Italian. Secret security clearance.

Education If you are a student or a recent graduate, place the education section next. If you have substantial professional experience, place the employment-history section before the education section.

Include at least the following information in the education section:

- *The degree.* After the degree abbreviation (such as BS, BA, AA, or MS), list your academic major (and, if you have one, your minor)—for example, “BS in Materials Engineering, minor in General Business.”
- *The institution.* Identify the institution by its full name: “Louisiana State University,” not “LSU.”
- *The location of the institution.* Include the city and state.
- *The date of graduation.* If your degree has not yet been granted, add “Anticipated date of graduation” or a similar phrase.
- *Information about other schools you attended.* List any other institutions you attended beyond high school, even those from which you did not earn a degree. The description for other institutions should include the same information as in the main listing. Arrange entries in reverse chronological order: that is, list first the school you attended most recently.

Guidelines

Elaborating on Your Education

The following four guidelines can help you develop the education section of your résumé.

- ▶ **List your grade-point average.** If your average is significantly above the median for the graduating class, list it. Or list your average in your major courses, or all your courses in the last two years. Calculate it however you wish, but be honest and clear.
- ▶ **Compile a list of courses.** Include courses that will interest an employer, such as advanced courses in your major, or communications courses, such as technical communication, public speaking, and organizational communication. For example, a list of business courses on an engineer's résumé shows special knowledge and skills. But don't bother listing required courses; everyone else in your major took the same courses. Include the substantive titles of listed courses; employers won't know what "Chemistry 450" is. Call it by its official title: "Chemistry 450. Organic Chemistry."
- ▶ **Describe a special accomplishment.** For a special senior design or research project, present the title and objective of the project, any special or advanced techniques or equipment you used, and, if you know them, the major results: "A Study of Shape Memory Alloys in Fabricating Actuators for Underwater Biomimetic Applications—a senior design project to simulate the swimming styles and anatomy of fish." A project discussion makes you seem more like a professional: someone who designs and carries out projects.
- ▶ **List honors and awards you received.** Scholarships, internships, and academic awards suggest exceptional ability. If you have received a number of such honors, or some that were not exclusively academic, you might list them separately (in a section called "Honors" or "Awards") rather than in the education section. Decide where this information will make the best impression.

The education section is the easiest part of the résumé to adapt in applying for different positions. For example, a student majoring in electrical engineering who is applying for a position requiring strong communications skills can list communications courses in one version of the résumé and advanced electrical engineering courses in another version. As you compose the education section, emphasize those aspects of your background that meet the requirements for the particular job.

Employment History Present at least the basic information about each job you have held: the dates of employment, the organization's name and location, and your position or title. Then, add carefully selected details. Readers want to know what you did and accomplished. Provide at least a two- to three-line description for each position. For particularly important

or relevant jobs, write more, focusing on one or more of the following factors:

- **Skills.** What technical skills did you use on the job?
- **Equipment.** What equipment did you operate or oversee? In particular, mention computer equipment or software with which you are familiar.
- **Money.** How much money were you responsible for? Even if you considered your data-entry position fairly easy, the fact that the organization grossed, say, \$2 million a year shows that the position involved real responsibility.
- **Documents.** What important documents did you write or assist in writing, such as brochures, reports, manuals, proposals, or Web sites?
- **Personnel.** How many people did you supervise?
- **Clients.** What kinds of, and how many, clients did you do business with in representing your organization?

Whenever possible, emphasize *results*. If you reorganized the shifts of the weekend employees you supervised, state the results:

Reorganized the weekend shift, resulting in a cost savings of more than \$3,000 per year.

Wrote and produced (with Adobe FrameMaker) a 56-page parts catalog that is still used by the company and that increased our phone inquiries by more than 25 percent.

When you describe positions, functions, or responsibilities, use the active voice (“supervised three workers”) rather than the passive voice (“three workers were supervised by me”). The active voice highlights action. Note that writers often omit the *I* at the start of sentences: “Prepared bids,” rather than “I prepared bids.” Whichever style you use, be consistent. Figure 15.3 lists some strong verbs to use in describing your experience.

In This Book

For more about using strong verbs, see Ch. 10, p. 236.

administered	coordinated	evaluated	maintained	provided
advised	corresponded	examined	managed	purchased
analyzed	created	expanded	monitored	recorded
assembled	delivered	hired	obtained	reported
built	developed	identified	operated	researched
collected	devised	implemented	organized	solved
completed	directed	improved	performed	supervised
conducted	discovered	increased	prepared	trained
constructed	edited	instituted	produced	wrote

Figure 15.3 Strong Action Verbs Used in Résumés

Here is a sample listing of employment history:

June–September 2011: Student Dietitian
Millersville General Hospital, Millersville, TX

Gathered dietary histories and assisted in preparing menus for a 300-bed hospital. Received “excellent” on all seven items in evaluation by head dietitian.

In just a few lines, you can show that you sought and accepted responsibility and that you acted professionally. Do not write, “I accepted responsibility”; instead, present facts that lead the reader to that conclusion.

Naturally, not all jobs entail professional skills and responsibilities. Many students find summer work as laborers, sales clerks, and so forth. If you have not held a professional position, list the jobs you have held, even if they were unrelated to your career plans. If the job title is self-explanatory, such as waitperson or service-station attendant, don’t elaborate. If you can write that you contributed to your tuition or expenses, such as by earning 50 percent of your annual expenses through a job, employers will be impressed by your self-reliance.

One further suggestion: if you have held a number of nonprofessional as well as several professional positions, group the nonprofessional ones:

Other Employment: cashier (summer 2007), salesperson (part-time, 2008), clerk (summer 2009)

This strategy prevents the nonprofessional positions from drawing the reader’s attention away from the more important positions.

List jobs in reverse chronological order on the résumé to highlight the most recent employment.

Two common circumstances call for some subtlety:

- *You have gaps in your employment history.* If you were not employed for several months or years because you were raising children, attending school, recovering from an accident, or for other reasons, consider using a skills résumé, which focuses more on your skills and less on your job history. Also, you can explain the gaps in the cover letter. For instance, you could write, “I spent 2007 and part of 2009 caring for my elderly parent, but during that time I was able to do some substitute teaching and study at home to prepare for my A+ and Network+ certification, which I earned in late 2008.” Do not lie or mislead about your dates of employment.
- *You have had several positions with the same employer.* If you want to show that you have had several positions with the same employer, you can present one description that encompasses all the positions or present a separate description for each position.

Presenting One Description

Blue Cross of Iowa, Ames, Iowa (January 2003–present)

- *Internal Auditor II (2007–present)*
- *Member Service Representative/Claims Examiner II (2005–2007)*
- *Claims Examiner II (2003–2005)*

As Claims Examiner II, processed national account inquiries and claims in accordance with . . . After promotion to Member Service Representative/Claims Examiner II position, planned policies and procedures, . . . As Internal Auditor II, audit claims, enrollment, and inquiries; run dataset population and sample reports . . .

This format enables you to mention your promotions and to create a clear narrative that emphasizes your progress within the company.

Presenting Separate Descriptions

Blue Cross of Iowa, Ames, Iowa (January 2003–present)

- *Internal Auditor II (2007–present)*
Audit claims, enrollment, and inquiries . . .
- *Member Service Representative/Claims Examiner II (2003–2007)*
Planned policies and procedures . . .
- *Claims Examiner II (2003–2005)*

Processed national account inquiries and claims in accordance with . . .

This format, which enables you to create fuller descriptions of each position, is effective if you are trying to show that each position is distinct and you wish to describe the more-recent positions more fully.

Interests and Activities The interests-and-activities section of the résumé is the appropriate place for several kinds of information about you:

- participation in community-service organizations (such as Big Brothers/Big Sisters) or volunteer work in a hospital
- hobbies related to your career (for example, electronics for an engineer)
- sports, especially those that might be socially useful in your professional career, such as tennis, racquetball, and golf
- university-sanctioned activities, such as membership on a team, work on the college newspaper, or election to a responsible position in an academic organization or a residence hall

Do not include activities that might create a negative impression, such as gambling or performing in a rock band. And always omit such activities as meeting people and reading: everybody does these things.

References Potential employers will want to learn more about you from your professors and previous employers. These people who are willing to speak or write on your behalf are called *references*.

Choose your references carefully. Solicit references only from those who know your work best and for whom you have done your best work—for instance, a previous employer with whom you worked closely or a professor from whom you received A's. Don't ask prominent professors who do not know your work well; they will be unable to write informative letters.

Do not simply assume that someone is willing to serve as a reference for you. Give the potential referee an opportunity to decline gracefully. Sometimes the person has not been as impressed with your work as you think. If you simply ask the person to serve as a reference, he or she might accept and then write a lukewarm letter. It is better to ask, "Would you be able to write an enthusiastic letter for me?" or "Do you feel you know me well enough to write a strong recommendation?" If the person shows any signs of hesitation or reluctance, withdraw the request. It may be a little embarrassing, but it is better than receiving a weak recommendation.

Once you have secured your references' permission to list them, create a references page. This page begins with your name and contact information, just as you present this information at the top of the résumé itself. Some job applicants add, for each reference, a sentence or two describing their relationship with the reference, such as, "Dr. Willerton was my adviser and my instructor for two courses; one in technical editing and one in document design." Figure 15.4 on page 416 shows a references page.

Other Elements The sections discussed so far appear on almost everyone's résumé. Other sections are either optional or appropriate for only some job seekers.

- **Computer skills.** Classify your skills in categories such as hardware, software, languages, and operating systems. List any professional certifications you have earned.
- **Military experience.** If you are a veteran, describe your military service as if it were a job, citing dates, locations, positions, ranks, and tasks. List positive job-performance evaluations.
- **Language ability.** A working knowledge of another language can be very valuable, particularly if the potential employer has international interests and you could be useful in translation or foreign service. List your proficiency, using terms such as *beginner*, *intermediate*, and *advanced*. Some applicants distinguish among reading, writing, and speaking abilities.
- **Willingness to relocate.** If you are willing to relocate, say so. Many organizations will find you a more attractive candidate.

Samantha Breveux

5986 Center Street Boise, ID 83703
208.555.8693 sbreveux@gmail.com

Professional References

Dr. Dale Cletis
Professor of English
Boise State University
Boise, ID 83725
208.555.2637
dcletis@boisestate.edu

Dr. Cletis was my instructor in three literature courses, as well as my adviser.

Dr. Miriam Finkelstein
Professor of Economics
Boise State University
Boise, ID 83725
208.555.9375
mfinkel@boisestate.edu

Dr. Finkelstein encouraged me to study for a minor in economics, which I did. She was my instructor in two courses.

Dr. Charles Tristan
Professor of English
Boise State University
Boise, ID 83725
208.555.1355
ctristan@boisestate.edu

Dr. Tristan, my instructor in two courses, encouraged me to study abroad. I spent my junior year in Paris.

Personal References

Mr. Heiko Yamamoto
Yamamoto Paving
1450 Industrial Drive
Eagle, ID 83467
208.555.2387
heiko@yamamotopaving.com

For three summers, beginning after my high-school graduation, I worked in Mr. Yamamoto's office as a bookkeeper.

Mr. Paul Engels
Yellow House Literary Cabin
1877 Capitol Boulevard
Boise, ID 83703
208.555.3827
pengels@yellowhouse.org

I volunteered my services writing and distributing press releases and advertising for the Yellow House Literary Cabin.

Martha Cummings, RN
St. Luke's Regional Medical Center
322 Bannock Street
Boise, ID 83604
208.555.3489
mcummings@stlukesrhc.org

For many years, my family has trained service dogs for hospital visitations. I worked with Ms. Cummings during high school and my first two years in college in helping other service-dog trainers.

Less-advanced job applicants are more likely than more-advanced job applicants to list personal references.

Figure 15.4 References Page

Elements of the Skills Résumé

A skills résumé differs from a chronological résumé in that it includes a separate section, usually called “Skills” or “Skills and Abilities,” that emphasizes job skills and knowledge. In a skills résumé, the employment section becomes a brief list of information about your employment history: company, dates of employment, and position. Here is an example of a skills section.

Skills and Abilities

Management

Served as weekend manager of six employees in a retail clothing business. Also trained three summer interns at a health-maintenance organization.

Writing and Editing

Wrote status reports, edited performance appraisals, participated in assembling and producing an environmental impact statement using desktop publishing.

Teaching and Tutoring

Tutored in the University Writing Center. Taught a two-week course in electronics for teenagers. Coach youth basketball.

In a skills section, you choose the headings, the arrangement, and the level of detail. Your goal, of course, is to highlight the skills the employer is seeking.

Figures 15.5, 15.6, and 15.7 on pages 418–20 show three examples of effective résumés.

WRITING ELECTRONIC RÉSUMÉS

Although paper résumés continue to be popular, especially after a company has decided to interview you, electronic résumés are more popular, especially for organizations that receive many applications and especially for a candidate’s first contact with the organization. According to CareerBuilder.com, 94 percent of the 500 largest U.S. companies use software for the first look at résumés (“Résumés Redefined,” 2008). For this reason, you will need an electronic résumé in addition to your traditional formatted paper résumé.

Most companies use computerized *applicant-tracking systems* to evaluate the dozens, hundreds, or even thousands of job applications they receive every day. Companies store the information from these applications in databases, which they search electronically for desired keywords to generate a pool of applicants for specific positions.

An electronic résumé can take several forms:

- A *formatted résumé attached to an e-mail message*. You attach the word-processing file to an e-mail message. Or you save your résumé as a Portable Document Format (PDF) file and attach it. (A PDF of your résumé retains the formatting of your original and prevents others from modify-

The writer uses design to emphasize his name and provides his contact information, including his e-mail address.

The writer could modify his objective to name the company to which he is applying.

The writer chooses to emphasize his advanced engineering courses. For another position, he might emphasize other courses.

The writer wisely creates a category that calls attention to his academic awards and his membership in his field's major professional organization.

The writer lists his references on a separate page and includes this page in his application materials only if an employer requests it. For each reference, the writer provides complete contact information and a statement describing his relationship to the person, as shown in Fig. 15.4 on p. 416.

In This Book

Many of the job boards listed on page 403 include samples of résumés.

CARLOS RODRIGUEZ
3109 Vista Street Philadelphia, PA 19136 (215) 555-3880 crodrig@dragon.du.edu

Objective
Entry-level position in signal processing

Education
BS in Electrical Engineering
Drexel University, Philadelphia, PA
Anticipated 6/2012
Grade-Point Average: 3.67 (on a scale of 4.0)
Senior Design Project: “Enhanced Path-Planning Software for Robotics”

Advanced Engineering Courses
Digital Signal Processing Computer Hardware
Introduction to Operating Systems I, II Systems Design
Digital Filters Computer Logic Circuits I, II

Employment
6/2009–1/2010 Electrical Engineering Intern II
RCA Advanced Technology Laboratory, Moorestown, NJ
Designed ultra-large-scale integrated circuits using VERILOG and VHDL hardware description languages. Assisted senior engineer in CMOS IC layout, modeling, parasitic capacitance extraction, and PSPICE simulation operations.

6/2008–1/2009 Electrical Engineering Intern I
RCA Advanced Technology Laboratory, Moorestown, NJ
Verified and documented several integrated circuit designs. Used CAD software and hardware to simulate, check, and evaluate these designs. Gained experience with Mathcad.

Honors and Organizations
Eta Kappa Nu (Electrical Engineering Honor Society)
Tau Beta Pi (General Engineering Honor Society)
IEEE

References
Available upon request

Figure 15.5 Chronological Résumé of a Traditional Student

Alice P. Linder	1781 Weber Road Warminster, PA 18974 (215) 555-3999 linderap423@aol.com		<i>The writer uses a table format for her résumé. Notice that all her headings are contained within the left-hand column.</i>
Objective	An internship in molecular research that uses my computer skills		<i>The writer indicates that she is interested in an internship, not a continuing position.</i>
Education	Harmon College, West Yardley, PA BS in Bioscience and Biotechnology Expected Graduation Date: 6/2012		
	<i>Related Course Work</i> General Chemistry I, II, III Biology I, II, III Organic Chemistry I, II Statistical Methods for Research Physics I, II Technical Communication Calculus I, II		<i>The writer's list of courses includes several outside her technical subject area to emphasize the skills she has demonstrated in her career.</i>
Employment Experience	6/2009–present (20 hours per week): Laboratory Assistant Grade 3 <i>GlaxoSmithKline, Upper Merion, PA</i> Analyze molecular data on E&S PS300, Macintosh, and IBM PCs. Write programs in C#, and wrote a user's guide for an instructional computing package. Train and consult with scientists and deliver in-house briefings.		<i>All of the writer's positions show an interest in working with people.</i>
	8/2006–present: Volunteer, Physical Therapy Unit <i>Children's Hospital of Philadelphia, Philadelphia, PA</i> Assist therapists and guide patients with their therapy. Use play therapy to enhance strengthening progress.		<i>The volunteer position says something about the writer's character.</i>
	6/1998–1/2001: Office Manager <i>Anchor Products, Inc., Ambler, PA</i> Managed 12-person office in \$1.2 million company. Also performed general bookkeeping and payroll.		<i>Before attending college, the writer worked as an office manager. Notice how the description of her position suggests that she is a skilled and responsible worker.</i>
Honors	Awarded three \$5,000 tuition scholarships (2008–2010) from the Gould Foundation.		
Additional Information	Member, Harmon Biology Club, Yearbook Staff Raising three school-age children Tuition 100% self-financed		<i>The writer believes that the skills required in raising children are relevant in the workplace. Others might think that because a résumé describes job credentials, this information should be omitted.</i>
References	Available upon request		

Figure 15.6 Chronological Résumé of a Nontraditional Student

This is another version of the résumé in Fig. 15.6.

In a skills résumé, you present the skills section at the start. This organization lets you emphasize your professional attributes. Notice that the writer uses specific details—names of software, number of credits, types of documents, kinds of activities—to make her case.

The employment section now contains a list of positions rather than descriptions of what the writer did in each position.

Alice P. Linder	1781 Weber Road Warminster, PA 18974	(215) 555-3999 linderap423@aol.com								
Objective	An internship in molecular research that uses my computer skills									
Skills and Abilities	<p><i>Laboratory Skills</i></p> <ul style="list-style-type: none"> Analyze molecular data on E&S PS300, Macintosh, and IBM PCs. Write programs in C#. Have taken 12 credits in biology and chemistry labs. <p><i>Communication Skills</i></p> <ul style="list-style-type: none"> Wrote a user's guide for an instructional computing package. Train and consult with scientists and deliver in-house briefings. <p><i>Management Skills</i></p> <ul style="list-style-type: none"> Managed 12-person office in \$1.2 million company. 									
Education	<p>Harmon College, West Yardley, PA BS in Bioscience and Biotechnology Expected Graduation Date: 6/2012</p> <p><i>Related Course Work</i></p> <table> <tr> <td>General Chemistry I, II, III</td> <td>Biology I, II, III</td> </tr> <tr> <td>Organic Chemistry I, II</td> <td>Statistical Methods for Research</td> </tr> <tr> <td>Physics I, II</td> <td>Technical Communication</td> </tr> <tr> <td>Calculus I, II</td> <td></td> </tr> </table>		General Chemistry I, II, III	Biology I, II, III	Organic Chemistry I, II	Statistical Methods for Research	Physics I, II	Technical Communication	Calculus I, II	
General Chemistry I, II, III	Biology I, II, III									
Organic Chemistry I, II	Statistical Methods for Research									
Physics I, II	Technical Communication									
Calculus I, II										
Employment Experience	<p>6/2009–present (20 hours per week) <i>GlaxoSmithKline, Upper Merion, PA</i> Laboratory Assistant Grade 3</p> <p>8/2006–present <i>Children's Hospital of Philadelphia, Philadelphia, PA</i> Volunteer, Physical Therapy Unit</p> <p>6/1998–1/2001 <i>Anchor Products, Inc., Ambler, PA</i> Office Manager</p>									
Honors	Awarded three \$5,000 tuition scholarships (2008–2010) from the Gould Foundation.									
Additional Information	<p>Member, Harmon Biology Club, Yearbook Staff Raising three school-age children Tuition 100% self-financed</p>									
References	Available upon request									

Figure 15.7 Skills Résumé of a Nontraditional Student

ing it.) Or you save your file in Rich Text Format (RTF) with the file extension .rtf. An RTF file retains some formatting and makes the information compatible across platforms (Apple, IBM, and UNIX) and word-processing programs (Word, WordPerfect, and others). Attaching an RTF file is a good choice when you do not know which file format the employer prefers. Follow the instructions the company offers on which file type to use and how to submit your materials. If the job ad requests, for example, “a plain-text document sent in the body of the message,” do not attach a file.

- A *text résumé*. Also referred to as a *plain-text résumé* or an *ASCII résumé*, a text résumé uses the limited ASCII character set and is saved as a .txt file, which can be entered directly into the organization’s keyword-searchable database. You can also paste text résumés piece-by-piece into Web-based forms, which often do not allow you to paste your complete résumé all at once.
- A *scannable résumé* (one that will be scanned into an organization’s database). There are dozens of database programs for this purpose, such as ResTrac or Resumix. Because most employers now prefer electronic submissions, scannable résumés are less common. However, if you submit a printed résumé to a company, you should consider how well the document will scan electronically.
- A *Web-based résumé*. You can put your résumé on your own Web site and hope that employers will come to you, or you can post it to a job board on the Web. As with any information you post on the Internet, you should carefully consider which personal details you reveal on your Web-based résumé.

Ways of creating and sending résumés will undoubtedly change as the technology changes. For now, you need to know that the traditional printed résumé is only one of several ways to present your credentials, and you should keep abreast of new techniques for applying for positions. Which form should your résumé take? Whichever form the organization prefers. If you learn of a position from an ad on the organization’s own site, the notice will tell you how to apply.

Content of the Electronic Résumé

Most of the earlier discussion of the content of a printed résumé also applies to an electronic résumé. The résumé must be honest and free of errors, and it must provide clear, specific information.

However, if the résumé is to be entered into a database instead of read by a person, include industry-specific jargon: all the keywords an employment officer might use in searching for qualified candidates. If an employment officer is looking for someone with experience writing Web pages, be sure you include the terms “Web page,” “Internet,” “XHTML,” “Java,” “CSS,” and any other relevant keywords. If your current position requires an understanding

of programming languages, list the languages you know. Also use keywords that refer to your communication skills, such as “public speaking,” “oral communication,” and “communication skills.” In short, whereas a traditional printed résumé focuses on *verbs*—tasks you have done—an electronic résumé focuses on *nouns*.

One hiring consultant puts it this way: “The bottom line is that if you apply for a job with a company that searches databases for keywords, and your résumé doesn’t have the keywords the company seeks for the person who fills that job, you are pretty much dead in the water” (Hansen, 2008).

► On TechComm Web

For more information on formatting electronic résumés, see The Riley Guide: Résumés, Cover Letters. Click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

Format of the Electronic Résumé

Because electronic résumés must be easy to read and scan, they require a very simple design. Consequently, they are not as attractive as paper-based résumés, and they are longer, because they use only a single narrow column of text.

Guidelines

Preparing a Plain-Text Résumé

Follow these three suggestions to ensure that your plain-text résumé is formatted correctly.

- ▶ **Use ASCII text only.** ASCII text includes the letters, numbers, and basic punctuation marks. Avoid boldface, italics, underlining, and special characters such as “smart quotation marks” or math symbols. Also avoid horizontal or vertical lines or graphics. To be sure you are using only ASCII characters, save your file as “plain text.” Then open it up using your software’s text editor, such as Notepad, and check to be sure it contains only ASCII characters: non-ASCII characters will appear as garbage text.
- ▶ **Left-align the information.** Do not try to duplicate the formatting of a traditional paper résumé. You can’t. Instead, left align each new item. For example, here is a sample listing from an employment-experience section:
 - 6/2009-present
 - (20 hours per week)
 - GlaxoSmithKline
 - Upper Merion, PA
 - Laboratory Assistant Grade 3
 - Analyze molecular data on E&S PS300, Macintosh, and IBM PCs. Write programs in C#, and wrote a user’s guide for an instructional computing package. Train and consult with scientists and deliver in-house briefings.
- ▶ **Send yourself a test version of the résumé.** When you finish writing and formatting the résumé, send yourself a copy, then open it in your text editor and see if it looks professional.

INTERACTIVE SAMPLE DOCUMENT

Preparing a Text Résumé

The following résumé was written by a graduating college senior who wanted to work for a wildland firefighting agency such as the U.S. Bureau of Land Management or U.S. Forest Service. The writer plans to save the résumé as a .txt file and enter it directly into these agencies' employment databases. The questions in the margin ask you to think about electronic résumés (as discussed on pages 417–24).

BURTON L. KREBS

34456 West Jewell St.
Boise, ID 83704

208-555-9627
burtonkrebs@mail.com

Objective

Lead crew position on rappel crew.

Career History

- Senior Firefighter, Moyer Rappel Crew, 05/11-present
- Senior Firefighter, Boise Helitack, 05/10-10/10
- Hotshot Crew Member, Boise Interagency Hotshot Crew, 07/09-09/09
- Helirappel Crew Member, Moyer Rappel Crew, 06/05-09/08

Fire and Aviation Qualifications

Crew Boss (T)
Helicopter Manager
Helicopter Rappeller
Helirappel Spotter
Helispot Manager
Type 2 Helibase Manager (T)
Incident Commander Type 4 (T)

Education

Bachelor of Arts in Communication Training and Development, Boise State University, Boise, Idaho, GPA 3.57, May 2012

Skills

- Excellent oral and written communication skills
- Proficient in Word, Excel, and PowerPoint
- Knowledgeable of helicopter contract administration
- Perform daily and cumulative flight invoice cost summaries

Awards

“Outstanding Performance” Recognition, U.S. Bureau of Land Management, 2010
“Outstanding Performance” Recognition, U.S. Forest Service, 2007, 2008, 2009

1. How effectively has the writer formatted this résumé?
2. What elements are likely to be problematic when the writer saves this résumé as a .txt file?
3. What is the function of the industry-specific jargon in this résumé?
4. Why does the writer place the education section below the sections on career history and fire and aviation qualifications?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 15 on <befordstmartins.com/techcomm>.

If you are mailing a paper résumé that will be scanned, follow the seven additional guidelines outlined in the box “Preparing a Scannable Résumé.” Figure 15.8 is an example of a scannable résumé.

Figure 15.8 Scannable Résumé

This is an electronic version of the résumé in Fig. 15.7. Notice that the writer uses ASCII text and left justification.

Throughout, the writer includes keywords such as C#, IBM, PC, Macintosh, bioscience, biotechnology, molecular research, laboratory assistant, management, volunteer, and physical therapy.

Alice P. Linder
1781 Weber Road
Warminster, PA 18974
(215) 555-3999
linderap423@aol.com

Objective: An internship in molecular research that uses my computer skills

Skills and Abilities:

Laboratory Skills. Analyze molecular data on E&S PS300, Macintosh, and IBM PCs. Write programs in C#. Have taken 12 credits in biology and chemistry labs.

Communication Skills. Wrote a user's guide for an instructional computing package. Train and consult with scientists and deliver in-house briefings.

Management Skills. Managed 12-person office in \$1.2 million company.

Education:

Harmon College, West Yardley, PA
BS in Bioscience and Biotechnology
Expected Graduation Date: June 2012

Related Course Work:

General Chemistry I, II, III
Organic Chemistry I, II
Physics I, II
Calculus I, II
Biology I, II, III
Statistical Methods for Research
Technical Communication

Employment Experience:

June 2009-present (20 hours per week)
GlaxoSmithKline, Upper Merion, PA
Laboratory Assistant Grade 3

August 2006-present

Children's Hospital of Philadelphia, Philadelphia, PA
Volunteer, Physical Therapy Unit

June 1998-January 2001

Anchor Products, Inc., Ambler, PA
Office Manager

Honors:

Awarded three \$5,000 tuition scholarships (2008-2010) from the Gould Foundation.

Additional Information:

Member, Harmon Biology Club, Yearbook Staff
Raising three school-age children
Tuition 100% self-financed

References:

Available upon request

Guidelines

Preparing a Scannable Résumé

Follow these seven suggestions to make sure your résumé will scan correctly.

- ▶ **Use a good-quality laser printer.** The better the resolution, the better the scanner will work.
- ▶ **Use white paper.** Even a slight tint to the paper can increase the chances that the scanner will misinterpret a character.
- ▶ **Do not fold the résumé.** The fold line can confuse the scanner.
- ▶ **Use a simple sans-serif typeface.** Scanners can easily interpret large, open typefaces such as Arial.
- ▶ **Use a single-column format.** A double-column text will scan inaccurately. Left-align everything.
- ▶ **Use wide margins.** Instead of an 80-character width, set your software for 65. This way, regardless of the equipment the reader is using, the lines will break as you intend them.
- ▶ **Use the space bar instead of the tab key.** Tabs will be displayed according to the settings on the reader's equipment, not the settings on yours. Therefore, use the space bar to move text horizontally.

WRITING JOB-APPLICATION LETTERS

Whether you send a formal letter in the mail or upload a statement to a Web site, you will need to write a job-application letter. The letter is crucial not only because it enables you to argue that you should be considered for a position but also because it shows your writing skills. Make your letter appeal as directly and specifically as possible to a particular person, and make sure it shows your best writing.

Selectivity and Development

The keys to a good letter are selectivity and development. *Select* two or three points of greatest interest to the potential employer and *develop* them into paragraphs. Emphasize results, such as improved productivity or quality or decreased costs. If one of your previous part-time positions called for skills that the employer is looking for, write a substantial paragraph about that position, even though the résumé devotes only a few lines to it.

 **In This Book**

For more about formatting letters, see Ch. 14, p. 376.

For most candidates, a job-application letter should fill the better part of a page. For more-experienced candidates, it might fill up to two pages. Regardless, if you write at length on a minor point, you become boring and appear to have poor judgment. Employers seek candidates who can say a lot in a small space.

Elements of the Job-Application Letter

The inside address—the name, title, organization, and address of the recipient—is important because you want to be sure your materials get to the right person. And you don't want to offend that person with a misspelling or an incorrect title. If you are uncertain about any of the information—the reader's name, for example, might have an unusual spelling—verify it by researching the organization on the Internet or by phoning.

When you do not know who should receive the letter, phone the company to find out who manages the department. If you are unsure of the appropriate department or division to write to, address the letter to a high-level executive, such as the president. The letter will get to the right person. Also, because the application includes both a letter and a résumé, use an enclosure notation.

The four-paragraph example discussed here is only a basic model, consisting of an introductory paragraph, two body paragraphs, and a concluding paragraph. At a minimum, your letter should include these four paragraphs, but there is no reason it cannot have five or six.

Plan the letter carefully. Draft it and then revise it. Let it sit for a while, then revise it again, and edit and proofread. Spend as much time on it as you can.

The Introductory Paragraph The introductory paragraph has four specific functions:

- *It identifies your source of information.* In an unsolicited application, all you can do is ask if a position is available. For a solicited application, however, state how you heard about the position.
- *It identifies the position you are interested in.* Often, the organization you are applying to is advertising several positions; if you omit the title of the position you are interested in, your reader might not know which one you seek.
- *It states that you wish to be considered for the position.* Although the context makes your wish obvious, you should mention it because the letter would be awkward without it.
- *It forecasts the rest of the letter.* Choose a few phrases that forecast the body of the letter so that the letter flows smoothly. For example, if you use the phrase “retail experience” in the opening paragraph, you are preparing your reader for the discussion of your retail experience later in the letter.

 **In This Book**

For more about developing paragraphs, see Ch. 9, p. 211.

These four points need not appear in any particular order, nor does each need to be covered in a single sentence. The following sample paragraphs demonstrate different ways of providing the necessary information:

Response to a Job Ad

I am writing in response to your notice in the online May 13 *New York Times*. I would like to be considered for the position in system programming. I hope you find that my studies in computer science at Eastern University, along with my programming experience at Airborne Instruments, qualify me for the position.

Note that the writer identifies the date of the ad, the name of the publication, and the name of the position. Then, she forecasts the main points she will make in the body of the letter.

Unsolicited Job Application

My academic training in hotel management and my experience with Sheraton International have given me a solid background in the hotel industry. Would you please consider me for any management trainee position that might be available?

The writer politely requests that the reader consider his application.

Unsolicited Personal Contact

Mr. Howard Alcott of your Research and Development Department suggested that I write to you. He thinks that my organic chemistry degree and my practical experience with Brown Laboratories might be of value to XYZ Corporation. Do you have an entry-level position in organic chemistry for which I might be considered?

Notice the tone in all three of these samples: quiet self-confidence. Don't oversell yourself ("I am the candidate you have been hoping for") or undersell yourself ("I don't know that much about computers, but I am willing to learn").

The Education Paragraph For most students, the education paragraph should come before the employment paragraph because the education paragraph will be stronger. However, if your employment experience is stronger, present it first.

In writing your education paragraph, take your cue from the job ad (if you are responding to one). What aspect of your education most directly fits the job requirements? If the ad stresses versatility, you might structure your paragraph around the range and diversity of your courses. Also, you might discuss course work in a subject related to your major, such as business or communication skills. Extracurricular activities are often very valuable; if you were an officer in a student organization, you could discuss the activities and programs that you coordinated. Perhaps the most popular strategy for developing the education paragraph is to discuss skills and knowledge gained from advanced course work in your major field.

Example About a Project Based on a Course Assignment

At Eastern University, I have taken a wide range of science courses, but my most advanced work has been in chemistry. In one laboratory course, I developed a new aseptic brewing technique that lowered the risk of infection by more than 40 percent. This new technique was the subject of an article in the *Eastern Science Digest*. Representatives from three national breweries have visited our laboratory to discuss the technique with me.

Note that the writer develops one idea, presenting enough information about it to interest the reader. Paragraphs that merely list a number of courses that the writer has taken are ineffective: everyone takes courses.

The writer elaborates on a field other than his major. Note how he develops an idea based on a detail in the job ad. This strategy shows that he studied the ad carefully and wrote a custom letter. This initiative makes this the sort of candidate most hiring officials would like to interview.

The writer develops an effective paragraph about a small aspect of her credentials. She sounds like a focused, intelligent person who wants to do some good.

The writer makes the point that he is being promoted within the company because of his good work. Notice his reference to the specialized software and the size of the project.

The writer starts by suggesting that he is hardworking. Notice that he doesn't say it explicitly; rather, he provides evidence to lead the reader to that conclusion.

Another theme in this paragraph is that the writer knows how to work with people effectively. Again, he doesn't say it; he implies it.

Example About Writing a Document

To broaden my education at Southern University, I took eight business courses in addition to my requirements for a degree in civil engineering. Because your ad mentions that the position will require substantial client contact, I believe that my work in marketing, in particular, would be of special value. In an advanced marketing seminar, I used InDesign to produce a 20-page sales brochure describing the various kinds of building structures for sale by Oppenheimer Properties to industrial customers in our section of the city. That brochure is now being used at Oppenheimer, where I am an intern.

Example About a Competition

The most rewarding part of my education at Western University occurred outside the classroom. My entry in a fashion-design competition sponsored by the university won second place. More important, through the competition I met the chief psychologist at Western Regional Hospital, who invited me to design clothing for people with disabilities. I have since completed six different outfits, which are now being tested at the hospital. I hope to be able to pursue this interest once I start work.

An additional point: if you haven't already specified your major and your college or university in the introductory paragraph, be sure to do so here.

The Employment Paragraph Like the education paragraph, the employment paragraph should begin with a topic sentence and develop a single idea. That idea might be that you have a broad background or that one job in particular has given you special skills that make you especially well suited for the available job.

Example About Advancement on the Job

For the past three summers and part-time during the academic year, I have worked for Redego, Inc., a firm that specializes in designing and planning industrial complexes. I began as an assistant in the drafting room. By the second summer, I was accompanying a civil engineer on field inspections. Most recently, I have used AutoCAD to assist an engineer in designing and drafting the main structural supports for a 15-acre, \$30 million chemical facility.

Example About Experience Working Collaboratively

Although I have worked every summer since I was 15, my most recent position, as a technical editor, was the most rewarding. I was chosen by Digital Systems, Inc., from among 30 candidates because of my dual background in computer science and writing. My job was to coordinate the editing of computer manuals. Our copy editors, most of whom were not trained in computer science, needed someone to help verify the technical accuracy of their revisions. When I was unable to answer their questions, I was responsible for interviewing our systems analysts to find the correct answers and to make sure the computer novice could follow them. This position gave me a good understanding of the process of creating operating manuals.

Example Based on Project-based Experience

I have worked in merchandising for three years as a part-time and summer salesperson in men's fashions and accessories. I have had experience running inventory-control software and helped one company switch from a manual to an online system. Most recently, I assisted in clearing \$200,000 in closeout men's fashions: I coordinated a campaign to sell half of the merchandise at cost and was able to convince the manufacturer's representative to accept the other half for full credit. For this project, I received a certificate of appreciation from the company president.

Although you will discuss your education and experience in separate paragraphs, try to link these two halves of your background. If an academic course led to an interest that you were able to pursue in a job, make that point in the transition from one paragraph to the other. Similarly, if a job experience helped shape your academic career, tell the reader about it.

In this paragraph, the writer suggests that she has technical and interpersonal skills and that her company thought she did an excellent job on a project she coordinated.

The theme of all these samples is that an effective paragraph has a sharp focus and specific evidence and that it clearly suggests the writer's qualifications.

The Concluding Paragraph The purpose of the concluding paragraph is to motivate the reader to invite you for an interview. In the preceding paragraphs, you provided the information that you hope has convinced the reader to give you another look. In the last paragraph, you want to make it easy for him or her to do so. The concluding paragraph contains three main elements:

- *A reference to your résumé.* If you have not yet referred to it, do so now.
- *A polite but confident request for an interview.* Use the phrase *at your convenience*. Don't make the request sound as if you're asking a personal favor.
- *Your phone number and e-mail address.* State the time of day you can be reached. Adding an e-mail address gives the employer one more way to get in touch with you.

Example 1

The enclosed résumé provides more information about my education and experience. Could we meet at your convenience to discuss the skills and experience I could bring to Pentamax? You can leave a message for me anytime at (303) 555-5957 or cfilli@claus.cmu.edu.

Example 2

More information about my education and experience is included on the enclosed résumé, but I would appreciate the opportunity to meet with you at your convenience to discuss my application. You can reach me after noon on Tuesdays and Thursdays at (212) 555-4527 or anytime at rforster@psu.edu.

All job letters end with a paragraph that urges the reader to contact the writer and provides the contact information that makes it easy to do so.

The examples of effective job-application letters in Figures 15.9 and 15.10 on pages 430–31 correspond to the résumés in Figures 15.5 and 15.6.

Figure 15.9 Job-Application Letter

Notice that the writer's own name does not appear at the top of his letter.

In the inside address, he uses the reader's courtesy title, "Mr."

The writer points out that he has taken two graduate courses. Notice that he discusses his senior design project, which makes him look more like an engineer solving a problem than a student taking a course.

Notice the use of "In addition" to begin the third sentence. This phrase breaks up the "I" openings of several sentences.

An enclosure notation refers to his résumé.

3109 Vista Street
Philadelphia, PA 19136

January 20, 2012

Mr. Stephen Spencer, Director of Personnel
Department 411
Boeing Naval Systems
103 Industrial Drive
Wilmington, DE 20093

Dear Mr. Spencer:

I am writing in response to your advertisement in the January 16 *Philadelphia Inquirer*. Would you please consider me for the position in Signal Processing? I believe that my academic training in electrical engineering at Drexel University, along with my experience with the RCA Advanced Technology Laboratory, would qualify me for the position.

My education at Drexel has given me a strong background in computer hardware and system design. I have concentrated on digital and computer applications, developing and designing computer and signal-processing hardware in two graduate-level engineering courses. For my senior design project, I am working with four other undergraduates in using OO programming techniques to enhance the path-planning software for an infrared night-vision robotics application.

While working at the RCA Advanced Technology Laboratory, I was able to apply my computer experience to the field of DSP. I designed ultra-large-scale integrated circuits using VERILOG and VHDL hardware description languages. In addition, I assisted a senior engineer in CMOS IC layout, modeling, parasitic capacitance extraction, and PSPICE simulation operations.

The enclosed résumé provides an overview of my education and experience. Could I meet with you at your convenience to discuss my qualifications for this position? Please leave a message anytime at (215) 555-3880 or e-mail me at crodrig@dragon.du.edu.

Yours truly,



Carlos Rodriguez

Enclosure (1)

In This Book

Many of the job boards listed on page 403 include samples of application letters.

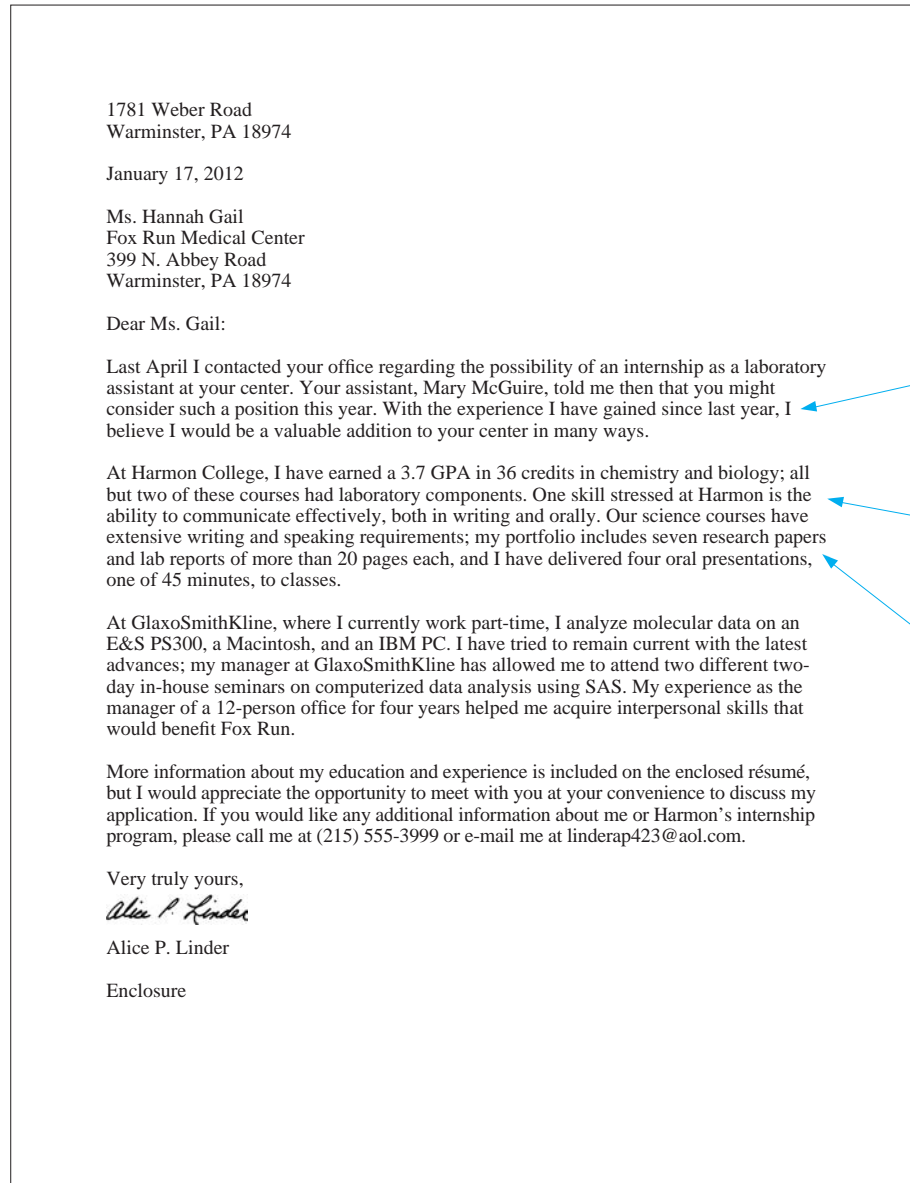


Figure 15.10
Job-Application Letter

The writer gracefully suggests that she would be an even better candidate this year than last year.

The writer is making two points: she is experienced in the lab, and she is an experienced communicator.

By mentioning her portfolio, she is suggesting that she would be happy to show the reader her documents. This statement is an example of understated self-confidence.

PREPARING FOR A JOB INTERVIEW

If your job-application letter is successful, you will be invited to a job interview, where both you and the organization can start to see whether you would be a good fit there.

On TechComm Web

For links to Web sites about employment, click on Links Library for Ch. 15 on <bedfordstmartins.com/techcomm>.

In This Book

For more about research techniques, see Ch. 6.

In This Book

For more about communicating persuasively, see Ch. 8.

Guidelines

Preparing for a Job Interview

For every hour you spend in a job interview, you need to do many hours of preparation.

- ▶ **Study job interviews.** The dozens of books and Web sites devoted to job interviews cover everything from how to do your initial research to common interview questions to how to dress. Although you can't prepare for everything that will happen, you can prepare for a lot of things.
- ▶ **Study the organization to which you applied.** If you inadvertently show that you haven't done your homework, the interviewer might conclude that you're always unprepared. Learn what products or services the organization provides, how well it has done in recent years, what its plans are, and so forth. Start with the organization's own Web site, especially corporate blogs, and then proceed to other online and print resources. Search for the organization's name on the Internet.
- ▶ **Think about what you can offer the organization.** Your goal during the interview is to show how you can help the organization accomplish its goals. Think about how your academic career, your work experience, and your personal characteristics and experiences have prepared you to solve problems and carry out projects to help the organization succeed. Make notes about projects you carried out in courses, experiences on the job, and experiences in your personal life that can serve as persuasive evidence to support claims about your qualifications.
- ▶ **Study lists of common interview questions.** Interviewers study these lists; you should, too. You're probably familiar with some of the favorites:
 - Can you tell me about yourself?
 - Where do you see yourself in five years?
 - Why did you apply to our company?
 - What do you see as your greatest strengths and weaknesses?
 - Tell me about an incident that taught you something important about yourself.
 - What was your best course in college? Why?
- ▶ **Compile a list of questions you wish to ask.** Near the end of the interview, the interviewer will probably ask if you have any questions. The interviewer expects you to have compiled a brief list of questions about working for the organization. Do not focus on salary, vacation days, or sick leave. Instead, ask about ways you can continue to develop as a professional, improving your ability to contribute to the organization.
- ▶ **Rehearse the interview.** It's one thing to think about how you might answer an interview question. It's another to have to answer it. Rehearse the interview by asking friends or colleagues to play the role of the interviewers, making up questions that you haven't thought about. Then ask these people for constructive criticism.

Job boards on the Internet can help you prepare for a job interview. They discuss questions such as the following:

- When should you arrive for the interview?
- What should you wear?
- How do interviewers interpret your body language?
- What questions are you likely to be asked?
- How long should your answers be?
- How do you know when the interviewer wishes to end the interview?
- How can you get the interviewer's contact information to write a follow-up letter?

 **In This Book**

For a list of Internet job boards, see p. 403.

WRITING FOLLOW-UP LETTERS OR E-MAILS AFTER AN INTERVIEW

After an interview, you should write a letter or e-mail of appreciation. If you are offered the job, you also may have to write a letter accepting or rejecting the position.

- *Letter of appreciation after an interview.* Thank the representative for taking the time to see you, and emphasize your particular qualifications. You can also restate your interest in the position. A follow-up letter can do more good with less effort than any other step in the job-application procedure because so few candidates take the time to write one.

Dear Mr. Weaver:

Thank you for taking the time yesterday to show me your facilities and to introduce me to your colleagues.

Your advances in piping design were particularly impressive. As a person with hands-on experience in piping design, I can appreciate the advantages your design will have.

The vitality of your projects and the good fellowship among your employees further confirm my initial belief that Cynergo would be a fine place to work. I would look forward to joining your staff.

Sincerely yours,



Harriet Bommarito

- *Letter accepting a job offer.* This one is easy: express appreciation, show enthusiasm, and repeat the major terms of your employment.

 **In This Book**

Many of the job boards listed on p. 403 include samples of follow-up letters for different situations that occur during the job search.

Dear Mr. Weaver:

Thank you very much for the offer to join your staff. I accept.

I look forward to joining your design team on Monday, July 19. The salary, as you indicate in your letter, is \$48,250.

As you have recommended, I will get in touch with Mr. Matthews in Personnel to get a start on the paperwork.

I appreciate the trust you have placed in me, and I assure you that I will do what I can to be a productive team member at Cynergo.

Sincerely yours,



Mark Greenberg

- *Letter rejecting a job offer.* If you decide not to accept a job offer, express your appreciation and, if appropriate, explain why you are declining the offer. Remember, you might want to work for this company sometime in the future.

Dear Mr. Weaver:

I appreciate very much the offer to join your staff.

Although I am certain that I would benefit greatly from working at Cynergo, I have decided to take a job with a firm in Baltimore, where I have been accepted at Johns Hopkins to pursue my master's degree at night.

Again, thank you for your generous offer.

Sincerely yours,



Cynthia O'Malley

- *Letter acknowledging a rejection.* Why write back after you have been rejected for a job? To maintain good relations. You might get a phone call the next week explaining that the person who accepted the job has had to change her plans and offering you the position.

Dear Mr. Weaver:

I was disappointed to learn that I will not have a chance to join your staff, because I feel that I could make a substantial contribution. However, I realize that job decisions are complex, involving many candidates and many factors.

Thank you very much for the courtesy you have shown me.

Sincerely yours,



Paul Goicochea

Writer's Checklist

Printed Résumé

- Does the résumé meet the needs of its readers? (p. 405)
- Does the résumé have a professional appearance, with generous margins, a balanced layout, adequate white space, and effective indentation? (p. 405)
- Is the résumé honest? (p. 406)
- Is the résumé free of errors? (p. 406)
- Does the identifying information contain your name, address(es), phone number(s), and e-mail address(es)? (p. 409)
- Does the résumé include a clear statement of your job objectives or a summary of your qualifications? (p. 409)
- Does the education section include your degree, your institution and its location, and your (anticipated) date of graduation, as well as any other information that will help a reader appreciate your qualifications? (p. 410)
- Does the employment section include, for each job, the dates of employment, the organization's name and location, and (if you are writing a chronological résumé) your position or title, as well as a description of your duties and accomplishments? (p. 411)
- Does the interests-and-activities section include relevant hobbies or activities, including extracurricular interests? (p. 414) Have you omitted any personal information that might reflect poorly on you? (p. 414)
- Does the references section include the names, job titles, organizations, mailing addresses, and phone numbers of three or four references? (p. 415) If you are not listing this information, does the strength of the rest of the résumé offset the omission? (p. 415)
- Does the résumé include any other appropriate sections, such as skills and abilities, military service, language abilities, or willingness to relocate? (p. 415)

Electronic Résumé

In addition to the items mentioned in the checklist for the printed résumé, did you

- use plain text? (p. 425)
- use a simple sans-serif typeface? (p. 425)
- use a single-column format? (p. 425)
- use wide margins? (p. 425)
- use the space bar instead of the tab key? (p. 425)

Job-Application Letter

- Does the letter meet your reader's needs? (p. 425)
- Does the letter look professional? (p. 405)
- Is the letter honest? (p. 409)
- Does the introductory paragraph identify your source of information and the position you are applying for, state that you wish to be considered, and forecast the rest of the letter? (p. 426)
- Does the education paragraph respond to your reader's needs with a unified idea introduced by a topic sentence? (p. 427)
- Does the employment paragraph respond to your reader's needs with a unified idea introduced by a topic sentence? (p. 428)
- Does the concluding paragraph include a reference to your résumé, a request for an interview, your phone number, and your e-mail address? (p. 429)
- Does the letter include an enclosure notation? (p. 430)

Preparing for a Job Interview


Did you

- study job interviews? (p. 432)
- study the organization to which you applied? (p. 432)
- think about what you can offer the organization? (p. 432)
- study lists of common interview questions? (p. 432)
- compile a list of questions you wish to ask? (p. 432)
- rehearse the interview? (p. 432)

Follow-up Letters

- Does your letter of appreciation for a job interview thank the interviewer and briefly restate your qualifications? (p. 433)
- Does your letter accepting a job offer show enthusiasm and repeat the major terms of your employment? (p. 433)
- Does your letter rejecting a job offer express your appreciation and, if appropriate, explain why you are declining the offer? (p. 434)
- Does your letter acknowledging a rejection have a positive tone that will help you maintain good relations? (p. 434)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1. INTERNET EXERCISE** Using a job board on the Web, list and briefly describe five positions in your field in your state. What skills, experience, and background does each position require? What is the salary range for each position?
- 2. INTERNET EXERCISE** Locate and provide the URLs of three job boards that provide interactive forms for creating a résumé automatically. In a brief memo to your instructor, describe the strengths and weaknesses of each. Which job board appears to be the easiest to use? Why?
- 3.** The following résumé was submitted in response to an ad describing the following duties: “CAM Technician to work with other technicians and manage some GIS and mapping projects. Also perform updating of the GIS database. Experience required.” In a brief memo to your instructor, describe how effective the résumé is. What are some of its problems?

Kenneth Bradley

530 Maplegrove Bozeman, Mont. 59715 (406)-484-2916

Objective Entry level position as a CAM Technician. I am also interested in staying with the company until after graduation, possibly moving into a position as a Mechanical Engineer.

Education Enrolled at Montana State University
August 2010- Present

Employment Fred Meyer
65520 Chinden
Garden City, MT
(208)-323-7030
Janitor- 7/09-6/10

Responsible for cleaning entire store, as well as equipment maintenance and floor maintenance and repair.

Assistant Janitorial Manager- 6/10-9/10
Responsible for cleaning entire store, equipment maintenance, floor maintenance and repair, scheduling, and managing personnel

Head of Freight- 9/10-Present

In charge of braking down all new freight, stocking shelves, cleaning the stock room, and managing personnel

Montana State University
Bozeman, MT

Teachers Aide ME 120- 1/09-5/09
Teachers Aide ME 120

In charge of keeping students in line and answering any questions related to drafting.

References

Timothy Rayburn
Janitorial Manager
(406)-555-8571

Eduardo Perez
Coworker
(406)-555-2032

- 4.** The following application letter responds to an ad describing the following duties: “CAM Technician to work with other technicians and manage some GIS and mapping projects. Also perform updating of the GIS database. Experience required.” In a brief memo to your instructor, describe how effective the letter is and how it could be improved.

530 Maplegrove
Bozeman, Mont. 59715
November 11, 2012

Mr. Bruce Hedley
Adecco Technical
Bozeman, Mont. 59715

Dear Mr. Hedley,

I am writing you in response to your ad on Monsterjobs .com. Would you please consider me for the position of CAM technician? I believe that my academic schooling at Montana State University, along with my work experience would make me an excellent candidate for the position.

While at Montana State University, I took one class in particular that applies well to this job. It was a CAD drafting class, which I received a 97% in. The next semester I was a Teachers Aid for that same class, where I was responsible for answering questions about drafting from my peers. This gave me a much stronger grasp on all aspects of CAD work than I could have ever gotten from simply taking the class.

My employment at Fred Meyer is also a notable experience. While there is no technical aspects of either positions I have held, I believe that my experience there will shed light on my work ethic and interpersonal skills. I started out as a graveyard shift janitor, with no previous experience. All of my coworkers were at least thirty years older than me, and had a minimum of five years of janitorial experience. However after working there for only one year I was promoted to assistant manager. Three months after I received this position, I was informed that Fred Meyer was going to contract out the janitorial work and that all of us would be losing our jobs. I decided that I wanted to stay within the company, and I was able to receive a position as head of freight.

The enclosed résumé provides an overview of my education and work experience. I would appreciate an opportunity to meet with you at your convenience to discuss my qualifications for this position. Please write me at the above

address or leave a message anytime. If you would like to contact me by e-mail, my e-mail address is kbradley@montanastate.edu.

Yours truly,

Ken Bradley

- 5.** How effective is the following letter of appreciation? How could it be improved? Present your findings in a brief memo to your instructor.

914 Imperial Boulevard
Durham, NC 27708

November 13, 2012

Mr. Ronald O’Shea
Division Engineering
Safeway Electronics, Inc.
Holland, MI 49423

Dear Mr. O’Shea:

Thanks very much for showing me around your plant. I hope I was able to convince you that I’m the best person for the job.

Sincerely yours,

Robert Harad

- 6.** In a newspaper or journal or on the Internet, find a job ad for a position in your field for which you might be qualified. Write a résumé and a job-application letter in response to the ad; include the job ad or a photocopy. You will be evaluated not only on the content and appearance of the materials, but also on how well you have targeted them to the job ad.

Case 15: Adding “Social” to “Networking”

Background

In your senior seminar course in your major, one of the guest speakers is Bob Viara, director of the Career Center. In his presentation, Bob discusses the services offered by the Career Center, focusing on techniques students can use to increase their chances of getting the right job when they graduate. At the end of the presentation, he asks students to get in touch with him if they have any suggestions about ways to improve the services that the Career Center offers.

Because you aren’t familiar with the Career Center, you decide to visit its Web site. In addition to offering information for potential employers about how to list jobs and interview students and for students about how to write résumés and application letters, the site offers a brief discussion about networking (see Document 15.1).

You write Bob Viara an e-mail that says, in part, that although you appreciate the advice about networking, you think there is more to be said about using social-networking sites such as LinkedIn in the job search. You include a link to a page on LinkedIn that lists some of

the ways LinkedIn can help professionals (see Document 15.2).

Later that afternoon, you receive a response from Bob Viara. “You’re absolutely right,” he says. “We need to beef up that section of the site. Any interest in working on it? I’d be happy to work with you in setting up an internship so you can get credit for it.”

Your Assignment

- Using a search engine, study social-networking sites that job seekers use. Write an e-mail to Bob Viara describing the topics you think students might want to see covered in a discussion of how to use social-networking sites. As you think about information to include in your e-mail, consider the journalistic questions: *who*, *what*, *when*, *where*, *why*, and *how*.
- Write a 1,000-word discussion for students about how to use social-networking sites as part of the job search. Because Bob Viara might want to incorporate this discussion into the Career Center Web site, you can include appropriate links to sites.

Document 15.1 Career Center Discussion of Networking

What Is Networking?

“It’s not what you know. It’s who you know.” That advice often applies when it comes to finding a job. But how exactly do you do it? The answer is in one word: networking.

Networking is a fancy way of saying connecting with people so that you get to know them and they get to know you.

You already do networking, even if only on a social basis. You get together with family, friends, and classmates. Now it’s time to learn how to do job-search networking. Think of it as another form of job interviewing—only it isn’t restricted to people who can offer you a job. It pays to network with anyone who can help you understand anything about the job search: how to prepare for the job search, how to learn about a particular company or industry, how to meet someone who might know of an opening.

Here are some tips:

1. Let people know you are looking for a job. Ask friends about openings at their company. Get in touch with people who work at companies where you’d like to work.
2. Reach out to trade and professional organizations in your field. Talk to professors; search the Internet for organizations.
3. Set up informational interviews. Find individuals in companies or industries in which you’d like to work and see if they would be willing to sit down with you for 15 minutes. You’d be surprised how willing people are to help you—if you ask politely and professionally. At an informational interview, you are likely to come away with two or three names of other people to contact.

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Document 15.2 LinkedIn Pop-up About Networking

The screenshot shows a LinkedIn pop-up window with a blue header and a close button in the top right corner. The main content is titled "What can your LinkedIn Network do for you?" and lists five numbered points:

- 1 Get introduced to the people you need**
When you need to reach a professional, LinkedIn will tell you who can introduce you to the person you need.
- 2 Find professionals your friends can vouch for**
Don't just search the web for people. Search the people your friends know and can recommend.
- 3 Keep up with friends and colleagues**
LinkedIn makes it easy to hear news about their careers, projects and professional lives.
- 4 Don't miss professional opportunities**
With LinkedIn, you hear about opportunities in your network, even if your friends don't tell you about them.
- 5 Build your relationships**
When a connection asks you to make an introduction, you build that relationship.

Source: LinkedIn, 2010 <www.linkedin.com/static?key=pop%2Fpop_more_five_reasons>.

Writing Proposals

U.S. Air Force photo by Don Lindsey.



*Whether the project is small or big,
it is likely to call for a proposal.*

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This photo shows an Air Force airman piloting a cockpit simulator at a symposium attended by military personnel and defense contractors. The military buys almost everything it uses—from food and water to uniforms, equipment, weapons systems, and security—from suppliers who compete for the contracts by writing proposals.

A proposal is an offer to carry out research or to provide a product or service. For instance, a physical therapist might write a proposal to her supervisor for funding to attend a convention to learn about current rehabilitation practices. The director of a homeless shelter might write a proposal for funding to expand the services offered by the shelter. Whether the project is small or big, within your own company or outside it, it is likely to call for a proposal.

UNDERSTANDING THE PROCESS OF WRITING PROPOSALS

Writing a proposal calls for the same process of planning, drafting, revising, editing, and proofreading that you use for other kinds of documents. Figure 16.1 presents an overview of this process.

THE LOGISTICS OF PROPOSALS

Proposals can be classified as either internal or external; external proposals are either solicited or unsolicited. Figure 16.2 on page 442 shows the relationship among these four terms.

Internal and External Proposals

Proposals are either internal (submitted to the writer’s own organization) or external (submitted to another organization).

Internal Proposals An internal proposal is an argument, submitted within an organization, for carrying out an activity that will benefit the organization. An internal proposal might recommend that the organization conduct research, purchase a product, or change some aspect of its policies or procedures.

For example, one day, while working on a project in the laboratory, you realize that if you had a fiber-curl measurement system, you could do your job better and faster. The increased productivity would save your company the cost of the system in a few months. Your supervisor asks you to write a memo describing what you want, why you want it, what you’re going to

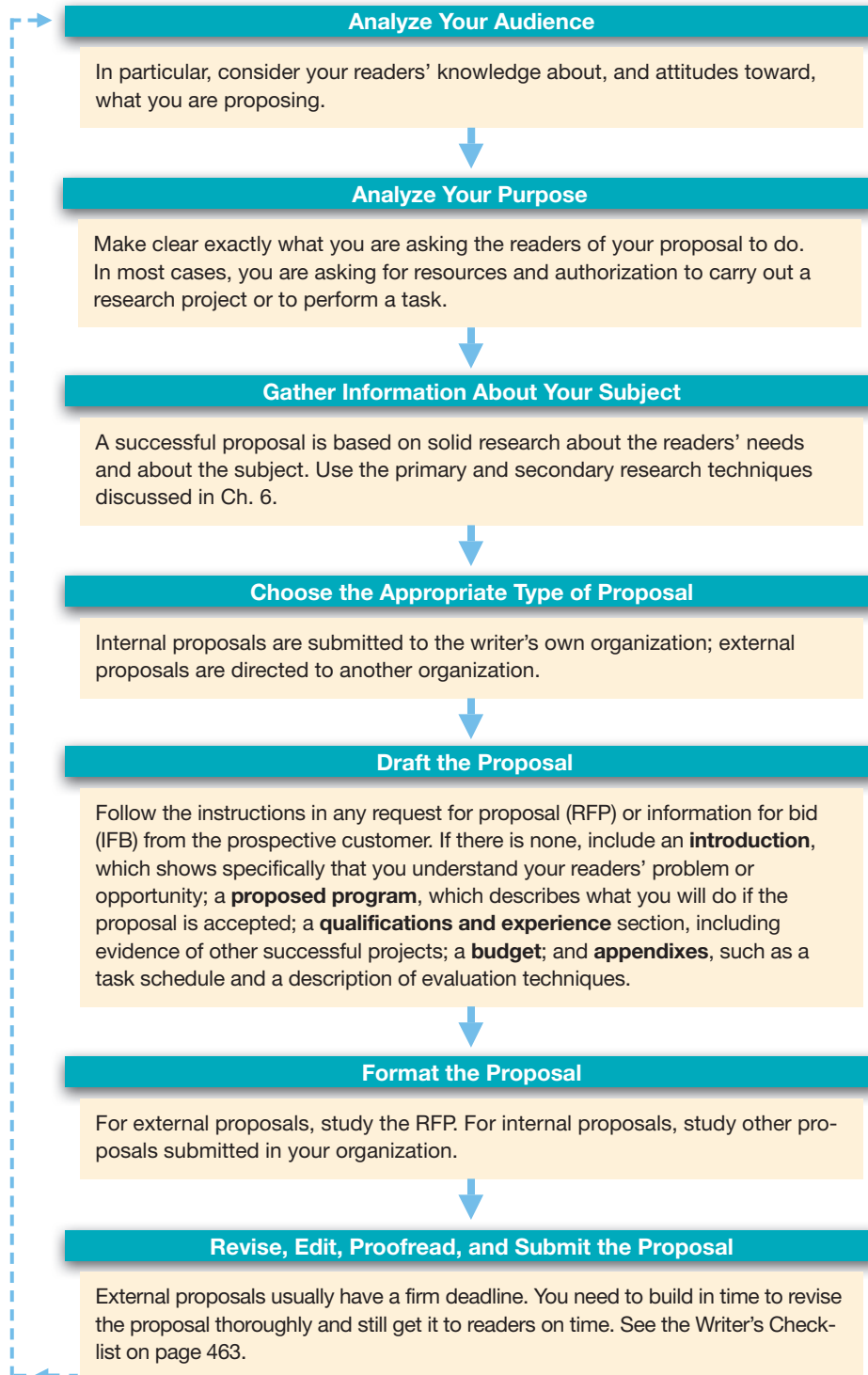


Figure 16.1 An Overview of the Process of Writing Proposals

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your audience, purpose, and subject.

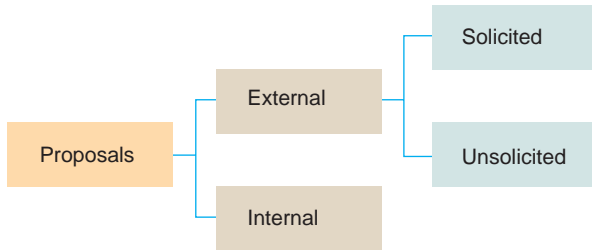


Figure 16.2 The Logistics of Proposals

do with it, and what it costs; if your request seems reasonable and the money is available, you'll likely get the new system.

Often, the scope of the proposal determines its format. A request for a small amount of money might be conveyed orally or by e-mail or a brief memo. A request for a large amount, however, is likely presented in a formal document such as a report.

External Proposals No organization produces all the products or provides all the services it needs. Web sites need to be designed, written, and maintained; inventory databases need to be created; facilities need to be constructed. Sometimes projects require unusual expertise, such as sophisticated market analyses. Because many companies supply these products and services, most organizations require that a prospective supplier compete for the business by submitting a proposal, a document arguing that it deserves the business.

Solicited and Unsolicited Proposals

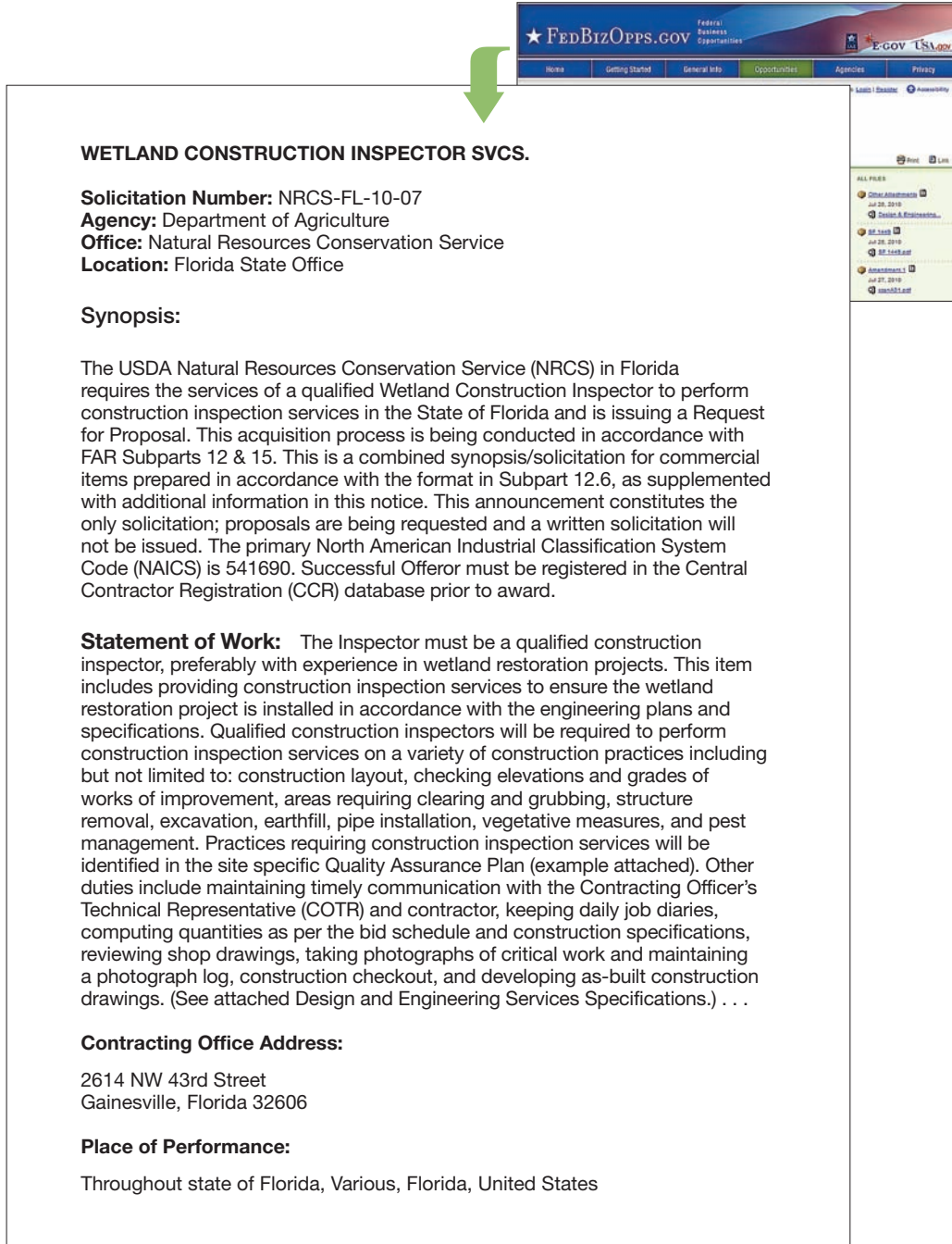
External proposals are either solicited or unsolicited. A *solicited proposal* is submitted in response to a request from the prospective customer. An *unsolicited proposal* is submitted by a supplier who believes that the prospective customer has a need for goods or services.

Solicited Proposals When an organization wants to purchase a product or service, it publishes one of two basic kinds of statements:

- An *information for bid (IFB)* is used for standard products. When a state agency needs desktop computers, for instance, it informs computer manufacturers of the configuration it needs. All other things being equal, the supplier that offers the lowest bid wins the contract.
- A *request for proposal (RFP)* is used for more-customized products or services. For example, if the Air Force needs an “identification of friend from foe” device, the RFP it publishes might be a long and detailed set of technical specifications. The supplier that can design, produce, and deliver the device most closely resembling the specifications—at a reasonable price—will probably win the contract.

Most organizations issue RFPs and IFBs in print and online. Government RFPs and IFBs are published on the FedBizOpps Web site. Figure 16.3 shows a portion of an RFP.

Unsolicited Proposals An unsolicited proposal is like a solicited proposal except that it does not refer to an RFP. Even though the potential customer never formally requested the proposal, in most cases, the supplier was



WETLAND CONSTRUCTION INSPECTOR SVCS.

Solicitation Number: NRCS-FL-10-07
Agency: Department of Agriculture
Office: Natural Resources Conservation Service
Location: Florida State Office

Synopsis:

The USDA Natural Resources Conservation Service (NRCS) in Florida requires the services of a qualified Wetland Construction Inspector to perform construction inspection services in the State of Florida and is issuing a Request for Proposal. This acquisition process is being conducted in accordance with FAR Subparts 12 & 15. This is a combined synopsis/solicitation for commercial items prepared in accordance with the format in Subpart 12.6, as supplemented with additional information in this notice. This announcement constitutes the only solicitation; proposals are being requested and a written solicitation will not be issued. The primary North American Industrial Classification System Code (NAICS) is 541690. Successful Offeror must be registered in the Central Contractor Registration (CCR) database prior to award.

Statement of Work: The Inspector must be a qualified construction inspector, preferably with experience in wetland restoration projects. This item includes providing construction inspection services to ensure the wetland restoration project is installed in accordance with the engineering plans and specifications. Qualified construction inspectors will be required to perform construction inspection services on a variety of construction practices including but not limited to: construction layout, checking elevations and grades of works of improvement, areas requiring clearing and grubbing, structure removal, excavation, earthfill, pipe installation, vegetative measures, and pest management. Practices requiring construction inspection services will be identified in the site specific Quality Assurance Plan (example attached). Other duties include maintaining timely communication with the Contracting Officer's Technical Representative (COTR) and contractor, keeping daily job diaries, computing quantities as per the bid schedule and construction specifications, reviewing shop drawings, taking photographs of critical work and maintaining a photograph log, construction checkout, and developing as-built construction drawings. (See attached Design and Engineering Services Specifications.) . . .

Contracting Office Address:

2614 NW 43rd Street
 Gainesville, Florida 32606

Place of Performance:

Throughout state of Florida, Various, Florida, United States

Figure 16.3 Excerpt from an RFP

Source: "Wetland Construction Inspector Svcs.," 2010 <www.fbo.gov/?s=opportunity&mode=form&id=7d54e4cc37cd00c29bcddc2a2cfc2715&tab=core&_cview=1>

invited to submit the proposal after people from the two organizations met and discussed the project. Because proposals are expensive to write, suppliers are reluctant to submit them without assurances that they will be considered carefully. Thus, the word *unsolicited* is only partially accurate.

THE “DELIVERABLES” OF PROPOSALS

A *deliverable* is what the supplier will deliver at the end of the project. Deliverables can be classified into two major categories: research or goods and services.

Research Proposals

In a research proposal, you are promising to perform research and then provide a report about it. For example, a biologist for a state bureau of land management writes a proposal to the National Science Foundation requesting resources to build a window-lined tunnel in the forest to study tree and plant roots and the growth of fungi. The biologist also wishes to investigate the relationship between plant growth and the activity of insects and worms. The deliverable will be a report submitted to the National Science Foundation and, perhaps, an article published in a professional journal.

Research proposals often lead to two other applications: progress reports and completion reports.

After a proposal has been approved and the researchers have begun work, they often submit one or more *progress reports*, which tell the sponsor of the project how the work is proceeding. Is it following the plan of work outlined in the proposal? Is it going according to schedule? Is it staying within budget?

At the end of the project, researchers prepare a *completion report*, often called a *final report*, a *project report*, a *recommendation report*, or simply a *report*. A completion report tells the whole story of the research project, beginning with the problem or opportunity that motivated it, the methods used in carrying it out, and the results, conclusions, and recommendations.

People carry out research projects to satisfy their curiosity and to advance professionally. Organizations often require that their professional employees carry out research and publish in appropriate reports, journals, or books. Government researchers and university professors, for instance, are expected to remain active in their fields. Writing proposals is one way to get the resources—time and money for travel, equipment, and assistants—to carry out the research.

Goods and Services Proposals

A *goods and services proposal* is an offer to supply a tangible product (a fleet of automobiles), a service (building maintenance), or some combination of the two (the construction of a building).

On TechComm Web

For sample proposals and writing checklists, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 16 on <bedfordstmartins.com/techcomm>.

In This Book

For more about progress reports and recommendation reports, see Ch. 17, p. 470, and Ch. 19.

A vast network of goods and services contracts spans the working world. The U.S. government, the world's biggest customer, spent \$297 billion in 2007 buying military equipment from organizations that submitted proposals (U.S. Department of Commerce, 2010, p. 494). But goods and services contracts are by no means limited to government contractors. An auto manufacturer might buy its engines from another manufacturer; a company that makes spark plugs might buy its steel from another company.

Another kind of goods and services proposal requests funding to support a local organization. For example, a homeless shelter might receive some of its funding from a city or county but might rely on grants from private philanthropies. Typically, an organization such as a shelter would apply for a grant to fund increased demand for its services due to a natural disaster or an economic slowdown in the community. Or it might apply for a grant to fund a pilot program to offer job training at the shelter. Most large corporations have philanthropic programs offering grants to help local colleges and universities, arts organizations, and social services.

PERSUASION AND PROPOSALS

A proposal is an argument. You must convince readers that the future benefits will outweigh the immediate and projected costs. Basically, you must persuade your readers of three things:

- that you understand their needs
- that you have already determined what you plan to do and that you are able to do it
- that you are a professional and are committed to fulfilling your promises

Understanding Readers' Needs

The most crucial element of the proposal is the definition of the problem or opportunity to which the proposed project responds. Although this point seems obvious, people who evaluate proposals agree that the most common weakness they see is an inadequate or inaccurate understanding of the problem or opportunity.

Readers' Needs in an Internal Proposal Writing an internal proposal is both simpler and more complicated than writing an external one. It is simpler because you have greater access to internal readers than you do to external readers, and you can get information more easily. However, it is more complicated because you might find it hard to understand the situation in your organization. Some colleagues will not tell you that your proposal is a long shot or that your ideas might threaten someone in the organization. Before you write an internal proposal, discuss your ideas with as many potential readers as you can to learn what the organization really thinks of them.

In This Book

For more about persuasion, see Ch. 8.

In This Book

For more about analyzing your audience, see Ch. 5.

Readers' Needs in an External Proposal Most readers will reject a proposal as soon as they realize that it doesn't address their needs. When you receive an RFP, study it thoroughly. If you don't understand something in it, contact the organization. They will be happy to clarify it, because a poor proposal wastes everyone's time.

When you write an unsolicited proposal, analyze your audience carefully. How can you define the problem or opportunity so that readers will understand it? Keep in mind readers' needs and, if possible, their backgrounds. Concentrate on how the problem has decreased productivity or quality or how your ideas would create new opportunities. When you submit an unsolicited proposal, your task in many cases is to convince readers that a need exists. Even when you have reached an understanding with some of your customer's representatives, your proposal will still have to persuade other officials in the company.

When you are preparing a proposal to be submitted to an organization in another culture, keep in mind the following six suggestions (Newman, 2006):

- *Understand that what makes an argument persuasive can differ from one culture to another.* Paying attention to the welfare of the company or the community might be more persuasive than a low bottom-line price. An American company was surprised to learn that the Venezuelan readers of its proposal had selected a French company that “had been making personal visits for years, bringing their families, and engaging in social activities long before there was any question of a contract” (Thrush, 2000).
- *Budget enough time for translating.* If your proposal has to be translated into another language, build in plenty of time. Translating long technical documents is a lengthy process because, even though some of the work can be done by computer software, the machine translation needs to be reviewed by native speakers of the target language.
- *Use simple graphics, with captions.* To reduce the chances of misunderstanding, use a lot of simple graphics, such as pie charts and bar graphs. Be sure to include captions so that readers can understand the graphics easily, without having to look through the text to see what each graphic means.
- *Write short sentences, using common vocabulary.* Short sentences are easier to understand than long sentences. Choose words that have few meanings. For example, use the word *right* as the opposite of *left*; use *correct* as the opposite of *incorrect*.
- *Use local conventions regarding punctuation, spelling, and mechanics.* Be aware that these conventions differ from place to place, even in the English-speaking world. For instance, the Australian state of New South Wales uses a different dictionary for spelling than all the other Australian states.
- *Ask if the prospective customer will do a read-through.* A *read-through* is the process of reading a draft of the proposal to determine whether it reveals any misunderstandings due to language or cultural differences. Why do prospective customers do this? Because it's in everyone's interest if the proposal responds clearly to the customer's needs.

 **In This Book**

For more about graphics, see
Ch. 12.

Describing What You Plan to Do

Once you have shown that you understand what needs to be done and why, describe what you plan to do. Convince your readers that you can respond effectively to the situation you have just described. Discuss procedures and equipment you would use. If appropriate, justify your choices. For example, if you say you want to do ultrasonic testing on a structure, explain why, unless the reason is obvious.

Present a complete picture of what you would do from the first day of the project to the last. You need more than enthusiasm and good faith; you need a detailed plan showing that you have already started to do the work. Although no proposal can anticipate every question about what you plan to do, the more planning you have done before you submit the proposal, the greater the chances you will be able to do the work successfully if it is approved.

Demonstrating Your Professionalism

Once you have shown that you understand readers' needs and can offer a well-conceived plan, demonstrate that you are the kind of person (or that yours is the kind of organization) that is committed to delivering what you promise. Convince readers that you have the pride, ingenuity, and perseverance to solve the problems that are likely to occur. In short, show that you are a professional.

Guidelines

Demonstrating Your Professionalism in a Proposal

In your proposal, demonstrate your ability to carry out the project by providing four kinds of information:

- ▶ **Credentials and work history.** Show that you know how to do this project because you have done similar ones. Who are the people in your organization with the qualifications to carry out the project? What equipment and facilities do you have that will enable you to do the work? What management structure will you use to coordinate the activities and keep the project running smoothly?
- ▶ **Work schedule.** Sometimes called a *task schedule*, a work schedule is a graph or chart that shows when the various phases of the project will be carried out. The work schedule reveals more about your attitudes toward your work than about what you will be doing on any given day. A detailed work schedule shows that you have tried to foresee problems that might threaten the project.
- ▶ **Quality-control measures.** Describe how you would evaluate the effectiveness and efficiency of your work. Quality-control procedures might consist of technical evaluations carried out periodically by the project staff, on-site evaluations by recognized authorities or by the prospective customer, or progress reports.
- ▶ **Budget.** Most proposals conclude with a detailed budget, a statement of how much the project will cost. Including a budget is another way of showing that you have done your homework on a project.

ETHICS NOTE**Writing Honest Proposals**

When an organization approves a proposal, it needs to trust that the people who will carry out the project will do it professionally. Over the centuries, however, dishonest proposal writers have perfected a number of ways to trick prospective customers into thinking the project will go smoothly:

- saying that certain qualified people will participate in the project, even though they will not
- saying that the project will be finished by a certain date, even though it will not
- saying that the deliverable will have certain characteristics, even though it will not
- saying that the project will be completed under budget, even though it will not

Copying from another company's proposal is another common dishonest tactic. Proposals are protected by copyright law. An employee may not copy from a proposal he or she wrote while working for a different company.

There are three reasons to be honest in writing a proposal:

- to avoid serious legal trouble stemming from breach-of-contract suits
 - to avoid acquiring a bad reputation, thus ruining your business
 - to do the right thing
-

WRITING A PROPOSAL

Although writing a proposal requires the same writing process that you use for most other kinds of technical documents, a proposal can be so large that two aspects of the writing process—resource planning and collaboration—are even more important than they are in smaller documents.

As discussed in Chapter 5, planning a project requires a lot of work. You need to see whether your organization can devote resources to writing the proposal and then to carrying out the project if the proposal is approved. Sometimes an organization writes a proposal, wins the contract, and then loses money because it lacks the resources to do the project and must subcontract major portions of it. The resources you need fall into three basic categories:

- *Personnel*. Will you have the technical personnel, managers, and support people you will need?
- *Facilities*. Will you have the facilities, or can you lease them? Can you profitably subcontract tasks to companies that have the right facilities?
- *Equipment*. Do you have the right equipment? If not, can you buy it or lease it or subcontract the work? Some contracts provide for the purchase of equipment, but others don't.

 **On TechComm Web**

For proposal-writing advice, see Joseph Levine's "Guide for Writing a Funding Proposal." Click on Links Library for Ch. 16 on <bedfordstmartins.com/techcomm>.

Don't write the proposal unless you are confident that you can carry out the project if you get the go-ahead.

Collaboration is critical in large proposals because no one person has the time and expertise to do all the work. Writing major proposals requires the expertise of technical personnel, writers, editors, graphic artists, managers, lawyers, and document-production specialists. Often, proposal writers use shared document workspaces and wikis. Usually, a project manager coordinates the process.

Proposal writers almost always reuse existing information, including boilerplate such as descriptions of other projects the company has done, histories and descriptions of the company, and résumés of the important personnel who will work on the project. This reuse of information is legal and ethical as long as it is the intellectual property of the company.

THE STRUCTURE OF THE PROPOSAL

Proposal structures vary greatly from one organization to another. A long, complex proposal might have 10 or more sections, including introduction, problem, objectives, solution, methods and resources, and management. If the authorizing agency provides an IFB, an RFP, or a set of guidelines, follow it closely. If you have no guidelines, or if you are writing an unsolicited proposal, use the structure shown here as a starting point. Then modify it according to your subject, your purpose, and the needs of your audience. An example of a proposal is presented on pages 457–62.

Summary

For a proposal of more than a few pages, provide a summary. Many organizations impose a length limit—such as 250 words—and ask the writer to present the summary, single-spaced, on the title page. The summary is crucial, because it might be the only item that readers study in their initial review of the proposal.

The summary covers the major elements of the proposal but devotes only a few sentences to each. Define the problem in a sentence or two. Next, describe the proposed program and provide a brief statement of your qualifications and experience. Some organizations wish to see the completion date and the final budget figure in the summary; others prefer that this information be presented separately on the title page along with other identifying information about the supplier and the proposed project.

Introduction

The purpose of the introduction is to help readers understand the context, scope, and organization of the proposal.

In This Book

For more about collaboration, see Ch. 4.

In This Book

For more about boilerplate, see Ch. 2, p. 26.

On TechComm Web

To view the proposal submission checklist of the Society for Human Resource Management Foundation, click on Links Library for Ch. 16 on <bedfordstmartins.com/techcomm>.

In This Book

For more about summaries, see Ch. 19, p. 526.

Guidelines

Introducing a Proposal

The introduction to the proposal should answer the following seven questions:

- ▶ **What is the problem or opportunity?** Describe the problem or opportunity in specific monetary terms, because the proposal itself will include a budget, and you want to convince your readers that spending money on what you propose is smart. Don't say that a design problem is slowing down production; say that it is costing \$4,500 a day in lost productivity.
- ▶ **What is the purpose of the proposal?** The purpose of the proposal is to describe a problem or opportunity and propose activities that will culminate in a deliverable. Be specific in explaining what you want to do.
- ▶ **What is the background of the problem or opportunity?** Although you probably will not be telling your readers anything they don't already know, show them that you understand the problem or opportunity: the circumstances that led to its discovery, the relationships or events that will affect the problem and its solution, and so on.
- ▶ **What are your sources of information?** Review the relevant literature, ranging from internal reports and memos to published articles or even books, so that readers will understand the context of your work.
- ▶ **What is the scope of the proposal?** If appropriate, indicate what you are—and are not—proposing to do.
- ▶ **What is the organization of the proposal?** Explain the organizational pattern you will use.
- ▶ **What are the key terms that you will use in the proposal?** If you will use any specialized or unusual terms, define them in the introduction.

Proposed Program

In the proposed program, sometimes called the *plan of work*, explain what you want to do. Be specific. You won't persuade anyone by saying that you plan to "gather the data and analyze it." *How* will you gather and analyze the data? Justify your claims. Every word you say—or don't say—will give your readers evidence on which to base their decision.

If your project concerns a subject written about in the professional literature, show your familiarity with the scholarship by referring to the pertinent studies. However, don't just string together a bunch of citations. For example, don't write, "Carruthers (2009), Harding (2010), and Vega (2010) have all researched the relationship between global warming and ground-water contamination." Rather, use the recent literature to sketch the nec-

On TechComm Web

For a sample literature review, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 16 on <bedfordstmartins.com/techcomm>.

essary background and provide the justification for your proposed program. For instance:

Carruthers (2009), Harding (2010), and Vega (2010) have demonstrated the relationship between global warming and groundwater contamination. None of these studies, however, included an analysis of the long-term contamination of the aquifer. The current study will consist of . . .

You might include only a few references to recent research. However, if your topic is complex, you might devote several paragraphs or even several pages to recent scholarship.

Whether your project calls for primary research, secondary research, or both, the proposal will be unpersuasive if you haven't already done a substantial amount of the research. For instance, say you are writing a proposal to do research on industrial-grade lawn mowers. You are not being persuasive if you write that you are going to visit Walmart, Lowe's, and Home Depot to see what kinds of lawn mowers they carry. This statement is unpersuasive for two reasons:

- You need to justify why you are going to visit those three retailers rather than others. Anticipate your readers' questions: Why did you choose these three retailers? Why didn't you choose specialized dealers?
- You should already have visited the appropriate stores and completed any other preliminary research. If you haven't done the homework, readers have no assurance that you will in fact do it or that it will pay off. If your supervisor authorizes the project and then learns that none of the lawn mowers on the market meets your organization's needs, you will have to go back and submit a different proposal—an embarrassing move.

Unless you can show in your proposed program that you have done the research—and that the research indicates that the project is likely to succeed—the reader has no reason to authorize the project.

Qualifications and Experience

After you have described how you would carry out the project, show that you can do it. The more elaborate the proposal, the more substantial the discussion of your qualifications and experience has to be. For a small project, include a few paragraphs describing your technical credentials and those of your co-workers. For larger projects, include the résumés of the project leader, often called the *principal investigator*, and the other important participants.

External proposals should also discuss the qualifications of the supplier's organization, describing similar projects the supplier has completed successfully. For example, a company bidding on a contract to build a large suspen-

In This Book

For more about researching a subject, see Ch. 6.

INTERACTIVE SAMPLE DOCUMENT

Writing the Proposed Program

The following project description is excerpted from a sample grant proposal seeking funding to begin a project to help police officers stay healthy (Ohio Office of Criminal Justice Services, 2003). The questions in the margin ask you to think about how to describe the project in a proposal.

1. The writer has used a lettering system to describe the four main tasks that he will undertake if he receives funding. What are the advantages of a lettering system?
2. How effective is the description of Task A? What factors contribute to the description's effectiveness or lack of effectiveness?
3. The descriptions of the tasks do not include cost estimates. Where would those estimates be presented in the proposal? Why would they be presented there?
4. How effective is the description of Task D? What additional information would improve its effectiveness?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 16 on <bedfordstmartins.com/techcomm>.

PROJECT DESCRIPTION

The proposed project is comprised of several different, but related activities:

A. Physical Evaluation of the Officers

The first component of this project is the physical examination of all Summerville P.D. sworn employees. Of special interest for purposes of the project are resting pulse rate, target pulse rate, blood pressure, and percentage of body fat of the program participants. Dr. Feinberg will perform the physical examinations of all participating officers. The measurement of body fat will be conducted at the University of Summerville's Health Center under the direction of Dr. Farron Updike.

B. Renovation of Basement

Another phase of this project involves the renovation of the basement of police headquarters. The space is currently being used for storing Christmas decorations for City Hall.

The main storage room will be converted into a gym. This room will accommodate the Universal weight machine, the stationary bike, the treadmill and the rowing machine. Renovation will consist of first transferring all the Christmas decorations to the basement of the new City Hall. Once that is accomplished, it will be necessary to paint the walls, install indoor/outdoor carpeting and set up the equipment.

A second, smaller room will be converted into a locker room. Renovation will include painting the floors and the installation of lockers and benches.

To complete the fitness center, a third basement room will be equipped as a shower room. A local plumber will tap into existing plumbing to install several showerheads.

C. Purchase of Fitness Equipment

The Department of Public Safety has identified five vendors of exercise equipment in the greater Summerville area. Each of these vendors submitted bids for the following equipment:

- Universal Weight Machine
- Atlas Stationary Bike
- Yale Rowing Machine
- Speedster Treadmill

D. Training of Officers

Participating officers must be trained in the safe, responsible use of the exercise equipment. Dr. Updike of the University of Summerville will hold periodic training sessions at the Department's facility.

sion bridge should describe other suspension bridges it has built. It should also focus on the equipment and facilities the company already has and on the management structure that will ensure the project will go smoothly.

Budget

Good ideas aren't good unless they're affordable. The budget section of a proposal specifies how much the proposed program will cost.

Budgets vary greatly in scope and format. For simple internal proposals, add the budget request to the statement of the proposed program: "This study will take me two days, at a cost of about \$400" or "The variable-speed recorder currently costs \$225, with a 10 percent discount on orders of five or more." Or present a brief budget such as the following:

Budget

Following is an itemized budget for our proposed research.

<i>Name</i>	<i>Hours</i>	<i>Hourly rate (\$)</i>	<i>Cost (\$)</i>
Jessie Pritiken	10	17	170
Megan Turner	10	15	150
Total			320

For more-complicated internal proposals and for all external proposals, include a more-explicit and complete budget.

Most budgets are divided into two parts: direct costs and indirect costs.

- *Direct costs* include such expenses as salaries and fringe benefits of program personnel, travel costs, and necessary equipment, materials, and supplies.
- *Indirect costs* cover the intangible expenses that are sometimes called *overhead*: general secretarial and clerical expenses not devoted exclusively to any one project, as well as operating expenses such as utilities and maintenance. Indirect costs are usually expressed as a percentage—ranging from less than 20 percent to more than 100 percent—of the direct expenses.

Appendixes

Many types of appendixes might accompany a proposal. Most organizations have boilerplate descriptions of the organization and of the projects they have completed. Another popular kind of appendix is the supporting letter: a testimonial to the supplier's skill and integrity written by a reputable and

well-known person in the field. Two other kinds of appendixes deserve special mention: the task schedule and the description of evaluation techniques.

Task Schedule The *task schedule* is almost always drawn in one of three graphical formats: a table, bar chart, or network diagram.

Tables The simplest but least informative way to present a schedule is in a table, as shown in Figure 16.4. As with all graphics, provide a textual reference that introduces and, if necessary, explains the table.

Although displaying information in a table is better than writing it out in sentences, readers still cannot “see” the information. They have to read it to figure out how long each activity will last, and they cannot tell whether any of the activities are interdependent. They have no way of determining what would happen to the overall project schedule if one of the activities faced delays.

Bar Charts Bar charts, also called *Gantt charts* after the early twentieth-century civil engineer who first used them, are more informative than tables. The basic bar chart shown in Figure 16.5 allows readers to see how long each task will take and whether different tasks will occur simultaneously. Like tables, however, bar charts do not indicate the interdependence of tasks.

Network Diagrams Network diagrams show interdependence among various activities, clearly indicating which must be completed before others can

Figure 16.4 Task Schedule as a Table

TASK SCHEDULE		
Activity	Start date	Finish date
Design the security system	4 Oct. 11	19 Oct. 11
Research available systems	4 Oct. 11	3 Jan. 12
Etc.		

Figure 16.5 Task Schedule as a Bar Chart

Schedule for Parking Analysis Project						
Number	Task	1/14	1/21	1/28	2/4	2/11
1	Perform research	■				
2	Identify options		■			
3	Analyze options		■			
4	Test options		■	■		
5	Collect and analyze data			■	■	
6	Formulate recommendations				■	■
7	Prepare report					■

TECH TIP

How to Create a Gantt Chart

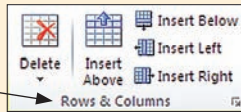
If you want to show how activities occur over time, you can create a simple **Gantt chart** using the **Table** feature in Word.

1. Create a **table** with enough cells to include your tasks and dates.

Task							
Task 1: Review Policies							
Task 2: Research Trends							
Task 3: Identify Criteria							
Task 4: Interview Experts							
Task 5: Evaluate Options							
Task 6: Prepare report							
	24	31	1	7	12	19	22

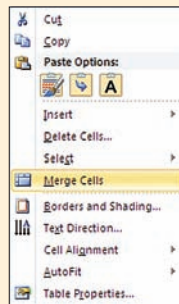
Enter the tasks in rows.
Enter the dates in columns.

If you need to add or remove rows or columns, you can use the buttons in the **Rows & Columns** group on the **Table Tools Layout** tab.



2. To create cells that span several columns, select the cells you wish to merge, right-click, and then select **Merge Cells** on the pop-up menu.

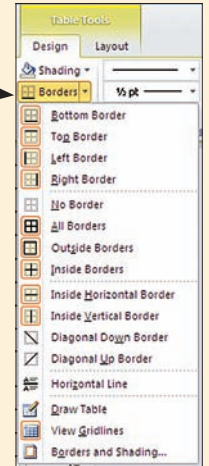
To create column headings and horizontal bars, merge cells.



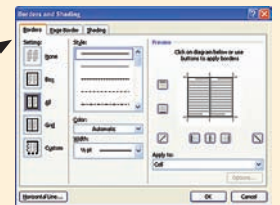
Task	Dates of Tasks						
Task 1: Review Policies							
Task 2: Research Trends							
Task 3: Identify Criteria							
Task 4: Interview Experts							
Task 5: Evaluate Options							
Task 6: Prepare report							
	24	31	1	8	15	19	22
	March			April			

3. To differentiate completed tasks (black bars) from tasks yet to be completed (gray bars) or to hide borders, select the cells you wish to modify and then choose the **Borders** button on the **Table Tools Design** tab. Then select **Borders and Shading**.

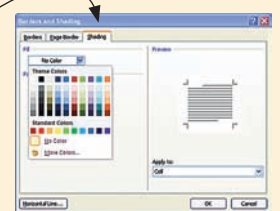
The **Borders and Shading** dialog box will appear.



The **Borders** tab allows you to hide borders of selected cells.



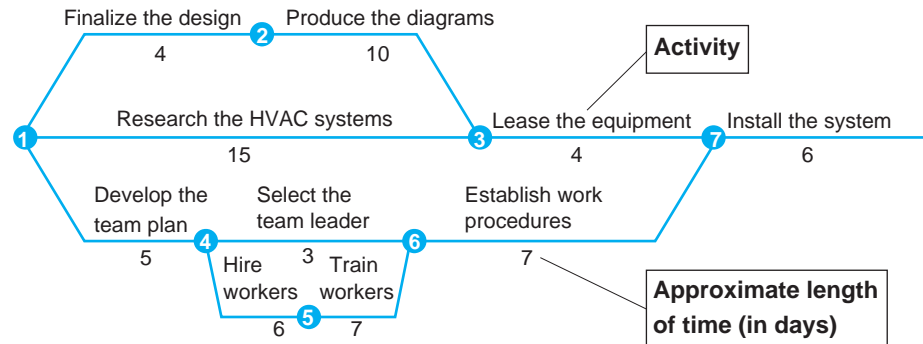
The **Shading** tab allows you to shade selected cells.



KEYWORDS: table, cells, merge cells, borders, shading

Figure 16.6 Task Schedule as a Network Diagram

A network diagram provides more useful information than either a table or a bar chart.



begin. However, even a relatively simple network diagram, such as the one shown in Figure 16.6, can be difficult to read. You would probably not use this type of diagram in a document intended for general readers.

Description of Evaluation Techniques Although *evaluation* can mean different things to different people, an *evaluation technique* typically refers to any procedure used to determine whether the proposed program is both effective and efficient. Evaluation techniques can range from simple progress reports to sophisticated statistical analyses. Some proposals call for evaluation by an outside agent, such as a consultant, a testing laboratory, or a university. Other proposals describe evaluation techniques that the supplier will perform, such as cost-benefit analyses.

The issue of evaluation is complicated by the fact that some people think in terms of *quantitative evaluations*—tests of measurable quantities, such as production increases—whereas others think in terms of *qualitative evaluations*—tests of whether a proposed program is improving, say, the workmanship of a product. And some people include both qualitative and quantitative testing when they refer to evaluation. An additional complication is that projects can be tested while they are being carried out (*formative evaluations*) as well as after they have been completed (*summative evaluations*).

When an RFP calls for “evaluation,” experienced proposal writers contact the prospective customer’s representatives to determine precisely what the word means.

SAMPLE INTERNAL PROPOSAL

The following example of an internal proposal has been formatted as a memo rather than as a formal proposal (Elkins & Carruthers, 2011). (See Chapter 17, pages 475–82, for the progress report written after this project was under way and Chapter 19, pages 532–58, for the recommendation report.)

Memo

Date: October 6, 2011
 To: Dr. Jill Bremerton, Vice President for Student Affairs
 Central Montana State University
 From: Jeremy Elkins, Co-chair
 Eloise Carruthers, Co-chair
 Student Affairs Advisory Committee
 Central Montana State University
 Subject: Proposal for Clicker Study at CMSU

Purpose

The purpose of our proposal is to request authorization to study the baseline requirements, including faculty and student attitudes and lecture-hall infrastructure, for adopting clickers at CMSU.

Summary

On September 6, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at CMSU, invited the CMSU Student Affairs Advisory Committee (SAAC) to participate in a feasibility study about the use of clickers at CMSU.

Currently, Academic Technologies has only a handful of sets of clickers for checkout by faculty for occasional use. Because there is an increasing consensus among scholars that clickers improve the classroom learning environment and can improve learning in large lecture courses, Dr. Bremerton has allocated resources for a large feasibility study of whether CMSU should select a particular clicker system for use by CMSU instructors and establish a policy to provide technical support for clicker use and a method for students to acquire clickers through the university. The research that Dr. Bremerton invited SAAC to perform will be part of this large feasibility study.

Dr. Bremerton asked the committee to perform research that would determine whether instructors and students would support a single clicker system campus-wide and whether the physical characteristics of the lecture halls or the existing computer infrastructure in the lecture halls would restrict the university's technical choices in selecting a clicker system.

We propose to research clicker use in higher education, answer these questions, and present our findings to Dr. Bremerton. To answer these questions, we would create questionnaires (for Questions 1 and 2) and perform interviews (for Questions 3 and 4).

To perform this research and present a recommendation report, we estimate that we would each require approximately 50–60 hours over the next two months. Jeremy Elkins and Louise Carruthers are both upper-division students with successful academic records at CMSU, including backgrounds in survey design. Upon submission of a satisfactory report, Dr. Bremerton would authorize each of the authors to receive one credit of 497 Internship.

In most professional settings, writers use letterhead stationery for memos, but because the writers are students, they decided to use plain stationery.

Proposals can be presented as memos or as reports.

The writers include their titles and that of their primary reader. This way, future readers will be able to more readily identify the reader and writers.

The subject heading indicates the subject of the memo (the clicker study at CMSU) and the purpose of the memo (proposal).

Memos of more than one page should begin with a clear statement of purpose. Here, the writers communicate the purpose of the document in one sentence.

Memos of more than one page should contain a summary to serve as an advance organizer or to help readers who want only an overview of the document.

Although the students are writing to Dr. Bremerton, they refer to her in the third person to suggest the formality of their relationship.

The background of the problem. Don't assume that your reader knows what you are discussing, even if it was the reader who suggested the project in the first place.

The problem at the heart of the project.

The proposal. The writers have already begun to plan what they will do if the proposal is accepted, but they use the conditional tense ("would") because they cannot assume that their proposal will be authorized.

A summary of the schedule and the credentials of the writers. Because the reader will likely want to read this entire proposal, the summary functions as an advance organizer.

Memo to Dr. Jill Bremerton

October 6, 2011

Page 2

If this proposal were authorized, we would begin our research immediately, submitting to Dr. Bremerton a progress report on November 7, 2011, and a recommendation report on December 14, 2011. The recommendation report would include the details of our research and recommendation regarding whether and how to proceed with the feasibility study.

Introduction

A brief statement of the context for the proposal.

On September 6, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at Central Montana State University (CMSU), invited the CMSU Student Affairs Advisory Committee (SAAC) to participate in a feasibility study about the use of student response systems, commonly called *clickers*, at CMSU.

An explanation of the problem: the current situation is inadequate because the university's administrators believe that clickers might be a useful educational tool for CMSU students. However, a number of important questions need to be answered before the administration decides to devote more resources to clickers.

Currently, Academic Technologies, which oversees all the computing functions in CMSU classrooms, has three sets of 100 clickers from Turning Technologies and two sets of 100 clickers from eInstruction. These clickers are available for instructors to check out for occasional use but may not be reserved for every meeting of an instructor's course. On the basis of an increasing consensus in the scholarly community that clickers improve the classroom learning environment and can improve learning in large lecture courses, Dr. Bremerton has allocated resources for a large feasibility study of whether CMSU should select a particular clicker system for use by CMSU instructors and establish a policy to provide technical support for clicker use and a method for students to acquire clickers through the university. The research that Dr. Bremerton invited SAAC to perform will be part of this large feasibility study.

Specifically, Dr. Bremerton asked the committee to perform research that would answer the following four questions:

The writers quote from a memo Dr. Bremerton had written to them. Often in technical communication, you will quote your reader's words to remind him or her of the context and to show that you are carrying out your tasks professionally.

1. Would instructors approve of a university policy that selects and provides technical support for a clicker system that they could use in large lecture courses?
2. Would students approve of a requirement that they purchase clickers as part of a university policy on clickers?
3. Would the physical characteristics of any of the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?
4. Would the computer platforms and operating systems used in the instructor stations in the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?

The writers show that they understand the relationship between their work and the larger feasibility study of which it is a part.

Dr. Bremerton explained that an understanding of faculty and student attitudes toward the adoption of a formal policy on clickers is fundamentally important because if faculty or students express no interest in their use or have serious reservations about their use, the university would need to consider whether and how to proceed with the feasibility study. Dr. Bremerton further explained that, for the university to study adopting a clicker policy, it would need to know whether the physical characteristics of the lecture halls and the existing computer environment in the lecture halls might influence the technical choices that need to be made.

Memo to Dr. Jill Bremerton

October 6, 2011

Page 3

For these reasons, Dr. Bremerton asked SAAC to present our findings and recommend whether the university should proceed with the clicker project and, if so, how the computing environment in the lecture halls would affect the direction of the feasibility study.

The following sections of this memo include the proposed tasks, the schedule, our experience, and the references cited.

Proposed Tasks

With Dr. Bremerton's approval, we would perform the following tasks to determine the baseline requirements for adopting clickers at CMSU:

Task 1. Acquire a basic understanding of clicker use in higher education.

We have already begun our research by surveying general introductions to clicker use in higher-education trade magazines and general periodicals, scholarly articles on student and faculty attitudes and on learning effects, technical specifications of clickers provided on the sites of the various manufacturers, and best practices presented on sites of colleges and universities that have adopted clickers.

Clickers, also called *classroom response systems*, *student response systems*, and *audience response systems*, are "wireless in-class electronic polling systems used by students to answer questions during lectures" (Ohio State, 2005, p. 2). In a clicker system, each student has an electronic device called a *clicker*, which looks like a TV remote control. The instructor poses a question, usually by embedding the question beforehand in a PowerPoint presentation, and students respond by inputting information using their clickers. Software on the instructor's computer tabulates the responses and presents them in a display, such as a bar graph, which appears on the instructor's screen, and (in some systems) on a screen on each student's clicker. Clickers are often used to engage students in learning, to give quizzes, and to take attendance (Vanderbilt University, 2010).

Anecdotal and scholarly evidence suggests clearly that instructors like using clickers because they improve classroom dynamics by encouraging active learning. Whereas a traditional lecture can be a passive experience, with the instructor talking to students, clickers encourage interaction not only between the instructor and the students but also between students (Draper & Brown, 2004). In a traditional lecture, students are often unwilling to participate because they are afraid of embarrassment or disapproval by their peers, or simply because they have learned not to participate in a lecture (Caldwell, 2007). In a typical lecture, a small number of students dominate the questioning, often giving the instructor an inaccurate impression of how many students understand the material (Simpson & Oliver, 2006).

We would still need to determine whether there is a consensus that clicker use affects student learning.

A formal statement of the task that Dr. Bremerton asked the committee to perform.

The introduction concludes with an advance organizer for the rest of the proposal.

By presenting the project as a set of tasks, the writers show that they are well organized.

This organization by tasks will be used in the progress report (see Ch. 17, pp. 475–82) and the recommendation report (see Ch. 19, pp. 532–58).

Following the recommendation from Dr. Bremerton, the writers start by outlining the secondary research they plan to do. The logic is obvious: if the students are to contribute to the project, they need to understand the subject they will study.

The proposal sounds credible because the writers have already begun their secondary research. Readers are reluctant to approve proposals unless they are sure that the writers have at least begun their research.

The writers explain what they still need to do to complete this task.

Memo to Dr. Jill Bremerton

October 6, 2011

Page 4

Task 2. Research faculty attitudes toward a formal policy on clicker use.

We would seek to answer the following question: "Would instructors approve of a university policy that selects and provides technical support for a clicker system that they could use in large lecture courses?"

The writers show that they have applied the insights they gathered from their secondary research. Now they propose doing primary research to determine whether instructors at CMSU share the attitudes of instructors across the country. The logic is clear: if they do, the university administrators will know that they should proceed with the feasibility study.

We would need to determine whether CMSU instructors are like those nationwide. We have spoken informally with about a dozen instructors, most of whom have never used clickers. Because those who have used them are highly positive about the experience but those who have not used them do not understand much about how they work or what their purpose is, we think we should create two questionnaires: one for each category of instructor. That way, we would be able to pay appropriate attention to the attitudes of the relatively small number of CMSU instructors experienced with clickers and therefore learn whether our instructors are essentially similar to those across the country in their attitudes and experiences.

We think it would be most convenient if we could use an online survey program, such as Qualtrics, for distributing our questionnaires. Qualtrics, which is free, would enable us to transfer data to Excel, thus making it simple to tabulate and analyze.

Each task begins with the question that the writers seek to answer.

Task 3. Research student attitudes toward a requirement to purchase a clicker.

We would seek to answer the following question: "Would students approve of a requirement that they purchase clickers as part of a university policy on clickers?"

Several research studies suggest that most students, across the country and across various course subjects, like using clickers. One study (Caldwell, 2007), at West Virginia University, found that some 88 percent of students "frequently" or "always" enjoyed using clickers in their introductory biology course. An aggregate of several studies shows that the percentage of student who approve of using clickers always exceeds 70 percent. Students comment that instructors who use clickers appear to be more aware of students' needs and employ a more responsive teaching style than those who don't use them.

Here, again, the writers explain the logic of their decision. They decide to focus on the one student concern that they can investigate effectively: the cost of the clicker.

One study (Caldwell, 2007) summarizing student perceptions notes that there are two main problems: some instructors do not know how to integrate the clickers effectively into their lectures, and the cost of the clickers to students. The first problem is something that the administration can address as part of an overall policy on clicker use. However, the cost problem is something we can learn about by performing primary research.

Task 4. Research the physical characteristics of the lecture halls.

We would seek to answer the following question: "Would the physical characteristics of any of the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?"

Memo to Dr. Jill Bremerton

October 6, 2011

Page 5

Our preliminary research indicates that there are two major technologies used in clicker systems: infrared (IR) and radio frequency (RF) (Ohio State University, 2005). IR, the technology used in television remote controls, requires a clear line of sight and has a limited range (40–80 feet). If IR is to be used for greater distances, the room would need to have additional receivers installed on the walls and connected either by wires or wirelessly to the instructor podium. In addition, IR signals can be disrupted by some classroom lighting systems.

By contrast, RF systems do not require a clear line of sight, have no range limitations, and are not subject to electronic interference. An RF system uses a receiver built into a USB device that attaches easily to the computer in the podium or to the instructor's laptop. For these reasons, RF systems are simpler and are becoming the industry standard.

However, IR systems are less expensive, with clickers costing less than \$10. Therefore, if CMSU lecture halls meet the line-of-sight and range requirements, already have receivers installed, and pose no interference risk, IR systems would be an option. But if any of the lecture halls does not meet one or more of these criteria, CMSU should consider only RF systems.

We would meet with Marvin Nickerson, the Director of Physical Plant, to explain our project and to give him a list of the questions we need to answer.

Task 5. Research the existing computer environment in the lecture halls.

We would seek to answer the following question: "Would the computer platforms and operating systems used in the instructor stations in the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?"

We would need to determine which platforms (Windows, Macintosh, or other) and which operating systems (for example, Windows XP, Vista, or 7, or Macintosh OSX) are used in the computers in each podium in the large lecture halls identified by Mr. Nickerson. This information would be necessary to ensure that any clicker system CMSU selects is compatible with the existing computer technology in the lecture halls.

We would meet with Arlene Matthews, the Director of Academic Technologies, to explain our project and to give her a list of the questions we needed to answer. As Director of AT, Ms. Matthews has a database of this information because AT participated in installing all the instructor podiums and related systems in all the lecture halls.

Task 6. Analyze our data and prepare this recommendation report.

We would prepare a recommendation report that explains the questions we sought to answer, our research methods, and our findings.

The writers cite their sources throughout the proposal.

The writers present just enough information about the two technologies to help the reader understand their logic. Writers sometimes present too much information; write only as much as necessary to get the job done.

The writers have already determined whom they need to interview to get the information they need.

Preparing the recommendation report is part of the project because the report is the deliverable.

Organizing the project by tasks makes it easy for the writers to present a Gantt chart. In addition, the task organization will help the writers stay on track if the proposal is approved and they continue their research.

Each task is presented with parallel grammar, which helps make the writers seem careful and professional.

Some tasks overlap in time: researchers often work on several tasks simultaneously.

The Tech Tip on p. 455 explains how to create a Gantt chart.

The writers summarize their credentials. Strong credentials help reinforce the writers' professionalism.

This proposal lacks a budget. Because the writers are students, they are being compensated with internship credits that Dr. Bremerton is overseeing.

This list of references follows the APA documentation style, which is discussed in Appendix, Part B, p. 670. The APA documentation system calls for References to begin a new page. Check with your instructor.

Memo to Dr. Jill Bremerton

October 6, 2011

Page 6

Schedule

Figure 1 is a schedule of the tasks we would complete for this project.

Tasks	Date of Tasks (by Weeks)											
Task 1: Research clicker use	■	■	■	■	■	■	■	■	■	■	■	■
Task 2: Research instructor attitudes												
Task 3: Research student attitudes												
Task 4: Research lecture halls												
Task 5: Research computer environment												
Task 6: Prepare report												
	10	17	24	31	7	14	21	28	5	12		
	Oct.			Nov.				Dec.				

Figure 1. Schedule of Project Tasks

Experience

We are academically successful students who are qualified to perform this research and present our findings and recommendation:

- Jeremy Elkins, Co-chair of the Student Affairs Advisory Committee at CMSU, is a technical-communication major in the English Department and an honor student each of his three years at CMSU. He has used clickers in two of his courses.
- Eloise Carruthers, Co-chair of the Student Affairs Advisory Committee, is a civil-engineering major and a CMSU Top Ten Scholar. She has studied statistics in several courses and is an experienced writer of Web-based questionnaires.

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Writer's Checklist

The following checklist covers the basic elements of a proposal. Guidelines established by the recipient of the proposal should take precedence over these general suggestions.

Does the summary provide an overview of

- the problem or the opportunity? (p. 449)
- the proposed program? (p. 449)
- your qualifications and experience? (p. 449)

Does the introduction indicate

- the problem or opportunity? (p. 450)
- the purpose of the proposal? (p. 450)
- the background of the problem or opportunity? (p. 450)
- your sources of information? (p. 450)
- the scope of the proposal? (p. 450)
- the organization of the proposal? (p. 450)
- the key terms that you will use in the proposal? (p. 450)

- Does the description of the proposed program provide a clear, specific plan of action and justify the tasks you propose performing? (p. 450)

Does the description of qualifications and experience clearly outline


- your relevant skills and past work? (p. 451)
- the skills and background of the other participants? (p. 451)
- your department's (or organization's) relevant equipment, facilities, and experience? (p. 453)

Is the budget

- complete? (p. 453)
- correct? (p. 453)
- accompanied by an in-text reference? (p. 453)

- Do the appendixes include the relevant supporting materials, such as a task schedule, a description of evaluation techniques, and evidence of other successful projects? (p. 453)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1. INTERNET EXERCISE** Study the National Science Foundation's (NSF) Grant Proposal Guide (click on Links Library for Chapter 16 on <bedfordstmartins.com/techcomm>). In what important ways does the NSF's guide differ from the advice provided in this chapter? What accounts for these differences? Present your findings in a 500-word memo to your instructor.
- 2. INTERNET/GROUP EXERCISE** Form groups according to major. Using the FedBizOpps Web site (click on Links Library for Chapter 16 on <bedfordstmartins.com/techcomm>), find a request for proposal for a project related to your academic field. Study the RFP. What can you learn about the needs of the organization that issued it? How effectively does the RFP describe what the issuing organization expects to see in the proposal? Is the RFP relatively general or specific? What sorts of evaluation techniques does the RFP call for? In your response, include a list of questions that you would ask the issuing organization if you were considering responding to the RFP. Present your results in a memo to your instructor.
- 3.** Write a proposal for a research project that will constitute a major assignment in this course. Your instructor will tell you whether the proposal is to be written individually or collaboratively. Start by defining a technical subject that interests you. (This subject could be one that you are involved with at work or in another course.) Using abstract services and other bibliographic tools, compile a bibliography of articles and books on the subject. (See Chapter 6 for a discussion of finding information.) Create a reasonable real-world context. Here are three common scenarios from the business world:
 - Our company uses Technology X to perform Task A. Should we instead be using Technology Y to perform Task A? For instance, our company uses traditional surveying tools in its contracting business. Should we be using GPS surveying tools instead?
 - Our company has decided to purchase a tool to perform Task A. Which make and model of the tool should we purchase, and from which supplier should we buy or lease it? For instance, our com-

pany has decided to purchase 10 multimedia computers. Which brand and model should we buy, and from whom should we buy them?

- Our company does not currently perform Function X. Is it feasible to perform Function X? For instance, we do not currently offer day care for our employees. Should we? What are the advantages and disadvantages of doing so? What forms can day care take? How is it paid for?

Following are some additional ideas for topics:

- the need to provide legal file-sharing access to students
- the value of using social media to form ties with a technical-communication class on another campus
- the need for expanded opportunities for internships in your major
- the need to create an advisory board of industry professionals to provide expertise about your major
- the need to raise money to keep the college's computer labs up-to-date
- the need to evaluate your major to ensure that it is responsive to students' needs

- the advisability of starting a campus branch of a professional organization in your field
- the need to improve parking facilities on campus
- the need to create or improve organizations for minorities or women on campus

These topics can be approached from different perspectives. For instance, the first one—on providing file-sharing access to students—could be approached in at least three ways:

- Our college currently purchases journals but does not provide legal file-sharing access for students. Should we consider reducing the library's journal budget to subsidize legal file-sharing access?
- Our college has decided to provide legal file-sharing access for students. How should it do so? What vendors provide such services? What are the strengths and weaknesses of each vendor?
- Our college does not offer legal file-sharing access for students. Should we make it a goal to do so? What are the advantages of doing so? The disadvantages?

Case 16: Revising a Brief Proposal

Background

StudentsFirst! Educational Software provides educational software to help children with learning challenges improve their reading, study skills, and writing so that they can succeed academically. The company's various software products are also used by students whose first language is not English.

The company's software is purchased by school districts and installed on school computers. Because most school districts are facing tough economic times, the company has created a guide to help them write proposals to private foundations that award grants to assist schools. You work in the Marketing Department at StudentsFirst! and report to Alex Haynes, who has called you into his office.

"We haven't updated our proposal guide in a few years, and I'd like you to help me," he says to you.

"What do you need?" you ask.

"Take a look at the sample proposal letter from the guide," he says (see Document 16.1). "Let me know if you think the letter is a good example. Is it well written? Does it make a really good case for the school district to obtain

funding from the granting agency? And one more thing: I'd like you to annotate it—you know, put little descriptions in the margin next to each paragraph—explaining what the writer is doing in that paragraph."

"Can you give me an idea of what you want the annotations to look like?"

"What I have in mind is just a couple of sentences. The first sentence explains what the writer should do. The second sentence explains why. Something like these," he says (see Document 16.2).

Your Assignment

1. Write a brief memo to Alex Haynes responding to his request that you evaluate the sample letter and recommend changes.
2. Using your word processor's Track Changes feature (see Chapter 4) so that Alex can see your suggestions easily, revise Document 16.1 according to your recommendations in Assignment 1. (Invent any reasonable details.) Using the Comment feature (see Chapter 4), supply the marginal annotations that Alex requested.

XYZ Foundation
130 Arlington Street
Boston, MA 02116

RE: READING READINESS PROJECT

The Eisenhower Middle School in Portland, Oregon, is seeking a grant to help vulnerable students improve their reading skills. These students are currently reading at three or even more grade levels behind their peers. The objective of the Reading Readiness project is to help these students improve their reading speed, attention span, and comprehension so that they can perform at grade level. We request funding of \$19,631 to design and implement this program and to purchase reading software and hardware for the school's resource lab.

Eisenhower Middle School has 265 students, of whom 61 are at risk in reading for several reasons, including dyslexia and attention deficit disorder (ADD), as well as other economic- and language-based factors. Additionally, Eisenhower Middle School is eligible for Title 1 funds. Finally, if these students cannot improve their reading skills, they are at increased risk of academic failure, which can lead to increased truancy and even dropping out of school entirely.

The Reading Readiness project gives students access to seven computers equipped with scanners and reading software. Students will be able to see their textbooks and other classroom materials on the screen, with words and text highlighted, while a human-like voice reads these materials to them. Included in the Reading Readiness project is a one-day training session for the Special Education Specialist and the teachers on how to use the StudentsFirst! software.

The goal of the Reading Readiness project is to help students with learning and reading disabilities improve their reading skills so that they can develop the skills they need to succeed in middle school and be prepared for high school and further education.

The budget includes funds for a Software Pack consisting of seven copies of StudentsFirst! Educational Software, seven computers, and seven scanners. This package will furnish seven independent assistive reading workstations, giving students great flexibility in using their textbooks and other teaching materials. The StudentsFirst! package is a reading program developed with input from leading reading experts.

Standardized reading tests will be conducted at the start of the Reading Readiness program to acquire baseline data on reading and then again at the end of the school year to determine improvements. In addition, we will test students with ADD for improvements in reading attention.

We appreciate XYZ Foundation's interest in helping Eisenhower Middle School create a program that will help our students succeed. Please give me a call at 617-555-1212 x125 if you need further information.

Sincerely,

Alison Galitz
Special Education Coordinator

Document 16.1 Sample Proposal Letter

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Document 16.2 Sample Annotations Written by Alex Haynes

Describe what you would do with the funding. The granting organization wants to make sure that your project aligns with its own values.

Explain what the problem is that you want to address. If the granting organization doesn't understand what the problem is, it's not going to read any further.

CHAPTER **17**

Writing Informational Reports



Bloomberg/Getty Images.

Complex, expensive projects call for lots of informational reports.

Complex, expensive projects, such as building and installing wind turbines, as shown here, call for a lot of documents. Before a project begins, a vendor might write a *proposal* to interest prospective clients in its work. After a project is completed, an organization might write a *completion report* to document the project or a *recommendation report* to argue for a future course of action. In between, many people will write various *informational reports*. For example, after this blade is installed on the wind turbine, the contractor will likely write and submit an informational report updating management on the status of the project.

Whether they are presented as memos, e-mails, reports, or Web pages, informational reports share one goal: to describe something that has happened or is happening now. Their main purpose is to provide clear, accurate, specific information to an audience. Sometimes, informational reports also analyze the situation. An *analysis* is an explanation of why something happened or how it happened. For instance, in an incident report about an accident on the job, the writer might speculate about how and why the accident occurred.

Informational reports include the following five kinds of communication discussed in this chapter:

- A supervisor writes a *directive* explaining the company's new policy on recycling and describing informational sessions that the company will offer to help employees understand how to implement the policy.
- An insurance adjuster writes a *field report* presenting the results of his inspection of a building after a storm caused extensive damage.
- A research team writes a *progress report* explaining what the team has accomplished in the first half of the project, speculating on whether it will finish on time and on budget, and describing how it has responded to unexpected problems.
- A worker at a manufacturing company writes an *incident report* after a toxic-chemical spill.
- A recording secretary writes a set of *meeting minutes* that will become the official record of what occurred at a meeting of the management team of a government agency.

Other types of informational reports are *lab reports* (see Chapter 18) and *recommendation reports* (see Chapter 19).

Understanding the Process of Writing Informational Reports 468

Writing Directives 469

Writing Field Reports 469

Writing Progress and Status Reports 470

Organizing Progress and Status Reports 473

Concluding Progress and Status Reports 474

Sample Progress Report 474

Writing Incident Reports 484

Writing Meeting Minutes 486

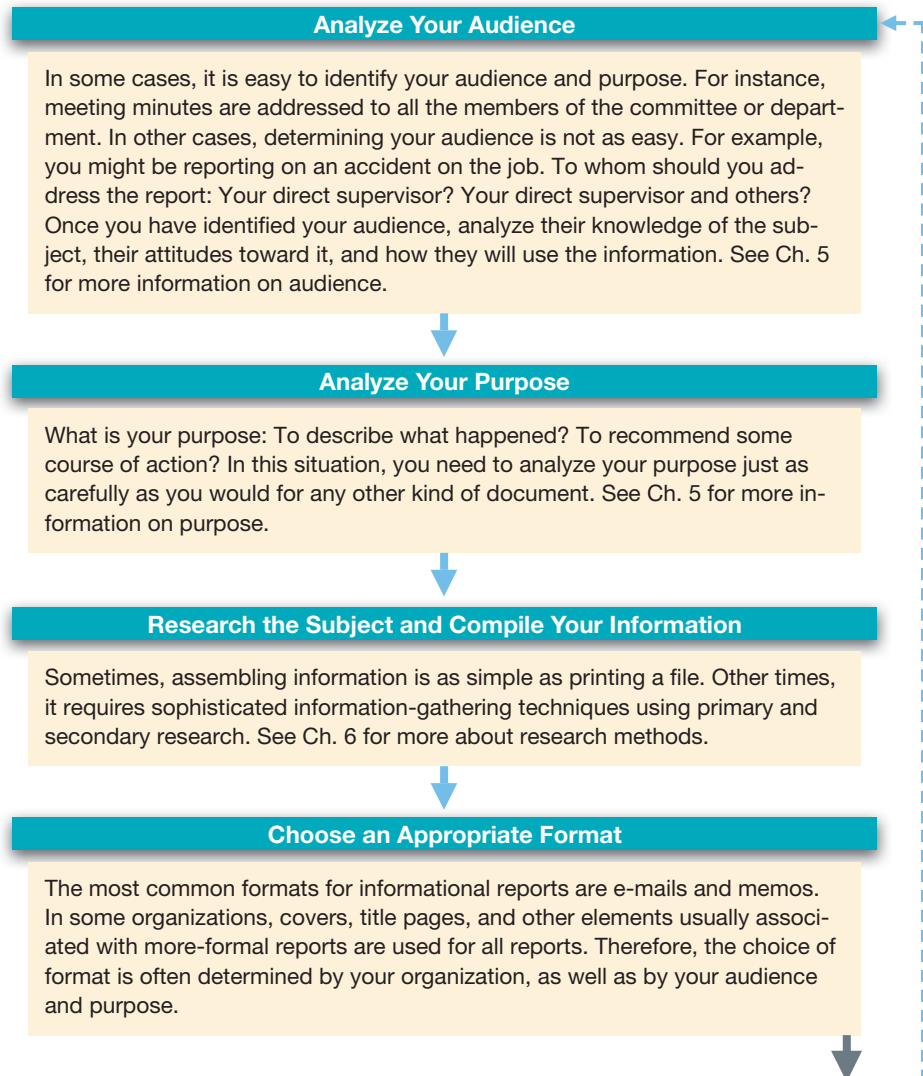
UNDERSTANDING THE PROCESS OF WRITING INFORMATIONAL REPORTS

Writing informational reports involves the same writing process used in most other kinds of technical communication. Figure 17.1 outlines this process.

If your informational report will be addressed to people from other cultures, think about how your readers will react to your choice of application and your writing style. For example, management scholar Geoff Walsham reports that a software company in India working with an American com-

Figure 17.1 An Overview of the Process of Writing Informational Reports

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your audience, purpose, and subject.



Draft the Report

For routine reports, you can sometimes use sections of previous reports. In a status report, for instance, you can copy the description of your current project from the previous report and then update it as necessary. This reuse of information is ethical. Some informational reports are drafted on-site. For instance, an engineer might use a handheld computer to “draft” an informational report as she walks around a site.



Revise, Edit, and Proofread the Report

Informal does not mean careless.

pany chose not to issue monthly progress reports because it did not want to conform to American business practices (2001, p. 30). If your readers expect a formal style, you might want to select a formal application (such as a report) rather than a memo. And consider adjusting your writing style, perhaps by adding parenthetical definitions and graphics or by using shorter sentences or more headings, to help readers whose first language is not English.

In This Book

For more about analyzing an audience from another culture, see Ch. 5, p. 94.

WRITING DIRECTIVES

In a *directive*, you explain a policy or a procedure you want your readers to follow. Even though you have the authority to require your readers to follow the new policy, you want to explain why the new policy is desirable or at least necessary. As discussed in Chapter 8, you are most persuasive when you present clear, compelling evidence (in the form of common-sense arguments, numerical data, and examples); when you consider opposing arguments effectively; and when you present yourself as cooperative, moderate, fair-minded, and modest. If appropriate, include arguments that appeal to your readers’ broader goals of security, recognition, personal and professional growth, and connectedness. Figure 17.2 on page 470 is an example of a directive.

WRITING FIELD REPORTS

A common kind of informational report describes inspections, maintenance, and site studies. These reports, often known as *field reports*, explain the problem, methods, results, and conclusions, but they deemphasize methods and can include recommendations. The report in Figure 17.3 on page 472 illustrates a possible variation on this standard report structure.

The writer begins with a clear explanation of the problem the directive addresses. Presenting the reasons for the new policy shows respect for the readers and therefore makes the directive more persuasive.

The writer's polite but informal tone throughout the memo is likely to motivate readers to cooperate. Notice the use of "please" and "thanks" in the second paragraph.

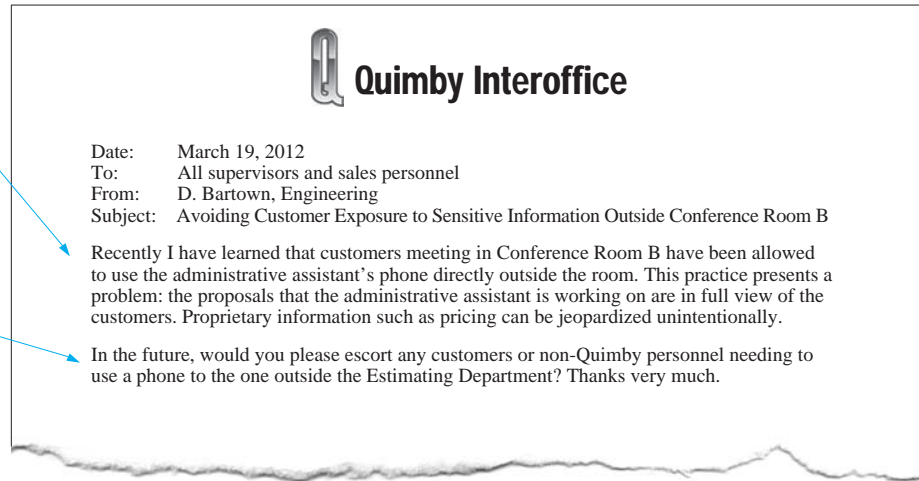


Figure 17.2 A Directive

Guidelines

Responding to Readers' Questions in a Field Report

Be sure to answer the following six questions:

- ▶ What is the purpose of the report?
- ▶ What are the main points covered in the report?
- ▶ What were the problems leading to the decision to perform the procedure?
- ▶ What methods were used?
- ▶ What were the results?
- ▶ What do the results mean?

If appropriate, also discuss what you think should be done next.

WRITING PROGRESS AND STATUS REPORTS

A *progress report* describes an ongoing project. A *status report*, sometimes called an *activity report*, describes the entire range of operations of a department or division. For example, the director of marketing for a manufacturing company might submit a monthly status report.

A progress report is an intermediate communication between the proposal (the argument that a project be undertaken) and the completion report (the comprehensive record of a completed project) or recommendation report

In This Book

For more about proposals, see Ch. 16. For more about completion reports and recommendation reports, see Ch. 19.

INTERACTIVE SAMPLE DOCUMENT

Writing a Persuasive Directive

The following directive was sent to the members of a Montana government department. The questions in the margin ask you to think about the process of writing persuasive directives (as discussed on page 469).

To: Members, Budget Allocation Office
From: Harold J. Jefferson, Director
Subject: Travel Policy
Date: January 23, 2012

It has come to my attention that certain members of this office are not abiding by the travel policies approved by the state. Let me offer a few examples.

The Montana Revised Code includes this statement in its introduction:

Persons who travel on State business are encouraged to incur the lowest practical and reasonable expense while still traveling in an efficient and timely manner. Those traveling on State business are expected to avoid impropriety, or the appearance of impropriety, in any travel expense. They must conduct State business with integrity, in compliance with applicable laws, and in a manner that excludes consideration of personal advantage.

Yet I have learned from official sources that on four occasions in the last fiscal year, employees of this office have acted in flagrant violation of this policy. Two occasions involved choosing a flight that left at a more convenient time in the morning but that cost almost \$160 more. One involved selecting a cab, rather than a shuttle bus, for a trip from the airport to downtown (a \$24 difference), and one involved using room service when the motel has a café (a \$14 difference).

Another provision of the travel policy that has been violated on more than one occasion is the following:

Travel expenses are not paid in advance except for airfare charged to the State air travel card, for online (Internet) air or train ticket purchases, and for conference registrations.

Two employees have on more than three occasions each received reimbursements for air and/or train reservations made using their personal credit cards. As you know, using personal credit cards leaves the State without official documentation of the expense and gives the traveler bonus miles and/or cash back that properly belongs to the State.

These are just two of the kinds of irregularities that have been brought to my attention. I do not need to tell you that these violations constitute serious breaches of public ethics. If they recur, they will be dealt with harshly. I sincerely hope that I do not have to address this issue again.

1. How would you describe the tone used by the writer? Provide an example to support your claim.
2. The writer presents examples of what he calls violations of the state travel policy. Do these examples provide solid evidence that violations of the policy have in fact occurred?
3. How effectively has the writer encouraged his staff to abide by the travel policy? How might he improve the persuasiveness of the directive?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 17 on <befordstmartins.com/techcomm>.

(an argument to take further action). Progress reports let you check in with your audience.

Regardless of how well the project is proceeding, explain clearly and fully what has happened and how it will affect the overall project. Your tone should be objective, neither defensive nor casual. Unless ineptitude or negligence caused the problem, you're not to blame. Regardless of the news you are delivering—good, bad, or mixed—your job is the same: to provide a clear and complete account of your activities and to forecast the next stage of the project.

Figure 17.3 A Field Report

Because the writer and the reader work for different companies, a letter is the appropriate format for this brief informational report.

The word *visual* describes the methods.

The writer states the purpose of the inspection.

The writer has chosen to incorporate the words *summary* and *conclusion* in the body of the letter rather than use headings as a method of organization.



LOBATE CONSTRUCTION

3311 Industrial Parkway
Speonk, NY 13508

Quality Construction Since 1957

April 11, 2012

Ms. Christine Amalli, Head
Civil Engineering
New York Power
Smithtown, NY 13507

Dear Ms. Amalli:

We are pleased to report the results of our visual inspection of the Chemopump after Run #9, a 30-day trial on Kentucky #10 coal.

The inspection was designed to determine if the new Chemopump is compatible with Kentucky #10, the lowest-grade coal that you anticipate using. In preparation for the 30-day test run, the following three modifications were made by your technicians:

- New front-bearing housing buffer plates of tungsten carbide were installed.
- The pump-casting volute liner was coated with tungsten carbide.
- New bearings were installed.

Our summary is as follows. A number of small problems with the pump were observed, but nothing serious and nothing surprising. Normal break-in accounts for the wear. The pump accepted the Kentucky #10 well.

The following four minor problems were observed:

- The outer lip of the front-end bell was chipped along two-thirds of its circumference.
- Opposite the pump discharge, the volute liner received a slight wear groove along one-third of its circumference.
- The impeller was not free-rotating.
- The holes in the front-end bell were filled with insulating mud.

The following three components showed no wear:

- 5½" impeller
- suction neck liner
- discharge neck liner

Our conclusion is that the problems can be attributed to normal break-in for a new Chemopump. The Kentucky #10 coal does not appear to have caused any extraordinary problems. In general, the new Chemopump seems to be operating well.

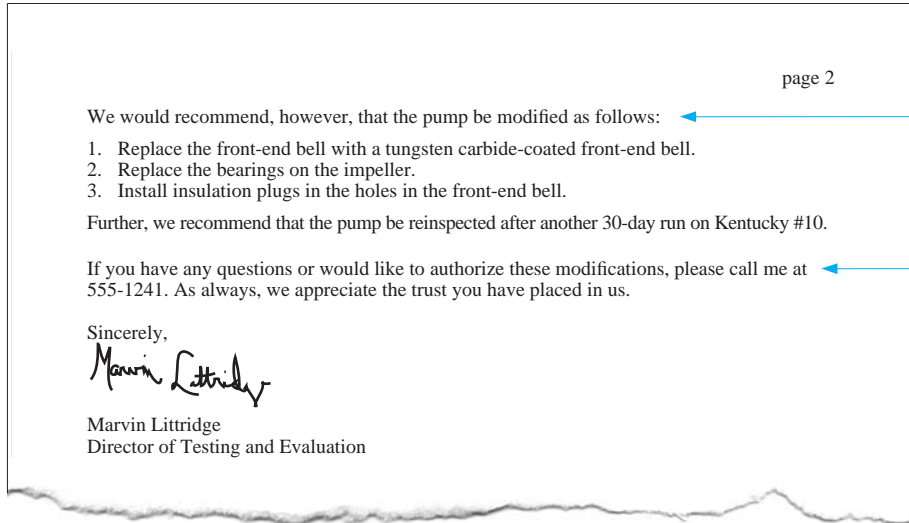


Figure 17.3 (continued)

Informational reports sometimes include recommendations.

The writer concludes politely.

When things go wrong, you might be tempted to cover up problems and hope that you can solve them before the next progress report. This course of action is unwise and unethical. Chances are that problems will multiply, and you will have a harder time explaining why you didn't alert your readers earlier.

ETHICS NOTE

Reporting Your Progress Honestly

Withholding bad news is unethical because it can mislead readers. As sponsors or supervisors of the project, readers have a right to know how it is going. If you find yourself faced with any of the following three common problems, consider responding in these ways:

- *The deliverable—the document or product you will submit at the end of the project—won't be what you thought it would be.* Without being defensive, describe the events that led to the situation and explain how the deliverable will differ from what you described in the proposal.
- *You won't meet your schedule.* Explain why you are going to be late, and state when the project will be complete.
- *You won't meet the budget.* Explain why you need more money, and state how much more you will need.

Organizing Progress and Status Reports

The time pattern and the task pattern, two organizational patterns frequently used in progress and status reports, are illustrated in Figure 17.4. A status report is usually organized according to task; by its nature, this type of report covers a specified time period.

In the time pattern, you describe all the work that you have completed in the present reporting period and then sketch in the work that remains. Some writers include a section on present work, which enables them to focus on a long or complex task still in progress.

The time pattern

- Discussion
- A. Past Work
 - B. Future Work

The task pattern

- Discussion
- A. Task 1
 - 1. Past work
 - 2. Future work
 - B. Task 2
 - 1. Past work
 - 2. Future work

The task pattern allows you to describe, in order, what has been accomplished on each task. Often a task-oriented structure incorporates the chronological structure.

Figure 17.4 Organizational Patterns in Reports

Concluding Progress and Status Reports

In the conclusion of a progress or status report, evaluate how the project is proceeding. In the broadest sense, there are two possible messages: things are going well, or things are not going as well as anticipated.

If appropriate, use appendixes for supporting materials, such as computations, printouts, schematics, diagrams, tables, or a revised task schedule. Be sure to cross-reference these appendixes in the body of the report, so that readers can find them easily.

Guidelines

Projecting an Appropriate Tone in a Progress or Status Report

Whether the news is positive or negative, these two suggestions will help you sound like a professional.

▶ **If the news is good, convey your optimism but avoid overstatement.**

- | | |
|------------|--|
| OVERSTATED | We are sure the device will do all that we ask of it, and more. |
| REALISTIC | We expect that the device will perform well and that, in addition, it might offer some unanticipated advantages. |

Beware of promising early completion. Such optimistic forecasts rarely prove accurate, and it is embarrassing to have to report a failure to meet an optimistic deadline.

▶ **Don't panic if the preliminary results are not as promising as you had planned or if the project is behind schedule.** Even the best-prepared proposal writers cannot anticipate all problems. As long as the original proposal was well planned and contained no wildly inaccurate computations, don't feel responsible. Just do your best to explain unanticipated problems and the status of the project. If your news is bad, at least give the reader as much time as possible to deal with it effectively.

▶ On TechComm Web

To see sample progress reports—one about selecting a table saw for a woodworking company, and one about selecting portable music players for a gym—click on Links Library for Ch. 17 on <bedfordstmartins.com/techcomm>.

Find other samples of progress reports at Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 17 on <bedfordstmartins.com/techcomm>.

Sample Progress Report

The following progress report was written for the project proposed on pages 457–62 in Chapter 16 (Elkins & Carruthers, 2011). (The recommendation report for this study is on page 532 in Chapter 19.)

Memo

Date: November 7, 2011
 To: Dr. Jill Bremerton, Vice President for Student Affairs
 Central Montana State University
 From: Jeremy Elkins, Co-chair
 Eloise Carruthers, Co-chair
 Student Affairs Advisory Committee
 Central Montana State University
 Subject: Progress Report for Clicker Study at CMSU

Purpose

This is a progress report on our research on the baseline requirements, including faculty and student attitudes and lecture-hall infrastructure, for adopting clickers at CMSU.

Summary

On October 10, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at CMSU, authorized our study of the baseline requirements for adopting clickers at CMSU. We have completed the first three tasks of our project: acquiring a basic understanding of clicker use in higher education, determining whether instructors would support clicker use, and determining whether students would support clicker use.

Our study is currently on schedule, and we expect to submit a recommendation report on December 14, 2011, as indicated in our proposal dated October 6, 2011.

Introduction

On October 10, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at Central Montana State University (CMSU), approved our proposal to participate in a feasibility study about the use of clickers at CMSU.

Currently, Academic Technologies has only three sets of 100 clickers from Turning Technologies and two sets of 100 clickers from eInstruction. These clickers are available for instructors to check out for occasional use but may not be reserved for every meeting of an instructor's course. On the basis of an increasing consensus in the scholarly community that clickers improve the classroom learning environment and can improve learning in large lecture courses, Dr. Bremerton has allocated resources for a large feasibility study of whether CMSU should select a particular clicker system for use by CMSU instructors and establish a policy to provide technical support for clicker use and a method for students to acquire clickers through the university. The research that Dr. Bremerton invited SAAC to perform will be part of this large feasibility study.

Dr. Bremerton approved our proposal to perform research and present our recommendation on whether the university should proceed with the clicker study and, if so, how the physical characteristics of the lecture halls and the existing computer environment in the lecture halls would affect the direction of the feasibility study.

In most professional settings, writers use letterhead stationery for memos, but because the writers are students, not employees, they decided to use plain stationery.

Progress reports can be presented as memos or as reports.

The writers include their titles and that of their primary reader. This way, future readers will be able to more readily identify the reader and writers.

The subject heading indicates the subject of the memo (the clicker study at CMSU) and the purpose of the memo (progress report).

Memos should begin with a clear statement of purpose. Here, the writers communicate the purpose of the document in one sentence.

Memos of more than one page should include a summary.

Readers of progress reports want to know whether the project is proceeding according to schedule and (if appropriate) on budget.

A brief statement of the context for the proposal. Note that the writers refer to the reader's having authorized their proposal.

A formal statement of the task that Dr. Bremerton asked the committee to perform.

Most of the information in the introduction is taken directly from the proposal. This reuse of text is ethical.

Memo to Dr. Jill Bremerton

November 7, 2011

Page 2

The writers begin by describing the organization of the results section. For a progress report, a chronological organization makes good sense.

Results of Research

In this progress report, we present our completed work on Tasks 1–3. Then we discuss our future work: Tasks 4–6.

The writers follow the task structure that they used in the proposal.

Completed Work

Task 1. Acquire a basic understanding of clicker use in higher education.

Clickers, also called *classroom response systems*, *student response systems*, and *audience response systems*, are “wireless in-class electronic polling systems used by students to answer questions during lectures” (Ohio State, 2005, p. 2). In a clicker system, each student has an electronic device called a clicker, which looks like a TV remote control. The instructor poses a question, usually by embedding the question beforehand in a PowerPoint presentation, and students respond by inputting information on their clickers. Software on the instructor’s computer tabulates the responses and presents them in a display, such as a bar graph, which appears on the instructor’s screen, and (in some systems) on a screen on each student’s clicker.

Clickers are often used to engage students in learning, to give quizzes, and to take attendance.

Clickers can help instructors improve the classroom atmosphere in a number of ways (Vanderbilt University, 2010):

- promote active student engagement during a lecture
- promote discussion and collaboration among students during class
- encourage participation from every student in a class
- check for student understanding during class
- teach in a way that adapts to the immediate learning needs of students

Anecdotal and scholarly evidence suggests clearly that using clickers improves classroom dynamics by encouraging active learning. Whereas a traditional lecture can be a passive experience, with the instructor talking to students, clickers encourage interaction not only between the instructor and the students but also between students (Draper & Brown, 2004). In a traditional lecture, students are often unwilling to participate because they are afraid of embarrassment or disapproval by their peers, or simply because they have learned not to participate in a lecture (Caldwell, 2007). In a typical lecture, a small number of students dominate the questioning, often giving the instructor an inaccurate impression of how many students understand the material (Simpson & Oliver, 2006).

The writers skillfully integrate their secondary research into their discussion of the criteria. By doing so, they enhance their credibility.

Although it makes sense to assume that a more active learning environment leads to better learning, measuring learning is very challenging, and therefore there is not yet complete consensus that clickers improve learning. There are some studies that do suggest improved learning. For instance, a study (Ohio State, 2008) of a large, multi-

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section physics course found that students in clicker sections outperformed those in non-clicker sections by 10 points on a final exam, and that female students did as well as males in the clicker sections (but not in non-clicker sections). And a meta-analysis by Fies and Marshall (2006) shows that some 11 of 26 studies show clear evidence of improved comprehension of complex concepts.

The bulk of scholarly literature, however, is consistent with Beatty et al. (2006), who see great potential for improved student learning. As Caldwell (2007) puts it,

Most reviews agree that “ample converging evidence” suggests that clickers generally cause improved student outcomes such as improved exam scores or passing rates, student comprehension, and learning and that students like clickers. The reviews of the literature, however, also agree that much of the research so far is not systematic enough to permit scientific conclusions about what causes the benefits. (n.p.)

At the very least, as Knight and Wood (2005) argue, students with clickers almost always do at least as well in exam scores as students who don’t use clickers.

Task 2. Research faculty attitudes toward a formal policy on clicker use.

Because student attendance, engagement, and participation increase with the use of clickers, it makes sense that many instructors would like clickers. Anecdotal evidence reported in Caldwell (2007) suggests that instructors do enjoy the improved student engagement and perceive that students learn more effectively in clicker courses.

However, the literature suggests (see Vanderbilt, 2010) that instructors have cited problems with clicker use:

- Technical problems with the hardware or software can occur during a class.
- It takes time for an instructor to learn a system and use it effectively.
- It takes time for an instructor to embed clicker questions in teaching materials (such as PowerPoint slides).
- Using clickers in class takes time away from other instructional activities.
- Changing a lesson “on the fly” or conducting a discussion in response to clicker responses can disrupt the flow of a lesson.

We considered these findings in devising our questionnaires for CMSU instructors. We wrote the two questionnaires, and then field-tested them with three faculty members from different colleges at CMSU. Then, we uploaded the survey to Qualtrics and sent an e-mail to the instructors, inviting them to respond to the appropriate questionnaire.

The 16 instructors who had taught with clickers at least two semesters were directed to the Faculty Questionnaire 1, which is presented in Appendix A, page

The cross-references to the questionnaires help readers find the information quickly.

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The writers have created and distributed the two questionnaires but have not yet collected and analyzed the data that the questionnaires will provide. They will report on these data in the recommendation report to be submitted on December 14.

9. The 56 instructors who had never taught with clickers (or taught with them for only one semester) but who regularly teach lectures with more than 100 students were directed to Faculty Questionnaire 2, which is presented in Appendix B, page 10. Both questionnaires have a deadline of November 20, 2011.

Task 3. Research student attitudes toward a requirement to purchase a clicker.

Several research studies suggest that most students, across the country and across various course subjects, like using clickers. One study (Caldwell, 2007), at West Virginia University, found that some 88 percent of students “frequently” or “always” enjoyed using clickers in their introductory biology course. Aggregating several studies, the percentage of students who approve of using clickers always exceeds 70 percent. Students comment that instructors who use clickers are more aware of students’ needs and employ a more responsive teaching style than those who don’t use them.

The writers cite their sources throughout the report.

However, students do not always approve of clicker use. The principal complaints reported nationally (Caldwell, 2007) relate to the following problems:

- Some clickers cost too much.
- Some instructors do not explain the purpose of using the clickers.
- Some instructors spend too much class time using the clickers.
- Some instructors let clicker use drive the course content.
- Some students are anxious about having their course grades depend, to some extent, on their use of an electronic device.

Of these concerns, all but the one related to the cost of the clicker refer to how instructors integrate the clickers into the course content. As many commentators suggest, schools need to provide training for instructors that covers not only technical questions about how to operate clickers and related software but also about how to use them effectively in teaching the course.

We concluded that the most useful data we could obtain would relate to what price our students thought was reasonable. A review of the sites of the four leading manufacturers of clicker systems (Turning Technologies, eInstruction, iClicker, and Qwizdom) shows that pricing can vary, depending on the pricing model the vendor uses. For instance, some companies (such as Turning Technologies) charge a one-time price, with no fees for registering the clicker each semester. Other companies (such as eInstruction) charge once for the clicker but have a per-semester registration fee. In addition, commentators (University of Wisconsin-Eau Claire, n.d.) point out that some vendors have established relationships with textbook manufacturers so that the clickers are packaged with selected textbooks. Finally, some schools have entered into contractual relationships with clicker vendors that call for a particular price for students at that school. Therefore, it is impossible to answer the cost question simply.

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We therefore decided to try to determine the one-time price that students would find reasonable for a clicker. Although CMSU might not in fact be able to achieve a one-time price contract for the clicker, the answer to this question would at least give the university an idea of student attitudes about price. We selected a price ranging from zero (for students who wish to express an opposition to having to buy a clicker at any price) to approximately \$60. (At this time, Quizdom's clicker, at \$66.55, represents the high end of prices.)

We wrote the following one-question questionnaire for the 11,324 currently enrolled undergraduate students.

As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether CMSU should select a single brand of clicker to be used in some lecture courses at CMSU. Clickers are used by students to respond to questions posed by instructors in large lecture courses. If such a choice were made, you might be required to purchase a clicker for use in some of your lecture courses. Following are some details:

1. The university would seek to enter into a two-year contract with a manufacturer of the clicker systems. Although the university would hope to renew that contract so that the one clicker you buy would last for your entire career at CMSU, it is possible that you would need to buy a new clicker as often as every two years.
2. You would be responsible for purchasing the batteries for your clicker. Batteries generally last from six months to a year, and replacement batteries cost approximately \$3–6.
3. You would be responsible for replacing your clicker if you lose it.

We would appreciate your telling us what price you think would be reasonable for the clicker unit. Please select one of the following responses, and then hit the Submit button.

- \$0. I don't want to have to buy any clicker.
- Up to \$20.
- Up to \$40.
- Up to \$60.

Thank you!

We made this questionnaire available for all undergraduate students because, of the 11,324 students currently enrolled, only 832 had ever used a clicker at CMSU. Because that number constituted only some 7 percent of the total undergraduate population, we felt that it was not worth the expense of separating out those who had used a clicker on campus.

The writers explain the logic of their decision. They decided to focus on what they think is the most appropriate information: student attitudes toward the price of the clickers. Questions related to how instructors use clickers will be addressed in Dr. Bremerton's larger study.

Writers often need to decide where to present information in a technical document. This questionnaire could have appeared in an appendix, as the two instructor questionnaires did. However, because it is relatively brief, the writers decided to include it in the body of the report.

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We then field-tested the question with the three other members of SAAC. Next, we uploaded the survey to Qualtrics and sent an e-mail to students, inviting them to respond to the question. The deadline for this questionnaire is November 27.

Future Work

We are now at work on Task 4: researching the physical characteristics of the lecture halls.

Task 4. Research the physical characteristics of the lecture halls.

We will seek to answer the following question: "Would the physical characteristics of any of the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?" We have scheduled a meeting for November 9 with Mr. Marvin Nickerson, the Director of Physical Plant, to explain our project and to give him a list of the questions we need to answer.

Task 5. Research the existing computer environment in the lecture halls.

We will seek to answer the following question: "Would the computer platforms and operating systems used in the instructor stations in the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?" We have scheduled a meeting with Dr. Arlene Matthews, the Director of Academic Technologies, on November 14, 2011, to explain our project and to give her a list of the questions we need to answer.

Task 6. Analyze our data and prepare a recommendation report.

We will prepare a recommendation report that explains the questions we sought to answer, our research methods, and our findings.

Updated Schedule

The dark blue bars represent completed tasks. The light blue bars represent tasks yet to be completed.

Tasks	Date of Tasks (by Weeks)											
Task 1: Research clicker use	■	■										
Task 2: Research instructor attitudes			■	■	■	■	■					
Task 3: Research student attitudes					■	■	■	■				
Task 4: Research lecture halls					■	■	■					
Task 5: Research computer environment						■	■					
Task 6: Prepare report								■	■	■	■	
	10	17	24	31	7	14	21	28	5	12		
	Oct.			Nov.				Dec.				

The Gantt chart shows the progress toward completing each of the project tasks. See the Tech Tip in Ch. 16, p. 455, for advice on how to create Gantt charts.

Figure 1. Schedule of Project Tasks

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Conclusion

We have successfully completed Tasks 1–3 and begun Tasks 4 and 5. We are on schedule to complete Tasks 4–6 by the December 14 deadline. We have acquired an understanding of how clickers are used in higher education and gone live with the questionnaires for instructors and students. We are currently preparing for our interviews to better understand the infrastructure of our lecture halls. In the report we will present on December 14, we will include our recommendation on how this background information should affect the larger feasibility study on clicker use at CMSU.

Please contact Jeremy Elkins at jelkins@cmsu.edu or at 444-3967 if you have questions or comments or would like to discuss this project further.

← The conclusion summarizes the status of the project.

← The writers end with a polite offer to provide additional information.

This progress report lacks a budget. Because the writers are students, they are being compensated with internship credits that Dr. Bremerton is overseeing.

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← This list of references follows the APA documentation style, which is discussed in Appendix, Part B, p. 670.

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Appendix A: Faculty Questionnaire 1

This is the questionnaire we distributed to the 16 CMSU instructors who had taught with clickers for at least two semesters.

Questionnaire on Clicker Use at CMSU

Directions: As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether to institute a formal mechanism for using clickers in large lecture courses at CMSU. We are asking you to participate in this study because you are an experienced user of clickers. We greatly appreciate your answering the following five questions.

1. I find it easy to use clickers in my lecture courses.
Strongly disagree _____ Strongly agree
2. Using clickers in my lecture classes improves student attendance and engagement.
Strongly disagree _____ Strongly agree
3. Using clickers in my lecture classes improves student learning.
Strongly disagree _____ Strongly agree
4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
Strongly disagree _____ Strongly agree
5. If CMSU selects a good clicker and provides good technical support, I will use it in my lecture courses.
Strongly disagree _____ Strongly agree

Thank you!

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Appendix B: Faculty Questionnaire 2

This is the questionnaire we distributed to the 56 CMSU instructors who had **not** taught with clickers for at least two semesters.

Questionnaire on Clicker Use at CMSU

Directions: As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether to institute a formal mechanism for using clickers in large lecture courses at CMSU. Students use clickers to respond to multiple-choice questions posed by faculty. Instructors use clickers for such tasks as assessing student understanding, prompting discussions, giving quizzes, and taking attendance.

We are asking you to participate in this study because we want to gauge your interest in using clickers in your lecture courses. We greatly appreciate your answering the following five questions.

1. I would like to make my lectures a more active learning experience for students.
Strongly disagree _____ Strongly agree
2. I would like to improve my ability to know how many students understand the concepts I am trying to present during my lectures.
Strongly disagree _____ Strongly agree
3. I would like to be able to automate tasks such as taking attendance or delivering quizzes quickly and accurately using clickers.
Strongly disagree _____ Strongly agree
4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
Strongly disagree _____ Strongly agree
5. I would be very interested in learning more about how I could use clickers in my lecture courses.
Strongly disagree _____ Strongly agree

Thank you!

In the introductory text before the five questions, the writers present a slightly more detailed explanation of clickers, because most of their readers have not used them.

WRITING INCIDENT REPORTS

An incident report describes events such as workplace accidents, health or safety emergencies, and equipment problems. (Specialized kinds of incident reports go by other names, such as *accident reports* or *trouble reports*.) The purpose of an incident report is to explain what happened, why it happened, and what the organization did (or is going to do) to follow up on the incident. Incident reports often contain a variety of graphics, including tables, drawings, diagrams, and photographs, as well as videos.

Incident reports can range from forms that are filled out on paper or online to substantial reports hundreds of pages long. Figure 17.5 shows an accident form used at a university.

UNC – Chapel Hill – Facilities Services – Safety Plan

Employee's Accident Report Form **APPENDIX A**
University of North Carolina at Chapel Hill

This form is to be completed by the employee and forwarded to the Health and Safety office as soon as practicable after the injury. (See Human Resources Manual)

Accident Date: _____

1. Name of employee: _____
2. Date and time of injury: _____
3. Describe how the injury occurred:

4. Describe what job duty you were doing at the time of your injury:

5. Describe what part of your body was injured:

6. Describe what you would recommend to prevent a reoccurrence:

7. Further information you would like to include regarding your injury:


 Employee signature _____ Date

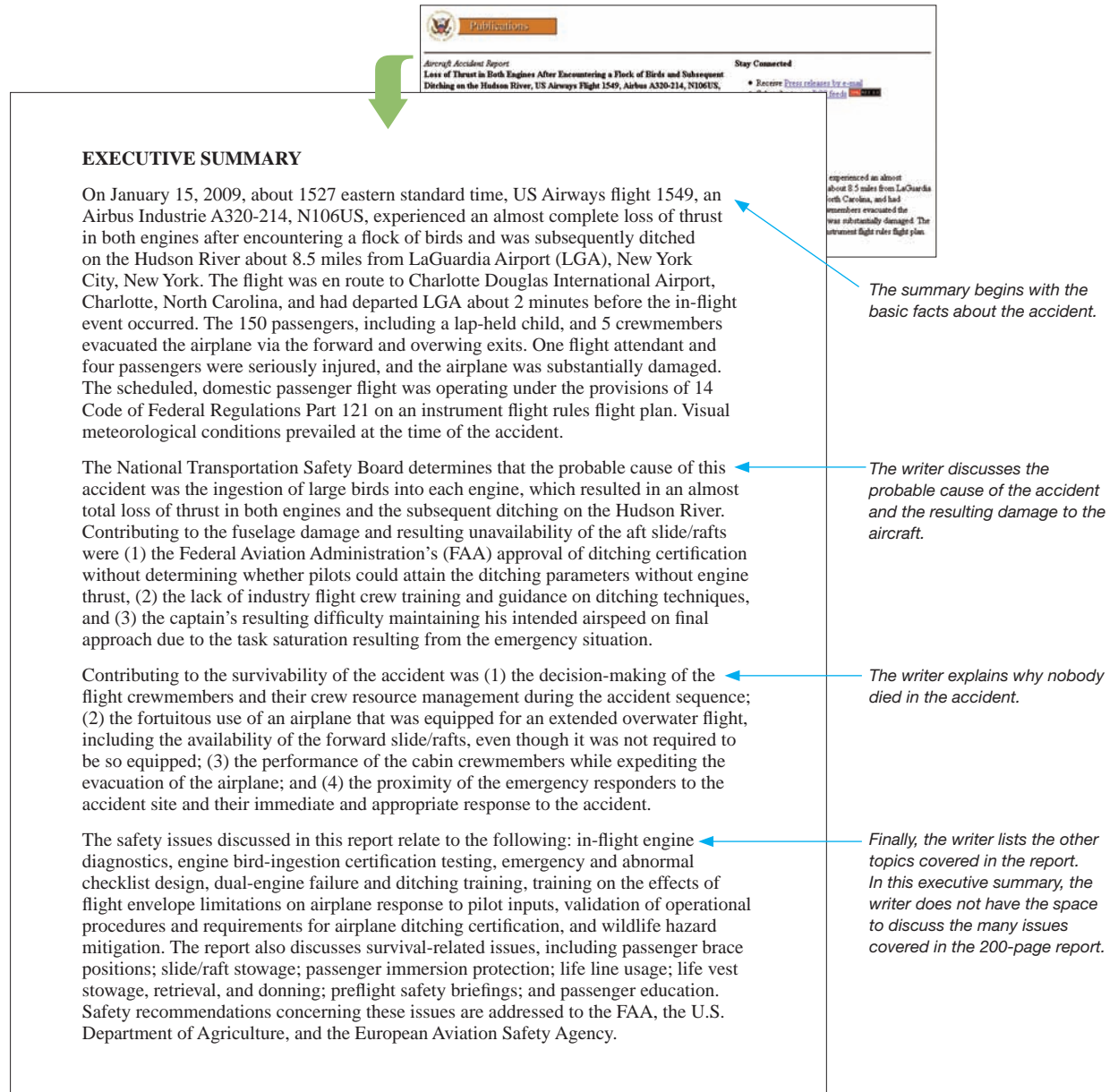
HTTP://www.fac.unc.edu

Figure 17.5 An Accident Report Form

Source: University of North Carolina–Chapel Hill, 2010 <www.fac.unc.edu/Employees/Safety/SafetyDocuments/tabid/233/Default.aspx>.

Figure 17.6 is the executive summary of the National Transportation Safety Board report about the US Airways flight that was forced to land in the Hudson River in 2009. Investigators spent many months researching and writing the full report.

 **On TechComm Web**
To see the entire report, click on Links Library for Ch. 17 on <bedfordstmartins.com/techcomm>.



Publications

Aircraft Accident Report
Loss of Thrust in Both Engines After Encountering a Flock of Birds and Subsequent Ditching on the Hudson River, US Airways Flight 1549, Airbus A320-214, N106US.

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EXECUTIVE SUMMARY

On January 15, 2009, about 1527 eastern standard time, US Airways flight 1549, an Airbus Industrie A320-214, N106US, experienced an almost complete loss of thrust in both engines after encountering a flock of birds and was subsequently ditched on the Hudson River about 8.5 miles from LaGuardia Airport (LGA), New York City, New York. The flight was en route to Charlotte Douglas International Airport, Charlotte, North Carolina, and had departed LGA about 2 minutes before the in-flight event occurred. The 150 passengers, including a lap-held child, and 5 crewmembers evacuated the airplane via the forward and overwing exits. One flight attendant and four passengers were seriously injured, and the airplane was substantially damaged. The scheduled, domestic passenger flight was operating under the provisions of 14 Code of Federal Regulations Part 121 on an instrument flight rules flight plan. Visual meteorological conditions prevailed at the time of the accident.

The National Transportation Safety Board determines that the probable cause of this accident was the ingestion of large birds into each engine, which resulted in an almost total loss of thrust in both engines and the subsequent ditching on the Hudson River. Contributing to the fuselage damage and resulting unavailability of the aft slide/rafts were (1) the Federal Aviation Administration's (FAA) approval of ditching certification without determining whether pilots could attain the ditching parameters without engine thrust, (2) the lack of industry flight crew training and guidance on ditching techniques, and (3) the captain's resulting difficulty maintaining his intended airspeed on final approach due to the task saturation resulting from the emergency situation.

Contributing to the survivability of the accident was (1) the decision-making of the flight crewmembers and their crew resource management during the accident sequence; (2) the fortuitous use of an airplane that was equipped for an extended overwater flight, including the availability of the forward slide/rafts, even though it was not required to be so equipped; (3) the performance of the cabin crewmembers while expediting the evacuation of the airplane; and (4) the proximity of the emergency responders to the accident site and their immediate and appropriate response to the accident.

The safety issues discussed in this report relate to the following: in-flight engine diagnostics, engine bird-ingestion certification testing, emergency and abnormal checklist design, dual-engine failure and ditching training, training on the effects of flight envelope limitations on airplane response to pilot inputs, validation of operational procedures and requirements for airplane ditching certification, and wildlife hazard mitigation. The report also discusses survival-related issues, including passenger brace positions; slide/raft stowage; passenger immersion protection; life line usage; life vest stowage, retrieval, and donning; preflight safety briefings; and passenger education. Safety recommendations concerning these issues are addressed to the FAA, the U.S. Department of Agriculture, and the European Aviation Safety Agency.

The summary begins with the basic facts about the accident.

The writer discusses the probable cause of the accident and the resulting damage to the aircraft.

The writer explains why nobody died in the accident.

Finally, the writer lists the other topics covered in the report. In this executive summary, the writer does not have the space to discuss the many issues covered in the 200-page report.

Figure 17.6 Executive Summary of a Complex Incident Report

Source: National Transportation Safety Board, 2010 <http://ntsb.gov/Publictn/A_Acc1.htm>.

 In This Book

For more about conducting meetings, see Ch. 4, p. 61.

WRITING MEETING MINUTES

Minutes, an organization's official record of a meeting, are distributed to all those who belong to the committee or any other unit represented at the meeting. Sometimes, minutes are written by administrative assistants; other times they are written by technical professionals or technical communicators.

In writing minutes, be clear, comprehensive, objective, and diplomatic. Do not interpret what happened; simply report it. Because meetings rarely follow the agenda perfectly, you might find it challenging to provide an accurate record of the meeting. If necessary, interrupt the discussion to request a clarification.

Do not record emotional exchanges between participants. Because minutes are the official record of the meeting, you want them to reflect positively on the participants and the organization.

Figure 17.7, an example of an effective set of minutes, was written using a Microsoft template. Many organizations today use a template like this one, which has three advantages:

- Because it is a word-processing template, the note taker can enter information on his or her laptop during the meeting, reducing the time it takes to publish the minutes.
- Because the template is a form, it prompts the note taker to fill in the appropriate information, thus reducing the chances that he or she will overlook something important.
- Because the template is a table, readers quickly become accustomed to reading it and thereby learn where to look for the important information they seek.

Weekly Planning Committee Meeting

MINUTES February 14, 2012 3:40 p.m. conference room

meeting called by	Principal Robert Barson
type of meeting	regular weekly
note taker	Zenda Hill
attendees	William Sipe, Patty Leahy, George Zaerr, Herbert Simon, Robert Barson, Zenda Hill. Absent: Heather Evett

The first section of this template calls for information about the logistics of the meeting. You can modify the template to make it appropriate for your organization.

Agenda topics

2 minutes approval of minutes zenda hill

discussion	The minutes of the February 7, 2012, meeting were read.	
action items	person responsible	deadline
One correction was made: In paragraph 2, "800 hours" was replaced with "80 hours." The minutes were then unanimously approved.	Zenda Hill	N/A

The second section of this template is devoted to the agenda items for the meeting.

30 minutes authorization for antidrug presentation by alan winston principal barson

discussion	Principal Barson reported on his discussion with Peggy Giles of the School District, who offered positive comments about Winston's presentations at other schools in the district last year. Mr. Zaerr expressed concern about the effect of the visit on the teaching schedule. Principal Barson acknowledged that the visit would disrupt one whole day but said that the chairs unanimously approved of the visit. Student participation would be voluntary, and the chairs offered to give review sessions to those students who elected not to attend. Ms. Hill asked if there was any new business. There was none.	
action items	person responsible	deadline
Ms. Hill called for a vote on the motion. The motion carried 5-0, with one abstention.	Ms. Hill will arrange the Winston visit.	February 23, 2012
There being no new business, Ms. Hill moved that the committee adjourn. Motion passed. The committee adjourned at 4:05 p.m.	N/A	N/A

Note that for each agenda item, the note taker is prompted to state how long the discussion took, the subject of the discussion, and the name of the person leading the discussion.

For each agenda item, the note taker records the main points of the discussion and the action items. Because the template calls for the action item (such as a vote or a task to be done), the name of the person responsible for doing the task, and the deadline for the task, there should be no confusion about who is to do which task and when it is due.

Figure 17.7 A Set of Meeting Minutes

Writer's Checklist

- Did you choose an appropriate application for the informational report? (p. 468)

Does the directive

- clearly and politely explain your message? (p. 469)
 explain your reasoning, if appropriate? (p. 469)

Does the field report

- clearly explain the important information? (p. 470)
 use, if appropriate, a problem-methods-results-conclusion-recommendations organization? (p. 470)

Does the progress or status report

- clearly announce that it is a progress or status report? (p. 470)
 use an appropriate organization? (p. 473)

- clearly and honestly report on the subject and forecast the problems and possibilities of the future work? (p. 474)

- append supporting materials that substantiate the discussion? (p. 474)


Does the incident report

- explain what happened? (p. 484)
 explain why it happened? (p. 484)
 explain what the organization did about it or will do about it? (p. 484)

Do the minutes

- provide the necessary housekeeping details about the meeting? (p. 486)
 explain the events of the meeting accurately? (p. 486)
 reflect positively on the participants and the organization? (p. 486)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. As the manager of Lewis, Lewis, and Wollensky Law, LPC, you have been informed by some clients that tattoos on the arms and chests of your employees create a negative impression. Write a directive in the form of a memo defining a new policy: employees are required to wear clothing that covers any tattoos on their arms and chests.
2. Write a progress report about the research project you are working on in response to Exercise 3 on page 463 in Chapter 16. If the proposal was a collaborative effort, collaborate with the same group members on the progress report.
3. **INTERNET/GROUP EXERCISE** You are one of three members of the administrative council of your college's student association. Recently, the three of you have

concluded that your weekly meetings, which are open to all students, have become chaotic. There are two main reasons for this: you do not use parliamentary procedure (rules for conducting meetings so that they are efficient and fair), and controversial issues have arisen that have attracted numerous students. You have decided that it is time to consider adopting parliamentary procedures. Look on the Web for models of parliamentary procedure. Is there one that you can adopt? Could you combine elements of several to create an effective model? Find or write a brief set of procedures, being sure to cite your sources. In a memo to your instructor, discuss the advantages and disadvantages of the model you propose, and submit it along with the procedures.

Case 17: Writing a Directive About Using Agendas for Meetings

Background

As the newest member of the support staff for Sonya Edelstein, the Director of Engineering at Plectrum Industries, you are charged with taking minutes for the Friday meeting of the engineering staff. The meetings are attended by 12

to 15 engineers and cover many issues, including progress reports from project-team leaders, status reports from division heads, announcements about updated policies, and procedures and general news items of interest to the engineers in the room.

“What I’m seeing,” Sonya says to you, “is that these meetings are getting longer and longer. I guess you’ve seen that, too.”

“Actually, I have,” you say. It takes you anywhere from two to five hours to write up the minutes. The discussions can be fast and very technical, and you need to show drafts of portions of the minutes to various attendees to be sure your explanations are clear and accurate.

“I looked through the file of minutes for the last year, and I didn’t like what I saw. We held 22 Friday meetings. They averaged about one and three-quarter hours in length, with an average of 13.4 people in attendance. Do you know the average hourly salary of those people in the room?” Sonya liked to pose questions that you couldn’t possibly answer. Luckily, she never expected you to answer. “With benefits, it’s \$43.35. Do you see where I’m going?”

“You’re going to tell me how much it costs us to hold these meetings?”

“That’s right. It works out to more than \$22,000, not counting the coffee.” She continues to gaze at you.

“That sounds like a lot,” you say.

“Here’s what I’d like you to do. I want to send out a memo to all the engineering division heads, explaining how we need to cut down the time we spend in meetings. Look around on the Web. Read up on agendas. Look around for templates. I downloaded this one from Word,” she says, passing you a sheet of paper (see Document 17.1). “But it doesn’t do much for me because it doesn’t tell you how long each item is going to take. I think that’s the key: we have to

tell people at the start how long they have. Otherwise, some of them just go on and on. And another point is that we have to be sure we’re using meetings for tasks that can only be done in meetings. We need to use other media for things that don’t require that we all be together in a room.”

“Okay, so we’re going beyond the agenda itself, right?”

“That’s right. We’re getting into how to hold meetings—what the ground rules are. But I think the key is to use an agenda to establish a plan for the meeting.”

Your Assignment

1. Search the Internet for advice on conducting meetings and using agendas. Also see if you can find agenda templates in your word-processing software and on the Internet. Write a brief directive that Sonya could revise and distribute to her engineering staff. In this directive, explain the reasoning behind the new policy about using an agenda to limit the length of meetings and explaining an approach to limiting the meetings to the kinds of communication that require face-to-face interaction.
2. Find or adopt a template for meeting agendas that you think Sonya will find useful. In a word-processing file, present the template (don’t forget to cite it if you did not create it yourself) and include an explanation of how Sonya can use the template for future Friday meetings. In this explanation, reinforce the points you made in Assignment 1 about how participants will be expected to participate in these meetings.

Meeting Agenda

[Date]

[Time]

Type of Meeting: [Description of meeting]

Meeting Facilitator: [Name of meeting facilitator]

Invitees: [List of invitees]

- I. Call to order
- II. Roll call
- III. Approval of minutes from last meeting
- IV. Open issues
[Description of open issue]
[Description of open issue]
[Description of open issue]
- V. New business
[Description of new business]
[Description of new business]
[Description of new business]
- VI. Adjournment

Document 17.1 A Template for a Meeting Agenda

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

CHAPTER **18**

Writing Lab Reports



Paul Nicklen/Getty Images.

Adding new knowledge to a field is the collective effort of many people.

Research can take place in a lab or at some remote site. In this photo, a research team is working with a tagged and tranquilized Atlantic walrus in studying the effects of global warming on indigenous wildlife. The team members will record their research methods, results, and conclusions in a lab report. Eventually, they will share their findings through established media, such as journals or professional Web sites, so that other scientists can replicate their findings and apply them in the field. Lab reports play an important role in the process of understanding a scientific problem and solving it in the real world.

Scientists and engineers spend a significant portion of their professional lives writing because communicating ideas in writing is central to the process of creating and publicizing knowledge. Lab reports are one important way they communicate the results of their work. Adding new knowledge to a field is the collective effort of many people, each contributing small pieces of knowledge and building on the work of others. Although scientists and engineers might work alone or in small groups in a lab, if they want to contribute to their fields, they must convince readers that their findings are valid. For this reason, the ability to write clearly and persuasively is both necessary and valued in the sciences and engineering.

PERSUASION AND LAB REPORTS

Early in your science or engineering course work, you will likely be required to write lab reports presenting routine findings. That is, you will be asked to replicate studies and test hypotheses that have already been replicated and tested. The reason your instructor asks you to do such labs is to introduce you to the scientific method and teach you important lab skills you will need later when you *do* conduct original research.

Your written lab report is the primary evidence on which your audience will judge your credibility and skills as a researcher. Sloppy writing, poor design, and a lack of attention to the conventions of written English will suggest that you might also be a sloppy researcher, thus casting doubt on your whole report. If you fail to convince your audience of the value of your work, you might lose funding to continue.

At first glance, a lab report might appear to be an unadorned presentation of methods, data, and formulas. It isn't. It is a carefully crafted argument meant to persuade an audience

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to accept your findings and conclusions. You need to justify virtually everything you did in the lab or the field. Here are six questions that you need to answer to be persuasive:

- Why is this topic important?
- What have others already learned about the subject?
- What remains to be learned about the subject?
- Why are you using this methodology, as opposed to other methodologies, in carrying out the work?
- Why do you draw these inferences, as opposed to others, from the data you generated?
- What should be done next? Why?

These questions do not have only one correct answer. You have to make the case that you have done your work professionally and used good judgment—from the reading you did, to the research in the field or the lab, to the writing of the report. In other words, you have to be persuasive. In each section of your lab report, you must persuade your readers that you are a competent researcher who is familiar with your subject area and that you are presenting information that is both interesting and significant.

Because of the way people read lab reports, each section of the report must be persuasive. Although the report is organized as a single cohesive argument, most readers will not read it in a linear fashion, from start to finish. In fact, many readers will not read the whole report. They might begin with the title and abstract. If these two elements suggest that the report might be relevant and useful, they might skip to the end and read the conclusions. If the conclusions are persuasive, they might next read your introduction. If your introduction makes it clear that you are familiar with the field and know what you are doing, readers might then read the other sections of your report.

If English is not your first language, allow extra time to revise, edit, and proofread your lab reports carefully. You might also consider asking a native speaker of English to review them and point out areas where you could be clearer.

UNDERSTANDING THE PROCESS OF WRITING LAB REPORTS

Many scientists and engineers record their laboratory work in notebooks with numbered pages or use specialized software. These notebooks contain enough information for other researchers or colleagues to understand how the procedures were conducted, why the procedures were conducted, and what the writers discovered. Your instructor might ask you to keep a lab notebook.

Although lab notebooks can be useful in legal disputes over who was first to conduct an experiment or make a discovery, their main purpose is to serve as researchers' personal records. When researchers are ready to communicate their findings, they turn to their notebooks to write their lab reports. If you understand what information goes where in your lab report, you can plan ahead during your research.

The sections of a lab report do not need to be written in sequence. Some sections can be written early in the writing process, while some sections must wait until you finish your analysis of data. For example, although the title and abstract are often the first items to be read, they are usually the last items to be written. Likewise, it's easier to write your introduction after you have written your methods, results, and discussion. Only then will you have a clear idea of how you wish to introduce your argument.

UNDERSTANDING THE STRUCTURE OF THE LAB REPORT

Most lab reports have eight basic elements: title, abstract, introduction, materials and methods, results, discussion, conclusion, and references. Some lab reports have additional elements, such as acknowledgments and appendixes. Although each researcher or instructor might prefer a slightly different format and style for organizing and presenting information, most lab reports follow a common structure reflecting the scientific method valued by scientists and engineers for centuries. This structure is followed in most lab reports in which you test a hypothesis or attempt to answer a question. It might also be used in lab reports in which you merely follow a procedure and report your results.

If you are a student, be sure to follow your instructor's guidelines for the structure of your report. For example, some instructors prefer that you combine the results and discussion sections. In studies involving multiple procedures and generating large amounts of data, your instructor might prefer that you present one group of data and analyze it before you introduce the next group of data.

The following discussion focuses on writing lab reports for undergraduate science and engineering courses.

Title

The title should be informative enough to enable readers to decide whether the report interests them. When scientists and engineers use abstracting and indexing services, an informative title helps them locate the most relevant research for their needs and saves them time.

Write your title with your readers in mind. Use only words and abbreviations that are familiar to them. The keywords in your title should be the terms

commonly used by readers searching for information in your subject area. Keep in mind that because effective titles are specific, they tend to be long.

WEAK	Babbler Behavior
IMPROVED	Endocrine Correlates of Social and Reproductive Behaviors in a Group-Living Australian Passerine, the White-Browed Babbler
WEAK	New Technologies for Power Plants
IMPROVED	Evaluating New Instrumentation and Control Technologies for Safety-Related Applications in Nuclear Power Plants

Abstract

The abstract summarizes the entire report, mirroring its structure: introduction, methods, results, discussion, and conclusion. However, because of space limitations, each section is addressed in only a sentence or two. Because your abstract might be distributed more widely than your entire report, it should contain enough information so that your readers can quickly decide whether to locate and read the whole report. Readers of abstracts are most interested in what questions motivated your study (introduction), what answers you discovered (results), and what implications your findings have (conclusions). A well-written abstract can also meet readers' need to stay up-to-date on research findings without spending a lot of time doing so.

Most readers prefer *informative abstracts*, which present the major findings. Less popular is the *descriptive abstract*, a shorter form that simply states the topics covered in the report without presenting the important results or conclusions.

Introduction

The introduction is the section of the report in which you begin to establish that your work is relevant and significant. Here, you place your work in the broader context of your field by describing what hypothesis or question your study attempted to answer and why this question is important. The introduction should include a concise review of previous research relevant to your study and should describe how your study extends the knowledge in your field or addresses a weakness in previous studies. By placing your study in the context of current research, you establish the significance of your study. Provide just enough detail to help readers understand how your study contributes new information to the field and to communicate the purpose of your study.

If you think readers will need specialized knowledge or theoretical background to understand your study, define important terms and present theoretical concepts in this section. Use your understanding of your audience to help you determine how much theoretical background to include. Often, instructors

In This Book

For more about informative and descriptive abstracts, see Ch. 19, p. 524.

In This Book

For more about definitions, see Ch. 20, p. 564.

will ask you to write for an audience of classmates who are familiar with the general subject area but not familiar with the specific lab you are reporting.

Your introduction should also briefly describe your methods: what you did to find an answer to your research question. Although your methods section provides a detailed account of your approach, your introduction should persuade your readers that your methods are appropriate given what has been done in previous studies.

If you include equations in the introduction, adhere to the conventions presented in the Guidelines box.

Guidelines

Writing Equations

When you write equations, follow these four suggestions:

- ▶ **Use an equation editor, or write equations by hand.** Some word processors include equation editors that allow you to insert mathematical symbols, Greek letters, integrals, and fractions. Unless your word processor includes an equation editor or you have access to a commercially available equation editor, do not try to approximate an equation with standard text and punctuation. Many instructors allow students to handwrite equations on lab reports after they have been printed. Check with your instructor.
- ▶ **Place each equation on a separate line.** Because equations often involve raised or lowered text as well as odd-shaped symbols, equations written in the body of your text sometimes create awkward line spacing, making your text difficult to read. Start each equation on a new line, with plenty of white space surrounding the equation.
- ▶ **Number each equation.** Label each equation with a number in ascending order. Refer to the equation by number in your text: “The line represents the theoretical curve based on equation 1.”
- ▶ **If appropriate, omit routine equations.** If your instructor’s guidelines permit it, omit basic equations with which your readers are familiar, especially in advanced lab reports. Starting at too basic a level will make your report too long and will interrupt your reader’s train of thought.

Materials and Methods

Your purpose in writing the materials and methods section (also called *equipment and methods*) is to convince your readers that your approach was appropriate for the question you hoped to answer, that you conducted your experiment carefully, and that your results are credible. Your methods should be detailed enough so that another researcher could perform the same experiment using the same materials and methods. This characteristic, called *reproducibility*, is one of the foundations of the scientific method.

Most researchers begin this section with a description or list of materials. Include any human subjects, organisms, chemicals, tools, and measuring devices. Your description of materials might also include sketches, diagrams, schematics, or photographs or drawings of equipment and how you set up that equipment.

Next, describe your procedures. Include relevant conditions such as temperatures, observation dates and times, instrument settings and calibration, and site locations for field studies. Also indicate whether you encountered any difficulties with standard procedures and how you modified your approach to address those difficulties. Finally, if you had to make subjective decisions in collecting data, explain your choices. Although your audience might want to repeat your experiment, some instructors prefer that you avoid numbered, step-by-step instructions, presenting instead an organized description of what you did in sufficient detail so that readers can understand your process. Organize this section chronologically, in the order in which you conducted your experiment. Include only those procedures that led to results that you present in the report.

When providing details, assume your readers are unfamiliar with the particulars of your experiment but know enough about lab procedures to evaluate your efforts. Your credibility rests on your ability to explain clearly what you did and why.

Although writing in the active voice (“I collected three soil samples”) is generally more concise, clearer, and more interesting than writing in the passive voice (“Three soil samples were collected”), the sciences and engineering have a long tradition of using the passive voice. The passive voice emphasizes the material studied and the actions taken, deemphasizing the role of the researcher. However, more and more publications in the sciences and engineering are using the active voice. Check with your instructor to learn which style he or she prefers.

In This Book

For more about active and passive voice, see Ch. 10, p. 241.

Results

Think of the results section as an opportunity to present the evidence you will use to support the claims you will make in your discussion. How persuasive this evidence is depends on how successfully you present it to your readers.

Your research will likely produce raw data in the form of numbers. In the results section, your task is to summarize the data relevant to the question or hypothesis you discussed in your introduction. Omit irrelevant data, but explain why you are doing so. When summarizing your data, help readers understand your findings by emphasizing major trends, magnitude of values, associations, patterns of statistical significance, and exceptions. Typically, results are presented in the same order in which they are described in the methods section, but you can change the order if you have a good reason to do so. For instance, you might use the more-important-to-less-important organizational pattern by beginning with the set of data that most clearly supports or negates your hypothesis.

In This Book

For more about organizational patterns, see Ch. 7, p. 155.

Be sure your data are complete and organized. For each major trend or pattern, begin with a statement of your findings and then support your statement with data. Depending on the type of data, you might present your supporting evidence with a combination of text and graphics (such as tables, graphs, and diagrams). If you include graphics, refer to them in the text with a statement explaining their significance.

WEAK	Results of bacteria sampling are shown in Table 1.
IMPROVED	As Table 1 shows, the rate of bacteria growth increased as ground-water temperature increased.

In the results section, avoid interpreting or explaining your data. In addition, avoid speculating about problematic or atypical data. Save those explanations for the next section, the discussion.

ETHICS NOTE

Presenting Data Honestly

The hallmark of good science is the honest and complete presentation of results, even if some of those results undercut the hypothesis. It is unethical to omit from your results section data that do not support your hypothesis. For instance, your hypothesis might be that as temperature increases, the growth rate of the organism you are studying increases. However, some of your data show that, above a certain temperature, the growth rate remains steady. You have replicated the procedure several times and gotten the same results, but you can't explain it. What do you do? You present the data and offer your best explanation, but you also state clearly that you can't fully explain the data. In other words, you tell the truth.

Likewise, it is unethical to choose a type of graphic that obscures negative findings or to design a graphic so that data points are omitted. For example, you use a spreadsheet to record your data about temperature and growth rate. To present these data in a graphic, such as a line graph, you must select the cells you want to be represented in the graph. It is easy to omit cells that include negative or inexplicable findings. However, doing so would be dishonest and therefore unethical—an obvious violation of the norms of scientific practice. Inconsistent data or contradictory results often lead researchers to examine their approach and assumptions more carefully, which can lead to breakthroughs in the understanding of a field.

Remember that inconsistent data or contradictory results do not necessarily mean that you performed the lab unprofessionally. They simply mean that reality is complicated. Readers will accept that. What they won't accept is a misleading or dishonest lab report.

Discussion

Sometimes called *analysis*, the discussion section is where you interpret your results: that is, you answer the question or support (or argue against) the hypothesis you discussed in your introduction.

In This Book

For more about explaining the significance of graphics, see Ch. 12, p. 306.

In organizing the discussion section, start by presenting the most important findings, which might include major trends, magnitude of values, associations, patterns of statistical significance, and exceptions. Focus on offering explanations for your findings. Support your argument with data from your results, and do not hesitate to discuss problematic data or “failed” experiments. Sometimes a negative result or a failure to find a significant difference helps researchers create new knowledge in your field. If your results do not support your hypothesis, argue for rejecting your hypothesis. If appropriate, support your argument with references to the work of other researchers, describing the degree to which your results match the results of previous studies. If your findings do not match the results of previous studies, suggest possible explanations for the differences.

Conclusion

Summarize the main points covered by your report in a concise paragraph or two. Begin by reviewing the purpose of your lab and the hypothesis (or hypotheses) you tested. Next, summarize the most important implications of your findings. The conclusion is your final opportunity to persuade your audience of the significance of your work. Do not introduce any new information or analysis in this section.

Acknowledgments

If you received assistance from colleagues during the study or while preparing the lab report, identify and thank these people in an acknowledgments section. If your study was supported by funding, list the source of financial support in this section as well. Figure 18.1 shows a concise acknowledgments section. Typically, scientists and engineers ask permission of the people they wish to thank before including them in the acknowledgments.

Use we if the report was written by more than one author. Use I if you are the sole author.

Acknowledgments

We wish to express our appreciation to the Robert Wood Johnson Foundation for their generous support of this study. We also thank Dr. Mark Greenberg, Dr. David Jones, and Dr. Eileen Whitney for their valuable comments about an early draft of this report.

Figure 18.1 Acknowledgments Section

References

List all the references you cited in your lab report. (Do not list any sources that you consulted but did not cite.) Most of your citations will appear in the introduction, materials and methods, and discussion sections. However, check the other sections as well to make sure you include *all* sources cited in your report. Most scientists and engineers follow a particular documentation system for their discipline (see Appendix, Part B). Check your instructor's preferences before selecting a documentation system.

Appendixes

An appendix, which follows the references, is the appropriate place for information that is not needed to understand the body of your lab report. For example, an appendix might include long tables of measurements, specialized data, logs, analyses, or calculations.

Following the basic structure of a lab report discussed here will help your readers manage the large quantities of information produced in science and engineering. The title and abstract will help readers quickly decide if a report is relevant. The introduction and conclusion will provide the context for the study and describe the most important results of the study. If readers are persuaded to read further, the methods, results, and discussion will provide the detailed information they seek.

UNDERSTANDING THE ROLE OF SCIENCE AND ENGINEERING ARTICLES

If you are a science or engineering student, once you enter the working world you will have many opportunities to write about your field. Rather than writing for an audience of teachers, you will write for a professional audience of supervisors, professional boards, government officials, clients, other scientists or engineers, and potential funding sources. Your reports might be read only by people in your organization, or you might have a global audience.

Both researchers and practitioners sometimes develop their lab reports into articles for publication in professional journals. Some companies offer a monetary bonus to employees who publish articles in scholarly journals. These articles help the companies gain recognition as leaders in innovation and help the researchers demonstrate their ability to contribute new ideas to the field.

Articles in the sciences and engineering are often organized like lab reports. However, rather than following an instructor's preferences, researchers in the workplace follow the *author guidelines* of the journal to which they will submit their article for publication. Figure 18.2 on page 500 shows author guidelines for preparing a manuscript.

This page provides prospective authors with information on how to prepare a manuscript for submission to IEEE journals. IEEE (which originally stood for Institute of Electrical and Electronics Engineers, Inc.) is the world's leading professional association for the advancement of technology. With 395,000 members (including 90,000 student members), IEEE publishes almost 150 journals and magazines.

Instructions explain how to number manuscript pages and graphics, how to format papers, what to include in an abstract, and how to document references.

IEEE publications require a specific documentation style and format. Sample formats for common types of references in this field are shown.

The more closely the article follows the author guidelines, the more likely it is to be accepted for publication and the more quickly it will be available to readers.

in the subjects being treated. The papers are of long-range interest and broad significance. Applications and technological issues, as well as theory, are emphasized. The topics include all aspects of electrical and computer engineering and science. From time to time, papers on managerial, historical, economic, and ethical aspects of technology are published. Papers are authored by recognized authorities and reviewed by experts. They include extensive introductions written at a level suitable for the nonspecialist, with ample references for those who wish to probe further. Several issues a year are devoted to a single subject of special importance.

Prospective authors, before preparing a full-length manuscript, are urged to submit a proposal containing a description of the topic and its importance to PROCEEDINGS readers, a detailed outline of the proposed paper and its type of coverage, and a brief biography showing the authors' qualifications for writing the paper. A proposal can be reviewed most efficiently if it is sent electronically to the Managing Editor at j.calder@ieee.org. If the proposal receives a favorable review, the author will be encouraged to prepare the paper for publication consideration through the normal review process.

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IV. GENERAL MANUSCRIPT PREPARATION

A. Consecutive Numbering of Parts

All manuscript pages, footnotes, equations, and references should be labeled in consecutive numerical order. Illustrations and tables should be cited in text in numerical order. See Section IV-G of this guide.

B. Manuscript Formats

See copies of the publications for examples of proper paper formats and requirements for the types of papers accepted for each publication (i.e., Full Papers, Letters, Short Papers, etc.).

Full length papers generally consist of the title, byline, author affiliation, footnote (including any financial support acknowledgment), index terms, abstract, nomenclature if present, introduction, body, conclusions, reference list, list of figures and table captions, and original figures and tables for reproduction. A paper may also include appendixes, a glossary of symbols, and an acknowledgment of nonfinancial support.

C. Abstract

The abstract should be limited to 50–200 words and should concisely state what was done, how it was done, principal results, and their significance. The abstract will appear later in various abstracts journals and should contain the most critical information of the paper.

D. References

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in text, not in alphabetical order. List only one reference per reference number.

In text, each reference number should be enclosed by square brackets. Citations of references may be given simply as "in [1] ...", rather than as "in reference [1] ...". Similarly, it is not necessary to mention the authors of a reference unless the mention is relevant to the text. It is almost never useful to give dates of references in text. These will usually be deleted by Staff Editors if included.

Footnotes or other words and phrases that are not part of the reference format do not belong on the reference list. Phrases such as "For example," should not introduce references in the list, but should instead be given in parentheses in text, followed by the reference number, i.e., "For example, see [5]."

Sample correct formats for various types of references are as follows.

Books:

- [1] G. O. Young, "Synthetic structure of industrial plastics," in *Plastics*, 2nd ed., vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.
- [2] W.-K. Chen, *Linear Networks and Systems*. Belmont, CA: Wadsworth, 1993, pp. 123–135.

Periodicals:

- [3] J. U. Duncombe, "Infrared navigation—Part I: An assessment of feasibility," *IEEE Trans. Electron Devices*, vol. ED-11, pp. 34–39, Jan. 1959.
- [4] E. P. Wigner, "Theory of traveling-wave optical laser," *Phys. Rev.*, vol. 134, pp. A635–A646, Dec. 1965.
- [5] E. H. Miller, "A note on reflector arrays," *IEEE Trans. Antennas Propagat.*, to be published.

Articles from Conference Proceedings (published):

- [6] D. B. Payne and J. R. Stern, "Wavelength-switched passively coupled single-mode optical network," in *Proc. IOOC-ECOC*, 1985, pp. 585–590.

Papers Presented at Conferences (unpublished):

- [7] D. Ebehard and E. Voges, "Digital single sideband detection for interferometric sensors," presented at the 2nd Int. Conf. Optical Fiber Sensors, Stuttgart, Germany, Jan. 2–5, 1984.

Standards/Patents:

- [8] G. Brandli and M. Dick, "Alternating current fed power supply," U.S. Patent 4 084 217, Nov. 4, 1978.

Technical Reports:

- [9] E. E. Reber, R. L. Mitchell, and C. J. Carter, "Oxygen absorption in the Earth's atmosphere," Aerospace Corp., Los Angeles, CA, Tech. Rep. TR-0200 (4230-46)-3, Nov. 1968.

Figure 18.2 Excerpt from IEEE Author Guidelines

Source: IEEE, 2007 <www.ieee.org/portal/cms_docs_iportals/iportals/publications/authors/transjn/auinfo07.pdf>.

INTERACTIVE SAMPLE DOCUMENT

Evaluating Lab Reports

The grading sheet included here is used by an engineering professor to evaluate the lab reports written by students in his Principles of Environmental Engineering lab course. One of the labs in that course requires students to evaluate the efficiencies of several wastewater-treatment strategies and then determine whether the strategies can meet or exceed proposed discharge-effluent limits. The questions in the margin ask you to consider the grading sheet based on the discussion of lab reports in this chapter.

SOLIDS REPORT GRADING SHEET

Total: /100		Student Names:
Points Earned	Points Possible	Report Section
	2	Cover (1) and title page (1)
	10	Abstract, including the following:
		Problem statement (3)
		Methods used (2)
		Results (2)
		Conclusions/Recommendations (3)
	6	Indices (generated by the software), including the following:
		Table of Contents (2)
		List of Figures (2)
		List of Tables (2)
	12	Summary includes the following:
		Evaluation of results (6)
		Answers to questions that management would be concerned with (6)
	10	Introduction includes the following:
		Background information (2)
		Problem/purpose statement (2)
		Plan/procedures for testing; outline for selection/solution (2)
		Description of rest of report (2)
		Definition of terms/limitations/assumptions (2)
	5	Procedures correctly name the tests and reference the procedures.
	10	Results summarize final results in paragraph form and include tables or graphs as appropriate. Results reference raw data and all example calculations.

1. In what ways does this grading sheet follow the basic format of a lab report discussed in this chapter? In what ways does it not follow the basic format?
2. In what ways do you agree or disagree with the relative importance placed on report elements in this grading sheet?
3. If the instructor distributed this grading sheet at the start of a lab assignment, how might students in the lab use it to help them write their lab reports?

Points Earned	Points Possible	Report Section
	10	Discussion correctly interprets results and discusses their meanings; correctly discusses acceptable/typical/reasonable ranges and explains unexpected results.
	5	References (complete and correctly using CSE style)
	10	Appendixes
	10	Sample calculations presented accurately (5 each)
	10	Writing skill and format:
		Correct spelling and grammar (4)
		Consistency of headings, capitalization, bolding, italicization, table and graph appearance, etc. (2)
		Correct numbering and titling of tables (2)
		Correct numbering, titling, and design of graphs (axes labeled correctly, clear legends) (2)
	100	TOTAL POINTS


On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 18 on <bedfordstmartins.com/techcomm>.

When a scientist or engineer submits an article for publication, the argument and its supporting evidence are carefully evaluated by other professionals in the field. This type of evaluation is called *peer review*. Peer reviewers make suggestions for revision and, ultimately, recommend whether the editor of the journal should accept the article for publication. The review process can involve extensive revisions, multiple drafts, and even disagreements. When the peer reviewers agree that the article represents a persuasive scientific argument and that it offers significant new insights, the article is ready for copy editing and eventual publication in the journal. The entire process, from initial submission to publication, can last several months to well over a year.

An increasing number of journals now allow prepublication. That is, they permit an author to post a draft of an article either on the journal's own Web site or on some other site, enabling other researchers to read the draft and offer comments or suggest revisions. Then, the author can revise the article and submit it for publication by the journal. This practice is meant to take advantage of the expertise of a broad community of readers while maintaining the rigor of refereed publication.

SAMPLE LAB REPORT

The following lab report (adapted from Thomford, 2008) was written for an undergraduate human-physiology lab experiment.

Bile Salts Enhance Lipase Digestion of Fats

Abstract

Bile salts, which are secreted by the gall bladder into the small intestine, play an important role in the digestion of dietary fats by pancreatic lipase. The digestion of milk fat by pancreatic lipase in the presence and absence of bile salts was tested to demonstrate whether bile salts help pancreatic lipase digest fat more efficiently. Based on pH measurements at four time intervals, the production of fatty acids occurred most quickly in the test group containing bile salts and pancreatic lipase. In the test group containing only bile salts, no fat digestion occurred. Bile salts enhanced the rate of lipase-fat digestion but did not digest fats alone. This lab shows that bile salts act only to emulsify fats, enabling pancreatic lipase to digest fats more efficiently.

Keywords in the title reflect the major focus of the lab.

The abstract concisely communicates the purpose of the lab, the approach, the results, and the significance of the findings. Some instructors require an abstract, and some do not.

1

Introduction

The pancreas secretes various enzymes into the small intestine. One of these enzymes, pancreatic lipase, digests dietary fats into products such as glycerol and fatty acids (Mader, 2007). However, fat is insoluble in water-based *chyme* (the liquefied food processed by the stomach), and in the intestines the fats cling together, providing little surface area for attachment of the enzymes. This prolongs the time it takes the lipase to digest the fat.

In order to speed up the fat digestion process, bile salts, secreted by the gall bladder into the small intestine, act as a detergent that breaks up the fat droplets in the watery chyme, thus increasing the surface area for enzymatic digestion by lipase (Martini & Timmons, 2005). In other words, bile is an emulsifying agent. Emulsification of fats is achieved upon exposure to bile salts, which allows pancreatic lipase to digest the fat more efficiently. To demonstrate that bile salts enhance the digestion of fats, the digestion of milk fat by pancreatic lipase in the presence and absence of bile salts was tested.

Headings reflect common elements in a lab report and help communicate the organization of the report.

Because the discussion moves from general to specific, readers are introduced to background concepts necessary to understand the rest of the report.

Statements are supported by references to research relevant to the lab.

The purpose of the lab is clearly stated.

Materials and Methods

Methods are detailed enough so that another researcher could perform the same experiment using the same methods.

Methods include relevant procedures, such as the type of pH paper used, incubation temperature, and testing intervals. Note that the entire materials and methods section is written in the past tense.

Three groups of test tubes were set up; three replicates were set up in each group in order to provide an adequate sample size. To each group of three test tubes, the following were added:

Group 1: 3.0 ml of whole milk + 5.0 ml of water + 3 grains of bile salts

Group 2: 3.0 ml of whole milk + 5.0 ml of pancreatin solution (*see below for concentration*)

Group 3: 3.0 ml of whole milk + 5.0 ml of pancreatin solution + 3 grains of bile salts

Dehydrated pancreatin, derived from pig pancreas, was reconstituted in water (@ 1g/100ml) immediately before use. This solution contained the pancreatic lipase enzyme that was used to digest the milk fats. Dried grains of bile salts, derived from the pig gall bladder, were dissolved directly in each test tube.

To determine the increase in fatty acid end-products during the digestion of fats, the pH of the incubated solutions (as fatty acid concentration increases, pH decreases) was tested. The pH of each test tube was determined at time zero (beginning of the experiment) using "short range" pH paper (reads pH 6–10). The test tubes were incubated at 37°C for 1 hour. During that hour, the pH was tested every 20 minutes.

3

Results

The pH did not decrease during the 60-minute incubation period in the negative control group 1, which contained only milk and bile salts (Table 1). In groups 2 and 3, the pH did decrease as the digestion of fats progressed, and fatty acids built up in the test tubes. After 20 minutes, the pH decreased in group 2 from 8.5 to 7.5, while there was a greater change in tube 3 (from pH 8.5 to 7.0). At 40 minutes incubation, the pH of the solutions in both groups 2 and 3 had dropped to 6.5 and did not decrease further at 60 minutes.

Table 1. Mean* pH of whole milk during incubation with bile salts and/or pancreatin

Time (minutes)	Group 1 (+ B.S. ¹)	Group 2 (+ pancreatin)	Group 3 (+ B.S. + pancreatin)
0	8.3	8.5	8.5
20	8.4	7.5	7.0
40	8.3	6.5	6.5
60	8.3	6.5	6.5

*Mean pH of three sample tubes per group

¹Bile salts

The data for all three groups are visually plotted in Figure 1.

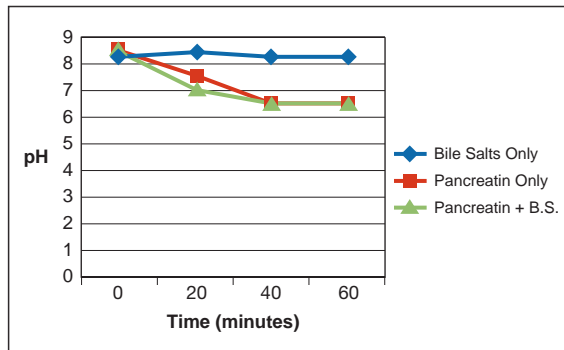


Figure 1. Mean pH of whole milk during incubation with bile salts and/or pancreatin

Data are presented not only in a table but also in the text. Both the table and the figure are referenced in the text. Note that the results are not interpreted in this section of the lab report.

Note that the entire results section is written in the past tense.

The table and figure are labeled with informative titles. Each graphic clearly presents a manageable amount of information.

The discussion explains the purpose of the lab: to demonstrate that bile salts enhance the digestion of fats.

Discussion

The discussion also explains why the experiment yielded the results that it did. Relevant research findings are referenced to support the writer's explanations.

The negative control tube containing only bile salts and milk did not exhibit a pH change. Therefore, it was concluded that bile salts alone did not digest milk fats. Digestion of milk fats occurred in tubes 2 and 3, based on the observation of fatty acid by-product accumulation, as measured by a decrease in pH. However, the production of fatty acids occurred faster in group 3, as evidenced by the data at 20 minutes. This finding suggests that something present in the solution of group 3 aided in the digestion of the fats. Since the concentration of pancreatin was identical in groups 2 and 3, the addition of bile salts must have contributed to the digestion of the fats by breaking up those fat droplets into smaller particles, which increased the availability of substrate in group 3. The action of bile salts enhanced the rate of the lipase-fat digestion. The data from group 1, as a negative control, demonstrates that bile salts do not digest fats; therefore, bile salts must act only to emulsify the fats, thus enabling pancreatic lipase to act more efficiently. This conclusion is also supported by work done by Patton and Carey (1979) and reported by Bowen (2007).

The final paragraph discusses the ambiguity of some of the results and suggests further experiments to address new questions raised by the current experiment.

It was also determined that either the enzymatic activity of pancreatic lipase is inhibited below pH 6.5, or the fat substrates were depleted by 40 minutes in tubes 2 and 3, since there was no change in pH between 40 and 60 minutes. Further experimentation will reveal which of these two possibilities occurred. Fox (2008) reported that the optimal activity of pancreatic lipase occurs at a pH of 8. Therefore, it is most likely that the lack of change in pH between 40 and 60 minutes in tubes 2 and 3 was due to the fact that the accumulation of fatty acid end-products produced an excessively acidic environment (pH 6.5 at 40 minutes), thereby inhibiting further enzyme activity. This may suggest that pancreatic lipase is denatured in weakly acidic conditions between pH 7.0 and 6.5. However, if this is not the case, an alternative conclusion may be that depletion of substrate occurred during the experimental period. This experiment should be re-run using cream or vegetable oil, both of which contain significantly more fat than whole milk.

5

References

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- Mader, S. (2007). *Human biology* (10th ed.). New York, NY: McGraw-Hill Science/Engineering/Math.
- Martini, F., & Timmons, M. (2005). *Human anatomy* (5th ed.). San Francisco, CA: Benjamin Cummings.
- Patton, J., & Carey, M. (1979). Watching fat digestion. *Science*, *204*, 145–148.

The references contain all the works cited in the body of the report. References are a mix of up-to-date sources and older but still relevant research. References follow American Psychological Association (APA) format.

Writer's Checklist

Does the title

- convey the major focus of your study? (p. 493)
- use words and abbreviations familiar to your readers? (p. 493)
- use keywords that readers would likely use to search for research in your subject area? (p. 493)

Does the abstract

- state the problem or question addressed by your study? (p. 494)
- summarize your approach? (p. 494)
- summarize key results and conclusions? (p. 494)
- briefly discuss the implications of your study? (p. 494)
- make sense to readers who have not read your entire report? (p. 494)

Does the introduction

- concisely review research relevant to your study? (p. 494)
- explain how your study contributes to the field? (p. 494)
- state the purpose of your study? (p. 494)
- briefly describe your approach? (p. 495)

Does the materials and methods section

- describe the materials and equipment used (if appropriate)? (p. 496)
- describe your procedures with enough detail for readers to understand what you did? (p. 496)
- address any problems encountered and describe your solutions? (p. 496)
- include a description and rationale for any subjective measurements? (p. 496)
- present information in a logical order? (p. 496)

Does the results section

- summarize all the data relevant to addressing the question or hypothesis you discussed in your introduction? (p. 496)
- exclude data not applicable to your argument? (p. 496)
- emphasize important trends and patterns? (p. 497)
- use text and graphics to present data concisely? (p. 497)

- introduce and explain (if appropriate) each graphic in your text? (p. 497)
- avoid interpreting, analyzing, and speculating about data? (p. 497)

Does the discussion section

- address the question or hypothesis discussed in your introduction? (p. 497)
- address the major trends, magnitude of values, associations, patterns of statistical significance, and exceptions in your study? (p. 498)
- present plausible explanations for your results? (p. 498)
- support your argument with data from your results? (p. 498)
- compare and comment on relevant work of other researchers? (p. 498)
- comment on problematic or “negative” results (if appropriate)? (p. 498)

Does the conclusion section

- briefly review the purpose of the lab? (p. 498)
- summarize implications of the study? (p. 498)
- avoid introducing new information? (p. 498)


Does the acknowledgments section

- thank the people who helped you conduct the lab or write the lab report? (p. 498)
- identify any sources of financial support for the study? (p. 498)
- identify only those people and organizations who have specifically given permission to be listed? (p. 498)

Does the references section

- identify each source cited in your lab report? (p. 499)
- contain complete and accurate information for each citation? (p. 499)
- follow your instructor's preferred format for references? (p. 499)
- Do the appendixes contain information too bulky for the body of your report? (p. 499)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1. INTERNET EXERCISE** Using an Internet search engine, locate three or four sample lab reports. In a brief memo to your instructor, compare and contrast the basic elements of each report. In what ways do they follow a similar format? If the reports differ in format, why do you think the authors chose to present information in the manner they did?
- Locate a word-processing program with an equation editor, or download a free equation editor from the Internet. Practice creating four to six equations you might use in your field. If you do not regularly use equations, copy a few equations from science or math textbooks. In a brief memo to your instructor, evaluate the equation editor's ease of use.
- Although you are likely to be unfamiliar with the subject of the following abstract (Zhang, Liu, & Li, 2009), the authors have made it possible for you to understand the logic of their article. In a brief memo to your instructor, identify the concept that the authors wished to study, the methods they used, their principal findings, and their recommendations. What techniques did the authors use to make it possible to understand their logic? (Sentence numbers have been added for convenience.)

Ecotourism and Nature-Reserve Sustainability in Environmentally Fragile Poor Areas: The Case of the Ordos Relict Gull Reserve in China

(1) This article explores the applicability of the conventional wisdom that economic growth is paramount

to environmental sustainability by examining ecotourism and nature-reserve sustainability in environmentally fragile poor regions. (2) The discussion focuses on the Ordos Relict Gull Reserve in the Inner Mongolia region of China. (3) The study evaluated reserve records of water and soil conditions and interpreted satellite images to identify lake-level and land-cover changes at the reserve. (4) The Ordos Relict Gulls seem to have abandoned the reserve following ecotourism development and established new colonies in northern Shaanxi. (5) We argue that ecotourism—especially ersatz ecotourism—in certain nature reserves is an unsustainable practice rooted in the conventional wisdom that economic development spurs environmental protection as suggested by the environmental Kuznets curve (EKC). (6) The article concludes that environmental protection rather than economic growth is of vital importance in nature-society interactions in environmentally fragile poor areas. (7) We call for prohibitions on tourism in such nature reserves to enhance sustainability.

- 4. INTERNET/GROUP EXERCISE** Form groups of students from different majors. Have each member locate author guidelines for a journal in his or her field. Often, author guidelines can be found on the Web site for a journal or in the back of journal issues. As a group, compare the guidelines. In what ways are the guidelines similar? How are they different? Present your results in a memo to your instructor.

Case 18: Introducing the Scientific Method Through a Lab Report

Background

You are a biology major at the University of Minnesota. Because you have a very good undergraduate record, you were invited to be a lab assistant in GC1135: Human Anatomy and Physiology, the first course in anatomy taken by students from many majors across the campus. GC1135 has a laboratory component. Your job is to assist the lab instructor.

At the first organizational meeting for new lab assistants, the course instructor, Dr. Murray Jensen, discusses the philosophy, the methods, and the materials that make

up the lab component. He distributes a sample lab report (Document 18.1).

"I use this in the first meeting," he explains. "Believe it or not, a lot of the students in 1135 have never taken a lab course in high school, or their high school labs were so different from the way we do them here that they don't really understand what we're asking them to do. So I use this sample lab report as a bridge from high school to college-level labs."

As you look at the sample lab report, you remember reading about the topic: the belief during the seventeenth

century that maggots spawn spontaneously on rotten meat.

“In this lab report, I’m trying to reinforce some basic principles of the scientific method that underlie all lab work, as well as start to establish principles of writing up labs,” Dr. Jensen continues. “But as you can see, this report exemplifies only some of the components and principles of a college-level lab report. So what I want to do is create a handout that explains what this lab report *does* and what it *doesn’t do*. I’d like to package this handout with the sample lab report so we don’t have to spend class time discussing it.”

“How do you want us to write this handout?” you ask.

“I haven’t really thought it through,” Dr. Jensen says.

“It’s addressed to beginning students, so don’t assume anything about what they know—either about the experi-

ment or about college-level labs. But organize it however you want. You can write the material so that students read it before they read the sample lab report, or after. Or you can put the information in marginal comments. Do whatever you think will work best.”

Your Assignment

Write a handout explaining what the sample lab does and does not do. In this handout, help students understand the objective of college-level labs and how lab reports relate to this objective. Describe the ways in which students will use strategies demonstrated in this sample lab when they write their own labs in this course. Briefly describe elements that they will write but that are not shown in this sample lab. (Annotate the sample lab if you wish.)

Document 18.1 Sample Lab Report

Source: Jensen, 2010

<<http://msjensen.cehd.umn.edu/1135/Worksheets/lab1.pdf>>.

Redi’s Spontaneous Generation Experiment

Introduction

Until the mid-1800s, most people believed that some forms of life arose through spontaneous generation. Spontaneous generation is essentially life arising from non-living things. People often noticed this phenomenon in decaying matter. In this time period, people believed that maggots arose from rotting meat through spontaneous generation. Francesco Redi was one of the first scientists to methodically test this idea, using the scientific method, in 1668. Redi’s hypothesis was that flies laid eggs on the rotting meat, and maggots developed from those eggs. The purpose of our experiment was to test this same principle of spontaneous generation. Like Redi, we hypothesized that maggots on meat come from fly eggs, not spontaneous generation. Therefore, we expected to see maggots only on meat that flies had access to, and we expected not to see any maggots on meat that flies could not land on.

Methods

To test our hypothesis, we set up an experiment like the one Redi carried out in 1668. We took three 1000 L glass beakers and put two 2-inch cubes of raw beef in the bottom of each beaker. The beef had been purchased 1 week before the experiment was set up, and had been refrigerated until the setup day. We then covered one beaker with a thin layer of gauze, which acted like fine netting, and secured the gauze with a rubber band. We covered the second beaker with plastic wrap, and left the top of the third beaker open. We set up five replicates of this experiment, so there were five of each type of beaker in total.

We let the beakers sit at room temperature for two weeks, making observations once each day to check for maggots. Each day, we made observations between the hours of 12:00 and 13:00. We looked at the meat in each beaker and simply recorded whether or not we saw maggots, and where the maggots were in the beaker (on the meat, on the sides of the glass, etc.).

Our independent variable in this experiment was the beaker covering. The control, therefore, was the beaker with no covering. We compared the results of the gauze and plastic wrap beakers to the control beaker. Our dependent variable was the presence or absence of maggots.

Results

We found that the beakers with no covering all had maggots on the meat and in the bottom of the beaker. The beakers covered in plastic wrap had no maggots at all. Of the beakers covered in gauze, some had no maggots at all and some had a few maggots on top of the gauze (Table 1). The number of maggots on top of each gauze-covered beaker was only about one fourth the number found in each uncovered jar. During a few observations, we saw flies crawling on the meat in the uncovered beakers.

Table 1. Presence or absence of maggots

	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5
Gauze	+ (on gauze)	0	+ (on gauze)	+ (on gauze)	0
Plastic Wrap	0	0	0	0	0
No Cover	+	+	+	+	+

+ = maggots present

0 = no maggots

Discussion

Our results did support our hypothesis. Maggots only appeared on the meat when the beaker was left uncovered. This tells us that maggots do not arise from the meat due to spontaneous generation. If they did, we would have seen maggots even in the beakers covered in plastic wrap.

The gauze-covered beakers showed interesting results, also. It seems that the flies tried to get to the meat in those jars, as the scent of the meat could travel through the gauze. The flies walked on the gauze and laid eggs there, but could not get to the meat. This is further reason to believe that maggots come from fly eggs, and not from spontaneous generation.

One problem with the setup of this experiment was that the plastic wrap, over time, loosened a bit around the rim of the beaker. We had to check this every day to ensure a tight seal. It is possible that, if left unchecked, this could have altered our results.

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on bedfordstmartins.com/techcomm.

CHAPTER **19**

Writing Recommendation Reports



Zilvinas Narvydas/Alamy.

What should we do next?

When the London Millennium Footbridge across the River Thames opened in 2000, it was a big hit. With some 2,000 people on the bridge, it began to sway, causing what engineers called *synchronous lateral excitation*: when the bridge swayed, people on the bridge began to sway in rhythm as they walked, which amplified the movement. Three days later, the bridge, newly nicknamed the Wobbly Bridge, was closed for study and repair. Engineers studied two options for fixing the problem: increasing the stiffness of the bridge or increasing its damping. Eventually, they wrote a report recommending the installation of 89 dampers, shown in the photo, to control horizontal and vertical movement. The bridge reopened in 2002, but Londoners still call it the Wobbly Bridge.

Chapter 17 discussed informational reports: those in which the writer's main purpose is to present information. This chapter discusses recommendation reports. A *recommendation report* also presents information but goes one step further by offering suggestions about what the readers ought to do next.

Here are examples of the kinds of questions a recommendation report might address:

- *What should we do about Problem X?* What should we do about the synchronous lateral excitation on the bridge?
- *Should we do Function X?* Although we cannot afford to reimburse tuition for all college courses our employees wish to take, can we reimburse them for classes directly related to their work?
- *Should we use Technology A or Technology B to do Function X?* Should we buy several high-output copiers or a larger number of low-output copiers?
- *We currently use Method A to do Function X. Should we be using Method B?* We sort our bar-coded mail by hand; should we buy an automatic sorter?

Each of these questions can lead to a wide variety of recommendations, ranging from “do nothing” to “study this some more” to “take the following actions immediately.”

Understanding the Role of Recommendation Reports 514

Using a Problem-Solving Model for Preparing Recommendation Reports 514

Identify the Problem or Opportunity 516

Establish Criteria for Responding to the Problem or Opportunity 516

Determine the Options 516

Study Each Option According to the Criteria 517

Draw Conclusions About Each Option 518

Formulate Recommendations Based on the Conclusions 519

Writing Recommendation Reports 519

Writing the Body of the Report 521

Writing the Front Matter 523

Writing the Back Matter 530

Sample Recommendation Report 531

UNDERSTANDING THE ROLE OF RECOMMENDATION REPORTS

In This Book

For more about proposals and progress reports, see Ch. 16 and Ch. 17, p. 470.

A recommendation report can be the final link in a chain of documents that begins with a proposal and continues with one or more progress reports. This last, formal report is often called a *final report*, *project report*, *recommendation report*, *completion report*, or simply a *report*. The sample report beginning on page 532 is the recommendation report in the series about clickers at CMSU presented in Chapters 16 and 17.

A recommendation report can also be a freestanding document, one that was not preceded by a proposal or by progress reports. For instance, you might be asked to recommend whether your company should offer employees comp pay (compensating those who work overtime with time off) instead of overtime pay. This task would call for you to research the subject and write a single recommendation report.

Most recommendation reports discuss questions of feasibility. *Feasibility* is a measure of the practicality of a course of action. For instance, a company might conduct a *feasibility study* of whether it should acquire a competing company. In this case, the two courses of action are to acquire the competing company or not to acquire it. Or a company might do a study to determine which make and model of truck to buy for its fleet.

A feasibility report is a report that answers three kinds of questions:

- *Questions of possibility.* We would like to build a new rail line to link our warehouse and our retail outlet, but if we cannot raise the money, the project is not possible. Even if we have the money, do we have government authorization? If we do, are the soil conditions appropriate for the rail link?
- *Questions of economic wisdom.* Even if we can afford to build the rail link, should we do so? If we use all our resources on this project, what other projects will have to be postponed or canceled? Is there a less expensive or a less financially risky way to achieve the same goals?
- *Questions of perception.* Because our company's workers have recently accepted a temporary wage freeze, they might view the rail link as an inappropriate use of funds. The truckers' union might see it as a threat to truckers' job security. Some members of the public might also be interested parties, because any large-scale construction might affect the environment.

USING A PROBLEM-SOLVING MODEL FOR PREPARING RECOMMENDATION REPORTS

The writing process for a recommendation report is similar to that for any technical communication:

- *Planning.* Analyze your audience, determine your purpose, and visualize the deliverable: the report you will submit. Conduct appropriate secondary and primary research.

- *Drafting.* Write a draft of the report. Large projects often call for many writers and therefore benefit from shared document spaces and wikis.
- *Revising.* Think again about your audience and purpose, and then make appropriate changes to your draft.
- *Editing.* Improve the writing in the report, starting with the largest issues of development and emphasis and working down to the sections, paragraphs, sentences, and individual words.
- *Proofreading.* Go through the draft slowly, making sure you have written what you wanted to write. Get help from others.

In addition to this model of the writing process, you need a problem-solving model for conducting the analysis that will enable you to write the recommendation report. The following discussion explains in more detail the problem-solving model shown in Figure 19.1.

In This Book

For more about the writing process, see Ch. 3 and Ch. 13, p. 350. For more about collaboration, see Ch. 4.

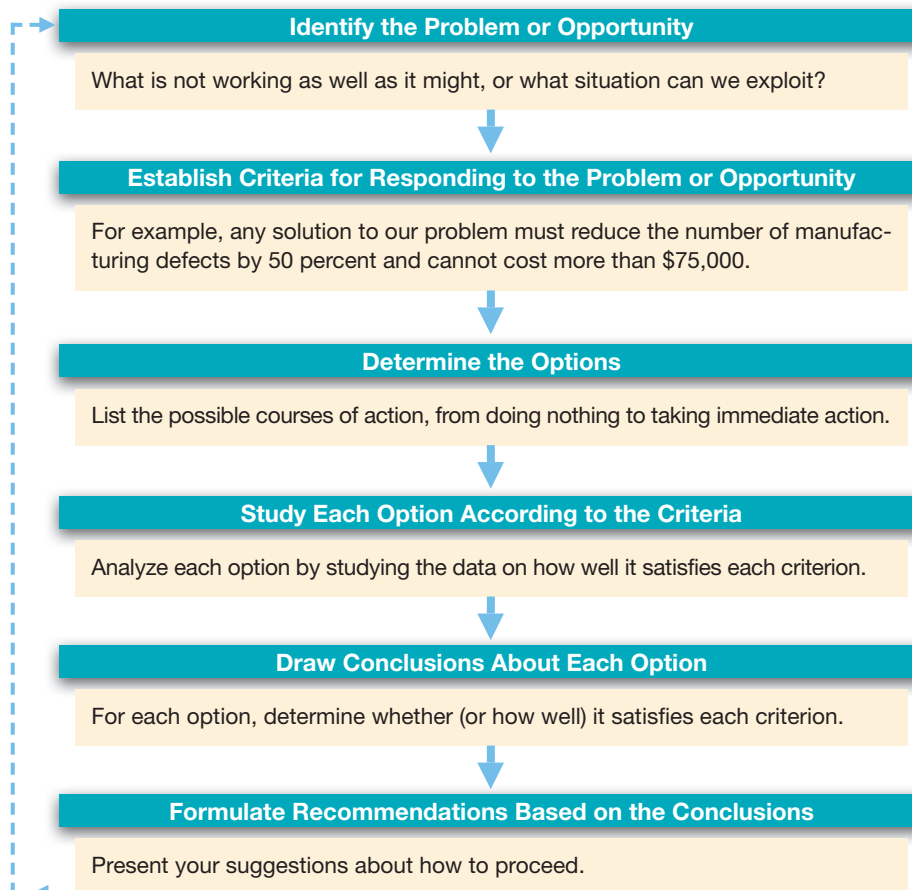


Figure 19.1 A Problem-Solving Model for Recommendation Reports

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your subject, audience, and purpose.

Identify the Problem or Opportunity

What is not working or is not working as well as it might? What situation presents an opportunity to decrease costs or improve the quality of a product or service? Without a clear statement of your problem or opportunity, you cannot plan your research.

For example, your company has found that employees who smoke are absent and ill more often than those who don't smoke. Your supervisor has asked you to investigate whether the company should offer a free smoking-cessation program. The company can offer the program only if the company's insurance carrier will pay for it. The first thing you need to do is talk with the insurance agent; if the insurance carrier will pay for the program, you can proceed with your investigation. If the agent says no, you have to determine whether another insurance carrier offers better coverage or whether there is some other way to encourage employees to stop smoking.

Establish Criteria for Responding to the Problem or Opportunity

Criteria are standards against which you measure your options. Criteria can be classified into two categories: *necessary* and *desirable*. For example, if you want to buy a photocopier for your business, necessary criteria might be that each copy cost less than two cents to produce and that the photocopier be able to handle oversized documents. If the photocopier doesn't fulfill those two criteria, you will not consider it further. By contrast, desirable criteria might include that the photocopier do double-sided copying and stapling. Desirable criteria let you make distinctions among a variety of similar objects, objectives, actions, or effects. If a photocopier does not fulfill a desirable criterion, you will still consider it, although it will be less attractive.

Until you can establish your criteria, you don't know what your options are. Sometimes you are given your criteria: your supervisor tells you how much money you can spend, for instance, and that figure becomes one of your necessary criteria. Other times, you derive your criteria from your research.

Determine the Options

After you establish your criteria, you determine your options. *Options* are potential courses of action you can take in responding to a problem or opportunity. Determining your options might be simple or complicated.

Sometimes your options are presented to you. For instance, your supervisor asks you to study two vendors for accounting services and recommend one of them. The options are Vendor A or Vendor B. That's simple.

In other cases, you have to consider a series of options. For example, your department's photocopier is old and breaking down. Your first decision is

In This Book

For more about establishing criteria, see Ch. 7, p. 162.

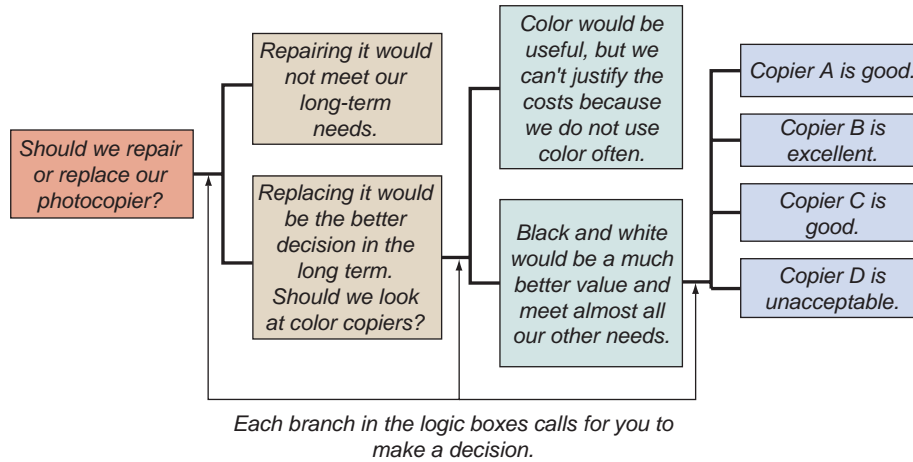


Figure 19.2 Using Logic Boxes to Plot a Series of Options

whether to repair it or replace it. Once you have answered that question, you might have to make more decisions. If you are going to replace it, what features should you look for in a new one? Each time you make a decision, you have to answer more questions until, eventually, you arrive at a recommendation. For a complicated scenario like this, you might find it helpful to use logic boxes or flowcharts to sketch the logic of your options, as shown in Figure 19.2.

As you research your topic, your understanding of your options will likely change. At this point, however, it is useful to understand the basic logic of your options or series of options.

Study Each Option According to the Criteria

Once you have identified your options (or series of options), study each one according to the criteria. For the photocopier project, secondary research would include studying articles about photocopiers in technical journals and specification sheets from the different manufacturers. Primary research might include observing product demonstrations as well as interviewing representatives from different manufacturers and managers who have purchased different brands.

To make the analysis of the options as objective as possible, professionals sometimes create a *decision matrix*, a tool for systematically evaluating each option according to each criterion. A decision matrix is a table (or a spreadsheet), as shown in Figure 19.3. Here the writer is nearly at the end of his series of options: he is evaluating three similar photocopiers according to three criteria. Each criterion has its own weight, which suggests how important it is. The greater the weight, the more important the criterion.

As shown in Figure 19.3, the criterion of pages per minute is relatively unimportant: it receives a weight of 1. For this reason, the Ricoh, even though

In This Book

For more about research techniques, see Ch. 6.

Criteria and Weight		Options					
		Ricoh		Xerox		Sharp	
Criterion	Weight	Rating	Score ⁽¹⁾	Rating	Score ⁽¹⁾	Rating	Score ⁽¹⁾
Pages/min.	1	9	9	6	6	3	3
Duplex	3	1	3	3	9	10	30
Color	4	10	40	1	4	10	40
Total Score			52		19		73

⁽¹⁾Score = weight × rating.

Figure 19.3 A Decision Matrix

Spreadsheet programs often contain templates for creating decision matrices.

it receives a high rating for pages per minute (9), receives only a modest score of 9 ($1 \times 9 = 9$). However, the criterion of color copying is quite important, with a weight of 4. On this criterion, the Ricoh, with its rating of 10, achieves a very high score ($4 \times 10 = 40$).

But a decision matrix cannot stand on its own. You need to explain your methods. That is, in the discussion or in footnotes to the matrix, you need to explain the following decisions:

- *Why you chose each criterion—or didn't choose a criterion the reader might have expected to see included.* For instance, why did you choose duplexing but not image storing?
- *Why you assigned a particular weight to each criterion.* For example, why is the copier's ability to do color copying four times more important than its speed?
- *Why you assigned a particular rating to each option.* For example, why does one copier receive only a rating of 1 on duplexing, whereas another receives a 3?

A decision matrix is helpful only if your readers understand your methods and agree with the logic you used in choosing the criteria and assigning weights and ratings for each option.

Although a decision matrix has its limitations, it is useful for both you and your readers. For you as the writer, the main advantage is that it helps you do a methodical analysis. For your readers, it makes your analysis easier to follow because it clearly presents your methods and results.

Draw Conclusions About Each Option

Whether you use a decision matrix or a less-formal means of recording your evaluations, the next step is to draw conclusions about the options you studied—by interpreting your results and writing evaluative statements about the options.

For the study of photocopiers, your conclusion might be that the Sharp model is the best copier: it meets all your necessary criteria and the greatest number of desirable criteria, or it scores highest on your matrix. Depending on your readers' preferences, you can present your conclusions in any one of three ways.

- *Rank all the options:* the Sharp copier is the best option, the Ricoh copier is second best, and so forth.
- *Classify all the options in one of two categories:* acceptable and unacceptable.
- *Present a compound conclusion:* the Sharp offers the most technical capabilities; the Ricoh is the best value.

Formulate Recommendations Based on the Conclusions

If you conclude that Option A is better than Option B—and you see no obvious problems with Option A—recommend Option A. But if the problem has changed or your company's priorities or resources have changed, you might decide to recommend a course of action that is inconsistent with the conclusions you derived. Your responsibility is to use your judgment and recommend the best course of action.

ETHICS NOTE

Presenting Honest Recommendations

As you formulate your recommendations, you might know what your readers want you to say. For example, they might want you to recommend the cheapest solution, or one that uses a certain kind of technology, or one that is supplied by a certain vendor. Naturally, you want to be able to recommend what they want, but sometimes the facts won't let you. Your responsibility is to tell the truth—to do the research honestly and competently and then present the findings honestly. Your name goes on the report. You want to be able to defend your recommendations based on the evidence and your reasoning.

One worrisome situation that arises frequently is that none of the options would be a complete success, or none would work at all. What should you do? You should tell the truth about the options, warts and all. Give the best advice you can, even if that advice is to do nothing.

WRITING RECOMMENDATION REPORTS

The following discussion presents a basic structure for a recommendation report. Remember that every document you write should reflect its audience, purpose, and subject. Therefore, you might need to modify, add to, or delete some of the elements discussed here.

The easiest way to draft a report is to think of it as consisting of three sections: the front matter, the body, and the back matter. Table 19.1 shows the purposes of and typical elements in these three sections.

You will probably draft the body before the front and the back matter. This sequence is easiest because you think through what you want to say in the body, and then draft the front and back matter based on it.

If you are writing your recommendation report for readers from another culture, keep in mind that conventions differ from one culture to another. In the United States, reports are commonly organized from general to specific. That is, the most general information (the abstract and the executive summary) appears early in the report. In many cultures, however, reports are organized from specific to general. Detailed discussions of methods and results precede discussions of the important findings.

Similarly, elements of the front and back matter are rooted in culture. For instance, in some cultures—or in some organizations—writers do not create executive summaries, or their executive summaries differ in length or orga-

TABLE 19.1 ► Elements of a Typical Report

Section of the report	Purposes of the section	Typical elements in the section
Front matter	<ul style="list-style-type: none"> to orient the reader to the subject to provide summaries for technical and managerial readers to help readers navigate the report to help readers decide whether to read the document 	<ul style="list-style-type: none"> letter of transmittal (p. 523) cover (p. 523) title page (p. 524) abstract (p. 524) table of contents (p. 525) list of illustrations (p. 526) executive summary (p. 526)
Body	<ul style="list-style-type: none"> to provide the most comprehensive account of the project, from the problem or opportunity that motivated it, to the methods and the most important findings 	<ul style="list-style-type: none"> introduction (p. 521) methods (p. 522) results (p. 522) conclusions (p. 522) recommendations (p. 522)
Back matter	<ul style="list-style-type: none"> to present supplementary information, such as more-detailed explanations than are provided in the body to enable readers to consult the secondary sources the writers used 	<ul style="list-style-type: none"> glossary (p. 530) list of symbols (p. 530) references (p. 531) appendixes (p. 531)

nization from those discussed here. According to interface designer Pia Honold (1999), German users of high-tech products rely on the table of contents in a manual because they like to understand the scope and organization of the manual. Therefore, writers of manuals for German readers should include comprehensive, detailed tables of contents.

Study samples of writing produced by people from the culture you are addressing to see how they organize their reports and use front and back matter.

Writing the Body of the Report

The elements that make up the body of a report are discussed here in the order in which they usually appear in a report. However, you should draft the elements in whatever order you prefer. The sample recommendation report on pages 532–58 includes these elements.

Introduction The introduction helps readers understand the technical discussion that follows. Start by analyzing who your readers are, then consider these questions:

- *What is the subject of the report?* If the report follows a proposal and a progress report, you can probably copy this information from one of those documents, modifying it as necessary. Reusing this information is efficient and ethical.
- *What is the purpose of the report?* The purpose of the report is not the purpose of the project. The purpose of the report is to present information and offer recommendations.
- *What is the background of the report?* Include this information, even if you have presented it before; some of your readers might not have read your previous documents or might have forgotten them.
- *What are your sources of information?* Briefly describe your primary and secondary research, to prepare your readers for a more detailed discussion of your sources in subsequent sections of the report.
- *What is the scope of the report?* Indicate the topics you are including, as well as those you are not.
- *What are the most significant findings?* Summarize the most significant findings of the project.
- *What are your recommendations?* In a short report containing a few simple recommendations, include those recommendations in the introduction. In a lengthy report containing many complex recommendations, briefly summarize them in the introduction, then refer readers to the more detailed discussion in the recommendations section.
- *What is the organization of the report?* Indicate your organizational pattern so that readers can understand where you are going and why.

In This Book

For more about purpose statements, see Ch. 5, p. 111.

- *What key terms are you using in the report?* The introduction is an appropriate place to define new terms. If you need to define many terms, place the definitions in a glossary and refer readers to it in the introduction.

Methods The methods section answers the question “What did you do?” In drafting the methods section, consider your readers’ knowledge of the field, their perception of you, and the uniqueness of the project, as well as their reasons for reading the report and their attitudes toward the project. Provide enough information to help readers understand what you did and why you did it that way. If others will be using the report to duplicate your methods, include sufficient detail.

Results Whereas the methods section answers the question “What did you do?” the results section answers the question “What did you see?”

Results are the data you have discovered or compiled. Present the results objectively, without comment. Save the interpretation of the results—your conclusions—for later. If you combine results and conclusions, your readers might be unable to follow your reasoning and might not be able to tell whether the evidence justifies your conclusions.

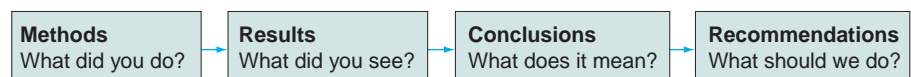
Your audience’s needs will help you decide how to structure the results. How much they know about the subject, what they plan to do with the report, what they expect your recommendation(s) to be—these and many other factors will affect how you present the results. For instance, suppose that your company is considering installing a VoIP phone system that will allow you to make telephone calls over the Internet. In the introduction, you explain the disadvantages of the company’s current phone system. In the methods section, you describe how you established the criteria you applied to the available phone systems, as well as your research procedures. In the results section, you provide the details of each phone system you are considering, as well as the results of your evaluation of each system.

Conclusions Conclusions answer the question “What does it mean?” They are the implications of the results. To draw conclusions, you need to think carefully about your results, weighing whether they point clearly to a single meaning.

Recommendations Recommendations answer the question “What should we do?” As discussed earlier in this chapter, recommendations do not always flow directly from conclusions. Always consider recommending that the organization take no action, or no action at this time.

In This Book

For more about evaluating evidence and drawing conclusions, see Ch. 6, pp. 133–36.



Guidelines

Writing Recommendations

As you draft your recommendations, consider the following four factors:

- ▶ **Content.** Be clear and specific. If the project has been unsuccessful, don't simply recommend that your readers "try some other alternatives." What alternatives do you recommend and why?
- ▶ **Tone.** When you recommend a new course of action, be careful not to offend whoever formulated the earlier course. Do not write that following your recommendations will "correct the mistakes" that have been made. Instead, your recommendations should "offer great promise for success." A restrained, understated tone is more persuasive because it shows that you are interested only in the good of your company, not personal rivalries.
- ▶ **Form.** If the report leads to only one recommendation, use traditional paragraphs. If the report leads to more than one recommendation, consider a numbered list.
- ▶ **Location.** Consider including a summary of the recommendations—or, if they are brief, the full list—after the executive summary or in the introduction as well as at the end of the body of the report.

Writing the Front Matter

Front matter is common in reports, proposals, and manuals. As discussed in Table 19.1 on page 520, front matter helps readers understand the whole report and find the information they seek. Most organizations have established formats for front matter. Study the style guide used in your company or, if there isn't one, examples from the files to see how other writers have assembled their reports.

Letter of Transmittal The letter of transmittal, which can take the form of a letter or a memo, introduces the primary reader to the purpose and content of the report. It is attached to the report, bound in with it, or simply placed on top of it. Even though the letter likely contains no information that is not included elsewhere in the report, it is important because it is the first thing the reader sees. It establishes a courteous and professional tone. Letters of transmittal are customary even when the writer and the reader both work for the same organization. See page 532 in the sample recommendation report for an example of a transmittal letter in the form of a memo.

Cover The cover protects the report from normal wear and tear and from harsher environmental conditions, such as water or grease. The cover usually contains the title of the report, the name and position of the writer, the date of

In This Book

For more about formatting a letter, see Ch. 14, p. 376.

 **In This Book**

For more about cover materials and types of bindings, see Ch. 11, p. 268.

 **In This Book**

For more about abstract services, see Ch. 6, p. 128.

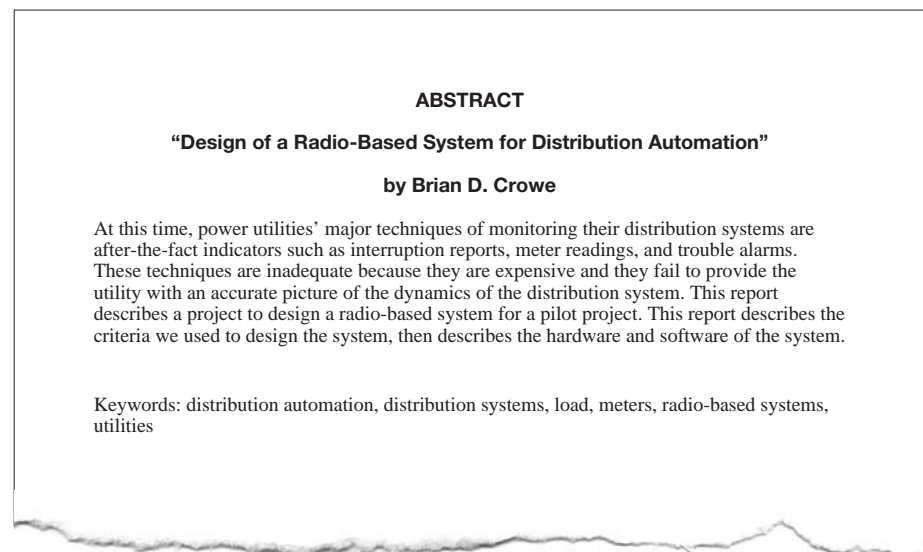
submission, and the name or logo of the writer's company. Sometimes the cover also includes a security notice or a statement of proprietary information.

Title Page A title page includes at least the title of the report, the name of the writer, and the date of submission. A more complex title page might also include a project number, a list of additional personnel who contributed to the report, and a distribution list. See page 533 in the sample recommendation report for an example of a title page.

Abstract An abstract is a brief technical summary of the report, usually no more than 200 words. It addresses readers who are familiar with the technical subject and who need to decide whether they want to read the full report. In an abstract, you can use technical terminology and refer to advanced concepts in the field. Abstracts are sometimes published by abstract services, which are useful resources for researchers.

Abstracts often contain a list of half a dozen or so keywords, which are entered into electronic databases. As the writer, one of your tasks is to think of the various keywords that will lead people to the information in your report.

There are two types of abstracts: descriptive and informative. A *descriptive abstract*—sometimes called a *topical, indicative, or table-of-contents abstract*—describes the kinds of information contained in the report. It does not provide the major findings (important results, conclusions, or recommendations). It simply lists the topics covered, giving equal emphasis to each. Figure 19.4 is a descriptive abstract from a report by a utility company about its pilot program



This abstract is descriptive rather than informative because it does not explain the criteria or describe the system.

Figure 19.4 Descriptive Abstract

Source: Crowe, 1985.

for measuring how much electricity its customers are using. A descriptive abstract is used most often when space is at a premium. Some government proposals, for example, call for a descriptive abstract to be placed at the bottom of the title page.

An *informative abstract* presents the major findings. If you don't know which kind of abstract the reader wants, write an informative one.

The distinction between descriptive and informative abstracts is not absolute. Sometimes you might have to combine elements of both in a single abstract. For instance, if there are 15 recommendations—far too many to list—you might simply note that the report includes numerous recommendations.

See page 534 in the sample recommendation report for an example of an informative abstract.

Table of Contents The table of contents, the most important guide to navigating the report, has two main functions: to help readers find the information they want and to help them understand the scope and organization of the report.

A table of contents uses the same headings as the report itself. Therefore, to create an effective table of contents, you must first make sure that the headings are clear and that you have provided enough of them. If the table of contents shows no entry for five or six pages, you probably need to partition that section of the report into additional subsections. In fact, some tables of contents have one entry, or even several, for every report page.

The following table of contents, which relies exclusively on generic headings (those that describe an entire class of items), is too general to be useful.

Table of Contents	
Introduction	1
Materials	3
Methods	4
Results	19
Recommendations	23
References	26
Appendixes	28

← This methods section, which goes from page 4 to page 18, should have subentries to break up the text and to help readers find the information they seek.

For more-informative headings, combine the generic and the specific:

Recommendations: Five Ways to Improve Information-Retrieval Materials Used in the Calcification Study

Results of the Commuting-Time Analysis

Then build more subheadings into the report itself. For instance, in the “Recommendations” example above, you could create a subheading for each of the five recommendations. Once you establish a clear system of headings

In This Book

For more about text attributes, see Ch. 11, p. 275.

In This Book

For more about pagination, see Ch. 9, p. 220.

within the report, use the same text attributes—capitalization, boldface, italics, and outline style (traditional or decimal)—in the table of contents.

When adding page numbers to your report, remember two points:

- The table of contents page does not contain an entry for itself.
- Front matter is numbered using lowercase Roman numerals (i, ii, and so forth), often centered at the bottom of the page. The title page of a report is not numbered, although it represents page i. The abstract is usually numbered page ii. The table of contents is usually not numbered, although it represents page iii. The body of the report is numbered with Arabic numerals (1, 2, and so on), typically in the upper outside corner of the page.

See page 535 in the sample recommendation report for an example of a table of contents.

List of Illustrations A list of illustrations is a table of contents for the figures and tables. List the figures first, then the tables. (If the report contains only figures, call it a *list of figures*. If it contains only tables, call it a *list of tables*.) You may begin the list of illustrations on the same page as the table of contents, or you may begin the list on a separate page and include it in the table of contents. Figure 19.5 shows a list of illustrations.

Executive Summary The executive summary (sometimes called the *epitome*, *executive overview*, *management summary*, or *management overview*) is a brief

LIST OF ILLUSTRATIONS	
Figures	
Figure 1.1	U.S. R&D Spending on Biotechnology 11
Figure 1.2	ESCA R&D Spending v. Biotech R&D Spending 14
Figure 2.1	Annual Sales 16
Figure 3.1	Hypothetical New-Product Decision Tree 21
Figure 3.2	Annual Sales 23
Tables	
Table 1.1	Industry Costs of the Final Rule (2005 Dollars) 12
Table 1.2	Industry Costs of the Final Rule (2010 Dollars) 12
Table 2.1	Government Costs of the Final Rule (2005 Dollars) 17
Table 2.2	Government Costs of the Final Rule (2010 Dollars) 18
Table 3.1	Applications Not Subject to ESCA 23
Table 3.2	Examples of Microbial Applications Under ESCA 26

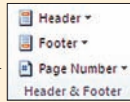
Figure 19.5 List of Illustrations

TECH TIP

How to Format Headers, Footers, and Page Numbers

In writing a report, you might want to use different headers, footers, and page-numbering schemes and styles in different sections of the report. To do this, you will create different sections in your Word file. Within each section, you can modify the headers, footers, and page numbers by using the **Header & Footer** group.

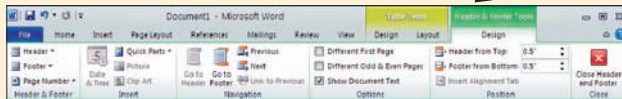
To **insert, remove, or edit the format** of headers, footers, and page numbers, use the drop-down menus in the **Header & Footer** group on the **Insert** tab.



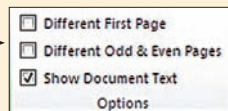
The **Header & Footer** drop-down menus allow you to insert headers and footers with **built-in** styles and to edit and remove headers and footers.



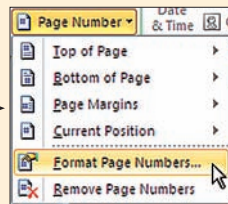
You can also add and modify header and footer text, insert page numbers and dates, and choose the format of page numbers by double-clicking the header or footer in **Print Layout View** and using the groups on the **Design** tab.



The **Options** group allows you to specify different headers and footers for odd and even pages, as well as the first page.



The **Page Number** drop-down menu allows you to change the format of page numbers.



KEYWORDS: header & footer group, options group, header, footer, print layout view, design tab, page number, format page numbers

TECH TIP

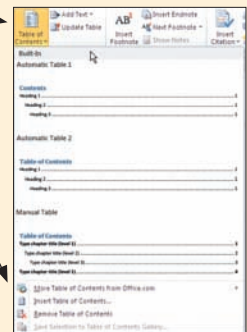
How to Create a Table of Contents

You can make a table of contents automatically in Word. You can then use the **Styles** feature to format the headings in your report.

Place your cursor where you want to create the table of contents.

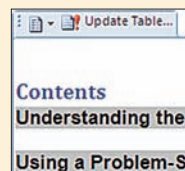
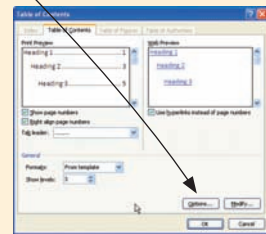
Use the **Table of Contents** drop-down menu in the **Table of Contents** group on the **Reference** tab to insert a table of contents with a **built-in** style.

You may also select **Insert Table of Contents** to choose the format for the table of contents, select the level of detail to show, and preview the appearance of the table.



If you select **Insert Table of Contents**, you can also **modify** the text attributes of the table levels to match the text attributes in your report.

If you later change your report and its pagination, you can update the page numbers or the entire table of contents by selecting the table of contents and then selecting **Update Table of Contents**.



In the **Update Table of Contents** dialog box, select the option you want: **update page numbers only**, or **update entire table**.



KEYWORDS: table of contents, table of contents group, update fields, update table of contents

condensation of the report addressed to managers. Most managers need only a broad understanding of the projects that the organization undertakes and how they fit together into a coherent whole.

An executive summary for a report under 20 pages is typically one page (double-spaced). For longer reports, the maximum length is often calculated as a percentage of the report, such as 5 percent.

The executive summary presents information to managers in two parts:

- *Background.* This section explains the problem or opportunity: what was not working or was not working effectively or efficiently; or what potential modification of a procedure or product had to be analyzed.
- *Major findings and implications.* This section might include a brief description—only one or two sentences—of the methods, followed by a full paragraph about the conclusions and recommendations.

An executive summary differs from an informative abstract. An abstract focuses on the technical subject (such as whether the new radio-based system monitors the energy usage effectively); an executive summary concentrates on whether the system can improve operations at a particular company.

Guidelines

Writing an Executive Summary

Follow these five suggestions in writing executive summaries:

- ▶ **Use specific evidence in describing the background.** For most managers, the best evidence includes costs and savings. Instead of writing that the equipment you are now using to cut metal foil is ineffective, write that the equipment jams once every 72 hours on average, costing \$400 in materials and \$2,000 in productivity. Then add up these figures for a monthly or an annual total.
- ▶ **Be specific in describing the research.** For instance, research suggests that if your company had a computerized energy-management system you could cut your energy costs by 20 to 25 percent. If your energy costs last year were \$300,000, you could save \$60,000 to \$75,000.
- ▶ **Describe the methods briefly.** If you think your readers are interested, include a brief description—no more than a sentence or two.
- ▶ **Describe the findings according to your readers' needs.** If your readers want to know your results, provide them. If your readers are unable to understand the technical data or are uninterested, go directly to the conclusions and recommendations.
- ▶ **Ask an outside reader to review your draft.** Give it to someone who has had no connection to the project. That person should be able to read your summary and understand what the project means to the organization.

See page 536 in the sample recommendation report for an example of an executive summary.

INTERACTIVE SAMPLE DOCUMENT

Analyzing an Executive Summary

The following executive summary comes from a corporate report on purchasing BlackBerry devices for employees. The questions in the margin ask you to think about the discussion of executive summaries (beginning on page 526).

Executive Summary

On May 11, we received approval to study whether BlackBerry devices could help our 20 engineers receive e-mail, monitor their schedules, take notes, and store files they need in the field. In our study, we addressed these problems experienced by many of our engineers:

- They have missed deadlines and meetings and lost client information.
- They have been unable to access important files from the field.
- They have complained about the weight of the binders and other materials—sometimes weighing more than 40 pounds—that they have to carry.
- They have to spend time keyboarding notes that they took in the field.

In 2011, missed meetings and other schedule problems cost the company over \$400,000 in lost business. And our insurance carrier settled a claim for \$50,000 from an engineer who experienced back and shoulder problems due to the weight of his pack.

We researched the capabilities of BlackBerry devices, then established these criteria for our analysis:

- The device must weigh less than four ounces.
- It must be compatible with Windows back to 98.
- It must have a full keyboard.
- It must have built-in GPS.
- It must have 3G connectivity.
- It must have Wi-Fi capability.
- It must have a 3.2 MP camera.
- It must have at least 512 MB of flash memory.
- It must have Bluetooth capability.
- It must cost \$500 or less.

On the basis of our analysis, we recommend that the company purchase five BlackBerry Bold devices, for a total cost of \$2,500. These devices best meet all our technical and cost criteria. We further recommend that after a six-month trial period, the company decide whether to purchase an additional 15 devices for the other engineers.

1. How clearly do the writers explain the background? Identify the problem or opportunity they describe in this executive summary.
2. Do the writers discuss the methods? If so, identify the discussion.
3. Identify the findings: the results, conclusions, and recommendations. How clearly have the writers explained the benefits to the company?



On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 19 on <bedfordstmartins.com/techcomm>.

Writing the Back Matter

The back matter of a recommendation report might include the following items: glossary, list of symbols, references, and appendixes.

Glossary and List of Symbols A *glossary*, an alphabetical list of definitions, is particularly useful if some of your readers are unfamiliar with the technical vocabulary in your report. Instead of slowing down your discussion by defining technical terms as they appear, you can use boldface, or some similar method of highlighting words, to indicate that the term is defined in the glossary. The first time a boldfaced term appears, explain this system in a footnote. For example, the body of the report might say, “Thus the **positron*** acts as the . . . ,” while a note at the bottom of the page explains:

*This and all subsequent terms in boldface are defined in the Glossary, page 26.

Although the glossary is usually placed near the end of the report, before the appendixes, it can also be placed immediately after the table of contents if the glossary is brief (less than a page) and if it defines essential terms. Figure 19.6 shows an excerpt from a glossary.

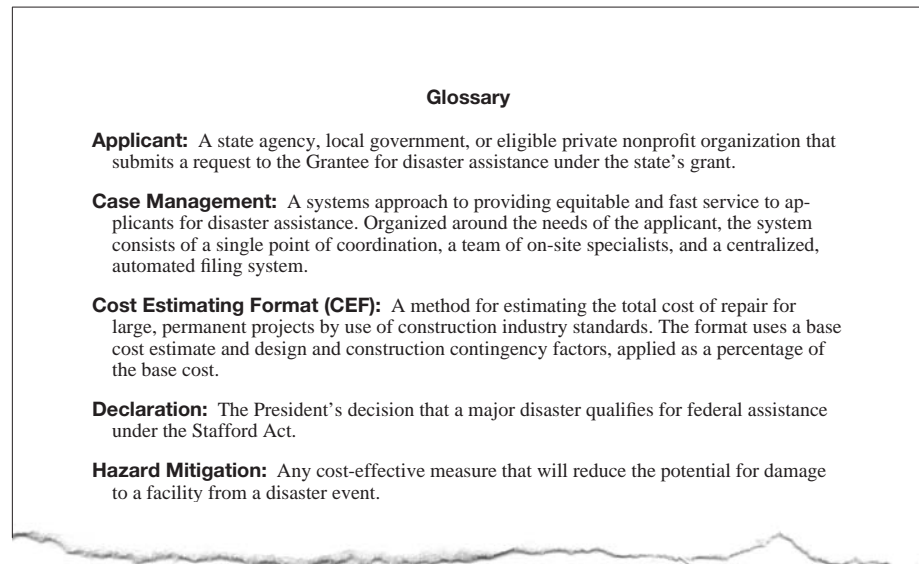


Figure 19.6 Glossary

A list of symbols is formatted like a glossary, but it defines symbols and abbreviations rather than terms. It, too, may be placed before the appendixes or after the table of contents. Figure 19.7 shows a list of symbols.

References Many reports contain a list of references (sometimes called a *bibliography* or *list of works cited*) as part of the back matter. References and the accompanying textual citations throughout the report are called *documentation*. Documentation acknowledges your debt to your sources, establishes your credibility as a writer, and helps readers locate and review your sources. See Appendix, Part B, for a detailed discussion of documentation. See page 556 in the sample recommendation report for an example of a reference list.

Appendixes An *appendix* is any section that follows the body of the report (and the glossary, list of symbols, or reference list). Appendixes (or *appendices*) convey information that is too bulky for the body of the report or that will interest only a few readers. Appendixes might include maps, large technical diagrams or charts, computations, computer printouts, test data, and texts of supporting documents.

Appendixes, usually labeled with letters rather than numbers (Appendix A, Appendix B, and so on), are listed in the table of contents and are referred to at appropriate points in the body of the report. Therefore, they are accessible to any reader who wants to consult them. See pages 557–58 in the sample recommendation report for examples of appendixes.

SAMPLE RECOMMENDATION REPORT

The following example (Elkins & Carruthers, 2011) is the recommendation report on the CMSU clicker project proposed in Chapter 16 on page 457. The progress report for this project appears in Chapter 17 on page 475.

List of Symbols

β	beta
CRT	cathode-ray tube
γ	gamma
Hz	hertz
rcvr	receiver
SNR	signal-to-noise ratio
uhf	ultra high frequency
vhf	very high frequency

Figure 19.7 List of Symbols

In most professional settings, writers use letterhead stationery for memos, but because the writers are students, they decided to use plain stationery.

Transmittal “letters” can be presented as memos.

The writers include their titles and that of their primary reader. This way, future readers will be able to more readily identify the reader and writers.

The subject heading indicates the subject of the report (the clicker study at CMSU) and the purpose of the report (recommendation report).

The purpose of the study. Notice that the writers link the recommendation report to the proposal, giving them an opportunity to state the main tasks they carried out in the study.

The methods the writers used to carry out the research.

The principal findings—the results and conclusions of the study.

The major recommendation.

A polite offer to participate further or to provide more information.

Memo

Date: December 14, 2011
 To: Dr. Jill Bremerton, Vice President for Student Affairs
 Central Montana State University
 From: Jeremy Elkins, Co-chair
 Eloise Carruthers, Co-chair
 Student Affairs Advisory Committee
 Central Montana State University
 Subject: Recommendation Report for Clicker Study at CMSU

Attached is the report for our study, “Establishing Baseline Requirements for Adopting Clickers at CMSU: A Recommendation Report.” We completed the tasks described in our proposal of October 6, 2011: familiarizing ourselves with clicker use in higher education, assessing instructor and student attitudes toward clickers, and determining whether the current infrastructure of the large lecture halls on campus would affect whether and how the university should pursue its feasibility study.

To perform these tasks, we performed secondary and primary research. We studied the literature on clicker use, conducted interviews, and distributed questionnaires to appropriate CMSU stakeholders. Then, we collected and analyzed our data and wrote the report.

Our findings suggest that instructors probably will be very receptive to your feasibility study. In addition, if CMSU adopts a formal policy of clicker use, faculty will be positive about it—provided that the university chooses a good clicker system and provides effective technical support. Further, we found that most CMSU students are willing to pay up to \$40 for a clicker. The infrastructure of our 17 large lecture halls presents no special difficulties for clicker use, provided that we restrict our study to radio-frequency-based systems. Although an older technology—infrared-based systems—offers cheaper clickers, it would require upgrading the lecture halls with additional hardware. Further, we found that the existing computer systems in the lecture halls include both Macs and PCs with operating systems back to Windows XP. Any clicker system selected would need to work with these operating systems.

On the basis of these findings, we recommend that CMSU proceed with its feasibility study of the costs and benefits of adopting a clicker policy on campus.

We appreciate the trust you have shown in inviting us to participate in the initial stages of the feasibility study, and we would look forward to working with you on other portions of the study. If you have any questions or comments, please contact Jeremy Elkins at jelkins@cmsu.edu or at 444-3967.

**Establishing Baseline Requirements for
Adopting Clickers at CMSU:
A Recommendation Report**

Prepared for: Dr. Jill Bremerton, Vice President for Student Affairs
Central Montana State University

Prepared by: Jeremy Elkins, Co-chair
Eloise Carruthers, Co-chair
Student Affairs Advisory Committee
Central Montana State University

December 14, 2011

A good title indicates the subject and purpose of the document. One way to indicate the purpose is to use a generic term—such as analysis, recommendation, summary, or instructions—in a phrase following a colon. For more about titles, see Ch. 9, p. 205.

The names and positions of the principal reader and the writers of the document.

The date the document was submitted.

The name or logo of the writers' organization often is presented at the bottom of the title page. In this case, the writers are students who have chosen not to use the university logo because they are not formal employees of the university.

The title of the report is often enclosed in quotation marks because the abstract might be placed outside the report, in which case the report is a separate document.

Abstracts are often formatted as a single paragraph.

The background and purpose of the report.

The methods.

The major findings.

The major recommendations.

The writers provide some technical information about student attitudes, about the system they are recommending, and about the infrastructure of the large lecture halls.

A keywords list ensures that if the report is searched electronically, it will register “hits” for each of the terms listed.

Abstract

“Establishing Baseline Requirements for Adopting Clickers at CMSU: A Recommendation Report”

Prepared by: Jeremy Elkins, Co-chair
Eloise Carruthers, Co-chair
Student Affairs Advisory Committee
Central Montana State University

On September 6, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at Central Montana State University (CMSU), formally asked the CMSU Student Affairs Advisory Committee (SAAC) to participate in a feasibility study about the use of student response systems, commonly called *clickers*, at CMSU by assessing instructor and student attitudes toward clickers and determining whether the current infrastructure of the large lecture halls on campus would affect whether and how the university should pursue its feasibility study. To perform this research, SAAC devised interview questions and questionnaires to distribute to appropriate CMSU stakeholders. We found that faculty—both those experienced with clickers and those without experience—are very receptive to a careful feasibility study. Faculty’s most important concern is that, if CMSU adopts a formal policy of clicker use, the university choose a good clicker system and provide effective technical support. More than half of the students expressed a willingness to pay up to \$40 for a clicker, with 23 percent willing to pay only \$20 and 19 percent willing to pay up to \$60. The lecture halls are not equipped to handle infrared-based clicker systems. We recommend that CMSU consider only radiofrequency-based systems. In addition, because our large lecture halls use both PCs and Macs, we should consider only those vendors that offer systems that are cross-platform and (for PCs) that are compatible back to the Windows XP operating system.

Keywords: clickers, student response systems, classroom response systems, student attitudes, faculty attitudes

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Note that the typeface and design of the headings in the table of contents match the typeface and design of the headings in the report itself.

In this table of contents, the two levels of headings are distinguished by type size, type style (boldface versus italic), and indentation.

The executive summary describes the project with a focus on the managerial aspects, particularly the recommendation. Note the writers' emphasis on the problem at CMSU.

Here the writers present a brief statement of the subject of their report.

The background of the feasibility study that Dr. Bremerton is funding.

A statement of the assignment that Dr. Bremerton gave the writers. This statement helps the reader remember the context for the report she is reading. Don't assume that your readers remember what they asked you to do weeks or months earlier.

A brief statement of the methods the writers used to carry out their research. Throughout this report, the writers use the active voice ("We familiarized ourselves . . ."). See Ch. 10, p. 241, for more on the active voice. Note, too, that the discussion of the methods is brief: most executive readers are not very interested in the details of the methods you used.

Findings are the important results and conclusions of a study. Here, the writers devote a few sentences to the findings related to instructor and student attitudes and a few sentences to the findings related to the infrastructure.

The writers use the word recommend. Using key generic terms such as problem, methods, results, conclusions, and recommendations helps readers understand the role that each section plays in the document.

1

Executive Summary

On September 6, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at Central Montana State University (CMSU), formally invited the CMSU Student Affairs Advisory Committee (SAAC) to participate in a feasibility study about the use of student response systems, commonly called *clickers*, at CMSU.

Currently, CMSU has only a few sets of clickers that instructors can check out for occasional use in their large lecture courses. Because of an increasing consensus in the scholarly community that clickers improve the classroom learning environment and can improve learning in large lecture courses, Dr. Bremerton has allocated resources for a large feasibility study of whether CMSU should select a particular clicker system for use on campus. The research that Dr. Bremerton asked SAAC to perform will be part of this large feasibility study.

Dr. Bremerton invited us to perform research that would assess instructor and student attitudes toward clickers and determine whether the current infrastructure of the large lecture halls on campus would affect whether and how the university should pursue its feasibility study. She further asked us to present our findings and recommendations.

To perform this research, we familiarized ourselves with the basics of clicker use in postsecondary schools. Then, we devised interview questions and questionnaires to distribute to appropriate CMSU stakeholders.

We found that instructors will likely be very receptive to this feasibility study. In addition, if CMSU adopts a formal policy of clicker use, faculty will be positive about it—provided the university chooses a good clicker system and provides effective technical support. Further, we found that more than half (56 percent) of the CMSU students who responded to our questionnaire expressed a willingness to pay up to \$40 for a clicker. A quarter (23 percent) are willing to pay only \$20, but a fifth (19 percent) are willing to pay up to \$60. The infrastructure of our 17 large lecture halls presents no special difficulties for clicker use, provided that we restrict our study to radiofrequency-based systems, which is becoming the standard technology for clickers. Further, we found that the existing computer systems in the lecture halls include both Macs and PCs with operating systems back to Windows XP.

On the basis of these conclusions, we recommend that CMSU proceed with its feasibility study of the costs and benefits of adopting a clicker policy on campus.

2

Introduction

On September 6, 2011, Dr. Jill Bremerton, Vice President for Student Affairs at Central Montana State University (CMSU), invited the CMSU Student Affairs Advisory Committee (SAAC) to participate in a feasibility study about the use of student response systems, commonly called *clickers*, at CMSU.

Currently, Academic Technologies, which oversees all the computing functions in CMSU classrooms, has three sets of 100 clickers from Turning Technologies and two sets of 100 clickers from eInstruction. These clickers are available for instructors to check out for occasional use but may not be reserved for every meeting of an instructor's course. On the basis of an increasing consensus in the scholarly community that clickers improve the classroom learning environment and can improve learning in large lecture courses, Dr. Bremerton has allocated resources for a large feasibility study of whether CMSU should select a particular clicker system for use by CMSU instructors and establish a policy to provide technical support for clicker use and a method for students to acquire clickers through the university. The research that Dr. Bremerton invited SAAC to perform will be part of this large feasibility study.

Specifically, Dr. Bremerton asked the committee to perform research that would answer the following four questions:

1. Would instructors approve a university policy that selects and provides technical support for a clicker system that they could use in large lecture courses?
2. Would students approve a requirement that they purchase clickers as part of a university policy on clickers?
3. Would the physical characteristics of any of the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?
4. Would the computer platforms and operating systems used in the instructor stations in the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?

Dr. Bremerton explained that an understanding of faculty and student attitudes toward the adoption of a formal policy on clickers was fundamentally important because if faculty or students expressed no interest in their use or held serious reservations about their use, the university would need to consider whether and how to proceed with the feasibility study. Dr. Bremerton further explained that, for the university to study adopting a clicker policy, the administration would need to understand whether the physical characteristics of the lecture halls and the existing computer environment in the lecture halls would influence the technical choices that needed to be made.

In some organizations, all first-level headings begin a new page.

A brief statement of the context for the report.

The word currently is used to introduce the background of the study: the current situation is inadequate because the university is not taking advantage of a potentially useful educational tool: clickers.

The writers quote from the memo Dr. Bremerton had written to them. Often in technical communication, you will quote your reader's words to remind him or her of the context and to show that you are carrying out your tasks professionally.

The writers show that they understand the relationship between their work and the larger feasibility study of which it is a part.

A formal statement of the task that Dr. Bremerton asked the committee to perform.

The methods the writers used to carry out their study.

The writers politely acknowledge the assistance they received from their colleagues on the committee.

The writers devote two paragraphs to their principal findings. Introductions can present the major findings of a report; technical communication is not about drama and suspense.

Notice the writers' use of the phrase "we recommend." Repeating key terms in this way helps readers understand the logic of a report and concentrate on the technical information it contains.

An advance organizer for the rest of the report.

For these reasons, Dr. Bremerton asked SAAC to present our findings and recommend whether the university should proceed with the clicker project and, if so, how the computing environment in the lecture halls would affect the direction of the feasibility study.

First, we sought to understand the basics of clicker use in higher education to inform our further research. Next, we wrote the interview questions and the questionnaires that we used to gather our data, field-tested the questions, and performed the interviews and distributed the questionnaires. Finally, we collected and analyzed the data, and then wrote this report.

We wish to thank the three other members of the SAAC—Melissa Otheridge, Larry Wilins, and Rebecca Phillips—for reviewing the draft and offering valuable suggestions for revision.

We found that instructors likely will be very receptive to a feasibility study. In addition, if CMSU adopts a formal policy of clicker use, faculty will be positive about it—provided that the university chooses a good clicker system and provides effective technical support. Further, we found that more than half (56 percent) of the CMSU students who responded to our questionnaire expressed a willingness to pay up to \$40 for a clicker. A quarter (23 percent) were willing to pay only \$20, but a fifth (19 percent) were willing to pay up to \$60.

The infrastructure of our 17 large lecture halls presents no special difficulties for clicker use, provided that we restrict our study to radiofrequency-based systems. Although an older technology—infrared-based systems—offers cheaper clickers, it would require upgrading of the lecture halls with additional hardware. Further, we found that the existing computer systems in the lecture halls include both Macs and PCs with operating systems back to Windows XP. Therefore, the selected system would need to work with all those operating systems.

On the basis of these findings, we recommend that CMSU proceed with its feasibility study of the costs and benefits of adopting a clicker policy on campus.

In the following sections, we provide additional details about our research methods, the results we obtained, the conclusions we drew from those results, and our recommendation.

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Research Methods

To acquire the information requested by Dr. Bremerton, we broke the project into six tasks:

1. acquire a basic understanding of clicker use in higher education
2. research faculty attitudes toward a formal policy on clicker use
3. research student attitudes toward a requirement to purchase a clicker
4. research the physical characteristics of the lecture halls
5. research the existing computer environment in the lecture halls
6. analyze our data and prepare this recommendation report

In the following discussion of how we performed each task, we explain the reasoning that guided our research.

Task 1. Acquire a basic understanding of clicker use in higher education

Dr. Bremerton pointed us to a number of resources on clicker use in higher education. In addition, we conducted our own literature review. Most of the research we studied fell into one of four categories:

- general introductions to clicker use in higher-education trade magazines and general periodicals
- scholarly articles on student and faculty attitudes and on learning effects
- technical specifications of clickers provided on the sites of the various manufacturers
- best practices presented on sites of colleges and universities that have adopted clickers

As we expected, the information we acquired about this commercial technology contained a mixture of research findings and marketing. We relied most heavily on manufacturers' Web sites for technical information on system capabilities and compatibility issues; we relied most heavily on university Web sites for information on instructor attitudes and experiences and best practices for implementing clicker programs. Finally, we relied most heavily on research literature for information about how clickers might affect classroom atmosphere and student learning.

Task 2. Research faculty attitudes toward a formal policy on clicker use

In performing Task 2, we sought to answer the following question posed by Dr. Bremerton: "Would instructors approve a university policy that selects and provides technical support for a clicker system that they could use in large lecture courses?"

The writers use the same task organization as in the proposal and progress report.

By stating that they know that their sources are a mixture of different kinds of information, not all of which is equally useful for every one of their questions, the writers suggest that they are careful analysts.

The writers carefully explain the logic of their methods. Do not assume that your readers will automatically understand why you did what you did. Sometimes it is best to explain your thinking. Technical communication contains a lot of facts and figures, but like other kinds of writing it relies on clear, logical arguments.

Including a page number in the cross-reference to Appendix A is a convenience to the reader. When you insert cross-references, remember to add the correct page number after you determine where the referenced material will appear in your report.

As discussed in Ch. 6, p. 144, some questions will misfire. Therefore, it is smart to field-test a questionnaire before you distribute it.

Note that these tasks begin with the question that the writers sought to answer. Don't be afraid to repeat information. Technical communication often calls for presenting different versions of the same information in different places in a document or in a set of documents.

The writers cite their sources throughout the report.

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Because our review of the research suggested that instructors across the country who have used clickers are generally quite positive about them, we wanted to ensure that we paid appropriate attention to the attitudes of the relatively small number of CMSU instructors experienced with clickers. This way, we could get a sense of whether our instructors are essentially similar to those across the country in their attitudes and experiences. We decided to use a slightly different questionnaire for instructors who have not used clickers.

We created Faculty Questionnaire 1 (see Appendix A, on page 22) for instructors who had taught with clickers at least two semesters. We chose two semesters as a minimum because we wanted to ensure that we were gathering data from instructors who are reasonably comfortable using clickers. Instructors who are new to clickers or who had taught with them only once and then abandoned them might not provide valid data. Of the 25 instructors who have used clickers at CMSU, 16 had used them at least two semesters and therefore received the questionnaire.

We created Faculty Questionnaire 2 (see Appendix B, on page 23) for the 56 instructors who regularly teach lectures with more than 100 students who had never used clickers or who had used them only one semester.

We field-tested the two questionnaires with the three other members of SAAC and, for each questionnaire, three faculty members from English, Physics, and Chemistry. We reviewed the comments from these field tests and incorporated changes in the two questionnaires.

With the authorization of Dr. Bremerton, we uploaded the questionnaires to Qualtrics, and then sent an e-mail to appropriate faculty inviting them to respond.

Task 3. Research student attitudes toward a requirement to purchase a clicker

In performing Task 3, we sought to answer the following question: "Would students approve a requirement that they purchase clickers as part of a university policy on clickers?"

Several research studies suggest that most students, across the country and across various course subjects, like using clickers. One study (Caldwell, 2007), at West Virginia University, found that some 88 percent of students "frequently" or "always" enjoyed using clickers in their introductory biology course. Aggregating several studies, the percentage of students who approve of using clickers always exceeds 70 percent. Students comment that instructors who use clickers are more aware of students' needs and employ a more responsive teaching style than those who don't use them.

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However, students do not always approve of clicker use. The principal complaints reported nationally (Caldwell, 2007) relate to the following problems:

- Some clickers cost too much.
- Some instructors do not explain the purpose of using the clickers.
- Some instructors spend too much class time using the clickers.
- Some instructors let clicker use drive the course content.
- Some students are anxious about having their course grades depend, to some extent, on their use of an electronic device.

Of these concerns, all except the one related to the cost of the clicker refer to how instructors integrate the clickers into the course content. As many commentators suggest, schools need to provide training for instructors that covers technical questions not only about how to operate clickers and related software but also about how to use them effectively in teaching the course.

We concluded that the most useful data we could obtain would relate to what price CMSU students thought was reasonable. A review of the sites of the four leading manufacturers of clicker systems (Turning Technologies, eInstruction, iClicker, and Qwizdom) shows that pricing can vary, depending on the pricing model the vendor uses. For instance, some companies (such as Turning Technologies) charge a one-time price, with no fees for registering the clicker so that it can be used. Other companies (such as eInstruction) charge once for the clicker but have a per-semester registration fee. In addition, commentators (University of Wisconsin-Eau Claire, n.d.) point out that some vendors have established relationships with textbook manufacturers so that the clickers are packaged with selected textbooks. Finally, some schools have entered into contractual relationships with clicker vendors that call for a particular price for students at that school. Therefore, it is impossible to answer the cost question simply.

We therefore decided to try to determine the one-time price that students would find reasonable for a clicker. Although CMSU might not in fact be able to achieve a one-time price contract for the clicker, the answer to this question will at least give the university an idea of student attitudes about price. We selected a price ranging from zero (for students who wish to express an opposition to having to buy a clicker at any price) to approximately \$60. (At this time, Quizdom's clicker, at \$66.55, represents the high end of prices.)

We wrote the following one-question questionnaire for the 11,324 currently enrolled undergraduate students.

← Here, again, the writers explain the logic of their methods. They decided to focus on what they think is the most appropriate information: student attitudes toward the price of the clickers. Questions related to how instructors use clickers will be addressed in Dr. Bremerton's larger study.

Writers often need to decide where to present information in a technical document. This questionnaire could have appeared in an appendix, as the two instructor questionnaires did. However, because it is relatively brief and readers are very interested in student attitudes, the writers decided to include it in the body of the report.

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As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether CMSU should select a single brand of clicker to be used in some lecture courses at CMSU. Clickers are used by students to respond to questions posed by instructors in large lecture courses. If such a choice were made, you might be required to purchase a clicker for use in some of your lecture courses. Following are some details:

1. The university would seek to enter into a two-year contract with a manufacturer of the clicker systems. Although the university would hope to renew that contract so that the one clicker you purchase would last for your entire career at CMSU, it is possible that you would need to purchase a new clicker as often as every two years.
2. You would be responsible for purchasing the batteries for your clicker. Batteries generally last from six months to a year, and replacement batteries cost approximately \$3–6.
3. You would be responsible for replacing your clicker if you lose it.

We would appreciate your telling us what price you think would be reasonable for the clicker unit. Please select one of the following responses, and then hit the Submit button.

- \$0. I don't want to have to buy any clicker.
- Up to \$20.
- Up to \$40.
- Up to \$60.

Thank you!

We made this questionnaire available for all undergraduate students because, of the 11,324 students currently enrolled, only 832 had ever used a clicker at CMSU. Because that number constituted only some 7 percent of the total undergraduate population, we felt that it was not worth the expense of separating out those who had used a clicker on campus.

We then field-tested the question with the three other members of SAAC. With the authorization of Dr. Bremerton, we uploaded the survey to Qualtrics, and then sent an e-mail to students, inviting them to respond to the question.

Task 4. Research the physical characteristics of the lecture halls

In performing Task 4, we sought to answer the following question: “Would the physical characteristics of any of the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?”

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Our research indicated that there are two major technologies used in clicker systems: infrared (IR) and radio frequency (RF) (Ohio State University, 2005). IR, which is the technology used in television remote controls, requires a clear line of sight and has a limited range (40–80 feet). If IR is to be used for greater distances, the room would need to have additional receivers installed on the walls and connected either by wires or wirelessly to the instructor podium. In addition, IR signals can be disrupted by some classroom lighting systems.

By contrast, RF systems do not require a clear line of sight, have no range limitations, and are not subject to electronic interference. An RF system uses a receiver built into a USB device that attaches easily to the computer in the podium or to the instructor's laptop. For these reasons, RF systems are simpler and are becoming the industry standard.

However, IR systems are less expensive, with clickers costing less than \$10. Therefore, if CMSU lecture halls meet the line-of-sight and range requirements, already have receivers installed, and pose no interference risk, IR systems would be an option. But if any of the lecture halls does not meet one or more of these criteria, CMSU should consider only RF systems.

We began by meeting with Marvin Nickerson, the Director of Physical Plant, on November 8, 2011, to explain our project and to give him a list of the questions we needed to answer. Table 1 shows the questions we posed, as well as the rationale for each question:

The writers present just enough information about the two technologies to help the reader understand their logic. Writers sometimes present too much information; write only as much as you need to get the job done.

Although the writers could have broken Table 1 across pages 8 and 9 of the report, a choice that would have saved some space, they decided to place the entire table on page 9, making it a little easier for readers to see all the information at once.

The table is an appropriate graphic for presenting the questions and their rationales economically. Again, the writers are explaining the logic of their decisions.

Table 1. Questions About the Physical Characteristics of the Lecture Halls

Question	Rationale
1. Which lecture halls have more than 100 seats?	Although clickers can be used in any size classroom, they are used most frequently in large lecture halls, where the effect they can have in increasing interactivity between the instructor and the students is most valuable.
2. For each of these lecture halls, what is the distance from the podium to the farthest student seat?	Because IR systems have a range of only 40–80 feet, we wanted to know whether CMSU would need to install extra IR receivers for the systems to work effectively.
3. Do any of these lecture halls have pillars or other obstructions between the podium and any of the student seats?	IR systems cannot function if there is a line-of-sight obstruction.
4. Do any of these lecture halls already have infrared receivers and transmission lines installed?	Because IR systems would require the installation of IR receivers and transmission lines, we wanted to know if such hardware is already in place.
5. Do any of these lecture halls have any technical characteristics that might interfere with either IR or RF transmission between the podium and any student seat?	We wanted to know if there was anything else about any of the lecture halls that we needed to consider. Although we are unaware of any other factors that might be relevant, we thought it appropriate to ask Mr. Nickerson, who has vast experience with the physical infrastructure of the classroom buildings.

Mr. Nickerson responded in an e-mail to us dated November 11, 2011. We thanked him in an e-mail the next day.

Task 5. Research the existing computer environment in the lecture halls

In performing Task 5, we sought to answer the following question: “Would the computer platforms and operating systems used in the instructor stations in the large lecture halls affect the decision whether to adopt clickers or restrict the university to a particular technology or brand of clicker?”

We wanted to determine which platform (Windows, Macintosh, or other) and which operating system (for example, Windows XP, Vista, or 7 or Macintosh OSX) are used in the computers used in each podium in the large lecture halls

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identified by Mr. Nickerson. This information would be necessary to ensure that any clicker system CMSU selects would work with the existing computer technology in the lecture halls.

We met with Dr. Arlene Matthews, the Director of Academic Technologies, on November 14, 2011, to explain our project and to give her a list of the questions we needed to answer. As Director of AT, Dr. Matthews would have a database of this information because AT participated in installing all the instructor podiums and related systems in all the lecture halls. We exchanged several phone calls during that week, and she responded in an e-mail dated November 17, 2011. We thanked her in an e-mail later that day.

On the basis of Dr. Matthews's e-mail, we made follow-up phone calls to the network administrators for three departments to obtain information that Dr. Matthews lacked or that we thought might be out of date.

Task 6. Analyze our data and prepare this recommendation report

We drafted this report and uploaded it to a wiki that we created to make it convenient for the other SAAC members to help us revise it. We incorporated most of our colleagues' suggestions and then presented a final draft of this report on the wiki to gather any final editing suggestions.

Because analyzing their data and writing this report is part of the writers' study, it is appropriate to include it as one of the steps. In some organizations, however, this task is assumed to be part of the study and is therefore not presented in the report.

The writers present an advance organizer for the results section.

The writers continue to use the task structure that they used in the methods section.

This photograph is the only one in the report. If the purpose of the report were to recommend which clicker system to use, the report would likely contain photos of each of the various brands of clickers. In this report, the photograph of students enthusiastically using the clickers is appropriate. The photo was first published in a student blog. Be sure to consider the intellectual-property issues related to your use of any copyrighted information, as discussed in Ch. 2, p. 24.

Results

In this section, we present the results of our research. For each of the tasks we carried out, we present the most important data we acquired.

Task 1. Acquire a basic understanding of clicker use in higher education

Clickers, which are also called *classroom response systems*, *student response systems*, and *audience response systems*, are “wireless in-class electronic polling systems used by students to answer questions during lectures” (Ohio State University, 2005, p. 2). In a clicker system, each student has an electronic device called a *clicker*, which looks like a TV remote control. The instructor poses a question, usually by embedding the question beforehand in a PowerPoint presentation, and students respond by inputting information on their clickers. Software on the instructor’s computer tabulates the responses and presents them in a display, such as a bar graph, which appears on the instructor’s screen, and (in some systems) on a screen on each student’s clicker.

Clickers are often used to engage students in learning, to give quizzes, and to take attendance.

Figure 1 shows students using clickers.



Figure 1. Students using clickers (Brilling, 2008)

Clickers can help instructors improve the classroom atmosphere in a number of ways (Vanderbilt University, 2010):

- promote active student engagement during a lecture
- promote discussion and collaboration among students during class
- encourage participation from every student in a class
- check for student understanding during class
- teach in a way that adapts to the immediate learning needs of students

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Anecdotal and scholarly evidence suggests clearly that using clickers improves classroom dynamics by encouraging active learning. Whereas a traditional lecture can be a passive experience, with the instructor talking to students, clickers encourage interaction not only between the instructor and the students but also between students (Draper & Brown, 2004). In a traditional lecture, students are often unwilling to participate because they are afraid of embarrassment or disapproval by their peers, or simply because they have learned not to participate in a lecture (Caldwell, 2007). In a typical lecture, a small number of students dominate the questioning, often giving the instructor an inaccurate impression of how many students understand the material (Simpson & Oliver, 2006).

Although it makes sense to assume that a more active learning environment leads to better learning, measuring learning is more challenging and therefore there is not yet complete consensus that clickers improve learning. There are some studies that do suggest improved learning. For instance, a study (Ohio State University, 2008) of a large, multi-section physics course found that students in clicker sections outperformed those in non-clicker sections by 10 points on a final exam, and that females students did as well as males in the clicker sections (but not in non-clicker sections). And a meta-analysis by Fies and Marshall (2006) shows that 11 of 26 studies show clear evidence of improved comprehension of complex concepts.

The bulk of scholarly literature, however, is consistent with Beatty et al. (2006), who see great potential for improved student learning. As Caldwell (2007) puts it,

Most reviews agree that “ample converging evidence” suggests that clickers generally cause improved student outcomes such as improved exam scores or passing rates, student comprehension, and learning and that students like clickers. The reviews of the literature, however, also agree that much of the research so far is not systematic enough to permit scientific conclusions about what causes the benefits. (n.p.)

At the very least, as Knight and Wood (2005) argue, students with clickers almost always do at least as well in exam scores as students who don't use clickers.

This is probably the most important point for this reader: no scholarly studies have found that clickers hurt the learning process.

Task 2. Research faculty attitudes

Because student attendance, engagement, and participation increase with the use of clickers, it makes sense that many instructors would like clickers. Anecdotal evidence reported in Caldwell (2007) suggests that instructors do enjoy the improved student engagement and perceive that students learn more effectively in clicker courses.

However, the literature suggests (see Vanderbilt, 2010) that instructors have cited problems with clicker use:

- Technical problems with the hardware or software can occur during a class.
- It takes time for an instructor to learn a system and use it effectively.
- It takes time for an instructor to embed clicker questions in teaching materials (such as PowerPoint slides).
- Using clickers in class takes time away from other instructional activities.
- Changing a lesson “on the fly” or conducting a discussion in response to clicker responses can disrupt the flow of a lesson.

We considered these findings in devising our questionnaires for CMSU instructors.

We distributed Faculty Questionnaire 1 to the 16 instructors who had taught with clickers at least two semesters. Of that number, 14 responded. Figure 2 shows the mean responses to the five questions (with 1 = “strongly disagree” and 6 = “strongly agree”):

- Q1. I find it easy to use clickers in my lecture courses.
- Q2. Using clickers in my lecture classes improves student attendance and engagement.
- Q3. Using clickers in my lecture classes improves student learning.
- Q4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
- Q5. If CMSU selects a good clicker and provides good technical support, I will use it in my lecture courses.

Even though the reader could flip to Appendix A to read the questions, it is more convenient to read the questions here, along with the data they elicited.

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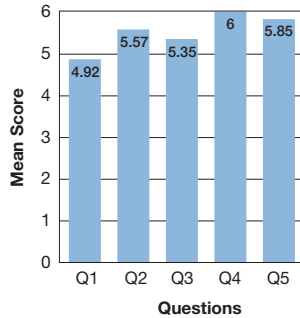


Figure 2. Attitudes of Faculty Experienced with Clickers

Appendix A, page 22, presents the raw data that are summarized in Figure 2.

We distributed Faculty Questionnaire 2 to the 56 instructors who had never taught with clickers (or taught with them for only one semester) but who regularly teach lectures with more than 100 students. Of the 56, 42 responded. Figure 3 shows the mean responses to the five questions (with 1 = “strongly disagree” and 6 = “strongly agree”):

- Q1. I would like to make my lectures a more active learning experience for students.
- Q2. I would like to improve my ability to know how many students understand the concepts I am trying to present during my lectures.
- Q3. I would like to be able to automate tasks such as taking attendance or delivering quizzes quickly and accurately using clickers.
- Q4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
- Q5. I would be very interested in learning more about how I could use clickers in my lecture courses.

Note that the writers use a conservative design for their bar graphs, with simple two-dimensional bars, labels presenting the data clearly, and same-color bars. If there is no reason to use different colors, don't.

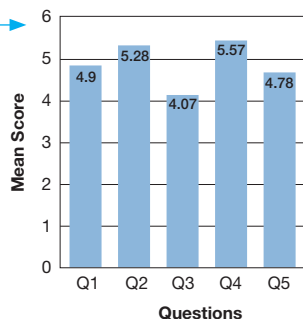


Figure 3. Attitudes of Faculty Not Experienced with Clickers

Appendix B, page 23, presents the raw data that are summarized in Figure 3.

Task 3. Research student attitudes

We received 8,576 responses to the questionnaire we made available to the 11,324 enrolled undergraduates. Figure 4 shows the responses:

A pie chart is a good choice for showing the relative proportions of a small set of data that add up to a whole. Again, note that the writers set their software so that the chart is a conservative design. For the colors, they chose different saturations of the same hue. For the data, they chose to present the maximum dollar figures and the percentage for each possible response to the question.

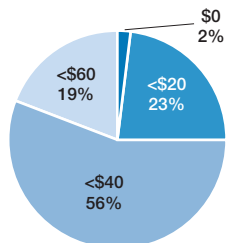


Figure 4. Students' Attitudes Toward Reasonable Price for a Clicker

Task 4. Research the physical characteristics of the lecture halls

Table 2 shows the questions we posed to Mr. Nickerson, the rationale for each question, and Mr. Nickerson's replies.

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Table 2. Questions and Answers About the Physical Characteristics of the Lecture Halls

Question	Rationale	Mr. Nickerson's reply
1. Which lecture halls have more than 100 seats?	Although clickers can be used in any size classroom, they are used most frequently in large lecture halls, where the effect they can have in increasing interactivity between the instructor and the students is most valuable.	There are 17 such rooms on campus: [here is the list of the rooms]
2. For each of these lecture halls, what is the distance from the podium to the farthest student seat?	Because IR systems have a range of only 40–80 feet, we wanted to know whether CMSU would need to install extra IR receivers for the systems to work effectively.	Of the 17, 15 have a distance of over 80 feet.
3. Do any of these lecture halls have pillars or other obstructions between the podium and any of the student seats?	IR systems cannot function if there is a line-of-sight obstruction.	Of the 17, 4 have pillars that obstruct up to 12 seats.
4. Do any of these lecture halls already have infrared receivers and transmission lines installed?	Because IR systems would require the installation of IR receivers and transmission lines, we wanted to know if such hardware is already in place.	No.
5. Do any of these lecture halls have any technical characteristics that might interfere with either IR or RF transmission between the podium and any student seat?	We wanted to know if there was anything else about any of the lecture halls that we needed to consider in evaluating the two main types of systems. Although we are unaware of any other factors that might be relevant, we thought it appropriate to ask Mr. Nickerson, who has vast experience with the physical infrastructure of the classroom buildings.	No.

The writers adapted the table from the methods section by adding the right-hand column for Mr. Nickerson's reply.

Task 5. Research the computers used in the lecture halls

From our meeting with Dr. Matthews, the Director of Academic Technologies, and some follow-up phone calls to her and representatives of three academic departments, we determined that the 17 large lecture halls in which we might use clicker systems use the following computer platforms and operating systems:

Small, informal tables like this one often are not numbered or titled. See Ch. 12, p. 321, for more on tables.

Platform	Operating system	Number of lecture halls
Macintosh	OSX	3
PC	XP	7
PC	Vista	7
PC	Windows 7	4

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Conclusions

In this section, we present our conclusions based on our research related to the four questions we were asked to answer.

Faculty attitudes

Faculty who have taught with clickers at least two semesters have very positive attitudes toward the technology. On a scale of 1–6 (with 1 = “strongly disagree” and 6 = “strongly agree”), they feel that systems were easy to use, improve student attendance and engagement, and improve learning. They were unanimous that it was important for CMSU to select a versatile, dependable clicker and provide adequate technical support and suggested very clearly that they would use a clicker system. In short, our instructors with experience using clickers want to proceed with the project.

Instructors who lacked significant experience with clickers but who regularly teach lectures with more than 100 students were somewhat less enthusiastic but still very positive. They feel that clickers would make their lectures a more active learning experience for students and help them understand the concepts presented in the lectures. They were less enthusiastic about using clickers to automate tasks such as taking attendance or delivering quizzes, but they echo the experienced instructors in feeling it important to select a versatile, dependable clicker and provide adequate technical support. Most importantly, they expressed a strong desire to learn more about using clickers in their large lecture courses. In short, these data suggest that instructors inexperienced with clickers wish to learn more about them and are at least open to the possibility that clickers will enhance the learning environment and improve student learning.

On the basis of the results of these two questionnaires, we think that instructors will be very receptive to a feasibility study. In addition, if CMSU adopts a formal policy of clicker use, faculty probably will be positive about it—provided that the university chooses a good clicker system and provides effective technical support.

Student attitudes

More than half (56 percent) of the CMSU students who responded to our questionnaire expressed a willingness to pay up to \$40 for a clicker. A quarter (23 percent) are willing to pay only \$20, but a fifth (19 percent) are willing to pay up to \$60. Two percent do not wish to pay anything for a clicker.

We therefore conclude that price is an important factor that the university should consider during the feasibility study. CMSU students make considerable sacrifices to attend the university, with the majority of them earning most, if not

The function of a conclusion is to explain what the data mean. Here the writers explain how their results can help their readers determine whether and how to proceed with the clicker study. Notice that a conclusion is not the same as a recommendation, which explains what the writers think should be done next.

The writers present an advance organizer for the conclusions section.

At this point in the document, the writers have decided to abandon the “task” labels. Their thinking is that they are focusing less on what they did and more on the meaning of the information they have gathered. However, they are retaining the headings that help readers understand the topic they are discussing.

all, of their college expenses. For a clicker program to be received positively by students here, they will need to believe that the cost to them is modest and that the advantages to them outweigh that cost.

Physical characteristics of the lecture halls

If a point can be made in only a few sentences, use only a few sentences.

▶ Although IR systems use cheaper clickers than RF systems do, our large lecture halls are not already equipped to handle IR systems. Therefore, we should consider only those vendors that offer RF systems.

Computers used in the lecture halls

Because our large lecture halls use both PCs and Macintoshes, we should consider only those vendors that offer systems that are cross-platform. In addition, we should ensure that the system we are considering is compatible with Windows XP (the oldest operating system on campus). If the system is not, we would need to upgrade the podium computers in seven of our large lecture halls.

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Recommendation

We recommend that CMSU proceed with its feasibility study of the costs and benefits of adopting a clicker policy on campus. Instructors, both those experienced with clickers and those who are not, are strongly positive toward the possibility of being able to use clickers, especially if the best one is selected and it is supported effectively by the university. Students are positive toward the possibility, especially if they are asked to spend no more than \$40 for a clicker. The existing infrastructure of the large lecture halls poses no particular problems, but we would need to adopt an RF-based system that is compatible with our current PC and Macintosh systems.

This recommendation states explicitly what the writers think the reader should do next.

The recommendation largely repeats information presented in other places in the report. In technical communication, repetition can reinforce important information and increase your chances of reaching readers who read only selected portions of long documents.

This list of references follows the APA documentation style, which is discussed in Appendix, Part B, p. 670.

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Appendix A: Faculty Questionnaire 1

This is the questionnaire we distributed to the 16 CMSU instructors who had taught with clickers for at least two semesters. Of the 16, 14 responded. The numbers in the responses represent the number of faculty who selected each response.

Questionnaire on Clicker Use at CMSU

Directions: As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether to institute a formal mechanism for using clickers in large lecture courses at CMSU. We are asking you to participate in this study because you are an experienced user of clickers. We greatly appreciate your answering the following five questions.

1. I find it easy to use clickers in my lecture courses.
Strongly disagree _____ **4** **7** **3** Strongly agree
2. Using clickers in my lecture classes improves student attendance and engagement.
Strongly disagree _____ **6** **8** Strongly agree
3. Using clickers in my lecture classes improves student learning.
Strongly disagree _____ **2** **5** **7** Strongly agree
4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
Strongly disagree _____ **14** Strongly agree
5. If CMSU selects a good clicker and provides good technical support, I will use it in my lecture courses.
Strongly disagree _____ **2** **12** Strongly agree

Thank you!

Presenting the raw data in boldface after each question is a clear way to communicate how the respondents voted. Although most readers will not be interested in the raw data, some will.

Appendix B: Faculty Questionnaire 2

This is the questionnaire we distributed to the 56 CMSU instructors who had *not* taught with clickers for at least two semesters. Of the 56 faculty, 42 responded. The numbers in the responses represent the number of faculty who selected each response.

Questionnaire on Clicker Use at CMSU

In the introductory text before the five questions, the writers present a slightly more detailed explanation of clickers, because most of their respondents have not used them.

Directions: As you may know, Vice President for Student Affairs Bremerton is conducting a study to determine whether to institute a formal mechanism for using clickers in large lecture courses at CMSU. Students use clickers to respond to multiple-choice questions posed by faculty. Instructors use clickers for such tasks as assessing student understanding, prompting discussions, giving quizzes, and taking attendance.

We are asking you to participate in this study because we want to gauge your interest in using clickers in your lecture courses. We greatly appreciate your answering the following five questions.

1. I would like to make my lectures a more active learning experience for students.
Strongly disagree ___ ___ 7 4 17 14 Strongly agree
2. I would like to improve my ability to know how many students understand the concepts I am trying to present during my lectures.
Strongly disagree ___ ___ ___ 9 12 21 Strongly agree
3. I would like to be able to automate tasks such as taking attendance or delivering quizzes quickly and accurately using clickers.
Strongly disagree ___ 8 3 16 8 7 Strongly agree
4. It is very important to me that CMSU select a versatile, dependable clicker and provide adequate technical support for faculty who choose to use it.
Strongly disagree ___ ___ ___ 18 24 Strongly agree
5. I would be very interested in learning more about how I could use clickers in my lecture courses.
Strongly disagree 4 2 3 9 12 12 Strongly agree

Thank you!

Writer's Checklist

In planning your recommendation report, did you

- analyze your audience? (p. 514)
- determine your purpose? (p. 514)
- identify the questions that need to be answered? (p. 516)
- carry out appropriate research? (p. 517)
- draw valid conclusions about the results (if appropriate)? (p. 518)
- formulate recommendations based on the conclusions (if appropriate)? (p. 519)

Does the transmittal letter

- clearly state the title and, if necessary, the subject and purpose of the report? (p. 523)
- clearly state who authorized or commissioned the report? (p. 523)
- briefly state the methods you used? (p. 523)
- summarize your major results, conclusions, and recommendations? (p. 523)
- acknowledge any assistance you received? (p. 523)
- courteously offer further assistance? (p. 523)

Does the cover include

- the title of the report? (p. 523)
- your name and position? (p. 523)
- the date of submission? (p. 523)
- the company name or logo? (p. 524)

Does the title page

- include a title that clearly states the subject and purpose of the report? (p. 524)
- list the names and positions of both you and your principal reader(s)? (p. 524)
- include the date of submission of the report and any other identifying information? (p. 524)

Does the abstract

- list the report title, your name, and any other identifying information? (p. 524)
- clearly define the problem or opportunity that led to the project? (p. 524)
- briefly describe (if appropriate) the research methods? (p. 524)
- summarize the major results, conclusions, and recommendations? (p. 524)

Does the table of contents

- clearly identify the executive summary? (p. 525)
 - contain a sufficiently detailed breakdown of the major sections of the body of the report? (p. 525)
 - reproduce the headings as they appear in your report? (p. 525)
 - include page numbers? (p. 526)
- Does the list of illustrations (or list of tables or list of figures) include all the graphics found in the body of the report? (p. 526)

Does the executive summary

- clearly state the problem or opportunity that led to the project? (p. 528)
- explain the major results, conclusions, recommendations, and managerial implications of your report? (p. 528)
- avoid technical vocabulary and concepts that a managerial audience is not likely to know? (p. 528)

Does the introduction

- explain the subject of the report? (p. 521)
 - explain the purpose of the report? (p. 521)
 - explain the background of the report? (p. 521)
 - describe your sources of information? (p. 521)
 - indicate the scope of the report? (p. 521)
 - briefly summarize the most significant findings of the project? (p. 521)
 - briefly summarize your recommendations? (p. 521)
 - explain the organization of the report? (p. 521)
 - define key terms used in the report? (p. 522)
- Does the methods section describe your methods in sufficient detail? (p. 522)
- Have you justified your methods where necessary, explaining, for instance, why you chose one method over another? (p. 522)

Are the results presented

- clearly? (p. 522)
- objectively? (p. 522)
- without interpretation? (p. 522)


Are the conclusions

- presented clearly? (p. 522)
- drawn logically from the results? (p. 522)

Are the recommendations

- clear? (p. 523)
 - objective? (p. 523)
 - polite? (p. 523)
 - in an appropriate form (list or paragraph)? (p. 523)
 - in an appropriate location? (p. 523)
- Does the glossary include definitions of all the technical terms your readers might not know? (p. 530)
- Does the list of symbols include all the symbols and abbreviations your readers might not know? (p. 531)
- Does the list of references include all your sources and adhere to an appropriate documentation system? (p. 531)
- Do the appendixes include supporting materials that are too bulky to present in the report body or are of interest to only a small number of your readers? (p. 531)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

- 1.** An important element in carrying out a feasibility study is determining the criteria by which to judge each option. For each of the following topics, list five necessary criteria and five desirable criteria you might apply in assessing the options.
 - a. buying a cell phone
 - b. selecting a major
 - c. choosing a company to work for
 - d. buying a car
 - e. choosing a place to live while you attend college
- 2. INTERNET EXERCISE** Using the Links Library for Chapter 6 on <bedfordstmartins.com/techcomm>, find a site that links to government agencies and departments. Then find a recommendation report on a subject that interests you. In what ways does the structure of the report differ from the structure described in this chapter? In other words, does it lack some of the elements described in this chapter, or does it have additional elements? Are the elements arranged in the same order in which they are described in this chapter? In what ways do the differences reflect the audience, purpose, and subject of the report?
- 3. GROUP EXERCISE** Write the recommendation report for the research project you proposed in response to Exercise 3 on page 463 in Chapter 16. Your instructor will tell you whether the report is to be written individually or collaboratively, but either way, work closely with a partner to review and revise your report. A partner can be very helpful during the planning phase, too, as you choose a topic, refine it, and plan your research.
- 4. INTERNET EXERCISE** Secure a recommendation report for a project subsidized by a city or federal agency, a private organization, or a university committee or task force. (Be sure to check your university's Web site; universities routinely publish strategic planning reports and other sorts of self-study reports. Also check <www.nas.edu>, which is the site for the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council, all of which publish reports on the Web.) In a memo to your instructor, analyze the report. Overall, how effective is the report? How could the writers have improved the report? If possible, submit a copy of the report along with your memo.

Case 19: Analyzing Decision Matrices

Background

You are the president of Harmony Music, a business that offers music instruction. You are a serious amateur pianist, but your company offers instruction in both piano and guitar. You purchase 10 new guitars every year to replenish your inventory, and this year you want to investigate the

feasibility of purchasing, for the first time, electric guitars that can be used for digital recording. You asked your Director of Guitar Instruction, Helen Ferguson, to study the question for you.

Helen is amply qualified to carry out this investigation; she is adept at both acoustic and electric guitars and uses

a home studio to record original music, which she mixes digitally and sells from her Web site. Helen has been keeping you up-to-date on her research. She is considering different models on the basis of four criteria: ease of use, sound quality/playability, MIDI (Musical Instrument Digital Interface) compatibility, and cost.

She e-mails you an update that contains two tables showing her analysis so far (see Document 19.1). You look it over, then send her an e-mail that contains some questions. She replies (see Document 19.2).

Your Assignment

Write an e-mail to Helen thanking her for getting back to you and explaining that you would like her to redo the research. Describe the methodological problems you see in the tables and in her explanations of them. Describe how to perform the research so that she will elicit more-objective information. Explain how to set up a decision matrix. Where appropriate, provide examples of how to present the data effectively in her tables.

Table 1 Digital Guitar Necessary-Criteria Evaluation

<i>Guitar Model</i>	<i>Ease of Use¹</i>	<i>Sound Quality/ Playability²</i>	<i>MIDI Compatibility³</i>	<i>Cost⁴</i>	<i>Consider Further?</i>
Epiphone Limited Edition 1966 G-400	No	Medium	Low	\$399	No
Fender VG Stratocaster	Yes	High	High	\$950	Yes
Gibson Les Paul Studio	No	High	Yes	\$1,399	No

¹Minimal setup time for each guitar, and instruction included; instruments with low learning curves and intuitive interfaces.

²Guitars require hum-canceling pickups that rate at least 1320 (5.9 kilonewtons) on the Janka Hardness Scale, white ash wood.

³Guitars require 1/4" coaxial, MIDI, DIN 5/180° in/out/thru and to-host connectors; guitars require separate MIDI interface units.

⁴Guitars at \$950 or less each.

Table 2 Digital Music Equipment Decision Matrix/Scores¹

<i>Piano/Guitar Brand</i>	<i>Ease of Use</i>	<i>Sound Quality/ Playability</i>	<i>MIDI Compatibility</i>	<i>Cost</i>	<i>Total Score</i>
Epiphone Limited Edition 1966 G-400	4	6	4	8	22
Fender VG Stratocaster	9	10	9	7	35
Gibson Les Paul Studio	4	8	7	4	23

¹Scores based on a 1–10 point scale, with 1 indicating the lowest score and 10 indicating the highest score.

Document 19.1 Two Tables from the Results Section of a Recommendation Report

**Document 19.2 Helen's
Response to Your E-mail
Asking for Clarification**

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Boss—

Answers to your questions below:

I've got a few technical questions for you:

1. I'm wondering why Table 1 doesn't use a scoring system, whereas Table 2 does. And if you conclude in Table 1 that you don't want to consider the Epiphone or the Gibson further, why is it included in Table 2?

I wanted to start out with just some general information to give you a feel for the different guitars, then save the numbers for the second table. Why Epiphone? The Ep is made by Gibson, and it has a long history. McCartney and Lennon each have a signature acoustic with Ep. Why Gibson? Because it's Gibson.

2. I'm having a little trouble understanding the grading system for some of the criteria. In Table 1, for instance, how do you come up with a yes or no on Ease of Use? On the next column, are sound quality and playability the same thing, or do the two things go together? Can't you have good playability (low action) but poor sound quality (fret buzz, etc.)?

Well, these things are kind of subjective. I had the three other guitar instructors give me their reactions. Then, I just took what they told me, marinated it in my own thoughts, and cooked it.

3. I don't know anything about MIDI compatibility. Isn't that a yes/no thing, or are some guitars "more MIDI compatible" than others?

Yeah, in one sense it's yes/no in that some guitars are not at all MIDI compatible. But in another sense, if you line up all the MIDI compatible guitars, some are a lot easier to use, some offer greater versatility, etc.

4. Why consider the Epiphone in the first place? At \$400, it's quite a bit cheaper than either of the others. Are we mixing apples and oranges here?

I really like the Eps, and I just wanted to see how it would come out head-to-head against the other brands, which are better known. And I think you're getting maybe 90 percent of the guitar for about 40 percent of the price of the Les Paul.

5. In Table 2, I'm not sure how you came up with the numbers for each cell in the table. Can you provide some details?

I averaged the scores that I got from the other guitar instructors. It's kind of a guesstimate, though, because some grade harder than others, and not every guitar was tested by the same instructors. This ain't exactly a science. ;-)

Writing Definitions, Descriptions, and Instructions



fotofo/Getty Images.

Do everything you can to ensure that your readers won't get hurt.

Writing Definitions 564

Analyzing the Writing Situation for Definitions 565

Determining the Kind of Definition to Write 566

Deciding Where to Place the Definition 571

Writing Descriptions 573

Analyzing the Writing Situation for Descriptions 573

Indicating Clearly the Nature and Scope of the Description 574

Introducing the Description Clearly 575

Providing Appropriate Detail 576

Concluding the Description 578

A Look at Several Sample Descriptions 578

Writing Instructions 581

Designing a Set of Instructions 584

Planning for Safety 586

Drafting Effective Instructions 588

Revising, Editing, and Proofreading Instructions 592

A Look at Several Sample Instructions 592

Writing Manuals 598

Instructions are all around us. This photo from the inside of a passenger train shows instructions explaining what to do in case of various kinds of emergencies. Notice that these instructions use images, words, and colors to help people understand how to make the right decisions quickly.

This chapter discusses definitions, descriptions, and instructions. We need to start by defining these three terms:

- A *definition* is typically a brief explanation of an item or concept using words and (sometimes) graphics. You could write a definition of *file format* or of *regenerative braking*.
- A *description* is typically a longer explanation—usually accompanied by graphics—of an object, mechanism, or process. You could write a description of a *wind turbine*, of *global warming*, or of *shale-oil extraction*.
- A set of *instructions* is a kind of process description, almost always accompanied by graphics, intended to enable a person to carry out a task. You could write a set of instructions for laying a brick patio or for making a playlist for your MP3 player.

Regardless of your field, you will write definitions, descriptions, and instructions frequently. Whether you are communicating with other technical professionals, with managers, or with the public, you must be able to define and describe your topic and explain how to carry out tasks.

WRITING DEFINITIONS

The world of business and industry depends on clear definitions. Suppose you learn at a job interview that the employer pays tuition and expenses for employees' job-related education. You'll need to study the employee-benefits manual to understand just what the company will pay for. Who, for instance, is an *employee*? Is it anyone who works for the company, or is it someone who has worked for the company full-time (40 hours per week) for at least six uninterrupted months? What is *tuition*? Does it include incidental laboratory or student fees? What is *job-related education*? Does a course about time management qualify under the company's definition? What, in fact, constitutes *education*?

Definitions are common in communicating policies and standards “for the record.” Definitions also have many uses outside legal or contractual contexts. Two such uses occur frequently:

- *Definitions clarify a description of a new development or a new technology in a technical field.* For instance, a zoologist who has discovered a new animal species names and defines it.
- *Definitions help specialists communicate with less knowledgeable readers.* A manual explaining how to tune up a car includes definitions of parts and tools.

Definitions, then, are crucial in many kinds of technical communication, from brief letters and memos to technical reports, manuals, and journal articles. All readers, from the general reader to the expert, need effective definitions to carry out their jobs.

Analyzing the Writing Situation for Definitions

The first step in writing effective definitions is to analyze the writing situation: the audience and the purpose of the document.

Unless you know who your readers will be and how much they know about the subject, you cannot determine which terms to define or what kind of definition to write. Physicists wouldn't need a definition of *entropy*, but lawyers might. Builders know what a molly bolt is, but many insurance agents don't.

When you write for people whose first language is not English, definitions are particularly important. Consider the following suggestions:

- *Add a glossary (a list of definitions).* For more on glossaries, see Chapter 19, page 530.
- *Use Simplified English and easily recognizable terms in definitions.* For more on Simplified English, see Chapter 10, page 252.
- *Pay close attention to key terms.* Be sure to carefully define terms that are essential for understanding the document. If, for instance, your document is about angioplasty, you will want to be especially careful when defining it.
- *Use graphics to help readers understand a term or concept.* Graphics are particularly helpful to readers of different languages, and they reduce the cost of translating text from one language to another.

Think, too, about your purpose. For readers who need only a basic understanding of a concept—say, *time-sharing vacation resorts*—a brief, informal definition is usually sufficient. However, readers who need to understand an object, process, or concept thoroughly and be able to carry out related tasks need a more formal and elaborate definition. For example, the definition of a “Class 2 Alert” written for operators at a nuclear power plant must be comprehensive, specific, and precise.

In This Book

For more about audience and purpose, see Ch. 5.

Determining the Kind of Definition to Write

Definitions can be short or long, informal or formal; it depends on your audience and your purpose. There are three basic types of definitions: parenthetical, sentence, and extended.

Writing Parenthetical Definitions A *parenthetical definition* is a brief clarification within an existing sentence. Sometimes, a parenthetical definition is simply a word or phrase that is enclosed in parentheses or commas or introduced by a colon or a dash. In the following examples, the term being defined is shown in italics, and the definition is underscored:

The computers were infected by a *Trojan horse* (a destructive program that appears to be benign).

Before the metal is plated, it is immersed in the *pickle*: an acid bath that removes scales and oxides from the surface.

Parenthetical definitions are not meant to be comprehensive; rather, they serve as quick and convenient ways of introducing terms. But make sure your definition is clear. You have gained nothing if readers don't understand it:

Next, check for blight on the *epicotyl*, the stem portion above the cotyledons.

Readers who need a definition of *epicotyl* are unlikely to know the meaning of *cotyledons*.

Writing Sentence Definitions A *sentence definition*—a one-sentence clarification—is more formal than a parenthetical definition. A sentence definition usually follows a standard pattern: the item to be defined is placed in a category of similar items and then distinguished from them.

Item	=	Category	+	Distinguishing characteristics
Crippleware	is	shareware		in which some features of the program are disabled until the user buys a license to use the program.
Hypnoanalysis	is	a psychoanalytical technique		in which hypnosis is used to elicit information from a patient's unconscious mind.

In many cases, a sentence definition also includes a graphic. For example, a definition of an electron microscope would probably include photographs, diagrams, or drawings.

Writers often use sentence definitions to present a working definition for a particular document: "In this report, *electron microscope* refers to any microscope that uses electrons rather than visible light to produce magnified im-

ages.” Such definitions are sometimes called *stipulative definitions* because the writer is stipulating how the term will be used in the document.

Guidelines

Writing Effective Sentence Definitions

The following four suggestions can help you write effective sentence definitions:

- ▶ **Be specific in stating the category and the distinguishing characteristics.**
If you write, “A Bunsen burner is a burner that consists of a vertical metal tube connected to a gas source,” the imprecise category—“a burner”—ruins the definition: many types of large-scale burners use vertical metal tubes connected to gas sources.
- ▶ **Don’t describe a specific item if you are defining a general class of items.** If you wish to define *catamaran*, don’t describe a particular catamaran. The catamaran you see on the beach in front of you might be made by Hobie and have a white hull and blue sails, but those characteristics are not essential to catamarans in general.
- ▶ **Avoid writing circular definitions, that is, definitions that merely repeat the key words or the distinguishing characteristics of the item being defined in the category.** The definition “A required course is a course that is required” is useless: required of whom, by whom? However, in defining electron microscopes, you can repeat *microscope* because *microscope* is not the difficult part of the item. The purpose of defining *electron microscope* is to clarify *electron* as it applies to a particular type of microscope.
- ▶ **Be sure the category contains a noun or a noun phrase rather than a phrase beginning with *when*, *what*, or *where*.**

INCORRECT A brazier is what is used to . . .

CORRECT A brazier is a metal pan used to . . .

INCORRECT Hypnoanalysis is when hypnosis is used to . . .

CORRECT Hypnoanalysis is a psychoanalytical technique in which . . .

Writing Extended Definitions An *extended definition* is a detailed explanation—usually one or more paragraphs—of an object, process, or idea. Often an extended definition begins with a sentence definition, which is then elaborated. For instance, the sentence definition “An electrophorus is a laboratory instrument used to generate static electricity” tells you the basic function of the device, but it doesn’t explain how it works, what it is used for, and its strengths and limitations. An extended definition would address these and other topics.

There is no one way to “extend” a definition. Your analysis of your audience and the purpose of your communication will help you decide which method to use. In fact, an extended definition sometimes employs several of the eight techniques discussed here.

Graphics Perhaps the most common way to present an extended definition in technical communication is to use a graphic, then explain it. Graphics are useful in defining not only physical objects but also concepts and ideas. A definition of *temperature inversion*, for instance, might include a diagram showing the forces that create temperature inversion.

The following passage from an extended definition of *additive color* shows how graphics can complement words in an extended definition.



The graphic effectively and economically clarifies the concept of additive color.

Additive color is the type of color that results from mixing colored light, as opposed to mixing pigments such as dyes or paints. When any two colored lights are mixed, they produce a third color that is lighter than either of the two original colors, as shown in this diagram. And when green, red, and blue lights are mixed together in equal parts, they form white light.

We are all familiar with the concept of additive color from watching TV monitors. A TV monitor projects three beams of electrons—one each for red, blue, and green—onto a fluorescent screen. Depending on the combinations of the three colors, we see different colors on the screen.

Examples Examples are particularly useful in making an abstract term easier to understand. The following paragraph is an extended definition of *hazing activities* (Fraternity, 2003).

No chapter, colony, student or alumnus shall conduct or condone hazing activities. Hazing activities are defined as: “Any action taken or situation created, intentionally, whether on or off fraternity premises, to produce mental or physical discomfort, embarrassment, harassment, or ridicule. Such activities may include but are not limited to the following: use of alcohol; paddling in any form; creation of excessive fatigue; physical and psychological shocks; quests, treasure hunts, scavenger hunts, road trips or any other such activities carried on outside or inside of the confines of the chapter house; wearing of public apparel which is conspicuous and not normally in good taste; engaging in public stunts and buffoonery; morally degrading or humiliating games and activities; and any other activities which are not consistent with academic achievement, fraternal law, ritual or policy or the regulations and policies of the educational institution or applicable state law.”

Partition Partitioning is the process of dividing a thing or an idea into smaller parts so that readers can understand it more easily. The following example (Brain, 2005) uses partition to define *computer infection*.

Types of Infection

When you listen to the news, you hear about many different forms of electronic infection. The most common are:

- **Viruses**—A virus is a small piece of software that piggybacks on real programs. For example, a virus might attach itself to a program such as a spreadsheet program. Each time the spreadsheet program runs, the virus runs, too, and it has the chance to reproduce (by attaching to other programs) or wreak havoc.

This extended definition is effective because the writer has presented a clear sentence definition followed by numerous examples.

In This Book

For more about partitioning, see Ch. 7, p. 168.

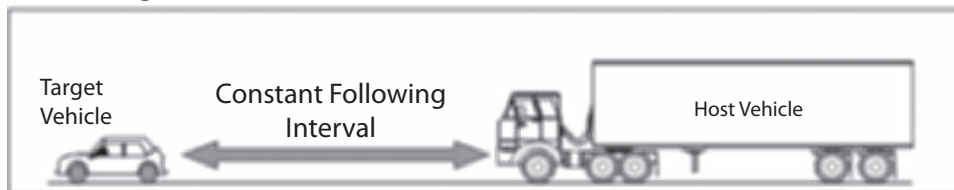
- **E-mail viruses**—An e-mail virus moves around in e-mail messages, and usually replicates itself by automatically mailing itself to dozens of people in the victim's e-mail address book.
- **Worms**—A worm is a small piece of software that uses computer networks and security holes to replicate itself. A copy of the worm scans the network for another machine that has a specific security hole. It copies itself to the new machine using the security hole, and then starts replicating from there, as well.
- **Trojan horses**—A Trojan horse is simply a computer program. The program claims to do one thing (it may claim to be a game) but instead does damage when you run it (it may erase your hard disk). Trojan horses have no way to replicate automatically.

Principle of Operation Describing the principle of operation—the way something works—is an effective way to develop an extended definition, especially for an object or a process. The following excerpt from an extended definition of *adaptive cruise control* (U.S. Department of Transportation, 2007) is based on the mechanism's principle of operation.

Without target vehicle



With target vehicle



The system maintains the host vehicle's following interval by adjusting its speed. If the target vehicle speeds up, increasing the following interval between the two vehicles, the system informs the engine control module to accelerate and increase the vehicle's speed until either the set following interval or the cruise control preset speed are reached. However, if the gap between the target and the host vehicles is decreasing, the system informs the engine control module to reduce the vehicle's speed. The engine control module then issues a command to de-throttle the engine (e.g., by reducing fuel), apply the engine brake, and, when available, downshift the automated transmission.

Comparison and Contrast Using comparison and contrast, a writer discusses the similarities or differences between the item being defined and an item with which readers are more familiar. The following definition of VoIP (Voice over Internet Protocol) contrasts this new form of phone service to the form we all know.

In This Book

For more about comparison and contrast, see Ch. 7, p. 162.

In this excerpt, the second and third paragraphs briefly compare VoIP and traditional phone service. Notice that this passage is organized according to the part-by-part comparison-and-contrast pattern. For more about this organizational pattern, see Ch. 7, p. 163.

Voice over Internet Protocol is a form of phone service that lets you connect to the Internet through your cable or DSL modem. VoIP service uses a device called a telephony adapter, which attaches to the broadband modem, transforming phone pulses into IP packets sent over the Internet.

VoIP is considerably cheaper than traditional phone service: for as little as \$20 per month, users get unlimited local and domestic long-distance service. For international calls, VoIP service is only about three cents per minute, about a third the rate of traditional phone service. In addition, any calls from one person to another person with the same VoIP service provider are free.

However, sound quality on VoIP cannot match that of a traditional land-based phone. On a good day, the sound is fine on VoIP, but frequent users comment on clipping and dropouts that can last up to a second. In addition, sometimes the sound has the distant, tinny quality of some of today's cell phones.

Analogy An *analogy* is a specialized kind of comparison. In a traditional comparison, the writer compares one item to another, similar item: an electron microscope to a common microscope, for example. In an analogy, however, the item being defined is compared to an item that is in some ways completely different but that shares some essential characteristic. For instance, the central processing unit of a computer is often compared to a brain. Obviously, these two items are very different, except that the relationship of the central processing unit to the computer is similar to that of the brain to the body.

The following example from a definition of *decellularization* (Falco, 2008) shows an effective use of an analogy.

Researchers at the University of Minnesota were able to create a beating [rat] heart using the outer structure of one heart and injecting heart cells from another rat. Their findings are reported in the journal *Nature Medicine*. Rather than building a heart from scratch, which has often been mentioned as a possible use for stem cells, this procedure takes a heart and breaks it down to the outermost shell. It's similar to taking a house and gutting it, then rebuilding everything inside. In the human version, the patient's own cells would be used.

The writer of this passage uses the analogy of gutting a house to clarify the meaning of decellularization.

Negation A special kind of contrast is sometimes called *negation* or *negative statement*. Negation clarifies a term by distinguishing it from a different term with which readers might confuse it. The following example uses negation to distinguish the term *ambulatory* from *ambulance*.

An ambulatory patient is not a patient who must be moved by ambulance. On the contrary, an ambulatory patient is one who can walk without assistance from another person.

Negation is rarely the only technique used in an extended definition; in fact, it is used most often in a sentence or two at the start. Once you have explained what the item is not, you still have to explain what it is.

Etymology *Etymology*, the derivation of a word, is often a useful and interesting way to develop a definition. The following example uses the etymology of *spam*—unsolicited junk e-mail—to define it.

For many decades, Hormel Foods has manufactured a luncheon meat called Spam, which stands for “Shoulder Pork and hAM”/“SPiced hAM.” Then, in the 1970s, the English comedy team Monty Python’s Flying Circus broadcast a skit about a restaurant that served Spam with every dish. In describing each dish, the waitress repeats the word *Spam* over and over, and several Vikings standing in the corner chant the word repeatedly. In the mid-1990s, two businessmen hired a programmer to write a program that would send unsolicited ads to thousands of electronic newsgroups. Just as Monty Python’s chanting Vikings drowned out other conversation in the restaurant, the ads began drowning out regular communication online. As a result, people started calling unsolicited junk e-mail *spam*.

Etymology is a popular way to begin definitions of *acronyms*, which are abbreviations pronounced as words:

RAID, which stands for redundant array of independent (or inexpensive) disks, refers to a computer storage system that can withstand a single (or, in some cases, even double) disk failure.

Etymology, like negation, is rarely used alone in technical communication, but it is an effective way to introduce an extended definition.

A Sample Extended Definition Figure 20.1 on page 572 is an example of an extended definition addressed to a general audience.

Deciding Where to Place the Definition

If you are writing a sentence definition or an extended definition, you need to decide where to put it. A definition is typically placed in one of these six locations:

- *In the text.* The text is an appropriate place for sentence definitions that many or most of your readers will need and for extended definitions of important terms.
- *In a marginal gloss.* Sentence definitions placed in the margin are easy to see, and they don’t interrupt readers who don’t need them.
- *In a hyperlink.* In a Web page, definitions can be put in a separate file, enabling the reader to click on (or mouse over) highlighted or underlined words to view their definitions.
- *In a footnote.* A footnote is a logical place for an occasional sentence definition or extended definition. The reader who doesn’t need it will ignore it. However, footnotes can slow readers down by interrupting the flow of the discussion. If you think you will need more than one footnote for a definition on every two to three pages, consider including a glossary.

The first paragraph of this extended definition of the greenhouse effect begins with a general description and ends with a sentence that explains the etymology of the term.

The body of this extended definition is a discussion of the factors that have increased the greenhouse effect.

Questions are effective in topic sentences, particularly in discussions aimed at general readers.

This diagram aids the reader by visually summarizing the principle of operation of the greenhouse effect.

THE GREENHOUSE EFFECT

Energy from the sun drives the earth's weather and climate, and heats the earth's surface; in turn, the earth radiates energy back into space. Atmospheric greenhouse gases (water vapor, carbon dioxide, and other gases) trap some of the outgoing energy, retaining heat somewhat like the glass panels of a greenhouse.

Without this natural "greenhouse effect," temperatures would be much lower than they are now, and life as known today would not be possible. Instead, thanks to greenhouse gases, the earth's average temperature is a more hospitable 60°F. However, problems may arise when the atmospheric concentration of greenhouse gases increases.

Since the beginning of the industrial revolution, atmospheric concentrations of carbon dioxide have increased nearly 30%, methane concentrations have more than doubled, and nitrous oxide concentrations have risen by about 15%. These increases have enhanced the heat-trapping capability of the earth's atmosphere. Sulfate aerosols, a common air pollutant, cool the atmosphere by reflecting light back into space; however, sulfates are short-lived in the atmosphere and vary regionally.

Why are greenhouse gas concentrations increasing? Scientists generally believe that the combustion of fossil fuels and other human activities are the primary reason for the increased concentration of carbon dioxide. Plant respiration and the decomposition of organic matter release more than 10 times the CO₂ released by human activities; but these releases have generally been in balance during the centuries leading up to the industrial revolution with carbon dioxide absorbed by terrestrial vegetation and the oceans.

What has changed in the last few hundred years is the additional release of carbon dioxide by human activities. Fossil fuels burned to run cars and trucks, heat homes and businesses, and power factories are responsible for about 98% of U.S. carbon dioxide emissions, 24% of methane emissions, and 18% of nitrous oxide emissions.

Increased agriculture, deforestation, landfills, industrial production, and mining also contribute a significant share of emissions. In 1997, the United States emitted about one-fifth of total global greenhouse gases.

Estimating future emissions is difficult, because it depends on demographic, economic, technological, policy, and institutional developments. Several emissions scenarios have been developed based on differing projections of these underlying factors. For example, by 2100, in the absence of emissions control policies, carbon dioxide concentrations are projected to be 30–150% higher than today's levels.

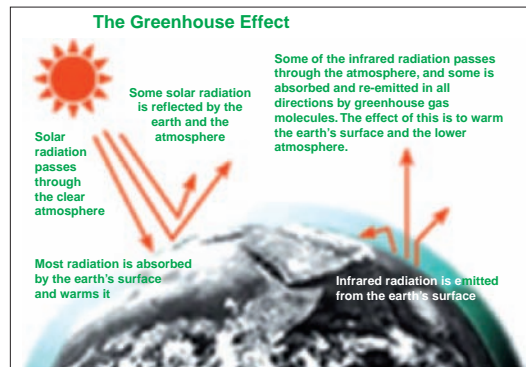


Figure 20.1 An Extended Definition

Source: U.S. Environmental Protection Agency, 2001 <www.epa.gov/globalwarming/climate.index/html>.

- *In a glossary.* A glossary—an alphabetized list of definitions—can accommodate sentence definitions and extended definitions of fewer than three or four paragraphs in one convenient location. A glossary can be placed at the beginning of a document (for example, after the executive summary in a report) or at the end, preceding the appendixes.
- *In an appendix.* An appendix is appropriate for an extended definition of one page or longer, which would be cumbersome in a glossary or footnote.

 **In This Book**

For more about glossaries and appendixes, see Ch. 19, pp. 530 and 531.

WRITING DESCRIPTIONS

Technical communication often requires descriptions: verbal and visual representations of objects, mechanisms, and processes.

- *Objects.* An object is anything ranging from a physical site, such as a volcano, to a synthetic artifact, such as a hammer. A tomato plant is an object, as is an automobile tire or a book.
- *Mechanisms.* A mechanism is a synthetic object consisting of a number of identifiable parts that work together. A cell phone is a mechanism, as is a voltmeter, a lawnmower, or a submarine.
- *Processes.* A process is an activity that takes place over time: species evolve; steel is made; plants perform photosynthesis. *Descriptions of processes*, which explain how something happens, differ from *instructions*, which explain how to do something. Readers of a process description want to *understand* the process; readers of instructions want a step-by-step guide to help them *perform* the process.

Descriptions of objects, mechanisms, and processes appear in virtually every kind of technical communication. For example, an employee who wants to persuade management to buy some equipment includes a mechanism description of the equipment in the proposal to buy it. A company manufacturing a consumer product provides a description and a graphic on its Web site to attract buyers. A developer who wants to build a housing project includes in his proposal to municipal authorities descriptions of the geographical area and of the process he will use in developing that area.

Typically, a description is part of a larger document. For example, a maintenance manual for an air-conditioning system might begin with a description of the system to help the reader understand first how it operates and then how to fix or maintain it.

Analyzing the Writing Situation for Descriptions

Before you begin to write a description, consider carefully how the audience and the purpose of the document will affect what you write.

What does the audience already know about the general subject? For example, if you want to describe how the next generation of industrial robots will affect car manufacturing, you first have to know whether your readers understand the current process and whether they understand robotics.

Your sense of your audience will determine not only how technical your vocabulary should be but also how long your sentences and paragraphs should be. Another audience-related factor is your use of graphics. Less-knowledgeable readers need simple graphics; they might have trouble understanding sophisticated schematics or decision charts. As you consider your audience, think about whether any of your readers are from other cultures and might therefore expect different topics, organization, or writing style in the description.

Consider, too, your purpose. What are you trying to accomplish with this description? If you want your readers to understand how a personal computer works, write a *general description* that applies to several varieties of computers. If you want your readers to understand how a specific computer works, write a *particular description*. A general description of personal computers might classify them by size, then go on to describe palmtops, laptops, and desktops in general terms. A particular description, however, will describe only one model of personal computer, such as a Millennium 2500. Your purpose will determine every aspect of the description, including its length, the amount of detail, and the number and type of graphics.

There is no single structure or format used for descriptions. Because descriptions are written for different audiences and different purposes, they can take many shapes and forms. However, the following four suggestions will guide you in most situations:

- Indicate clearly the nature and scope of the description.
- Introduce the description clearly.
- Provide appropriate detail.
- Conclude the description.

Indicating Clearly the Nature and Scope of the Description

If the description is to be a separate document, give it a title. If the description is to be part of a longer document, give it a section heading. In either case, clearly state the subject and indicate whether the description is general or particular. For instance, a general description of an object might be entitled “Description of a Minivan,” and a particular description, “Description of the 2012 Honda Odyssey.” A general description of a process might be called “Description of the Process of Designing a New Production Car,” and a particular description, “Description of the Process of Designing the Chevrolet Malibu.”

In This Book

For more about titles and headings, see Ch. 9, pp. 205 and 206.

Introducing the Description Clearly

Provide information that readers need in order to understand the detailed information that follows. Most introductions to descriptions are general: you want to give readers a broad understanding of the object, mechanism, or process. You might also provide a graphic that introduces your readers to the overall concept. For example, in describing a process, you might include a flowchart summarizing the steps in the body of the description; in describing an object, such as a bicycle, you might include a photograph or a drawing showing the major components you will describe in detail in the body.

Table 20.1 shows some of the basic kinds of questions you might want to answer in introducing object, mechanism, and process descriptions. If the answer is obvious, simply move on to the next question.

Figure 20.2 on page 576 shows the introductory graphic accompanying a description of an electric bicycle.

TABLE 20.1 ► Questions to Answer in Introducing a Description

For object and mechanism descriptions	For process descriptions
<ul style="list-style-type: none"> • <i>What is the item?</i> You might start with a sentence definition. • <i>What is the function of the item?</i> If the function is not implicit in the sentence definition, state it: “Electron microscopes magnify objects that are smaller than the wavelengths of visible light.” • <i>What does the item look like?</i> Include a photograph or drawing if possible. (See Ch. 12 for more about incorporating graphics with text.) If not, use an analogy or comparison: “The USB drive is a plastic- or metal-covered device, about the size of a pack of gum, with a removable cap that covers the type-A USB connection.” Mention the material, texture, color, and the like, if relevant. Sometimes an object is best pictured with both graphics and words. • <i>How does the item work?</i> In a few sentences, define the operating principle. Sometimes objects do not “work”; they merely exist. For instance, a ship model has no operating principle. • <i>What are the principal parts of the item?</i> Limit your description to the principal parts. A description of a bicycle, for instance, would not mention the dozens of nuts and bolts that hold the mechanism together; it would focus on the chain, gears, pedals, wheels, and frame. 	<ul style="list-style-type: none"> • <i>What is the process?</i> You might start with a sentence definition. • <i>What is the function of the process?</i> Unless the function is obvious, state it: “The main purpose of performing a census is to obtain current population figures, which government agencies use to revise legislative districts and determine revenue sharing.” • <i>Where and when does the process take place?</i> “Each year the stream is stocked with hatchery fish in the first week of March.” Omit these facts only if your readers already know them. • <i>Who or what performs the process?</i> If there is any doubt about who or what performs the process, state it. • <i>How does the process work?</i> “The four-treatment lawn-spray plan is based on the theory that the most effective way to promote a healthy lawn is to apply different treatments at crucial times during the growing season. The first two treatments—in spring and early summer—consist of . . .” • <i>What are the principal steps of the process?</i> Name the steps in the order in which you will describe them. The principal steps in changing an automobile tire, for instance, include jacking up the car, replacing the old tire with the new one, and lowering the car back to the ground. Changing a tire also includes secondary steps, such as placing chocks against the tires to prevent the car from moving once it is jacked up. Explain or refer to these secondary steps at the appropriate points in the description.

This Web-based description includes five labels. When you click on a label, you see an expanded description, complete with an embedded video, that explains more about the system. Here we see the expanded description of the regenerative braking system. Videos are used frequently in Web-based descriptions and instructions.



Figure 20.2 Graphic with Linked Detailed Graphics and Descriptions

Source: Trek Bicycle, 2011 <www.trekbikes.com/us/en/rideplus/technology>.

Providing Appropriate Detail

In the body of a description—the part-by-part or step-by-step section—treat each major part or step as a separate item. In describing an object or a mechanism, define each part and then, if applicable, describe its function, operating principle, and appearance. In discussing the appearance, include shape, dimensions, material, and physical details such as texture and color (if essential). Some descriptions might call for other qualities, such as weight or hardness.

In describing a process, treat each major step as if it were a separate process. Do not repeat your answer to the question about who or what performs the action unless a new agent performs it, but do answer the other important questions: what the step is; what its function is; and when, where, and how it occurs.

A description can have not only parts and steps but also subparts and substeps. A description of a computer system includes a keyboard as one of its main parts, and the description of the keyboard includes the numeric keypad as one of its subparts. And the description of the numeric keypad includes the arrow keys as one of its subparts. The level of detail depends on the complexity of the item and the readers' needs. The same principle applies in describing processes: a step might have substeps. For each substep, you need to describe who or what performs it (if it is not obvious), and you need to describe what the substep is, what its function is, and when, where, and how it occurs.

Guidelines

Providing Appropriate Detail in Descriptions

Use the following techniques to flesh out your descriptions.

For mechanism and object descriptions

- **Choose an appropriate organizational principle.** Two organizational principles are common:
 - **Functional:** how the item works or is used. In a radio, the sound begins at the receiver, travels into the amplifier, and then flows out through the speakers.
 - **Spatial:** based on the physical structure of the item (from top to bottom, east to west, outside to inside, and so forth).

Descriptions can be organized in various ways. For instance, the description of a house could be organized functionally (the different electrical and mechanical systems) or spatially (top to bottom, inside to outside, east to west, and so on). A complex description can use a combination of patterns at different levels in the description.

- **Use graphics.** Present a graphic for each major part. Use photographs to show external surfaces, drawings to emphasize particular items on the surface, and cutaways and exploded diagrams to show details beneath the surface. Other kinds of graphics, such as graphs and charts, are often useful supplements (see Chapter 12).

For process descriptions

- **Structure the step-by-step description chronologically.** If the process is a closed system—such as the cycle of evaporation and condensation—and thus has no first step, begin with any principal step.
- **Explain causal relationships among steps.** Don't present the steps as if they have nothing to do with one another. In many cases, one step causes another. In the operation of a four-stroke gasoline engine, for instance, each step creates the conditions for the next step.
- **Use the present tense.** Discuss steps in the present tense unless you are writing about a process that occurred in the historical past. For example, use the past tense in describing how the Snake River aquifer was formed: "The molten material condensed . . ." However, use the present tense in describing how steel is made: "The molten material is then poured into . . ." The present tense helps readers understand that, in general, steel is made this way.
- **Use graphics.** Whenever possible, use graphics to clarify each point. Consider flowcharts or other kinds of graphics, such as photographs, drawings, and graphs. For example, in a description of how a four-stroke gasoline engine operates, use diagrams to illustrate the position of the valves and the activity occurring during each step.

Concluding the Description

A typical description has a brief conclusion that summarizes it and prevents readers from overemphasizing the part or step discussed last.

A common technique for concluding descriptions of mechanisms and of some objects is to state briefly how the parts function together. At the end of a description of how the Apple iPhone touch screen works, for example, the conclusion might include the following paragraph:

When you touch the screen, electrical impulses travel from the screen to the iPhone processor, which analyzes the characteristics of the touch. These characteristics include the size, shape, and location of the touch, as well as whether you touched the screen in several places at once or moved your fingers. The processor then begins to process this data by removing any background noise and mapping and calculating the touch area or areas. Using its gesture-interpreting software, which combines these data with what it already knows about which function (such as the music player) you were using, the processor then sends commands to the music-player software and to the iPhone screen. How long does this process take? A nanosecond.

Like an object or mechanism description, a process description usually has a brief conclusion: a short paragraph summarizing the principal steps. Here, for example, is the concluding section of a description of how a four-stroke gasoline engine operates:

In the intake stroke, the piston moves down, drawing the air-fuel mixture into the cylinder from the carburetor. As the piston moves up, it compresses this mixture in the compression stroke, creating the conditions necessary for combustion. In the power stroke, a spark from the spark plug ignites the mixture, which burns rapidly, forcing the piston down. In the exhaust stroke, the piston moves up, expelling the burned gases.

For descriptions of more than a few pages, a discussion of the implications of the process might be appropriate. For instance, a description of the Big Bang might conclude with a discussion of how the theory has been supported and challenged by recent astronomical discoveries and theories.

A Look at Several Sample Descriptions

A look at some sample descriptions will give you an idea of how different writers adapt basic approaches for a particular audience and purpose.

Figure 20.3 shows the extent to which a process description can be based on a graphic. The topic is a household solar array. The audience is the general reader.

Figure 20.4 on page 580 shows an excerpt from a mechanism description of three different types of hybrid drivetrains used in automobiles: series, parallel, and series/parallel.

How Our Solar Electric System Works

Your solar electric system is most likely to be what is called a **direct grid-tie system**. This means it is connected into the electricity system provided by your utility company.

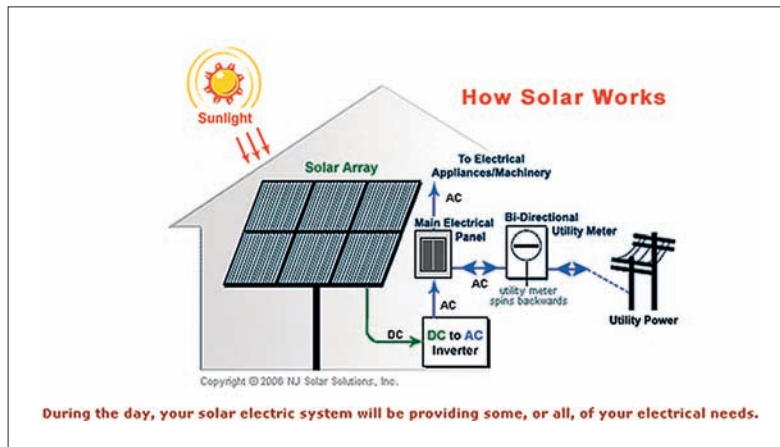
Here's how it works . . .

The sun strikes the panels of your **solar array** and a flow of **direct current (DC) electricity** is produced. This is the only type of current produced by solar cells.

Appliances and machinery, however, are run on higher voltage **alternating current (AC) electricity** as supplied by your utility.

The lower voltage DC is fed into an **inverter** that transforms it into alternating current. The AC feeds into the **main electrical panel** from which it powers your household's or your business's electrical needs.

Your electrical panel is also connected to a **specially installed bi-directional utility meter**. This is **connected to the electrical grid**, which is the utility's means of delivering electricity. This set up allows AC electricity to flow both into, and out of, your home or business.



How much will depend, firstly, on the intensity of the sunlight; the system produces less power on cloudy days and during the winter months. It will also depend on the appliances or machinery you are running at the time.

If your solar system is not providing all the power you need at any time, the **balance is automatically provided by your utility**.

On days when sunlight is intense, **your system may well produce more than you need**. The excess is automatically fed into the grid. This is registered on your bi-directional meter which will spin backwards, **giving you credit for the electricity you are providing**. (This is known as net metering.)

At night, your utility company automatically provides your electrical needs.

If there is a utility power outage, your grid-tie system will shut down immediately for safety reasons. Your power will be reinstated moments after grid power is restored.

A grid-tie solar electric system does not provide power during outages **unless it incorporates a battery storage system**. If your home or business has critical needs that require an uninterrupted power supply, we'll be happy to take you through the various alternatives available to you.

Off-grid, or stand-alone, solar systems produce power independently of the utility grid. They are most appropriate for remote or environmentally sensitive areas; stand-alone systems may effectively provide farm lighting, fence charging or solar water pumps. Most of these systems rely on battery storage so that power produced during the day can be used at night.

Figure 20.3 A Process Description Based on a Graphic

Source: Vanguard Energy Partners, 2010 <www.vanguardenergypartners.com/how solarworks.html>.

This description begins with an informal definition of "direct grid-tie system."

In the next section, the writer presents the steps of the process in chronological order.

The description uses boldfaced text to emphasize key terms, most of which appear in the graphic.

The description focuses on the operating principle of the system. It does not seek to explain the details of how the system works. Accordingly, the graphic focuses on the logic of the process, not on the particulars of what the components look like or where they are located in the house.

Figure 20.4 Excerpt from a Mechanism Description

Source: Union of Concerned Scientists, 2010 <www.hybridcenter.org/hybrid-center-how-hybrid-cars-work-under-the-hood-2.html>.

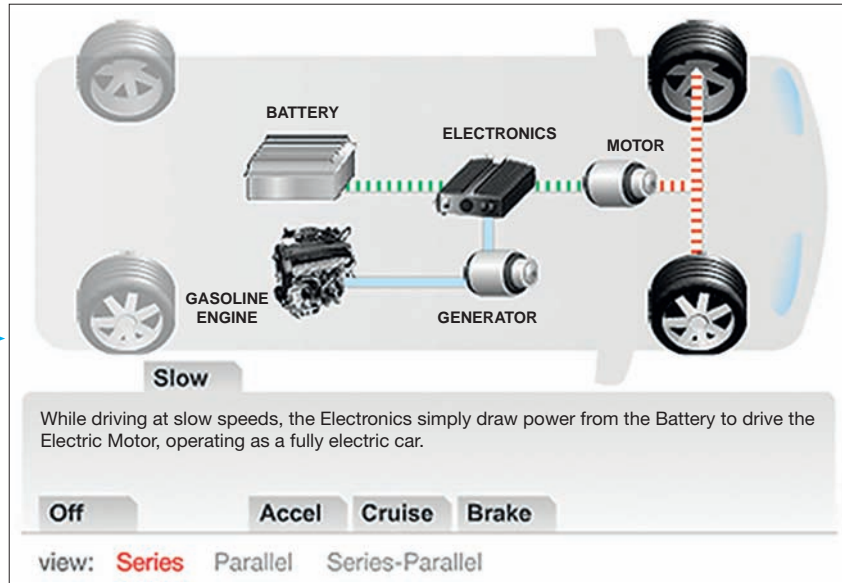
This excerpt from a mechanism description begins with an advance organizer that helps the reader make the transition from the previous section (a basic description of hybrid technology) to the present section, which discusses the three types of drivetrains.

The interactive graphic enables the reader to view the principle of operation of three types of hybrid drivetrains, each during five modes. Here, the graphic shows how the components of the series drivetrain work together as the car operates at slow speeds. On the Web site, the red and green striped lines are animated to highlight the components operating during the mode the reader has selected.

For each of the three types of drivetrains, the text begins with a description of the operating principle, followed by explanations of the strengths and weaknesses of the drivetrain. Notice that the audience and purpose of this description determine the kind of information it contains. Because this description seeks to explain the operating principle behind each of the three types of drivetrains, it focuses on the drivetrains' functions, not on the materials they are made of or on their technical specifications.

Drivetrains

Now that we've covered the basic technology that defines hybrid vehicles, let's take a look at how they are put together to move the vehicle. The drivetrain of a vehicle is composed of the components that are responsible for transferring power to the drive wheels of your vehicle. With hybrids there are three possible setups for the drivetrain: the series drivetrain, the parallel drivetrain, and the series/parallel drivetrain.



Series Drivetrain

This is the simplest hybrid configuration. In a series hybrid, the electric motor is the only means of providing power to get your wheels turning. The motor receives electric power from either the battery pack or from a generator run by a gasoline engine. A computer determines how much of the power comes from the battery or the engine/generator set. Both the engine/generator and regenerative braking recharge the battery pack. The engine is typically smaller in a series drivetrain because it only has to meet average driving power demands; the battery pack is generally more powerful than the one in parallel hybrids (see below) in order to provide remaining peak driving power needs. This larger battery and motor, along with the generator, add to the cost, making series hybrids more expensive than parallel hybrids.

While the engine in a conventional vehicle is forced to operate inefficiently in order to satisfy varying power demands of stop-and-go driving, series hybrids perform at their best in such conditions. This is because the gasoline engine in a series hybrid is not coupled to the wheels. This means the engine is no longer subject to the widely varying power demands experienced in stop-and-go driving and can instead operate in a narrow power range at near optimum efficiency. This also eliminates the need for a complicated multi-speed transmission and clutch. Because series drivetrains perform best in stop-and-go driving they are primarily being considered for buses and other urban work vehicles.

Figure 20.4 (continued)

Parallel Drivetrain

Some up-and-coming hybrid models use a second electric motor to drive the rear wheels, providing electronic all-wheel drive that can improve handling and driving in bad weather conditions.

With a parallel hybrid electric vehicle, both the engine and the electric motor generate the power that drives the wheels. The addition of computer controls and a transmission allow these components to work together. This is the technology in the Insight, Civic, and Accord hybrids from Honda. Honda calls it their Integrated Motor Assist (IMA) technology. Parallel hybrids can use a smaller battery pack and therefore rely mainly on regenerative braking to keep it recharged. However, when power demands are low, parallel hybrids also utilize the drive motor as a generator for supplemental recharging, much like an alternator in conventional cars.

Since the engine is connected directly to the wheels in this setup, it eliminates the inefficiency of converting mechanical power to electricity and back, which makes these hybrids quite efficient on the highway. Yet the same direct connection between the engine and the wheels that increases highway efficiency compared to a series hybrid does reduce, but not eliminate, the city driving efficiency benefits (i.e., the engine operates inefficiently in stop-and-go driving because it is forced to meet the associated widely varying power demands).

Series/Parallel Drivetrains

This drivetrain merges the advantages and complications of the parallel and series drivetrains. By combining the two designs, the engine can both drive the wheels directly (as in the parallel drivetrain) and be effectively disconnected from the wheels so that only the electric motor powers the wheels (as in the series drivetrain). The Toyota Prius has made this concept popular, and a similar technology is also in the new Ford Escape Hybrid. As a result of this dual drivetrain, the engine operates at near optimum efficiency more often. At lower speeds it operates more as a series vehicle, while at high speeds, where the series drivetrain is less efficient, the engine takes over, and energy loss is minimized. This system incurs higher costs than a pure parallel hybrid since it needs a generator, a larger battery pack, and more computing power to control the dual system. However, the series/parallel drivetrain has the potential to perform better than either of the systems alone.

Conclusion

Knowing what's under the hood of hybrid electric vehicles will help you evaluate the available choices in the market. Considering most major auto manufacturers plan to release HEVs in the next few years, you'll be ready to choose the right one for you. Enjoy driving into the future.

This section of the description ends with a brief conclusion.

Figure 20.5 on page 582 shows an excerpt from a set of specifications.

Figure 20.6 on page 583 is a description of the process of turning biomass into useful fuels and other products.

WRITING INSTRUCTIONS

This section discusses *instructions*, which are process descriptions written to help readers perform a specific task—for instance, installing a water heater in a house.


 **On TechComm Web**
For examples of instructions, see Writing Guidelines for Engineering and Science Students. Click on Links Library for Ch. 20 on <bedfordstmartins.com/techcomm>.

Figure 20.5 Specifications

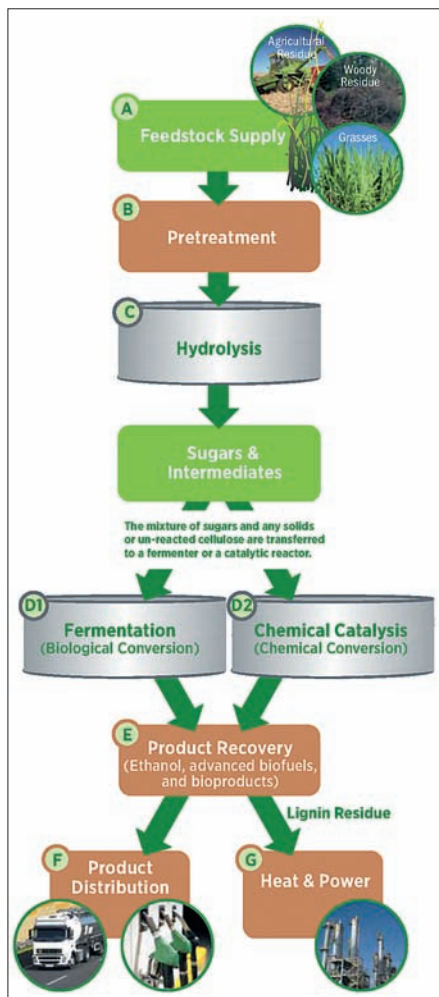
Source: Motorola, 2011 <<http://mediacenter.motorola.com/Fact-Sheets/Motorola-XOOM-Fact-Sheet-3537.aspx>>.

An important kind of description is called a specification. A typical specification consists of a graphic and a set of statistics about the device and its performance characteristics. Specifications help readers understand the capabilities of an item. You will see specifications on devices as small as transistors and as large as aircraft carriers.

**Motorola XOOM Tablet**

OS	Android 3.0 Honeycomb
Differentiation	Larger display in smaller form-factor, 1080p HD support, first tablet with Honeycomb software, dual-core 1GHz processor, and a wide range of docking options
Dimensions	249.1mm (h) x 167.8mm (w) x 12.9mm (d)
Display	10.1" 1280x800 resolution
Weight	730 g
Processor	NVIDIA® Tegra™ 2: 1GHz dual-core processor
Battery	Up to 10 hour video playback
Connectivity	3.5mm, micro USB 2.0 HS, Corporate Sync, Wi-Fi 2.4GHz & 5GHz 802.11b/g/n, Bluetooth 2.1 + EDR + HID
Network	3G, 4G LTE upgradeable, 802.11n w/Personal Hotspot
Messaging/Web/Apps	Email (Corporate Sync, Google Mail, POP3/IMAP embedded, Push Email, Yahoo Mail), WebKit w/ Flash
Audio	AAC, AAC+, AMR NB, AMR WB, MP3, XMF
Video	720p capture/1080p playback/streaming, H.263, H.264, MPEG4
Camera	5MP rear-facing camera with dual LED flash/2MP front-facing camera
Memory	32GB on board user memory, SD card support after software update, 1GB DDR2 RAM

Because this Web-based spec sheet accompanies a consumer product, the specs are classified into categories geared toward the interests of the likely purchasers.



Biochemical conversion uses biocatalysts, such as enzymes, in addition to heat and other chemicals, to convert the carbohydrate portion of the biomass (hemicellulose and cellulose) into an intermediate sugar stream. These sugars are intermediate building blocks that can then be fermented or chemically catalyzed into ethanol, other advanced biofuels, and value-added chemicals. The overall process can be broken into the following essential steps:

A. Feedstock Supply: Feedstocks for biochemical processes are selected for optimum composition, quality, and size. Feedstock handling systems tailored to biochemical processing are essential to cost-effective, high-yield operations.

B. Pretreatment: Biomass is heated (often combined with an acid or base) to break the tough, fibrous cell walls down and make the cellulose easier to hydrolyze (see next step).

C. Hydrolysis: Enzymes (or other catalysts) enable the sugars in the pretreated material to be separated and released over a period of several days.

D1. Fermentation: Microorganisms are added to the mixture to ferment the sugars into alcohol or other fuels, much like the centuries-old process for winemaking.

D2. Chemical Catalysis: Instead of fermentation, the sugars can be converted to fuel or an entire suite of other useful products using chemical catalysis.

E. Product Recovery: Products are separated from water, solvents, and any residual solids.

F. Product Distribution: Fuels are transported to blending facilities, while other products and intermediates may be sent to traditional refineries or processing facilities for use in a diverse slate of consumer products.

G. Heat & Power: The remaining solids are mostly lignin, which can be burned for heat and power.

Figure 20.6 An Effective Process Description

Source: U.S. Department of Energy, 2010 <www1.eere.energy.gov/biomass/pdfs/biochemical_four_pager.pdf>.

This description begins with an overview of the process of biochemical conversion: the process of using fermentation and catalysis to make fuels and products.

The description includes a flowchart explaining the major steps in the process. The designers included photographs to add visual interest to the flowchart.

The lettered steps in the flowchart correspond to the textual descriptions of each step in the process.

Most of the description is written in the passive voice (such as "Feedstocks for biochemical processes are selected . . ."). The passive voice is appropriate because the focus of this process description is on what happens to the materials, not on what a person does. By contrast, in a set of instructions the focus is on what a person does.

 **In This Book**

For more about usability testing, see Ch. 13, p. 357.

When you write instructions, you use the same planning, drafting, revising, editing, and proofreading process that you use with other kinds of technical documents. In addition, you might perform one other task—usability testing—to ensure that the instructions are accurate and easy to follow.

Designing a Set of Instructions

As you plan to write a set of instructions, think about how readers will be using it. Analyzing your audience and purpose and gathering and organizing your information will help you decide whether you should write a one-page set of instructions or a longer document that needs to be bound. You might realize that the information would work better as a Web-based document that allows readers to link to the information they need and that enables you to include videos. Or you might decide to write several versions of the information: a brief paper-based set of instructions and a longer, Web-based document with links.

As always in technical communication, imagining how readers will use what you write will help you plan your document. For example, having decided that your audience, purpose, and subject call for a paper-based set of instructions of perhaps 1,000 words and a dozen drawings and photographs, you can start to design the document. You will need to consider your resources, especially your budget: long documents cost more than short ones; color costs more than black and white; heavy paper costs more than light paper; secure bindings cost more than staples.

Designing a set of instructions is much like designing any other kind of technical document. As discussed in Chapter 11, you want to create a document that is attractive and easy to use. When you design a set of instructions, you need to consider a number of issues related to document design and page design:

- *What are your readers' expectations?* For instructions that accompany a simple, inexpensive product, such as a light switch, readers will expect instructions written on the back of the package or, at most, printed in black and white on a small sheet of paper folded inside the package. For instructions that accompany an expensive consumer product, such as a high-definition TV, readers will expect a more sophisticated full-color document printed on high-quality paper.
- *Do you need to create more than one set of instructions for different audiences?* If you are writing about complex devices such as electronic thermostats, you might decide to create one set of instructions for electricians (who will install and maintain the device) and one set for homeowners (who will operate the device). You might decide to create a paper-based document that can also be read easily on the Internet, as well as a brief video of the tasks you describe.
- *What languages should you use?* In most countries, including the United States, several or many languages are spoken. You might decide to include instructions in two or more languages. Doing so will help you

 **In This Book**

For more about planning, see Ch. 3.

communicate better with more people, and it can help you avoid legal problems. In liability cases, U.S. courts sometimes find that if a company knows that many of its customers speak only Spanish, for example, the instructions should appear in Spanish as well as in English. You have two choices: simultaneous or sequential. In a *simultaneous design*, you might create a multi-column page. One column presents the graphics; another presents the text in English; another presents the text in Spanish. Obviously, this won't work if you have more than two or three languages. But it is efficient because you can present each graphic only once. In a *sequential design*, you present all the information in English (say, on pages 1–8), then all the information in Spanish (on pages 9–16). The sequential design is easier for readers to use because they are not distracted by text in other languages, but you will have to present the graphics more than once, which will make the instructions longer.

- *Will readers be anxious about the information?* If readers will find the information intimidating, make the design unthreatening. For instance, if you are writing for general readers about how to set up a wireless network for home computers, create open pages with a lot of white space and graphics. Use large type and narrow text columns so that each page contains a relatively small amount of information.
- *Will the environment in which the instructions are read affect the document design?* If people will be using the instructions outdoors, you will need to use a coated paper that can tolerate a little water. If people will be reading the instructions while sitting in a small, enclosed area, you might select a small size of paper and a binding that allows the reader to fold the pages over to save space. If people have a lot of room, you might decide to create poster-size instructions that can be taped to the wall and that are easy to read from across the room.

Guidelines

Designing Clear, Attractive Pages

To design pages that are clear and attractive, follow these two guidelines:

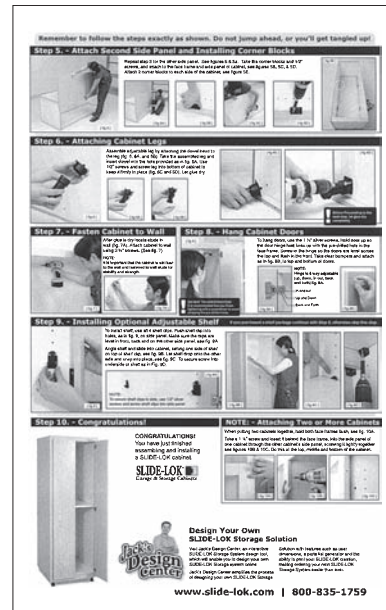
- ▶ **Create an open, airy design.** Do not squeeze too much information onto the page. Build in space for wide margins and effective line spacing, use large type, and chunk the information effectively.
- ▶ **Clearly relate the graphics to the text.** In the step-by-step portion of a set of instructions, you will want to present graphics to accompany every step or almost every step. Create a design that makes it clear which graphics go with each text passage. One easy way to do this is to use a table, with the graphics in one column and the text in the other. A horizontal rule or extra line spacing separates the text and graphics for one step from the text and graphics for the next step.

Figure 20.7 on page 586 illustrates these points.



In This Book

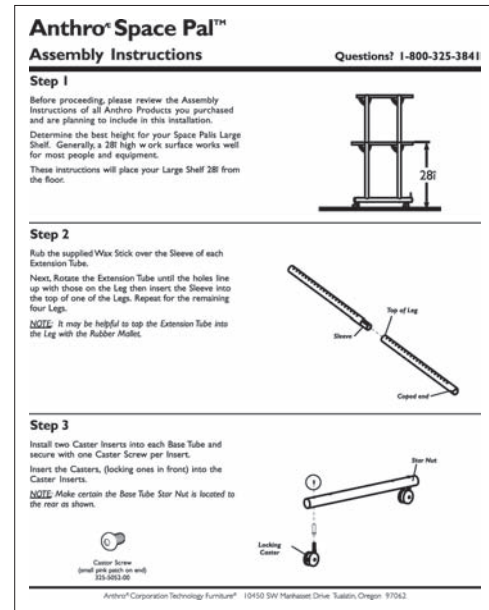
For more about chunking, see Ch. 11, p. 271.



a. Cluttered design

This page is cluttered, containing far too much information. In addition, the page is not chunked effectively. As a result, the reader's eyes don't know where to focus. Would you look forward to using these instructions to assemble a cabinet?

Source: Slide-Lok, 2005 <www.slide-lok.com/assembly/P2468/P2468.pdf>.



b. Attractive design

This page is well designed, containing an appropriate amount of information presented in a simple two-column format. Notice the effective use of white space and the horizontal rules separating the steps.

Source: Anthro, 2005 <www.anthro.com/assemblyinstructions/300-5237-00.pdf>.

Figure 20.7 Cluttered and Attractive Page Designs in a Set of Instructions

On TechComm Web

For advice on communicating safety information on Web pages, see Lisa A. Tallman's "Designing for the Web: Special Considerations for Safety Information." Click on Links Library for Ch. 20 on <bedfordstmartins.com/techcomm>.

Planning for Safety

If the subject you are writing about involves safety risks, your most important responsibility is to do everything you can to ensure your readers' safety.

ETHICS NOTE

Protecting Your Readers' Safety

To a large extent, the best way to keep your readers safe is to be honest and write clearly. If readers will encounter safety risks, explain what those risks are and how to minimize them. Doing so is a question of rights. Readers have a right to the best information they can get.

Protecting your readers' safety is also a question of law. People who get hurt can sue the company that made the product or provided the service. As discussed in Chapter 2, this field of law is called *liability*. Your company is likely to have legal professionals on staff or on retainer whose job is to ensure that the company is not responsible for putting people at unnecessary risk.

When you write safety information, be clear and concise. Avoid complicated sentences.

COMPLICATED	It is required that safety glasses be worn when inside this laboratory.
SIMPLE	You must wear safety glasses in this laboratory.
SIMPLE	Wear safety glasses in this laboratory.

Sometimes a phrase works better than a sentence: “Safety Glasses Required.”

Because a typical manual or set of instructions can contain dozens of comments—some related to safety and some not—experts have devised *signal words* to indicate the seriousness of the advice. Unfortunately, signal words are not used consistently. For instance, the American National Standards Institute (ANSI) and the U.S. military’s MILSPEC publish definitions that differ significantly, and many private companies have their own definitions. Figure 20.8 presents the four most popular signal words. The first three signal words are accompanied by symbols showing the color combinations endorsed by ANSI in its standard Z535.4.




Signal Word	Explanation	Example
<p><i>Danger</i></p> 	<p><i>Danger</i> is used to alert readers about an immediate and serious hazard that will likely be fatal. Writers often use all-uppercase letters for danger statements.</p>	<p>DANGER: EXTREMELY HIGH VOLTAGE. STAND BACK.</p>
<p><i>Warning</i></p> 	<p><i>Warning</i> is used to alert readers about the potential for serious injury or death or serious damage to equipment. Writers often use all-uppercase letters for warning statements.</p>	<p>WARNING: TO PREVENT SERIOUS INJURY TO YOUR ARMS AND HANDS, YOU MUST MAKE SURE THE ARM RESTRAINTS ARE IN PLACE BEFORE OPERATING THIS MACHINE.</p>
<p><i>Caution</i></p> 	<p><i>Caution</i> is used to alert readers about the potential for anything from moderate injury to serious equipment damage or destruction.</p>	<p>Caution: Do not use nonrechargeable batteries in this charging unit; they could damage the charging unit.</p>
<p><i>Note</i></p>	<p><i>Note</i> is used for a tip or suggestion to help readers carry out the procedure successfully.</p>	<p>Note: Two kinds of washers are provided—regular washers and locking washers. Be sure to use the locking washers here.</p>

Figure 20.8 Signal Words

The yellow triangle is consistent with the ISO approach. Because ISO creates standards for international use, its safety labels use icons, not words, to represent safety dangers.

The Danger signal word and the text are consistent with the ANSI approach. The information is presented in English.



Figure 20.9 A Typical Safety Label

Source: HCS, 2004 <www.safetylabel.com/search/index.php?pn=H6010-CDDHPL>.

Whether the safety information is printed in a document or on machinery or equipment, it should be prominent and easy to read. Many organizations use visual symbols to represent levels of danger, but these symbols are not standardized.

Organizations that create products that are used only in the United States use safety information that conforms

with standards published by ANSI and with the federal Occupational Safety and Health Administration (OSHA). Organizations that create products that are also used outside the United States use safety information that conforms with standards published by the International Organization for Standardization (ISO). Figure 20.9 shows a safety label that incorporates both ANSI and ISO standards.

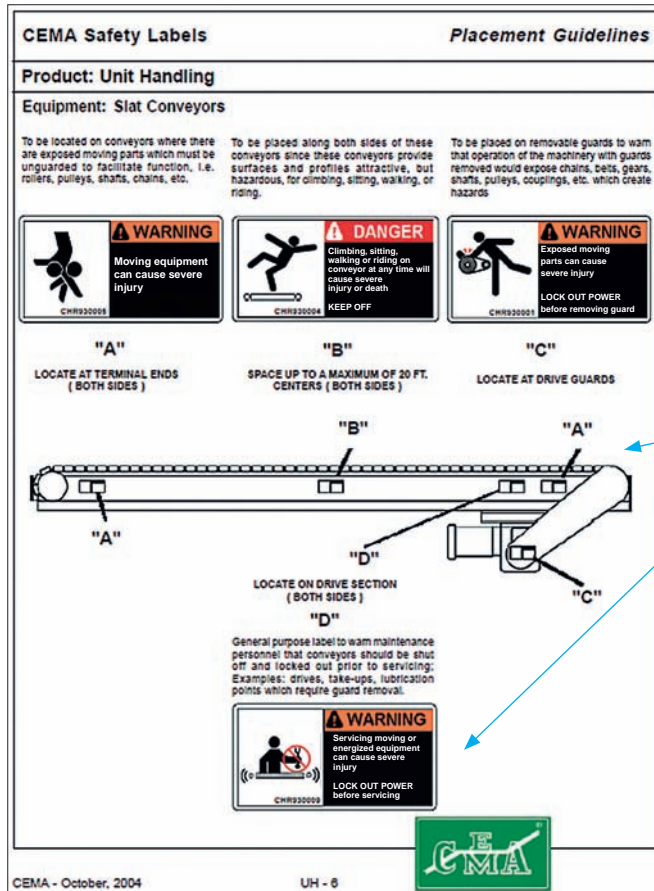
Part of planning for safety is determining the best location for the safety information. This question has no easy answer because you cannot control how your audience reads your document. Be conservative: put safety information wherever you think the reader is likely to see it, and don't be afraid to repeat yourself. A reasonable amount of repetition—such as including the same safety comment at the top of each page—is effective. But don't repeat the same piece of advice in each of 20 steps, because readers will stop paying attention to it. If your company's format for instructions calls for a safety section near the beginning of the document, place the information there and repeat it just before the appropriate step in the step-by-step section.

Figure 20.10 shows one industry association's guidelines for placing safety information on conveyor belts.

Drafting Effective Instructions

Instructions can be brief (a small sheet of paper) or extensive (up to 20 pages or more). Brief instructions might be produced by a writer, a graphic artist, and a subject-matter expert. Longer instructions might call for the assistance of others, such as marketing and legal personnel.

Regardless of the size of the project, most instructions are organized like process descriptions. The main difference is that the conclusion of a set of instructions is not a summary but an explanation of how to make sure readers have followed the instructions correctly. Most sets of instructions contain four elements: a title, a general introduction, step-by-step instructions, and a conclusion.



This page shows the four safety labels that the industry association recommends for use on conveyor belts.

The diagram of the conveyor belt shows where the organization recommends placing the safety labels.

Figure 20.10 Placement of Safety Information on Equipment

Source: Conveyor Equipment Manufacturers Association, 2004 <<http://cemanet.org/safety/uh6.pdf>>.

Drafting Titles A good title for instructions is simple and clear. Two forms are common:

- *How-to*. This is the simplest: “How to Install the J112 Shock Absorber.”
- *Gerund*. The gerund form is the -ing form of the verb: “Installing the J112 Shock Absorber.”

One form to avoid is the noun string, which is awkward and difficult for readers to understand: “J112 Shock Absorber Installation Instructions.”

Drafting General Introductions The general introduction provides the preliminary information that readers will need to follow the instructions safely and easily.

In This Book

For more about noun strings, see Ch. 10, p. 245.

Guidelines

Drafting Introductions for Instructions

Every set of instructions is unique and therefore calls for a different introduction. Where appropriate, consider answering the following six questions:

- ▶ **Who should carry out this task?** Sometimes you need to identify or describe the person or persons who are to carry out a task. Aircraft maintenance, for example, may be performed only by those certified to do it.
- ▶ **Why should the reader carry out this task?** Sometimes the reason is obvious: you don't need to explain why a backyard barbecue grill should be assembled. But you do need to explain the rationale for many tasks, such as changing radiator antifreeze in a car.
- ▶ **When should the reader carry out this task?** Some tasks, such as rotating tires or planting crops, need to be performed at particular times or at particular intervals.
- ▶ **What safety measures or other concerns should the reader understand?** In addition to the safety measures that apply to the whole task, mention any tips that will make the job easier:

NOTE: For ease of assembly, leave all nuts loose. Give only 3 or 4 complete turns on bolt threads.

- ▶ **What items will the reader need?** List necessary tools, materials, and equipment so that readers will not have to interrupt their work to hunt for something. If you think readers might not be able to identify these items easily, include drawings next to the names.
- ▶ **How long will the task take?** Consider stating how long the task will take readers with no experience, some experience, and a lot of experience.

In This Book

For more about graphics, see Ch. 12.

Drafting Step-by-Step Instructions The heart of a set of instructions is the step-by-step information.

Guidelines

Drafting Steps in Instructions

Follow these six suggestions for writing steps that are easy to understand.

- ▶ **Number the instructions.** For long, complex instructions, use two-level numbering, such as a decimal system:

1
1.1
1.2

On TechComm Web

For examples of instructions, see Knowledge Hound. Click on Links Library for Ch. 20 on <bedfordsmartins.com/techcomm>.

2

2.1

2.2

etc.

If you need to present a long set of steps, such as 50, group them logically into, say, six sets of eight or nine steps, and begin each set with a clear heading.

- ▶ **Present the right amount of information in each step.** Each step should define a single task the reader can carry out easily, without having to refer back to the instructions.

TOO MUCH INFORMATION

1. Mix one part cement with one part water, using the trowel. When the mixture is a thick consistency without any lumps bigger than a marble, place a strip of the mixture about 1" high and 1" wide along the face of the brick.

TOO LITTLE INFORMATION

1. Pick up the trowel.

RIGHT AMOUNT OF INFORMATION

1. Mix one part cement with one part water, using the trowel, until the mixture is a thick consistency without any lumps bigger than a marble.
2. Place a strip of the mixture about 1" high and 1" wide along the face of the brick.

- ▶ **Use the imperative mood.** For example, "Attach the red wire . . ." The imperative is more direct and economical than the indicative mood ("You should attach the red wire . . ." or "The operator should attach the red wire . . ."). Avoid the passive voice ("The red wire is attached . . ."), because it can be ambiguous: is the red wire already attached?
- ▶ **Do not confuse steps and feedback statements.** A *step* is an action that the reader is to perform. A *feedback statement* describes an event that occurs in response to a step. For instance, a step might read "Insert the disk in the drive." That step's feedback statement might read "The system will now update your user information." Do not make a feedback statement a numbered step. Present it as part of the step to which it refers. Some writers give all feedback statements their own design.
- ▶ **Include graphics.** When appropriate, add a photograph or a drawing to show the reader what to do. Some activities—such as adding two drops of a reagent to a mixture—do not need an illustration, but they might be clarified by charts or tables.
- ▶ **Do not omit articles (*a*, *an*, *the*) to save space.** Omitting articles can make the instructions unclear and hard to read. In the sentence "Locate midpoint and draw line," for example, the reader cannot tell if "draw line" is a noun (as in "locate the draw line") or a verb and its object (as in "draw a line").

 **In This Book**

For more about the imperative mood and the passive voice, see Ch. 10, pp. 240 and 241.

Drafting Conclusions Instructions often conclude by stating that the reader has now completed the task or by describing what the reader should do next. For example:

Now that you have replaced the glass and applied the glazing compound, let it sit for at least five days so that the glazing can cure. Then, prime and paint the window.

Some conclusions end with *maintenance tips* or a *troubleshooting guide*. A troubleshooting guide, usually presented as a table, identifies common problems and explains how to solve them.

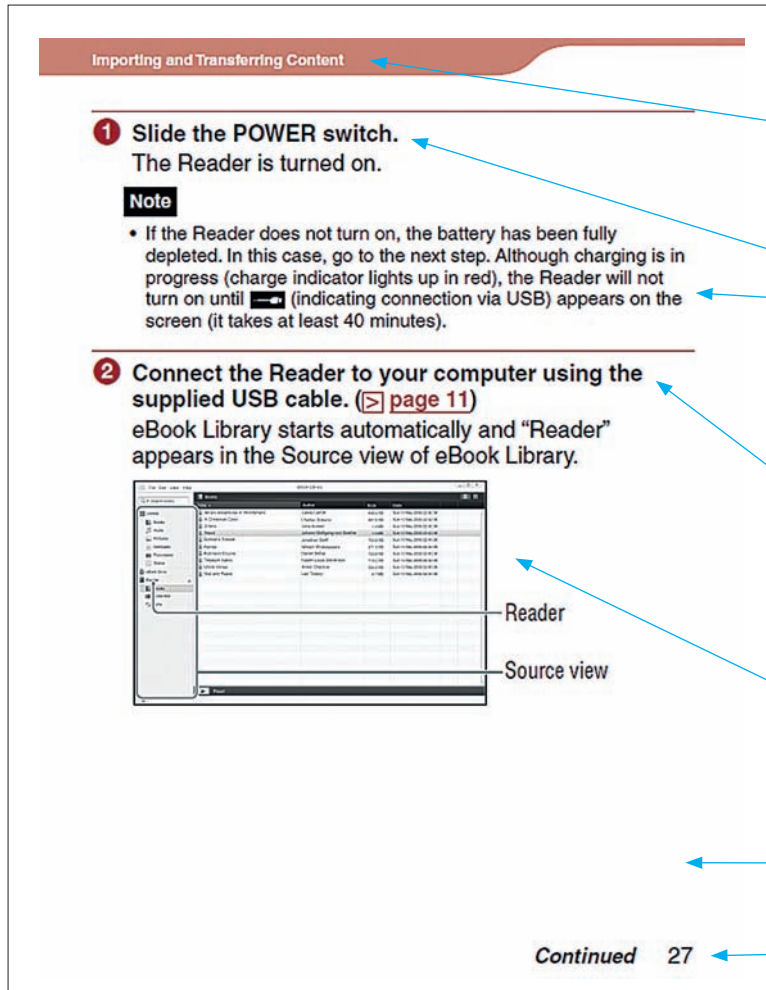
Revising, Editing, and Proofreading Instructions

You will want to revise, edit, and proofread all the documents you write to make sure they are honest, clear, accurate, comprehensive, accessible, concise, professional in appearance, and correct. When you write instructions, you should be extra careful, for two reasons.

First, your readers rely on your instructions to carry out the task. If they can't complete it—or they do complete it, but the device doesn't work correctly—they'll be unhappy. Nobody likes to spend a few hours assembling a garage-door opener, and then find a half dozen parts left over. Second, your readers rely on you to help them complete the task safely. To prevent injuries—and liability actions—build time into the budget to revise, edit, and proofread the instructions carefully. Then, if you can, carry out usability testing on the instructions.

A Look at Several Sample Instructions

Figure 20.11 is an excerpt from a set of instructions. Figure 20.12 on page 594 shows a list of tools and materials from a set of instructions. Figure 20.13 on page 595 is an excerpt from the safety information in a set of instructions. Figure 20.14 on page 596 shows an excerpt from the conclusion to a set of instructions. Figure 20.15 on page 596 is a portion of the troubleshooting guide in the instructions for a lawnmower.



This page from the user's manual for a Sony Reader discusses how to transfer a downloaded book from a computer to a Sony Reader.

The writer uses gerunds (-ing phrases) to describe the actions ("importing and transferring content") and uses the imperative mood ("Slide the POWER switch") for steps.

The typography varies with the type of information the writer is presenting. The action the reader is to perform is in large, boldfaced type, following the step number. Non-boldfaced type is used for the feedback statement: what the device does in response to the action that has just been described. The Note is presented in even smaller type.

Step 2 includes a cross-reference to a different section of the instructions to help readers who might need help carrying out a portion of the task.

A labeled screenshot helps readers recognize what they will see on their Reader.

The ample white space makes the information seem less overwhelming.

The footer contains a continued symbol (telling the reader that the instructions continue on the next page) and the page number.

Figure 20.11 Excerpt from a Set of Instructions

Source: Sony Corporation, 2009 <<http://www.docs.sony.com/release/PRS300RCB.pdf>>.

Installation Instructions

PREPARE TO INSTALL THE RANGE

FOR YOUR SAFETY:

All rough-in and spacing dimensions must be met for safe use of your range. Electricity to the range can be disconnected at the outlet without moving the range if the outlet is in the preferred location (remove lower drawer).

To reduce the risk of burns or fire when reaching over hot surface elements, cabinet storage space above the cooktop should be avoided. If cabinet storage space is to be provided above the cooktop, the risk can be reduced by installing a range hood that sticks out at least 5" beyond the front of the cabinets. Cabinets installed above a cooktop must be no deeper than 13".

Be sure your appliance is properly installed and grounded by a qualified technician.

Make sure the cabinets and wall coverings around the range can withstand the temperatures (up to 200°F.) generated by the range.

MATERIALS YOU MAY NEED



Tin Snips



Lag Bolts



Anchor Sleeves

(For Anti-Tip Bracket Mounted
on Concrete Floors Only)



(UL Approved 40 AMP)

4-Wire Cord OR 3-Wire Cord
4' Long 4' Long

Squeeze Connector
(For Conduit
Installations Only)

PARTS INCLUDED



Anti-Tip Bracket Kit

TOOLS YOU WILL NEED



Drill with 1/8" Bit



Safety Glasses



Adjustable Wrench



Tape Measure



Pliers



Pencil



1/4" Nut Driver



Level



Phillips Screwdriver

Flat-blade
Screwdriver

1 REMOVE SHIPPING MATERIALS

Remove packaging materials. Failure to remove packaging materials could result in damage to the appliance.

Drawings of tools, materials,
and parts are more effective
than lists.

Figure 20.12 List of Tools and Materials
Source: General Electric, 2003.

PLAY HEALTHY

⚠ IMPORTANT HEALTH WARNINGS ABOUT PLAYING VIDEO GAMES

Photosensitive seizures

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these “photosensitive epileptic seizures” while watching video games.

These seizures may have a variety of symptoms, including lightheadedness, altered vision, eye of face twitching, jerking or shaking of arms or legs, disorientation, confusion or momentary loss of awareness. Seizures may also causes loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

Immediately stop playing and consult a doctor if you experience any of these symptoms. Parents should watch for or ask their children about the above symptoms—children and teenagers are more likely than adults to experience these seizures. The risk of photosensitive epileptic seizures may be reduced by taking the following precautions:

- Sit farther from the TV screen.
- Use a smaller TV screen.
- Play in a well-lit room.
- Do not play when you are drowsy or tired.

If you or any of your relatives have a history of seizures or epilepsy, consult a doctor before playing.

This excerpt from a user manual for a video game describes photosensitive seizures, a rare but serious risk for video-game players. Notice that the excerpt begins with a warning symbol and the signal word warnings.

Notice that the excerpt uses mandatory language: “Immediately stop playing and consult a doctor . . .” Although politeness is desirable most of the time, you don’t want to sound as if you are making a suggestion or asking readers to do you a favor. For instance, if goggles are required, do not write, “You might consider wearing safety goggles.” Instead, write, “You must wear safety goggles when using this equipment.”

The explanation describes the symptoms of photosensitive seizures and the injuries they can cause.

Figure 20.13 Excerpt from Safety Information

Source: Microsoft, 2010 <http://download.microsoft.com/ConsolePrem_EMEA_West.pdf>.

The Federal Trade Commission concludes its instructions on how to avoid medical identity theft with a list of resources people can use if they think their medical information has been compromised.

For More Information

For information about getting and correcting your medical records:

World Privacy Forum
2033 San Elijo Avenue, #402
Cardiff by the Sea, CA 92007
www.worldprivacyforum.org
760-436-2489

Center on Medical Record Rights and Privacy
Health Policy Institute
Georgetown University
Box 57144
Washington DC 20057-1485
<http://ihcrp.georgetown.edu/privacy/records.html>
202-687-0880

If you believe that a health plan or provider violated your rights under HIPAA, you may want to file a complaint with:

U.S. Department of Health and Human Services
Office for Civil Rights
200 Independence Avenue, SW
Washington, DC 20201
www.hhs.gov/ocr

The FTC works to prevent fraudulent, deceptive and unfair business practices in the marketplace and to provide information to help consumers spot, stop and avoid them. To file a [complaint](#) or get [free information on consumer issues](#), visit ftc.gov or call toll-free, 1-877-FTC-HELP (1-877-382-4357); TTY: 1-866-653-4261. Watch a video, [How to File a Complaint](#), at ftc.gov/video to learn more. The FTC enters consumer complaints into the [Consumer Sentinel Network](#), a secure online database and investigative tool used by hundreds of civil and criminal law enforcement agencies in the U.S. and abroad.

Figure 20.14 Excerpt from the Conclusion to a Set of Instructions

Source: U.S. Federal Trade Commission, 2010 <<http://ftc.gov/bcp/edu/pubs/consumer/idtheft/idt10.shtm>>.

Problem	Cause	Correction
The mower does not start.	<ol style="list-style-type: none"> 1. The mower is out of gas. 2. The gas is stale. 3. The spark plug wire is disconnected from the spark plug. 	<ol style="list-style-type: none"> 1. Fill the gas tank. 2. Drain the tank and refill it with fresh gas. 3. Connect the wire to the plug.
The mower loses power.	<ol style="list-style-type: none"> 1. The grass is too high. 2. The air cleaner is dirty. 3. There is a buildup of grass, leaves, or trash in the underside of the mower housing. 	<ol style="list-style-type: none"> 1. Set the mower to a “higher cut” position. See page 10. 2. Replace the air cleaner. See page 11. 3. Disconnect the spark plug wire, attach it to the retainer post, and clean the underside of the mower housing. See page 8.

Figure 20.15 Excerpt from a Troubleshooting Guide

INTERACTIVE SAMPLE DOCUMENT

Presenting Clear Instructions

The following page is from a set of instructions in a user's manual. The questions in the margin ask you to think about the discussion of instructions on pages 581–92.

6 External cards and devices

Using SD Card Reader cards

Optional digital cards provide secure data storage and convenient data sharing. These cards are often used with digital media–equipped cameras and PDAs as well as with other devices.

The SD Card Reader supports the following formats:

- Secure Digital High Capacity (SDHC) Memory Card (standard and large size)
- xD-Picture card

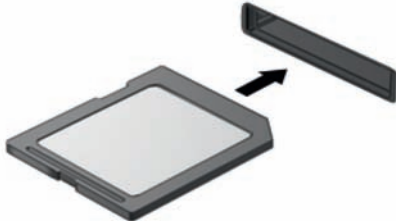
Inserting a digital card

CAUTION: To avoid damaging the digital card or the Slate, do not insert any type of adapter into the SD Card Reader.

CAUTION: To prevent damage to the digital card connectors, use minimal force to insert a digital card.

NOTE: The SD Card Reader is located on the left edge of the Slate.

1. Hold the digital card label-side up, with the connectors toward the Slate.
2. Insert the card into the SD Card Reader, and then push in on the card until it is firmly seated.



You will hear a sound when the device has been detected, and a menu of options may be displayed.

36 Chapter 6 External cards and devices

1. How effectively has the designer helped readers recognize the distinction between cautions and notes?
2. Is the amount of information presented in each step appropriate?
3. How effective is the graphic in helping readers understand the information?
4. How effectively has the designer used typography to distinguish steps from feedback statements?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 20 on bedfordstmartins.com/techcomm.

WRITING MANUALS

There is no absolute distinction between a set of instructions and a manual. Typically, the two share a main purpose: to explain how to carry out a task safely, effectively, and efficiently. A set of instructions is typically shorter (usually 1 to 20 pages) and more limited in its subject. For example, a set of instructions might discuss how to use an extension ladder, whereas a manual might discuss how to use a laptop computer. Obviously, using a laptop includes many more topics than using a ladder.

Manuals are not more important simply because they tend to be longer and more involved than instructions. Both kinds of documents can include safety information. The ladder instructions need to explain how to avoid power lines and how to avoid falling off the ladder. The laptop manual needs to explain how to avoid electrocution when you open the case.

A manual, therefore, includes much of the same sort of information found in a set of instructions. However, it is also likely to include some sections not found in a set of instructions. For instance, it typically has a title page. The main difference between the two is that a manual has more-elaborate front matter and back matter:

- *Front matter.* The introduction, sometimes called a *preface*, often contains an *overview of the contents*, frequently in the form of a table, which explains the main contents of each section and chapter. It also contains a *conventions* section, which explains the typography of the manual. For instance, *italics* are used for the titles of books, **boldface** for keyboard keys, and so forth. It also might include a *where to get help* section, referring readers to other sources of information, such as the company's Web site and customer-support center. And it might contain a section listing the *trademarks* of the company's own products and those of other companies.
- *Back matter.* Manuals typically include a set of *specifications* of the device or system, a list of relevant government *safety regulations* and *industry standards* that the device or system supports, *tips on maintenance and servicing* the device, a *copyright page* listing bibliographic information about the manual, and an *index*. Many manuals also include *glossaries*.

Organizations work hard to make their instructions and manuals appropriate for multicultural readers. Because important instructions and manuals can be read by readers from several or even dozens of cultures, you need to answer three important questions as you plan the documents:

- *In what language should the information be written?* You can either translate the document into the reader's native language or try to make the English easy to understand. Although translation is sometimes the best or only alternative, companies often use Simplified English or some other form of English with a limited grammar and vocabulary. On many organizations' Web sites, you will find manuals available as PDF documents for download in various languages.

In This Book

For more about typography, see Ch. 11, p. 275.

In This Book

For more about trademarks, see Ch. 2, p. 26.

In This Book

For more about Simplified English, see Ch. 10, p. 252.

- *Do the text or graphics need to be modified?* As discussed in Chapter 5, communicators need to be aware of cultural differences. For example, a printer manual for an Italian audience presented nude models with strategically placed rectangles showing the various colors the machine could reproduce. Nudity would be inappropriate in almost all other countries. A software manual in the United States showed an illustration of a person's left hand. Because the left hand is considered unclean in many countries in the Middle East, the manual would need to be modified for those countries (Delio, 2002).
- *What is the readers' technological infrastructure?* If your readers don't have Internet access, there is no point in making a Web version of the information. If your readers pay by the minute for Internet access, you will want to create Web-based information that downloads quickly.


On TechComm Web

Read Michelle Delio's article about cultural factors and manuals in *Wired News*. Click on Links Library for Ch. 20 on <bedfordstmartins.com/techcomm>.

Writer's Checklist

Parenthetical, Sentence, and Extended Definitions

- Are all necessary terms defined? (p. 565)

Are the parenthetical definitions

- appropriate for the audience? (p. 566)
- clear? (p. 566)
- smoothly integrated into the sentences? (p. 566)

Does each sentence definition

- contain a sufficiently specific category and distinguishing characteristics? (p. 567)
- avoid describing one particular item when a general class of items is intended? (p. 567)
- avoid circular definition? (p. 567)
- begin with a category that contains a noun or a noun phrase? (p. 567)

- Are the extended definitions developed logically and clearly? (p. 567)
- Are the definitions placed in the location most useful to readers? (p. 571)

Descriptions of Objects and Mechanisms

- Did you clearly indicate the nature and scope of the description? (p. 574)

In introducing the description, did you answer, if appropriate, the following questions:

- What is the item? (p. 575)
- What is its function? (p. 575)
- What does it look like? (p. 575)
- How does it work? (p. 575)
- What are its principal parts? (p. 575)

- Did you include a graphic identifying all the principal parts? (p. 575)

In providing detailed information, did you

- answer, for each of the major components, the questions listed in the second item in this section? (p. 577)
- choose an appropriate organizational principle? (p. 577)
- include graphics for each of the components? (p. 577)

In concluding the description, did you

- summarize the major points in the part-by-part description? (p. 578)
- include (where appropriate) a description of the item performing its function or an attempt to motivate readers to take action? (p. 578)

Process Descriptions

- Did you clearly indicate the nature and scope of the description? (p. 574)

In introducing the description, did you answer, if appropriate, the following questions:

- What is the process? (p. 575)
- What is its function? (p. 575)
- Where and when does the process take place? (p. 575)
- Who or what performs it? (p. 575)
- How does the process work? (p. 575)
- What are its principal steps? (p. 575)

- Did you include a graphic identifying all the principal steps? (p. 575)

In providing detailed information, did you

- answer, for each of the major steps, the questions for introducing a description in Table 20.1? (p. 575)
- discuss the steps in chronological order or other logical sequence? (p. 577)
- make clear the causal relationships among the steps? (p. 577)
- include graphics for each of the principal steps? (p. 577)

In concluding the description, did you

- summarize the major points in the step-by-step description? (p. 578)
- discuss, if appropriate, the importance or implications of the process? (p. 578)
- attempt (if appropriate) to motivate readers to take action? (p. 578)

Instructions

- Are the instructions designed effectively, with adequate white space and a clear relationship between

the graphics and the accompanying text? (p. 585)

- Do the instructions have a clear title? (p. 589)

Does the introduction to the set of instructions

- state the purpose of the task? (p. 590)
- describe safety measures or other concerns that readers should understand? (p. 590)
- list necessary tools and materials? (p. 590)

Are the step-by-step instructions


- numbered? (p. 590)
- expressed in the imperative mood? (p. 591)
- simple and direct? (p. 591)

- Are appropriate graphics included? (p. 591)

Does the conclusion

- include any necessary follow-up advice? (p. 592)
- include, if appropriate, a troubleshooting guide? (p. 592)

Exercises





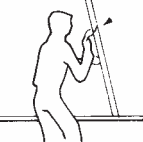
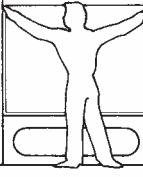
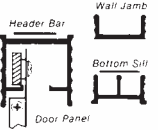
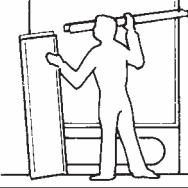
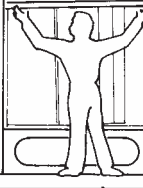
 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Add a parenthetical definition for the italicized term in each of the following sentences:
 - a. Reluctantly, he decided to *drop* the physics course.
 - b. Last week, the computer was *down*.
 - c. The department is using *shareware* in its drafting course.
2. Write a sentence definition for each of the following terms:
 - a. catalyst
 - b. job interview
 - c. Web site
3. Revise any of the following sentence definitions that need revision:
 - a. A thermometer measures temperature.
 - b. The spark plugs are the things that ignite the air-gas mixture in a cylinder.
 - c. Parallel parking is where you park next to the curb.
 - d. A strike is when the employees stop working.
 - e. Multitasking is when you do two things at once while you're on the computer.
4. Write a 500- to 1,000-word extended definition of one of the following terms or of a term used in your field of study. If you do secondary research, cite your sources clearly and accurately. In addition, check that the graphics are appropriate for your audience and purpose. In a brief note at the start, indicate the audience and purpose for your definition.
 - a. flextime
 - b. binding arbitration
 - c. robotics
 - d. an academic major (don't focus on any particular major; instead, define what a major is)
 - e. bioengineering
5. Write a 500- to 1,000-word description of one of the following items or of a piece of equipment used in your field. Include appropriate graphics, and be sure to cite them correctly if you did not create them. In a note preceding the description, specify your audience and indicate the type of description (general or particular) you are writing.
 - a. GPS device
 - b. MP3 player

- c. waste electrical and electronic equipment
 d. automobile jack
 e. camera phone
6. Write a 500- to 1,000-word description of one of the following processes or a similar process with which you are familiar. Include appropriate graphics. In a note preceding the description, specify your audience and indicate the type of description (general or particular) you are writing. If you use secondary sources, cite them properly (see Appendix, Part B, for documentation systems).
- a. how a wind turbine works
 b. how a food co-op works
 c. how a suspension bridge is constructed
- d. how we see
 e. how a baseball player becomes a free agent
7. **INTERNET EXERCISE** Study a set of instructions from Knowledge Hound <www.knowledgehound.com>. Write a memo to your instructor evaluating the quality of the instructions. Attach a screen shot or a printout of representative pages from the instructions.
8. You work in the customer-relations department of a company that makes plumbing supplies. The head of product development has just handed you the draft of installation instructions for a sliding tub door. She has asked you to comment on their effectiveness. Write a memo to her, evaluating the instructions and suggesting improvements.

INSTALLATION INSTRUCTIONS


CAUTION: SEE BOX NO. 1 BEFORE CUTTING ALUMINUM HEADER OR SILL

<p>1 Measure the wall to wall opening at the tub rim.</p> <p>CAUTION: Do not forget to add 2" to inside tape measurement when required.</p> <p>USE YOUR TAPE CORRECTLY.</p> 	<p>2 Cut the bottom sill track 1/4" less than opening.</p> 	<p>3 If desired, use a good all purpose caulk on the under side of sill. Press sill down on tub rim. Be sure drain holes face into tub.</p> 
<p>4 Set wall jambs against the wall. Align vertically, mark wall with pencil or crayon.</p> 	<p>5 Peel backing from installation tape on jambs, install by setting each jamb firmly over and down upon the sill. Press firmly to the wall for a good bond.</p> 	<p>6 Measure the width inside the installed jambs, cut header bar 1/8" less.</p> 
<p>7</p>  <p>Mount nylon rollers on top of each door panel (see sketch) using the center hole. Other holes will raise or lower the doors for wall alignment. Thread door panels onto header bar with smooth side of panels facing inside the tub.</p> 	<p>8 Push doors to the center of header bar. Lift and lower into place, easing bottom nylon door guides into the proper channel of sill.</p> 	

<p style="text-align: center;">TRIDOR MODEL ONLY:</p> <p>To reverse direction of panels, raise panels out of bottom track and slide catches past each other thereby reversing direction so that shower head does not throw water between the panels.</p>	<p style="text-align: center;">HARDWARE KIT CONTENTS</p> <p style="text-align: center;">TUDOR MODEL</p> <p>4 nylon bearings 4 ball bearing screws # 8-32 x 3/8"</p> <p style="text-align: center;">TRIDOR MODEL</p> <p>6 nylon bearings 6 ball bearing screws # 8-32 x 3/8"</p>
---	--

9. Write a brief manual for a process familiar to you. Consider writing a procedures manual for a school activity or a part-time job, such as your work as the business manager of the school newspaper or as a tutor in the Writing Center.
10. **GROUP EXERCISE** Write instructions for one of the following activities or for a process used in your field. Include appropriate graphics. In a brief note preceding the instructions, indicate your audience and purpose. Exchange these materials with a partner. Observe your partner and take notes as he or she attempts to carry out the instructions. Then revise your instructions and share them with your partner;
 - a. how to change a bicycle tire
 - b. how to convert a WAV file to an MP3 file
 - c. how to find an online discussion board and subscribe to it
 - d. how to locate, download, and install a file from CNET's Shareware.com (<www.shareware.com>), CNET's Download.com (<<http://download.cnet.com>>), or a similar site

Case 20: Balancing Clarity, Conciseness, and Usability in a Description

 **In This Book** For more about memos, see Ch. 14, p. 385.

Background

ENERGY STAR is an information program of the U.S. Environmental Protection Agency and the U.S. Department of Energy. Its purpose is to certify products used by households and businesses as being energy efficient. Begun in 1992, ENERGY STAR provides information to the general public and to more than 15,000 private and public organizations and manufacturers of office equipment, building products, appliances, and home electronics. In 2009, ENERGY STAR delivered more than \$17 billion in cost savings to consumers and businesses in the United States.

You work on the ENERGY STAR Web site. Your supervisor, William Gottering, has asked for your help in planning for a focus group that he will be leading to assess the usefulness of one section of the site: the public information about compact fluorescent lightbulbs (CFLs).

“Our goal is to increase the use of CFLs because they use about one-quarter the energy of a traditional incandescent bulb. But they’re a little trickier than incandescent, and they require careful disposal because they contain mercury. So we first want to describe them by discussing how they work,” he says. (See Document 20.1.) “We’ve got a diagram of CFLs with a label for each of the parts. I think the diagram looks good, and the linked words and phrases in the text lead to a useful glossary.”

“And the other part of this section, about what consumers need to know?” you ask as you look at your site. (See Document 20.2.)

“I’m not as happy with this section,” William says. “I’ve got a couple of concerns. First, some of the tips are kind of hard to visualize.”

“I see what you mean,” you say. “Like that second one: ‘Don’t flip too fast.’ That photograph doesn’t really show what we’re trying to show.”

“That’s right,” William says. “And the little headings are kind of dorky. ‘Do the twist.’ I don’t think that makes us look very cutting-edge.”

“Another thing I think we can improve,” you say, “is the clarity of the descriptions. In the first one, we tell people to hold the ballast, not the bulb, but we don’t say why. We’re missing an opportunity to educate people.”

“Do you think you can write up a set of concerns that I can use to plan for the focus group?”

Your Assignment

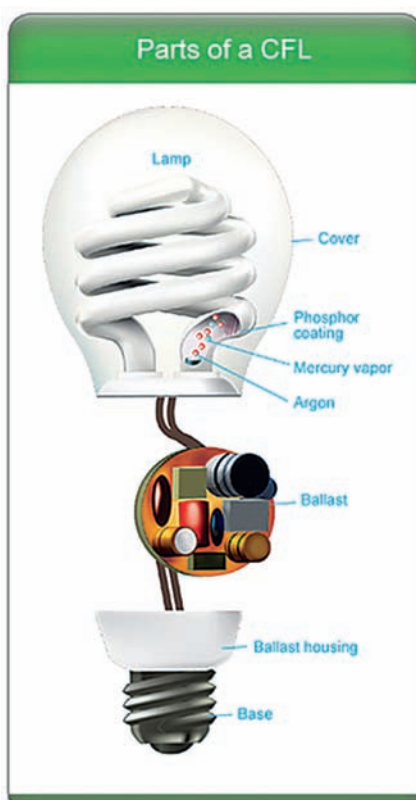
1. Study Document 20.1. Write a 500-word memo to William discussing issues you think he should bring up in the focus group. Do you think consumers want to understand how CFLs work? If so, does Document 20.1 effectively describe the principle of operation? Can you think of ways to improve the text or the diagram? Would additional information help consumers? Should the technical terms that link to the glossary be defined in Document 20.1 itself, or is linking to a glossary a better idea?
2. Study Document 20.2. Write a 500-word memo to William discussing issues you think he should bring up in the focus group. Evaluate the graphic for each tip. Can you suggest other graphics that might work better? Evaluate the text for each tip. Can you suggest ways to clarify the tips so that they more effectively educate consumers and motivate them to use CFLs?

How do CFLs work?

CFLs produce light differently than incandescent bulbs. In an incandescent, electric current runs through a wire filament and heats the filament until it starts to glow. In a CFL, an electric current is driven through a tube containing argon and a small amount of mercury vapor. This generates invisible ultraviolet light that excites a fluorescent coating (called phosphor) on the inside of the tube, which then emits visible light.

CFLs need a little more energy when they are first turned on, but once the electricity starts moving, use about 75 percent less energy than incandescent bulbs. A CFL's ballast helps "kick start" the CFL and then regulates the current once the electricity starts flowing.

Older CFLs used large and heavy magnetic ballasts that caused a buzzing noise in some bulbs. Most CFLs today—and all ENERGY STAR qualified CFLs—use electronic ballasts, which do not buzz or hum.



Sample definitions from the glossary:

“Filament: The wire inside an incandescent light bulb that produces light.”

“Argon: An inert gas used in CFLs to regulate the environment inside the glass tubing so that the mercury vapor can absorb the electrical currents.”

Document 20.1 “How Do CFLs Work?” and Sample Sentence Definitions

Sources: ENERGY STAR, 2009b <www.energystar.gov/index.cfm?c=cfls.pr_cfls_about> and ENERGY STAR, 2009a <www.energystar.gov/index.cfm?c=cfls.pr_cfls_glossary#filament>.

 **On TechComm Web**

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Document 20.2 “How Do I Get the Most from My CFLs?”

Source: ENERGY STAR, 2009b
 <www.energystar.gov/index.cfm?c=cfls.pr_cfls_about>.



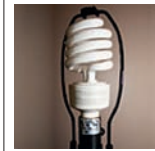
Do the twist.

Screw in your CFL by holding the ballast (the white plastic part), NOT the glass tubing.



Don't flip too fast.

You'll maximize the lifetime savings and effectiveness of your CFLs by keeping them on for 15 minutes or more at a time.



Choose 3 for 3.

Only use bulbs labeled as three-way on three-way sockets.



Don't dim a non-dimmable.

Only use bulbs labeled as dimmable on dimmer switches.



Check your controls.

Most photocells, motion sensors and electric timers are not designed to work with CFLs. Always check with the manufacturer of the control for compatibility.



Give them air.

CFLs are sensitive to extreme temperatures, so place your CFLs in open fixtures indoors. Using them in enclosed fixtures indoors can create a hot environment that reduces the lifetime of your bulbs. Note that covered reflectors are best used in recessed cans.



Protect them outside.

Protect bulbs from the elements by placing them inside enclosed fixtures outdoors. For colder climates, look at the packaging for optimal operating temperatures.

Making Oral Presentations



iStockphoto.

An oral presentation doesn't have to be deadly dull.

Understanding the Role of Oral Presentations 606**Understanding the Process of Preparing and Delivering the Oral Presentation** 607**Preparing the Presentation** 607

Analyzing the Speaking Situation 609

Organizing and Developing the Presentation 609

Preparing Presentation Graphics 611

Choosing Effective Language 621

Rehearsing the Presentation 623

Delivering the Presentation 624

Calming Your Nerves 624

Using Your Voice Effectively 625

Using Your Body Effectively 626

Answering Questions After the Presentation 627**Sample Evaluation Form** 628

A search for “death by PowerPoint” on Google Images returned some 1,410,000 hits. Apparently, a lot of people have been on the receiving end of boring presentations built around bullet slides. But an oral presentation with slides doesn’t have to be deadly dull.

And the process of creating and delivering a presentation doesn’t have to be frightening. You might not have had much experience in public speaking, and perhaps your few attempts have been difficult. However, if you approach it logically, an oral presentation is simply another application you need to master in your role as a technical professional or technical communicator. Once you learn that the people in the room are there to hear what you have to say—not to stare at you or evaluate your clothing or catch you making a grammar mistake—you can calm down and deliver your information effectively while projecting your professionalism.

There are four basic types of presentations:

- *Impromptu presentations.* You deliver the presentation without advance notice. For instance, at a meeting, your supervisor calls on you to speak for a few minutes about a project you are working on.
- *Extemporaneous presentations.* You planned and rehearsed the presentation, and you might refer to notes or an outline, but you create the sentences as you speak. At its best, an extemporaneous presentation is clear and sounds spontaneous.
- *Scripted presentations.* You read a text that was written out completely in advance (by you or someone else). You sacrifice naturalness for increased clarity and precision.
- *Memorized presentations.* You speak without notes or a script. Memorized presentations are not appropriate for most technical subjects because most people cannot memorize presentations of more than a few minutes.

This chapter discusses extemporaneous and scripted presentations.

UNDERSTANDING THE ROLE OF ORAL PRESENTATIONS

An oral presentation has one big advantage over a written one: it enables a dialogue between the speaker and the audience. Listeners can make comments or simply ask questions, and the speaker and listeners can talk before and after the presenta-

tion. As a technical communicator, you can expect to give oral presentations to four types of audiences:

- *Clients and customers.* You present the features of your products or services and their advantages over the competition. After the sale or contract, you might provide oral operating instructions and maintenance tips to users.
- *Colleagues in your organization.* You might instruct fellow workers on a subject you know well. After you return from an important conference or an out-of-town project, you might brief your supervisors. If you have an idea for improving operations at your organization, you might write an informal proposal and then present it orally to a small group of managers. Your presentation helps them determine whether to study the idea.
- *Fellow professionals at technical conferences.* You might speak about your own research project or about a team project to professionals in your field or in other fields.
- *The public.* You might deliver oral presentations to civic organizations and government bodies.

UNDERSTANDING THE PROCESS OF PREPARING AND DELIVERING THE ORAL PRESENTATION

Figure 21.1 on page 608 presents an overview of the process for preparing and delivering an oral presentation. The rest of this chapter discusses this process, beginning with how to prepare a presentation.

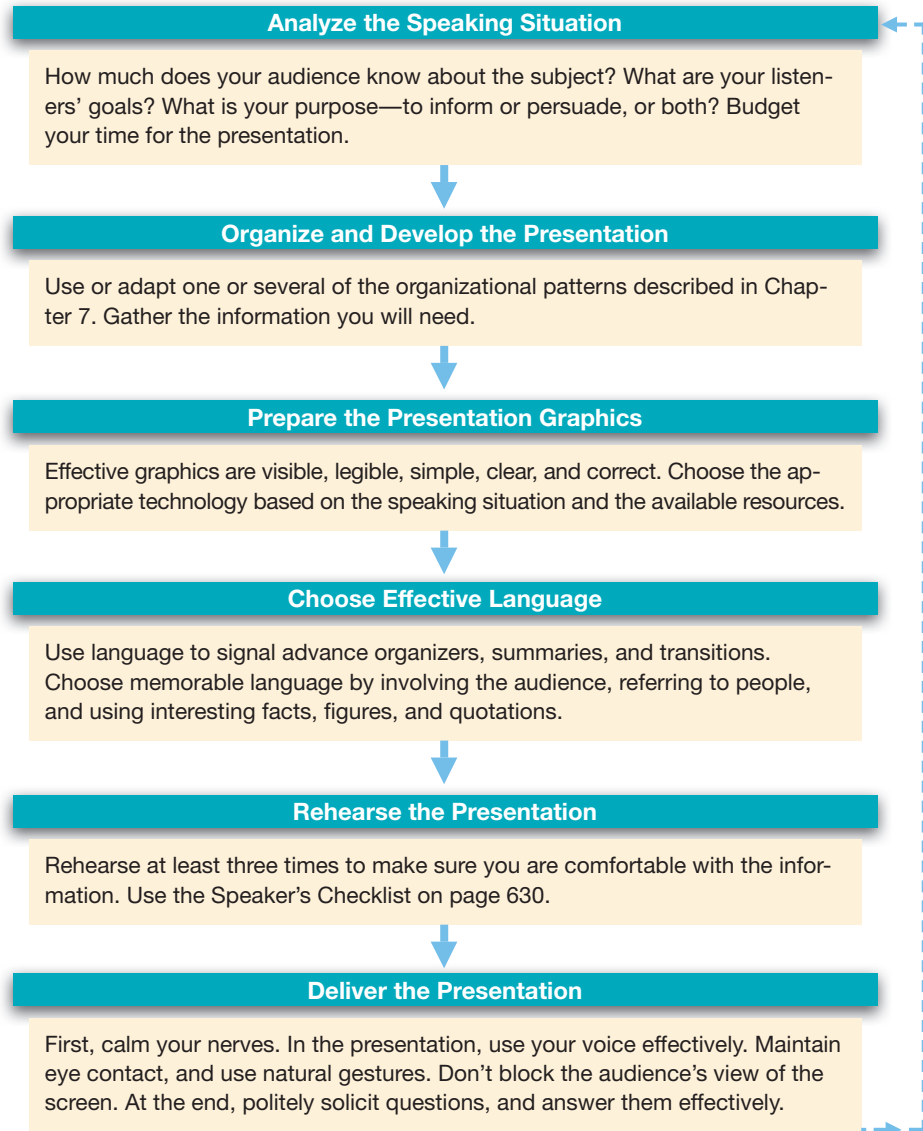
PREPARING THE PRESENTATION

When you see an excellent 20-minute presentation, you are seeing only the last 20 minutes of a process that took many hours. Experts recommend devoting 20 to 60 minutes of preparation time for each minute of the finished presentation (Smith, 1991). That means that a 20-minute presentation takes an average of more than 13 hours to prepare. Obviously, there are many variables, including your knowledge of the subject and your experience creating graphics and giving presentations on that subject. But the point is that good presentations don't just happen.

As you start to prepare a presentation, think about ways to enlist others to help you prepare and deliver it. If possible, you should rehearse the presentation in front of others. You can also call on others to help you think about your audience and purpose, the organization of the information, the types of graphics to use, appropriate designs for slides, and so forth. The

Figure 21.1 An Overview of the Process of Preparing and Delivering Oral Presentations

As you work through this process, you might find that you need to go back to a previous step—or even to the first step—as you think more about your audience, purpose, and subject.



more extensively you work with other people as you plan, assemble, and rehearse, the more successful the presentation is likely to be.

Preparing an oral presentation requires five steps:

- analyzing the speaking situation
- organizing and developing the presentation
- preparing presentation graphics

- choosing effective language
- rehearsing the presentation

Analyzing the Speaking Situation

First, analyze your audience and purpose, and then determine how much information you can deliver in the allotted time.

Analyzing Your Audience and Purpose In planning an oral presentation, consider audience and purpose, just as you would in writing a document.

- **Audience.** What does the audience know about your subject? Your answer will help you determine the level of technical vocabulary and concepts you will use, as well as the types of graphics. Why are audience members listening to your presentation? Are they likely to be hostile, enthusiastic, or neutral? A presentation on the benefits of free trade, for instance, will be received one way by conservative economists and another way by U.S. steelworkers. Does your audience include nonnative speakers of English? If so, prepare to slow down the pace of the delivery and use simple vocabulary.
- **Purpose.** Are you attempting to inform, or to both inform and persuade? If you are explaining how wind-turbine farms work, you might describe the process. If you are explaining why your wind turbines are an economical way to generate power, you might compare them with other power sources.

Your analysis of your audience and purpose will affect the content and the form of your presentation. For example, you might have to emphasize some aspects of your subject and ignore others altogether. Or you might have to arrange topics to accommodate an audience's needs.

Budgeting Your Time At most professional meetings, each speaker is given a maximum time, such as 20 minutes. If the question-and-answer period is part of your allotted time, plan accordingly. Even for an informal presentation, you will probably have to work within an unstated time limit that you must determine from the speaking situation. If you take more than your time, eventually your listeners will resent you or simply stop paying attention.

For a 20-minute presentation, the time allotment shown in Table 21.1 is typical. For scripted presentations, most speakers need a little over a minute to deliver a double-spaced page of text effectively.

TABLE 21.1 ► Time Allotment for a 20-Minute Presentation

Task	Time (minutes)
• Introduction	2
• Body	
– First Major Point	4
– Second Major Point	4
– Third Major Point	4
• Conclusion	2
• Questions	4

Organizing and Developing the Presentation

The speaking situation will help you decide how to organize and develop the information you will present.

 **In This Book**

For more about organizational patterns, see Ch. 7.

Start by considering the organizational patterns used typically in technical communication. One of them might fit the speaking situation. For instance, if you are a quality-assurance engineer for a computer-chip manufacturer and must address your technical colleagues on why one of the company's products is experiencing a higher-than-normal failure rate, think in terms of cause and effect: the high failure rate is the effect, but what is the cause? Or think in terms of problem-method-solution: the high failure rate is the problem; the research you conducted to determine its cause is the method; your recommended action is the solution. Of course, you can combine and adapt several organizational patterns.

While you devise an effective organizational pattern for your presentation, note the kinds of information you will need for each section of the presentation. Some of this information will be data; some of it will be graphics that you can use in your slides; some might be objects that you want to pass around in the audience.

Some presenters like to outline their presentations on paper or in a word-processing program. More and more, however, people are outlining in their presentation software.

This is also a good time to plan the introduction and the conclusion of your presentation.

Planning the Introduction Like an introduction to a written document, an introduction to an oral presentation helps your audience understand what you are going to say, why you are going to say it, and how you are going to say it.

Guidelines

Introducing the Presentation

In introducing a presentation, consider these five suggestions.

- ▶ **Introduce yourself.** Unless you are speaking to the colleagues you work with every day, begin with an introduction: "Good morning. My name is Omar Castillo, and I'm the Director of Facilities here at United." If you are using slides, include your name and position on the title slide.
- ▶ **State the title of your presentation.** Like all titles, titles of presentations should explain the audience and purpose, such as "Replacing the HVAC System in Building 3: Findings from the Feasibility Study." Include the title of your presentation on your title slide.
- ▶ **Explain the purpose of the presentation.** This explanation can be brief: "My purpose today is to present the results of the feasibility study carried out by the Facilities Group. As you may recall, last quarter we were charged with determining whether it would be wise to replace the HVAC system in Building 3."

- ▶ **State your main point.** An explicit statement can help your audience understand the rest of the presentation: “Our main finding is that the HVAC system should be replaced as soon as possible. Replacing it would cost approximately \$120,000. The payback period would be 2.5 years. We recommend that we start soliciting bids now, for an installation date in the third week of November.”
- ▶ **Provide an advance organizer.** Listeners need advance organizers: specific statements of where you are going: “First, I’d like to describe our present system, highlighting the recent problems we have experienced. Next, I’d like to . . . Then, I’d like to . . . Finally, I’d like to conclude and invite your questions.”

Planning the Conclusion Like all conclusions, a conclusion to an oral presentation reinforces what you have said and looks to the future.

Guidelines

Concluding the Presentation

In concluding a presentation, consider these four suggestions.

- ▶ **Announce that you are concluding.** For example, “At this point, I’d like to conclude my talk.” This statement helps the audience focus on your conclusions.
- ▶ **Summarize the main points.** Because listeners cannot replay what you have said, you should briefly summarize your main points. If you are using slides, you should list each of your main points in one short phrase.
- ▶ **Look to the future.** If appropriate, speak briefly about what you think (or hope) will happen next: “If the president accepts our recommendation, you can expect the renovation to begin in late November. After a few hectic weeks, we’ll have the ability to control our environment much more precisely than we can now—and start to reduce our expenses and our carbon footprint.”
- ▶ **Invite questions politely.** You want to invite questions because they help you clarify what you said or communicate information that you did not present in the formal presentation.

Preparing Presentation Graphics

Graphics clarify or highlight important ideas or facts. Statistical data, in particular, lend themselves to graphical presentation, as do abstract relationships and descriptions of equipment or processes. Research reported by speaking coach Terry C. Smith (1991) indicates that presentations that include graphics are judged more professional, persuasive, and credible than those that do not. In addition, Smith notes, audiences remember the information better:

	<i>Retention after</i>	
	3 hours	3 days
Without graphics	70%	10%
With graphics	85%	65%

One other advantage of using presentation graphics is that the audience is not always looking at you. Giving the audience another visual focus can reduce your nervousness.

Characteristics of an Effective Graphic An effective presentation graphic has five characteristics:

- *It presents a clear, well-supported claim.* In a presentation slide, the best way to present a claim and to support it is to put the claim in the headline section of the slide and the support in the body of the slide. Engineering professor and presentations specialist Michael Alley (2007) recommends the structure shown in Figure 21.2.
- *It is easy to see.* The most common problem with presentation graphics is that they are too small. In general, text has to be in 24-point type or larger to be visible on the screen. Figure 21.3 shows a slide that contains so much information that most of it is too small to see easily.

In This Book

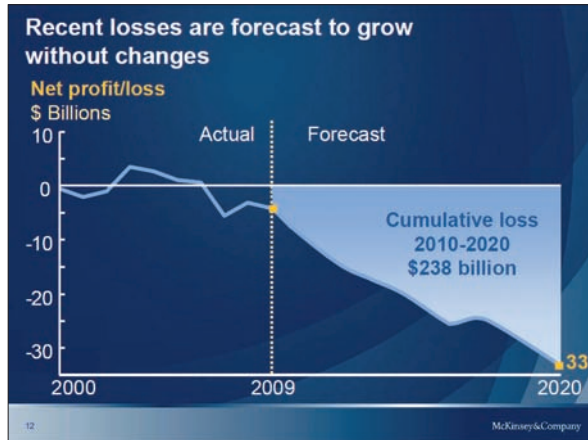
For more about creating graphics, see Ch. 12.

Here you present the claim (in the form of a complete clause) that you will support with the graphics and words below and with the words you speak.

Here you present the support for your claim. The support will consist of graphics, such as photographs, diagrams, and tables. Where appropriate, you should add brief clarifying comments in words. Some slides will include only one large graphic. Others will include several graphics.

a. The structure of a typical slide

Figure 21.2 Michael Alley's Claim-and-Support Structure for Presentation Graphics



b. A slide with a claim and a single large graphic

This slide is structured like a paragraph. The words are the topic sentence; the graphic is the support.

Source: McKinsey & Company, 2010 <www.usps.com/strategicplanning/_pdf/McKinsey_March_2nd_Presentation2.pdf>

Figure 21.2 (continued)



c. A slide with a claim, several graphics, and textual callouts

In this slide, the headline functions as an advance organizer, introducing the three main options. Each option has its own graphic and its own key term, presented in yellow.

Source: McKinsey & Company, 2010 <www.usps.com/strategicplanning/_pdf/McKinsey_March_2nd_Presentation2.pdf>

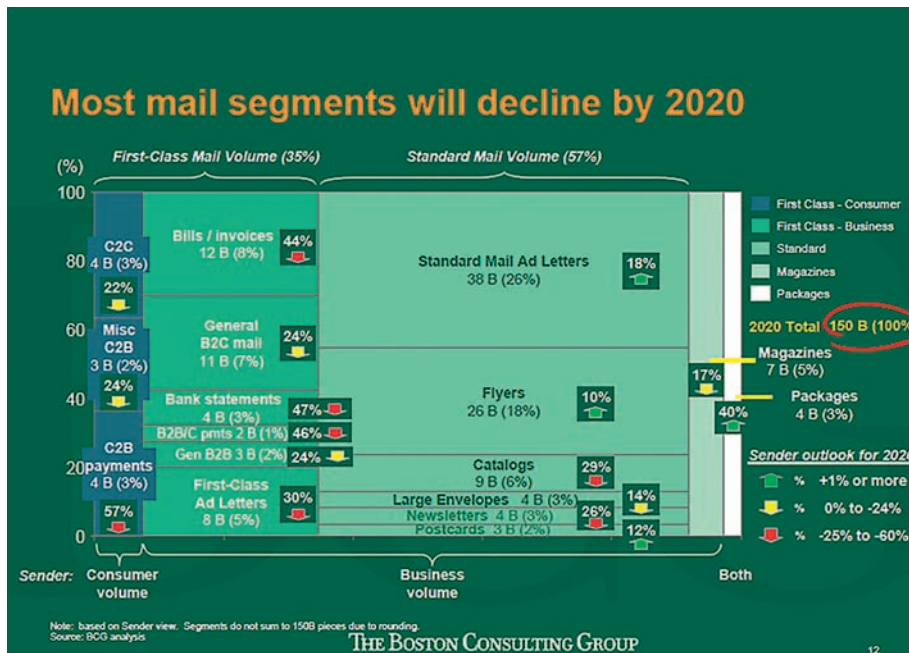


Figure 21.3 Too Much Information on a Slide

Source: Boston Group, 2010 <www.usps.com/strategicplanning/_pdf/BCG_Detailed%20presentation.pdf>

- It is *easy to read*. Use clear, legible lines for drawings and diagrams: black on white works best. Use legible typefaces for text; a boldfaced sans-serif typeface such as Arial or Helvetica is effective because it reproduces clearly on a screen. Avoid shadowed and outlined letters.
- It is *simple*. Text and drawings must be simple. Each graphic should present only one idea. Your listeners have not seen the graphic before and will not be able to linger over it.
- It is *correct*. Proofread your graphics carefully. Everyone makes mistakes of grammar, punctuation, or spelling, but mistakes are particularly embarrassing when they are 10 inches tall on a screen.

When you use presentation software to create a set of graphics for a presentation, avoid the templates, many of which violate basic design principles. Instead, create a simple design using the Slide Master feature.

Presentation software programs contain many fancy animation effects. For example, you can set the software so that when a new slide appears, it is accompanied by the sound of applause or of breaking glass, and the heading text spins around like a pinwheel. Do not use animation effects that are unrelated to your subject. They undercut your professionalism and will quickly become tiresome.

However, one animation effect, sometimes called *appear and dim*, is useful. When you need to create a bulleted list, you can set the software to make the next bullet item appear when you click the mouse. When you do so, the previous bullet item dims. This feature is useful because it focuses the audience's attention on the bullet item you are discussing.

One more point: you cannot use copyrighted material—images, text, music, video, or other material—in your presentation without written permission to do so. (Your presentations in class, however, do not require permission because they are covered by the fair-use exemption.)

Graphics and the Speaking Situation To plan your graphics, analyze four aspects of the speaking situation:

- *Length of the presentation*. How many slides should you have? Smith (1991) suggests showing a different slide approximately every 30 seconds of the presentation. This figure is only a guideline; base your decision on your subject and audience. Still, the general point is valid: it is far better to have a series of simple slides than to have one complicated one that stays on the screen for five minutes.
- *Audience aptitude and experience*. What kinds of graphics can your audience understand easily? You don't want to present scatter graphs, for example, if your listeners do not know how to interpret them.
- *Size and layout of the room*. Graphics to be used in a small meeting room differ from those to be used in a 500-seat auditorium. Think first about

In This Book

For more about typefaces, see Ch. 11, p. 276. For more about using color in graphics, see Ch. 12, p. 314.

On TechComm Web

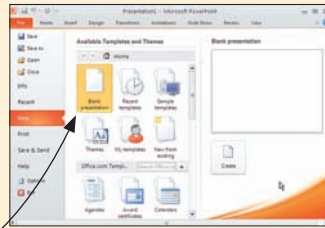
See the Copyright Clearance Center's materials on copyright. Click on Links Library for Ch. 21 on <bedfordstmartins.com/techcomm>.

TECH TIP

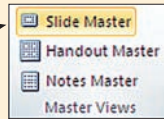
How to Create a Master Page Design in PowerPoint

To create a page design of your own, you can use the **Slide Master** feature to consistently apply design elements to your slides.

1. If a blank presentation does not open when you launch PowerPoint, select **New** from the **File** tab. Next, select **Blank Presentation**, and then select **Create**.



2. Select **Slide Master** from the **Master Views** group on the **View** tab.



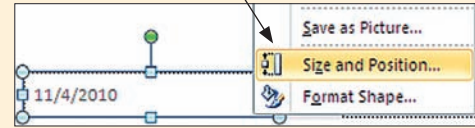
By selecting elements on the master slide and then using the commands on the **Slide Master** tab, you can add a background, choose a color scheme, and choose type styles and sizes.



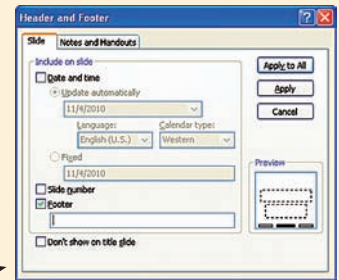
To add graphics to the master slide, use the **Images** and **Illustrations** groups on the **Insert** tab.



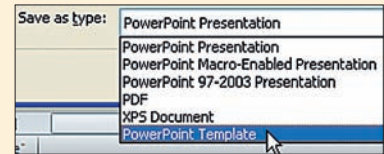
To modify the format, size, or position of placeholders for header and footer information, right-click on the header or footer box on the slide, and then make a selection from the pop-up menu.



To make changes to the type of information displayed in placeholders, select the **Header & Footer** button in the **Text** group on the **Insert** tab, and then use the **Header and Footer** dialog box.



3. To save your page design so that you can use this design for another presentation, select **Save As** from the **File** tab, and then select **PowerPoint Template** from the drop-down menu.



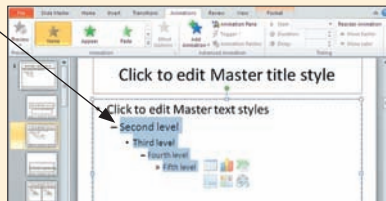
KEYWORDS: slide master, presentation views, background, slide design, placeholder, header and footer, PowerPoint template, templates

TECH TIP

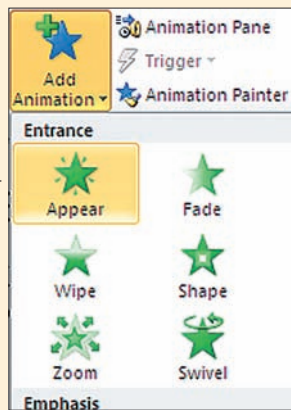
How to Set List Items to Appear and Dim During a Presentation

To help your audience focus on the point you are discussing, you can apply PowerPoint's **custom animation** feature to the **Master Page** so that list items appear and then dim when the next item appears.

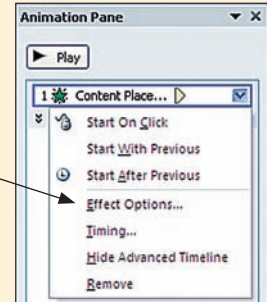
1. To apply a **custom animation**, select the **Title and Content Layout** slide in the **Slide Master** view, and then highlight the list on the slide.



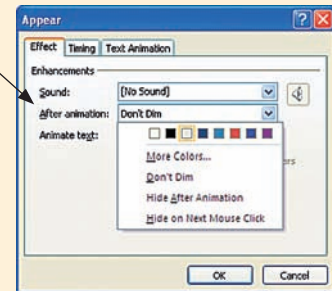
2. In the **Advanced Animation** group, select **Add Animation**, and then select the **Entrance** category and the **Appear** effect.



3. Select the **Animation Pane** button in the **Advanced Animation** group. In the **Animation Pane**, click the drop-down menu and select **Effect Options**.



4. On the **Effect** tab in the **Appear** dialog box, click the **After Animation** drop-down menu and select a dim color.



KEYWORDS: custom animation, slide master, effect options, entrance effects

the size of the images, then about the layout of the room. For instance, will a window create glare that you will have to consider as you plan the type or placement of the graphics?

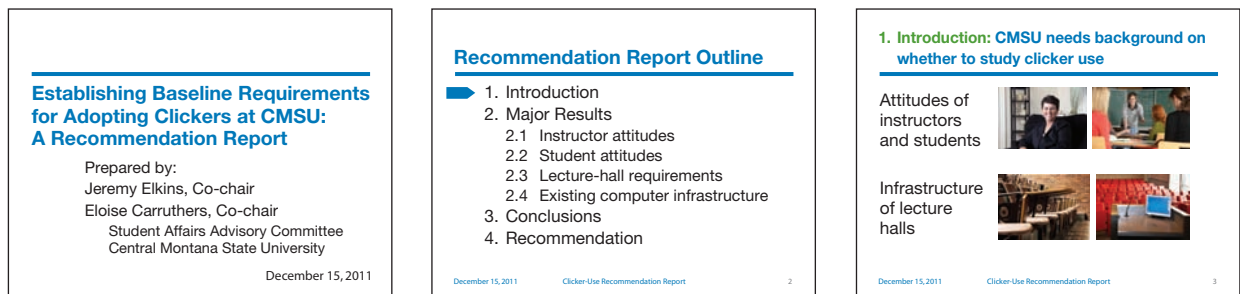
- **Equipment.** Find out what kind of equipment will be available in the presentation room. Ask about backups in case of equipment failure. If possible, bring your own equipment. That way, you know it works and you know how to use it. Some speakers bring graphics in two media just in case; that is, they have slides, but they also have transparencies of the same graphics.

Using Graphics to Signal the Organization of the Presentation Used effectively, graphics can help you communicate how your presentation is organized. For example, you can use the transition from one graphic to the next to indicate the transition from one point to the next. Figure 21.4 shows the slides for a presentation that accompanied the report in Chapter 19 on clickers at CMSU (see page 532).

Presentation software allows you to create two other kinds of documents—*speaking notes* and *handouts*—that can enhance a presentation. Figure 21.5 on page 619 shows a page of speaking notes. Figure 21.6 on page 619 shows a page from a handout.

On TechComm Web

For excellent advice on designing slides, see Garr Reynolds's site. Click on Links Library for Ch. 21 on <bedfordstmartins.com/techcomm>.



The first slide—the title slide—shows the title of the presentation and the name and affiliation of each speaker. You might also want to include the date of the presentation.

The next slide presents an outline of the presentation. The arrow identifies the point the speaker is addressing.

At the bottom of each slide in the body of the presentation is a footer with the date, a shortened presentation title, and the number of the slide. The slide numbers enable audience members to ask questions by referring to the number.

The title of the third slide uses the numbering system introduced in the previous slide.

The cue helps the audience understand the structure of the presentation. Following the colon is an independent clause that presents the claim that will be supported in the slide.

If the images in your presentation are your own intellectual property or are clip art that comes with the software, you can legally display them anywhere.

Figure 21.4 Sample PowerPoint Presentation



1. Introduction: Our study is part of the university's feasibility study

December 15, 2011 Clicker-Use Recommendation Report 4

The slide was made using SmartArt graphics, which are part of PowerPoint. SmartArt graphics help you show logical relationships. Here, the graphic shows that the questions the students are studying—about attitudes and about the infrastructure of the lecture halls—are the foundation on which the rest of the feasibility study will rest.

1. Introduction: Clickers are wireless in-class electronic polling systems

December 15, 2011 Clicker-Use Recommendation Report 5

This photograph shows an instructor displaying the question he asked and a bar graph showing the students' lecture responses.

Even if an image is not your own intellectual property, you can display it in a class because it is covered by the fair-use provisions of U.S. copyright law. However, in a business presentation, you need formal written permission from the copyright holders. See Ch. 2, pp. 23–26, for more information.

Recommendation Report Outline

1. Introduction
- ➡ 2. Major Results
 - 2.1 Instructor attitudes
 - 2.2 Student attitudes
 - 2.3 Lecture-hall requirements
 - 2.4 Existing computer infrastructure
3. Conclusions
4. Recommendation

December 15, 2011 Clicker-Use Recommendation Report 6

This slide is identical to Slide 2, except that the arrow has been moved. This slide helps the audience remember the overall organization of the presentation.

2.1 Instructor Attitudes: Experienced instructors are highly positive about clicker use

Q1. Clickers are easy to use.
 Q2. Clickers improve student attendance and engagement.
 Q3. Clickers improve student learning.
 Q4. CMSU must select a good clicker and provide technical support.
 Q5. If so, I will use it.

December 15, 2011 Clicker-Use Recommendation Report 7

This bar graph shows the questions (and the mean scores) on the questionnaire for instructors experienced with clickers.

2.1 Instructor Attitudes: Inexperienced instructors are also highly positive about clicker use

Q1. I want a more active learning experience for my students.
 Q2. I want to know better how many students understand the concepts.
 Q3. I want to automate tasks such as attendance or quizzes.
 Q4. CMSU must select a good clicker and provide technical support.
 Q5. I want to learn more about clickers.

December 15, 2011 Clicker-Use Recommendation Report 8

This slide presents the same kinds of information for the questionnaire completed by inexperienced instructors.

2.2 Student Attitudes: Students are willing to pay approximately \$40 for a clicker

December 15, 2011 Clicker-Use Recommendation Report 9

A pie chart is a logical choice for representing a small number of components that add up to 100 percent.

The speakers use conservative blues for all their graphics on the slide set.

2.3 Lecture-hall requirements: Radio-frequency systems have no technical limitations

December 15, 2011 Clicker-Use Recommendation Report 10

This is another SmartArt graphic, representing a balancing of two options. The speakers added the check mark to show that the radio-frequency system is preferable to the infrared system.

2.4 Existing computer infrastructure: We have both platforms and many OSs

Platform	Operating system	Number of lecture halls
Macintosh	OSX	3
PC	XP	7
PC	Vista	7
PC	Win 7	4

December 15, 2011 Clicker-Use Recommendation Report 11

When you use tables, keep them simple. If you have a lot of rows and columns, present the data on several slides.


Recommendation Report Outline

1. Introduction
2. Major Results
 - 2.1 Instructor attitudes
 - 2.2 Student attitudes
 - 2.3 Lecture-hall requirements
 - 2.4 Existing computer infrastructure
- ➡ 3. Conclusions
4. Recommendation


December 15, 2011 Clicker-Use Recommendation Report 12

The speakers presented this organizing slide here to clarify the transition from Section 2 to Section 3. They did not present this slide at the start of each of the four subsections of Section 2.

3. Conclusions: Instructors and students are positive about clickers




Yes, **but** choose the right clicker and provide excellent tech support.




Yes, **but** don't ask us to spend more than approximately \$40.

December 15, 2011 Clicker-Use Recommendation Report 13

3. Conclusions: The infrastructure poses no serious limitations




System must be RF, **not** IR.



Both PC and Mac, back to Win XP.

December 15, 2011 Clicker-Use Recommendation Report 14

4. Recommendation: Proceed with the feasibility study



December 15, 2011 Clicker-Use Recommendation Report 15

The formatting that appears throughout the slide set—the background color, the horizontal rule, and the footer—was created in the Slide Master view. This formatting will appear in every slide unless it is modified or deleted for that slide.

Note that the speakers use color—sparingly—for emphasis.

As discussed in Ch. 19, conclusions are inferences you draw from results. When you wish to cite sources, you have three choices: add source statements at the bottom of the appropriate slides, make a sources slide that you show at the end of the presentation, or make a paper copy of the sources to distribute.

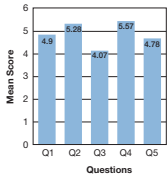
Recommendations are statements about what you think should be done next. This final photograph underscores the speakers' recommendation: let's proceed with this study.

Some speakers make a final slide with the word "Questions?" on it to signal the end of the presentation. You can also display contact information to encourage audience members to get in touch with you.

Figure 21.4 (continued)

2.1 Instructor Attitudes: Inexperienced instructors are also highly positive about clicker use

Q1. I want a more active learning experience for my students.
 Q2. I want to know better how many students understand the concepts.
 Q3. I want to automate tasks such as attendance or quizzes.
 Q4. CMSU must select a good clicker and provide technical support.
 Q5. I want to learn more about clickers.



Question	Mean Score
Q1	4.9
Q2	5.28
Q3	4.07
Q4	5.57
Q5	4.78

December 15, 2011 Clicker-Use Recommendation Report 8

Click to add text

To create speaking notes for each slide, use your presentation software to type the notes in the box under the picture of the slide, and then print the notes pages. You can print the slides on your notes pages in color or black and white.

The problem with using speaking notes is that you cannot read your notes and maintain eye contact at the same time.

Figure 21.5 Speaking Notes

Establishing Baseline Requirements for Adopting Clickers at CMSU: A Recommendation Report

Prepared by:
 Jeremy Elkins, Co-chair
 Eloise Carruthers, Co-chair
 Student Affairs Advisory Committee
 Central Montana State University
 December 15, 2011

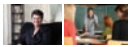
Recommendation Report Outline

- Introduction
- Major Results
 - Instructor attitudes
 - Student attitudes
 - Lecture-hall requirements
 - Existing computer infrastructure
- Conclusions
- Recommendation

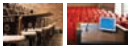
December 15, 2011 Clicker-Use Recommendation Report 3

1. Introduction: CMSU needs background on whether to study clicker use

Attitudes of instructors and students




Infrastructure of lecture halls




December 15, 2011 Clicker-Use Recommendation Report 3

1. Introduction: Our study is part of the university's feasibility study



December 15, 2011 Clicker-Use Recommendation Report 4

1. Introduction: Clickers are wireless in-class electronic polling systems



December 15, 2011 Clicker-Use Recommendation Report 5

Recommendation Report Outline

- Introduction
- Major Results
 - Instructor attitudes
 - Student attitudes
 - Lecture-hall requirements
 - Existing computer infrastructure
- Conclusions
- Recommendation

December 15, 2011 Clicker-Use Recommendation Report 6

The software is set to display six slides on the page.

Figure 21.6 Handout

Typical Media Used to Present Graphics Table 21.2 describes the typical media used to present graphics.

If you are using presentation software, keep in mind that many of the templates provided with the software are unnecessarily ornate, full of fancy shading and designs and colors. If you choose a template, choose a simple one, and then modify it for your situation. You want the audience to focus on your delivery of the information, not on the complex design of the graphics.

In addition, set the software so that you use the mouse (or a colleague does) to advance from one graphic to the next. If you set the software so that the graphics advance automatically at a specified interval, such as 60 seconds, you will have to speed up or slow down your presentation to keep up with the graphics.

TABLE 21.2 ▶ Typical Media Used to Present Graphics

Medium	Advantages	Disadvantages
Computer presentations: images are projected from a computer to a screen.	<ul style="list-style-type: none"> • Very professional appearance. • You can produce any combination of static or dynamic images, from simple graphs to sophisticated, three-dimensional animations, as well as sound and video. • You can embed links to videos or animations on the Web. 	<ul style="list-style-type: none"> • The equipment is expensive and not available everywhere. • Preparing the graphics can be time-consuming. • Presentations prepared using one piece of software might not run on all systems.
Overhead projector: projects transparencies onto a screen.	<ul style="list-style-type: none"> • Transparencies are inexpensive and easy to create. • You can draw transparencies “live.” • You can create overlays by placing one transparency over another. • Lights can remain on during the presentation. 	<ul style="list-style-type: none"> • Not as professional-looking as a computer presentation. • Each transparency must be loaded separately by hand.
Chalkboard or other hard writing surface.	<ul style="list-style-type: none"> • Almost universally available. • You have complete control; you can add, delete, or modify the graphic easily. 	<ul style="list-style-type: none"> • Complicated or extensive graphics are difficult to create. • Ineffective in large rooms. • Very informal appearance.
Objects: models or samples of material that can be held up or passed around the audience.	<ul style="list-style-type: none"> • Interesting for the audience. • Provides a close look at the object. 	<ul style="list-style-type: none"> • Audience members might not be listening while they are looking at the object. • It can take a long while to pass an object around a large room. • The object might be damaged.
Handouts: photocopies of written material given to each audience member.	<ul style="list-style-type: none"> • Much material can fit on the page. • Audience members can write on their copies and keep them. 	<ul style="list-style-type: none"> • Audience members might read the handout rather than listen to the speaker.

INTERACTIVE SAMPLE DOCUMENT

Integrating Graphics and Text on a Presentation Slide

The following slide is part of a presentation about the Human Genome Project. The questions in the margin ask you to think about the discussion of preparing presentation graphics (on pages 611–20).

Chromosome Facts

- number of chromosomes: 22 pairs + 1 pair sex-determining chromosomes = 46
 - one chromosome of each pair donated from each parent's egg or sperm
 - sex chromosomes: X,Y for males; X,X for females
 - largest chromosome: #1 = ~263 million base pairs (bp)
 - smallest chromosome: Y = ~59 million bp

1. How effective is the Human Genome Project logo in the upper left-hand corner of the slide?
2. How well does the graphic of DNA support the accompanying text on chromosome facts?
3. Overall, how effective is the presentation graphic?

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 21 on <bedfordstmartins.com/techcomm>.

Choosing Effective Language

Delivering an oral presentation is more challenging than writing a document for two reasons:

- Listeners can't reread something they didn't understand.
- Because you are speaking live, you must maintain your listeners' attention, even if they are hungry or tired or the room is too hot.

Using language effectively helps you meet these two challenges.

Using Language to Signal Advance Organizers, Summaries, and Transitions

Even if you use graphics effectively, listeners cannot “see” the organization of a presentation as well as readers can. For this reason, use language to alert your listeners to advance organizers, summaries, and transitions.

- *Advance organizers.* Use an advance organizer (a statement that tells the listener what you are about to say) in the introduction. In addition, use advance organizers when you introduce main ideas in the body of the presentation.

- *Summaries.* The major summary is in the conclusion, but you might also summarize at strategic points in the body of the presentation. For instance, after a three- to four-minute discussion of a major point, you might summarize it in one sentence before going on to the next major point. Here is a sample summary from a conclusion:

Let me conclude by summarizing my three main points about the implications of the new RCRA regulations on the long-range waste-management strategy for Radnor Township. The first point is . . . The second point is . . . The third point is . . . I hope this presentation will give you some ideas as you think about the challenges of implementing the RCRA.

- *Transitions.* As you move from one point to the next, signal the transition clearly. Summarize the previous point, and then announce that you are moving to the next point:

It is clear, then, that the federal government has issued regulations without indicating how it expects county governments to comply with them. I'd like to turn now to my second main point. . . .

Using Memorable Language Effective presentations require memorable language.

Guidelines

Using Memorable Language in Oral Presentations

Draw on these three techniques to help make a lasting impression on your audience.

- ▶ **Involve the audience.** People are more interested in their own concerns than in yours. Talk to the audience about their problems and their solutions. In the introduction, establish a link between your topic and the audience's interests. For instance, a presentation to a city council about waste management might begin like this:

Picture yourself on the Radnor Township Council two years from now. After exhaustive hearings, proposals, and feasibility studies, you still don't have a waste-management plan that meets federal regulations. What you do have is a mounting debt: the township is being fined \$1,000 per day until you implement an acceptable plan.

- ▶ **Refer to people, not to abstractions.** People remember specifics; they forget abstractions. To make a point memorable, describe it in human terms:

What could you do with that \$365,000 every year? In each computer lab in each school in the township, you could replace each laptop every three years instead of every four years. Or you could expand your school-lunch program to feed every needy child in the township. Or you could extend your after-school programs to cover an additional 3,000 students.

- **Use interesting facts, figures, and quotations.** Search the Internet for interesting information about your subject. For instance, you might find a brief quotation from an authoritative figure in the field or a famous person not generally associated with the field (for example, Theodore Roosevelt on waste management and the environment).

A note about humor: only a few hundred people in the United States make a good living being funny. Don't plan to tell a joke. If something happens during the presentation that provides an opening for a witty remark, and you are good at making witty remarks, fine. But don't *prepare* to be funny.

Rehearsing the Presentation

Even the most gifted speakers need to rehearse. It is a good idea to set aside enough time to rehearse your speech thoroughly.

Rehearsing the Extemporaneous Presentation Rehearse your extemporaneous presentation at least three times.

- *First rehearsal.* Don't worry about posture or voice projection. Just present your presentation aloud with your presentation slides. Your goal is to see if the speech makes sense—if you can explain all the points and create effective transitions. If you have trouble, stop and try to figure out the problem. If you need more information, get it. If you need a better transition, create one. You are likely to learn that you need to revise the order of your slides. Pick up where you left off and continue the rehearsal, stopping again where necessary to revise.
- *Second rehearsal.* This time, the presentation should flow more easily. Make any necessary changes to the slides. When you have complete control over the organization and flow, check to see if you are within the time limit.
- *Third rehearsal.* After a satisfactory second rehearsal, try the presentation under more realistic circumstances—if possible, in front of others. The listeners might offer questions or constructive advice about your speaking style. If people aren't available, tape-record or videotape the presentation, and then evaluate your own delivery. If you can visit the site of the presentation to rehearse there, you will find giving the actual speech a little easier.

Rehearse again until you are satisfied with your presentation, but don't try to memorize it.

Rehearsing the Scripted Presentation Rehearsing a scripted presentation is a combination of revising and editing the text and rehearsing your delivery. As you revise, read the script aloud to hear how it sounds. Once you think the presentation says what you want to say, try reading it into an audio or video recorder. Revise it until you are satisfied, and then rehearse in front of real people. Do not memorize the presentation. There is no need to; you will have your script in front of you on the podium.

DELIVERING THE PRESENTATION

When giving your presentation, you will concentrate on what you have to say. However, you will have three additional concerns: staying calm, using your voice effectively, and using your body effectively.

Calming Your Nerves

Most professional actors admit to being nervous before a performance, so it is no wonder that most technical speakers are nervous. You might well fear that you will forget everything or that no one will be able to hear you. These fears are common. But keep in mind three facts about nervousness:

- *You are much more aware of your nervousness than the audience is.* They are farther away from your trembling hands.
- *Nervousness gives you energy and enthusiasm.* Without energy and enthusiasm, your presentation will be flat. If you seem bored and listless, your audience will become bored and listless.
- *After a few minutes, your nervousness will pass.* You will be able to relax and concentrate on the subject.

This advice is unlikely to make you feel much better if you are distracted by nerves as you wait to give your presentation. Experienced speakers offer three tips for coping with nervousness:

- *Realize that you are prepared.* If you have done your homework, prepared the presentation carefully, and rehearsed it several times, you'll be fine.
- *Realize that the audience is there to hear you, not to judge you.* Your listeners want to hear what you have to say. They are much less interested in your nervousness than you are.
- *Realize that your audience is made up of individual people who happen to be sitting in the same room.* You'll feel better if you realize that audience members also get nervous before making presentations.

When it is time to begin, don't jump up to the lectern and start speaking quickly. Walk up slowly and arrange your text, outline, or note cards before you. If water is available, take a sip. Look out at the audience for a few seconds before you begin. Begin with "Good morning" (or "Good afternoon" or

“Good evening”), and refer to the officers and dignitaries present. If you have not been introduced, introduce yourself. In less-formal contexts, just begin your presentation.

So that the audience will listen to you and have confidence in what you say, use your voice and your body to project an attitude of restrained self-confidence. Show interest in your topic and knowledge about your subject.

Guidelines

Releasing Nervous Energy

Experienced speakers suggest the following four strategies for dealing with nervousness before a presentation.

- ▶ **Walk around.** A brisk walk of a minute or two can calm you by dissipating some of your nervous energy.
- ▶ **Go off by yourself for a few minutes.** Getting away can help you compose your thoughts and realize that you can handle your nervousness.
- ▶ **Talk with someone for a few minutes.** For some speakers, distraction works best. Find someone to talk to.
- ▶ **Take several deep breaths, exhaling slowly.** Doing so will help you control your nerves.

Using Your Voice Effectively

Inexperienced speakers often have problems with five aspects of vocalizing.

- *Volume.* Because acoustics vary greatly from room to room, you won't know how well your voice will carry in a particular setting until you have heard someone speaking there. In some rooms, speakers can use a conversational volume. Other rooms require greater voice projection. These circumstances aside, more people speak too softly than too loudly. After your first few sentences, ask if the people in the back of the room can hear you. When people speak into microphones, they tend to speak too loudly. Glance at your audience to see if you need to adjust your volume. The body language of audience members will be clear.
- *Speed.* Nervousness makes people speak quickly. Even if you think you are speaking at the right rate, you might be going a little too fast for some listeners. Although you know your subject well, your listeners are trying to understand new information. For particularly difficult points, slow down for emphasis. After finishing one major point, pause before introducing the next one.
- *Pitch.* In an effort to control their voices, many speakers end up flattening their pitch. The resulting monotone is boring and, for some listeners, distracting. Try to let the pitch of your voice go up or down as it would in a normal conversation.

- **Articulation.** Nervousness can accentuate sloppy pronunciation. If you want to say *environment*, don't say *envirament*. A related problem involves technical words and phrases, especially the important ones. When a speaker uses a phrase over and over, it tends to get clipped and becomes difficult to understand. Unless you articulate carefully, *Scanlon Plan* will end up as *Scanluhplah*.
- **Nonfluencies.** Avoid such meaningless fillers as *you know*, *like*, *okay*, *right*, *uh*, and *um*. These phrases do not hide the fact that you aren't saying anything. A thoughtful pause is better than an annoying verbal tic.

Using Your Body Effectively

Besides listening to you, the audience will be looking at you. Effective speakers use their body language to help listeners follow the presentation.

Guidelines

Facing an Audience

As you give a presentation, keep in mind these four guidelines about physical movement.

- ▶ **Maintain eye contact.** Eye contact helps you see how the audience is receiving the presentation. You will see, for instance, if listeners in the back are having trouble hearing you. For small groups, look at each listener randomly; for larger groups, look at each segment of the audience frequently during your speech. Do not stare at the screen, the floor, or out the window.
- ▶ **Use natural gestures.** When people talk, they often gesture with their hands. Most of the time, gestures make the presentation look natural and improve listeners' comprehension. You can supplement your natural gestures by using your arms and hands to signal pauses and to emphasize important points. When referring to graphics, walk toward the screen and point to direct the audience's attention. Avoid mannerisms—physical gestures that serve no useful purpose, such as jiggling the coins in your pocket or pacing back and forth. Like verbal mannerisms, physical mannerisms are often unconscious. Constructive criticism from friends can help you pinpoint them.
- ▶ **Don't block the audience's view of the screen.** Stand off to the side of the screen. Use a pointer to indicate key words or images on the screen.
- ▶ **Control the audience's attention.** People will listen to and look at anything that is interesting. If you hand out photocopies at the start of the presentation, some people will start to read them and stop listening to you. If you leave an image on the screen after you finish talking about it, some people will keep looking at it instead of listening to you. When you want the audience to look at you and listen to you, remove the graphics or make the screen blank.

If your audience includes people of different cultures and native languages, keep in mind the following three suggestions:

- *Hire translators and interpreters if necessary.* If many people in the audience do not understand your language, hire interpreters (people who translate your words as you speak them) and translators (people who translate your written material in advance).
- *Use graphics effectively to reinforce your points for nonnative speakers.* Try to devise ways to present information using graphics—flowcharts, diagrams, and so forth—to help your listeners understand you. Putting more textual information on graphics will allow your listeners to see the accompanying text while you explain your points.
- *Be aware that gestures can have cultural meanings.* As discussed in Chapter 12, hand gestures (such as the thumbs-up sign or the “okay” gesture) have different—and sometimes insulting—meanings in other cultures. Therefore, it’s a good idea to limit the use of these gestures. You can’t go wrong with an arms-out, palms-up gesture that projects openness and inclusiveness.

ANSWERING QUESTIONS AFTER THE PRESENTATION

When you finish a presentation, thank the audience simply and directly: “Thank you for your attention.” Then invite questions. Don’t abruptly ask, “Any questions?” This phrasing suggests that you don’t really want any questions. Instead, say something like this: “If you have any questions, I’ll be happy to try to answer them now.” If invited politely, people will be much more likely to ask; in that way, you will be more likely to communicate your information effectively.

When you respond to questions, you might encounter any of these four situations:

- *You’re unsure everyone heard the question.* Ask if people have heard it. If they haven’t, repeat or paraphrase it, perhaps as an introduction to your response: “Your question is about the efficiency of these three techniques. . . .” Some speakers always repeat the question, which gives them an extra moment to prepare an answer.
- *You don’t understand the question.* Ask for clarification. After responding, ask if you have answered the question adequately.
- *You have already answered the question during the presentation.* Restate the answer politely. Begin your answer with a phrase such as the following: “I’m sorry I didn’t make that point clear in my talk. I wanted to explain how . . .” Never insult the person by pointing out that you already answered the question.
- *A belligerent member of the audience rejects your response and insists on restating his or her original point.* Politely offer to discuss the matter further after the session. This way, the person won’t bore or annoy the rest of the audience.

If it is appropriate to stay after the session to talk individually with members of the audience, offer to do so.

ETHICS NOTE

Answering Questions Honestly

If an audience member asks a question to which you do not know the answer, admit it. Simply say, “I don’t know” or “I’m not sure, but I think the answer is . . .” Smart people know that they don’t know everything. If you have some ideas about how to find out the answer—by checking a particular reference source, for example—share them. If the question is obviously important to the person who asked it, you might offer to meet with him or her to discuss ways for you to give a more complete response, perhaps by e-mail.

SAMPLE EVALUATION FORM

Figure 21.7 is a form that can help you focus your thoughts as you watch and listen to a presentation.

Figure 21.7 Sample Evaluation Form

On TechComm Web

To download this form in an electronic format, see Forms for Technical Communication on <bedfordstmartins.com/techcomm>.

Oral Presentation Evaluation Form		
Speaker(s) _____	Topic _____	
<p>The left-hand column lists statements about different aspects of the presentation. In the middle column, rate the speaker(s) on each aspect of the presentation by writing a number from 1 to 6, with 1 signifying that you strongly disagree with the statement and 6 signifying that you strongly agree with the statement. In the right-hand column, write any comments you wish the speaker(s) to see.</p>		
Aspect of the Presentation	Rating (1 = strongly disagree; 6 = strongly agree)	Comments
Organization and Development		
1. In the introduction, the speaker related the topic to the audience’s concerns.		
2. In the introduction, the speaker explained the main points he or she wanted to make in the presentation.		
3. In the introduction, the speaker explained the organization of the presentation.		

Figure 21.7 (continued)

Aspect of the Presentation	Rating (1 = strongly disagree; 6 = strongly agree)	Comments
Organization and Development		
4. I found it easy to understand the organization of the presentation.		
5. The speaker used appropriate and sufficient evidence to clarify the subject.		
6. In the conclusion, the speaker summarized the main points effectively.		
7. In the conclusion, the speaker invited questions politely.		
8. In the conclusion, the speaker answered questions effectively.		
9. The speaker used the allotted time effectively.		
Verbal and Physical Presence		
10. The speaker used interesting, clear language to get the points across.		
11. The speaker used clear and distinct enunciation.		
12. The speaker seemed relaxed and poised.		
13. The speaker exhibited no distracting vocal mannerisms.		
14. The speaker exhibited no distracting physical mannerisms.		
15. The speaker made eye contact effectively.		
16. The speaker was enthusiastic.		
Use of Graphics		
17. The speaker used graphics effectively to reinforce and explain the main points.		
18. The speaker used appropriate kinds of graphics.		
19. The speaker used graphics effectively to highlight the organization of the presentation.		
20. The graphics were easy to see.		
21. The graphics were easy to understand.		
22. The graphics looked correct and professional.		



Figure 21.7 (continued)

Aspect of the Presentation	Rating (1 = strongly disagree; 6 = strongly agree)	Comments
Use of Graphics		
23. The graphics helped me understand the organization of the presentation.		
For Group Presentations		
24. The group seemed well rehearsed.		
25. The graphics were edited so that they looked consistent from one group member to the next.		
26. The transitions from one group member to the next were smooth.		
27. Each group member seemed to have done an equal amount of work in preparing and delivering the presentation.		
<p>On the other side of this sheet, answer the following two questions. 28. What did you particularly like about this presentation? 29. What would you have done differently if you had been the speaker?</p>		

Speaker's Checklist

- Did you analyze the speaking situation—the audience and purpose of the presentation? (p. 609)
- Did you determine how much information you can communicate in your allotted time? (p. 609)
- Did you organize and develop the presentation? (p. 609)

Does each presentation graphic have these five characteristics?

- It presents a clear, well-supported claim. (p. 612)
 - It is easy to see. (p. 612)
 - It is easy to read. (p. 614)
 - It is simple. (p. 614)
 - It is correct. (p. 614)
- In planning your graphics, did you consider the length of your presentation, your audience's aptitude and experience, the size and layout of the room, and the equipment available? (p. 614)

- Did you plan your graphics to help the audience understand the organization of your presentation? (p. 617)
- Did you make sure that the presentation room will have the necessary equipment for the graphics? (p. 620)
- Did you choose appropriate media for your graphics? (p. 620)
- Did you use language to signal advance organizers, summaries, and transitions? (p. 621)
- Did you choose language that is vivid and memorable? (p. 622)
- Did you rehearse your presentation several times with a tape recorder, videocamera, or live audience? (p. 623)

Exercises

1. Learn some of the basic functions of a presentation software program. For instance, modify a template, create your own original design, add footer information to a master slide, insert a graphic on a slide, and set the animation feature to make each bullet item appear only after a mouse click.
2. Using presentation software, create a design to be used for the master slide of a computer presentation. Then, for the same information, create a design to be used for a transparency made on a black-and-white photocopier.
3. Prepare a five-minute presentation, including graphics, on one of the topics listed here. For each presentation, your audience will consist of the other students in your class, and your purpose is to introduce them to an aspect of your academic field.
 - a. Define a key term or concept in your field.
 - b. Describe how a particular piece of equipment is used in your field.
 - c. Describe how to carry out a procedure common in your field.

The instructor and the other students will evaluate the presentation by filling out the form in Figure 21.7.
4. **GROUP EXERCISE** Prepare a five-minute presentation based either on your proposal for a research report or on your completion report. Your audience will consist of the other students in your class, and your purpose is to introduce them to your topic. The instructor and the other students will evaluate the presentation by filling out the form in Figure 21.7. If your instructor wishes, this assignment can be done collaboratively.

Case 21: Understanding the Claim-and-Support Structure for Presentation Graphics

Background

You're excited when you see your friend Carol Gaurda. You are eager to tell her that your paper on biometrics has been selected for a student conference sponsored by the Criminology Department. "I'm excited about it, but a little scared, too, because I'm not too experienced giving presentations."

You tell Carol that you will have 20 minutes to introduce the uses of biometrics in security applications, such as permitting access to restricted areas or information. The presentation will be accompanied by presentation graphics; the organizers have Microsoft PowerPoint on all the computers in the presentation rooms.

Carol asks to see your notes for the slides. You pass her a draft of some text you want to say, as well the draft of the slide (see Document 21.1). "I'm just getting started, but what I've got seems kind of flat to me," you tell her. "Any suggestions?"

"Well, I see you're using the bullet-point approach, one of the slide types that the software offers. The problem with

bullet points is that they just encourage you to read to the audience. And they don't show any movement. What I'd do is look for a key term in the information that suggests what kind of organization might work best for the information."

You look at your text. "You mean 'process'?"

"Exactly," Carol says. "Portraying the information as a process shows more movement than just bullet points, which are static. And a process helps the audience see the concept you're communicating."

"So you're saying I should switch to a numbered list?"

"I think you can do better than that. Take a look at the Shapes and the SmartArt in the Insert tab on your software. There are a lot of designs that you can use to make the process more vivid."

"Okay, but I don't want to just add fancy designs if all I'm showing is steps in a process."

"I agree with you," Carol says, "so the next step is to create or find graphics that will substitute for the words. Show the graphics, say the words."

"For instance?"

“If you’re trying to show the first step—using sensors to collect data—find images of sensors. Select one that will be clear to your audience. Everyone understands the process of putting ink on a person’s fingers to record fingerprints.”

“And for the second step—converting data into a template—I could show the fingerprint data going into a computer and coming out the other side as digital data.”

“That’s right. You don’t need to show the actual process; you’re trying to convey the concept. So use text boxes to show the inked fingerprint on the left, with an arrow pointing to the computer. Then, use an arrow and another text box coming out the right side of the computer with a digital version of the information. Maybe a series of 0s and 1s to suggest digitization.”

“This is great. Any other suggestions?” you ask.

“I’d make the slide headings more clear,” Carol says. “Make each heading a complete clause, like a sentence. Sentences force you to make a claim, which is necessarily more informative than a mere phrase.”

“How about the sentence I’ve already got: Biometric systems use a three-step process?” you ask.

“Why not start to communicate the key words: ‘Biometric systems *collect*, *convert*, and *compare* biometric data’?”

“Wow, you’re really good at this, Carol. How about you do all the slides for me?” Carol laughs. “Well, how about looking at some revisions instead?”

“You know I like good coffee, don’t you?” Carol says. “Deal.”

Your Assignment

1. For each of the five sets of text in Document 21.1, write a paragraph describing the organizational pattern that best captures the information in the text. Study the Shapes and the SmartArt tabs in your software to see if any of the graphics portray the pattern that you think would work best. If you don’t see any appropriate graphics, how could you create a graphic that would be effective? What photographs or illustrations available on the Internet would help you communicate the idea to your audience?
2. In a presentation program such as PowerPoint, create a slide for each set of text in Document 21.2.

Document 21.1 Sample Text and Draft of a Slide

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordsmartins.com/techcomm>.

Sample Text

Biometric systems use a three-step process. The first step involves using various sensors to observe or collect biometric data. The second step converts and describes these data digitally in what is called a *template*. In the third step, the template is compared with one or more templates stored in a database. This yields a “match” or a “non-match” result.

Sample Slide

Biometric Systems Process

- Observation and collection of data
- Conversion and description of the data into a template
- Comparison of template with templates in database

Document 21.2 Five Sets of Text to Convert to Slides**Text for Slide 1**

There are three ways to identify someone: by what they possess (such as an ID card), by what they know (such as a PIN), and by what they are (a biometric marker).

Text for Slide 2

Biometrics commonly implemented or studied include fingerprint, face, iris, voice, signature, and hand geometry.

Text for Slide 3

Three key terms used in biometrics:

- *Recognition* simply means to “know again.” All biometric systems perform recognition to “know again” a person who has been previously enrolled.
- *Verification* is the task of attempting to confirm an individual’s claimed identity by comparing a submitted sample to one or more previously enrolled templates.
- *Identification* is the task of attempting to determine an individual’s identity. Biometric data are collected and compared to the templates in a database. In “closed-set” identification, investigators know that the person exists in the database. In “open-set” identification, investigators do not know whether the person exists in the database.

Text for Slide 4

A typical biometric system comprises five integrated components. A sensor collects the data and converts them to a digital format. Signal processing algorithms perform quality-control activities and develop the biometric template. A data storage component keeps information that new biometric templates will be compared to. A matching algorithm compares the new biometric template to one or more templates kept in data storage. Finally, a decision process (either automated or human-assisted) uses the results from the matching component to make a system-level decision.

Text for Slide 5

Although both biometrics and forensics involve human recognition, biometrics typically uses automated techniques before an event occurs, such as an attempt to gain access to sensitive information or to a secured facility. By contrast, forensic applications typically use automated and non-automated techniques after a crime has been committed. Forensic methods are used to assist in the legal process to determine guilt or innocence.

CHAPTER **22**

Connecting with the Public



AP Photo/Marcio Jose Sanchez.

The new philosophy of communication is bottom up.

This photo shows Mark Zuckerberg, president and CEO of Facebook, speaking at a conference. This book and its Web site, TechComm Web, devote a lot of attention to the ways that new technologies are changing how people in the working world communicate. From word-processing programs to spreadsheets and presentation slides, from instant messaging to blogs and social media such as Facebook, the tools are everywhere, and they keep getting better. To succeed in the working world, you need to know how to use these tools effectively.

But the tools are just one part of the big change in communication practices. The other part is a new philosophy of communication. The old philosophy was top down. For example, when a company wanted to publicize a new product, it would issue press releases, write articles for trade magazines, and place ads in magazines and on TV. The new philosophy is bottom up; that is, the company uses social media to connect with its various stakeholders. It's the difference between *selling* and *engaging*.

This chapter discusses strategies for communicating with the public or, to be more precise, publics: investors, prospective employees, state and local officials, prospective donors, community members, current and prospective customers, and industry colleagues, to name just a few. Although people and organizations have always been able to communicate with their publics, today's technology has made it much easier and cheaper to do so. With a personal computer, basic office software, and Internet access, you can create and distribute newsletters, brochures, white papers, and podcasts to help you present information to community members. And you can collaborate with those community members through social media tools such as discussion boards, blogs, and wikis. This chapter discusses these seven applications, focusing first on those that are best at presenting information and then on those that are best at fostering collaboration with a community.

UNDERSTANDING THE ROLE OF CONNECTING WITH THE PUBLIC

Why is it important for organizations to connect with their publics? One reason is that our culture values *accountability*. The public expects organizations of all kinds to communicate hon-

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estly and clearly and to take responsibility for their actions. The public wants to know, for instance, how a carmaker such as Ford is responding to the challenges of global warming. Here are just a few of the questions that the general public and interest groups ask Ford:

- What are you doing to improve the gas mileage and decrease the toxic emissions of your vehicles?
- What are you doing to improve the safety of your vehicles?
- What are you doing to reduce the carbon footprint of your manufacturing facilities and your supply chain?
- What are you doing to increase employment opportunities, especially for women and minorities?
- What are you doing to improve the socioeconomic conditions in the communities in which you have facilities?

Notice that some of these questions directly relate to technical aspects of Ford's core products, but others relate more to Ford's role as a corporate citizen. Twenty or thirty years ago, Ford simply thought of itself as a maker of cars and trucks. Today, however, Ford is typical of virtually all organizations in that it sees itself as a member of many different communities, from the community of carmakers to the community of manufacturing companies to the community of Dearborn, Michigan, and many other locations.

Just as organizations now see themselves as members of many communities, individuals working for organizations also see themselves as members of many communities. A person who works for Ford is likely to see herself as a Ford employee but also as a member of one or two community organizations and a political group, as well as a supporter of her daughter's school. As a member of these organizations, this Ford worker might contribute to various outreach and communication efforts by participating in fund-raising events, volunteering her time to help maintain a computer lab at her child's school, writing articles for newsletters, and maintaining a blog.

Many organizations use this sense of community in devising their advertising and marketing. The "chief consumer engagement officer" at PepsiCo writes that "our consumers' social relationships serve as the foundation for our most effective marketing. Once you engage your loyal consumers to help lead the evolution of your brand or products, those consumers communicate authentically within their real-life social networks about the meaning of your brands and the reasons others should love them too" (Warner, 2010).

However, organizations also see community as a way to combine education and marketing. When a large oil company such as ExxonMobil buys expensive ads that describe how much money it spends on research and development of alternative fuels, it wants the public to see it as a responsible

corporate citizen, not a predatory big-oil conglomerate. The ads are meant to educate the public and government about how the company is acting responsibly. If the ads also make the public a little less unhappy about the price of gas and discourage the government from imposing windfall-profits taxes on ExxonMobil, all the better.

Some organizations use community to motivate people to support causes. For example, Jeff Swartz, the President and CEO of outdoor clothing company Timberland, uses Facebook and Twitter to communicate about the environmental causes he cares about. He rarely mentions Timberland; typically, he discusses Earthkeepers, the environmental organization his company supports. However, his posts might make environmentally minded potential customers more likely to consider Timberland products.

Every one of the applications discussed in this chapter can be created from a variety of motivations and can serve a number of purposes.

PERSUASION AND CONNECTING WITH THE PUBLIC

All the applications discussed in this chapter share one characteristic: if they are to succeed, they must be persuasive. As discussed in Chapter 8, a persuasive message must appeal to one or several of an audience's broader goals: security, recognition, personal or professional growth, and connectedness. A brochure from the American Cancer Society that explains how to recognize the warning signs of cancer obviously appeals to a reader's goal of security. A blog that explains how to use wikis to improve communication in a company appeals to a reader's desire to grow professionally.

In addition, if a persuasive message is to succeed, it must present an effective argument. It must contain a clear and compelling claim based on appropriate evidence, and it must rest on valid reasoning and sound logic. For instance, a company offers a service to prevent hackers from invading an organization's database and stealing the personal information of the organization's customers. The company might publish on its Web site a white paper explaining the nature and extent of the threat and describing how its service can help reduce that threat. It's a marketing message, but it won't attract any interest unless it's persuasive. It must be attractive and well written; it must present appropriate evidence that the threat is real and serious and that the company's service will work. That evidence might consist of *commonsense arguments* (such as the idea that because hackers look for easy opportunities to invade a company, any sort of obstacles the company erects will reduce the threat); *numerical data* (statistics showing how organizations that purchase the company's service have been hit by hackers less often); *examples* (case studies of satisfied customers); and *expert testimony* (awards and commendations from professional data-security organizations).

PRESENTING INFORMATION TO THE PUBLIC

In This Book

For more about collaboration, see Ch. 4.

The four applications discussed in this section—newsletters, brochures, white papers, and podcasts—differ from one another in many ways. For instance, newsletters have been used for hundreds of years, whereas podcasts have been around for only a few. Newsletters and brochures are often created by teams of people working collaboratively: one person might serve as the editor and project manager; someone else might do the layout and graphics; others might do some of the writing. By contrast, podcasts are often produced by one person. Three of the applications can be printed on paper or distributed electronically, whereas podcasts are downloaded and used electronically.

The common characteristic of these four applications, however, is that they are essentially one-way applications. That is, they are best at presenting information to an audience of readers, listeners, or viewers. For example, a physician who places brochures about his services in a display rack is primarily interested in presenting information to the person who picks up the brochure. The physician might hope that person will contact him for an appointment or pass the brochure along to a friend or family member. But the brochure's main purpose is to communicate a message to an audience.

Newsletters

A newsletter—a short newspaper published by an organization—can help the organization foster a sense of community within its membership, both internal and external, including customers, employees, investors, and the general public. Following are typical news items in a newsletter:

- descriptions of new activities undertaken by the organization
- major investments by the organization in new equipment or facilities
- announcements for upcoming events and summaries of previous events, such as presentations, performances, or lectures given by organization members
- notices of available jobs in the organization
- profiles of new members, officers, or administrators
- important changes in relevant laws or regulations

Many computer programs include templates for newsletters, which often look like miniature newspapers.

Guidelines

Designing an Effective Newsletter

Whether you use a template or create your own design, include these 10 elements to enhance the usefulness and professional appearance of your newsletter.

- ▶ **Banner.** Use a distinctive design at the top of the first page to give the newsletter a strong identity. Include the organization's logo. Indicate the date and, if appropriate, the volume and number of the issue.
- ▶ **A table of contents.** Provide page numbers for the main items.
- ▶ **Headline.** Begin the main story on the front page. Many newsletters begin two or even three stories on the front page.
- ▶ **Bylines.** When several writers contribute newsletter content, clearly identify each author.
- ▶ **Jump lines and end signs.** If a story continues on another page, direct readers there with a jump line, such as "continued on p. 3." If a story does *not* continue, use an *end sign*: a symbol such as a square or large bullet. Many newsletters use a subject-related end sign, such as a small drawing of a car for a car-related newsletter.
- ▶ **Continuation headings.** Use descriptive headings to identify stories that began on a previous page.
- ▶ **Photographs.** Use photos to make the story memorable and to help convey information quickly.
- ▶ **Pull quotes.** Use quotations or other information to draw attention to something especially interesting.
- ▶ **Publisher.** Clearly identify your organization as the publisher.
- ▶ **Postal information.** If the newsletter is to be sent through the mail, leave sufficient space for your return address, an address label, and postage. See if your organization has a bulk-mail provider; bulk mail can save a lot of money if you send thousands of copies.

In This Book

For more about tables of contents, see Ch. 19, p. 525.

In This Book

For more about pull quotes, see Ch. 11, p. 285.

Make sure you have a system to distribute your newsletter. While you might post copies on a Web site or place a stack of newsletters in an office, the most effective technique is to distribute newsletters to individual readers through a mailing or e-mail list. Figure 22.1 on page 640 shows the front page of a newsletter.

Brochures

A brochure is a brief document used to provide information or to promote something. Here are some examples of the kinds of information that might be communicated in a brochure:

- products produced by a small manufacturer of roofing materials

The clear and legible banner at the top identifies the newsletter's name and topic, as well as the date of the issue.

The first page presents two main stories, each of which is accompanied by a photograph.

The jump lines at the bottom of each story direct readers to the page where the story continues.

The design for the front page has two unequal columns: a wide one for text and a narrow one for the table of contents and other information about the newsletter and its publisher.

in this issue

- 3 From the Director
- 5 Interview: Xiaoming Tian, L.Ac., C.M.D.
- Get the Facts: Colds and Flu: Can CAM Help?
- 7 New Portal: "Resources for Health Care Providers"
- 10 Research Digest
- 12 Resources: What's New from Cochrane?

Acupuncture and Pain: Applying Modern Science to an Ancient Practice

Qi, meridians, yin, yang. How can researchers study acupuncture, a 2,000-year-old form of traditional Chinese medicine (TCM) based on foreign concepts that seem impossible to measure, let alone define?

To Richard Nahin, Ph.D., M.P.H., NCCAM's Senior Advisor for Scientific Coordination and Outreach, the answer is obvious: "We don't necessarily have to understand the concepts of qi or meridians to study the safety or efficacy of acupuncture."

Harvard Medical School neuroscientist (and practicing acupuncturist) Vitaly Napadow, Ph.D., L.Ac., agrees. "I firmly believe that everything can be studied with

NCCAM's 10th Anniversary Research Symposium: Exploring the Science of CAM

Ten years of rigorous research and advances in the science of complementary and alternative medicine (CAM) were celebrated at NCCAM's 10th Anniversary Research Symposium on December 8, 2009, held in the National Institutes of Health (NIH) Clinical Center's Masur Auditorium in Bethesda, Maryland. Prominent researchers shared exciting findings on a wide range of topics—the body's microbial communities and their role in health and disease, the neuroscience of acupuncture and meditation, and the behavioral science of stress and coping—with an in-person and online audience of approximately 400 health care practitioners, researchers, and members of the public.

Figure 22.1 The Front Page of a Newsletter

Source: National Institutes of Health, 2010 <http://nccam.nih.gov/news/newsletter/2010_february/2010february.pdf>.


- services offered by a new sports-medicine clinic
- benefits of joining a particular professional organization or a community group
- techniques for choosing healthy foods and reducing calories

Although some brochures consist of more than one page, the typical brochure is made from a single page that is folded as part of the printing process. The folds create panels you can use to group information in logical categories. A brochure for the manufacturer of roofing materials, for instance, might


INTERACTIVE SAMPLE DOCUMENT

Evaluating the Design of a Newsletter

The newsletter shown here is published by the National Weather Service Forecast Office in Chicago. The questions in the margin ask you to think about newsletter design.



National Weather Service Forecast Office Chicago



Fall 2010
Volume 8, Issue 3


Inside this issue:

Hot Autumn Weather in Chicago and Rockford 1

Quantifying Weather Risk using National Weather Service Products 3

Skywarn Recognition Day 5

La Niña: What has happened in past winters and what it could mean for our weather this upcoming winter 6



Hot Autumn Weather in Chicago and Rockford
by Jim Allsopp, Warning Coordination Meteorologist

Labor Day weekend is considered by many to be the unofficial end of summer. For meteorologists and climatologists, August 31 is the official end of summer. For astronomers, the equinox on September 22 signals the change of seasons. There is no doubt that September is a transitional month, meteorologically speaking, with the days getting shorter and noticeably cooler. However, sometimes summer hangs on despite the calendar.

Chicago averages 17.8 days a year with temperatures of 90 or greater, but less than 10% of them, 1.7, occur after August 31. 1931 holds the record with nine days of at least 90 degrees in September. By October, 90 degree weather becomes extremely rare. In 129 years of records, only five Octobers have recorded days with a temperature of at least 90 degrees. The latest date of a 90 degree day was October 6, 1963 when the temperature hit 94. 100 degree weather in fall is even more unusual, having occurred only 4 times; 1939, 1960 and twice in 1953.

Septembers with the most days of 90 degrees or warmer
1931...9
1959...8
1971...8
1978...8
1939...7
1953...7
1960...7

Octobers with the most days of 90 or warmer
1971...2
1951...1
1953...1
1954...1
1963...1

1. How effectively does the banner provide a distinctive identity for the newsletter?
2. How effectively does this page identify the publisher of the newsletter?
3. Does the story conclude on the first page, or is it continued on another page? How would you present the answer to this question in the newsletter itself?
4. The two lists of years in the article on page 1 could be reformatted to take up much less space. Describe two ways that page 1 could be redesigned to use that extra space effectively.

On TechComm Web

To submit your responses to your instructor, click on Interactive Sample Documents for Ch. 22 on <bedfordsmartins.com/techcomm>.

Source: National Weather Service, Chicago, 2010 <www.crh.noaa.gov/images/lot/newsletter/fall2010.pdf>.

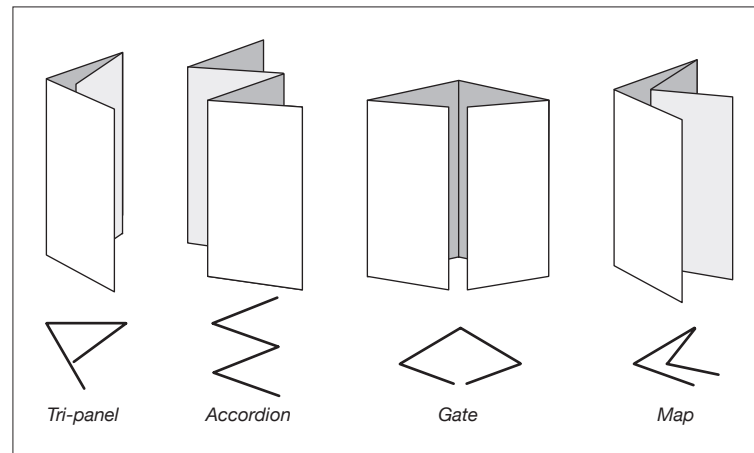


Figure 22.2 Typical Fold Designs for Brochures

devote one panel to composite shingles, another to slate, and another to tile. Or it might devote one panel to product descriptions, one to the warranty, and one to customer service. Most brochures have a three-panel design, although some have four panels. Standard letter-size paper (8.5×11 inches) is most commonly used, but legal-size paper (8.5×14 inches) provides extra space for content. Figure 22.2 shows typical fold designs for brochures.

Like all applications, brochures must be designed to meet the needs of the audience and to fulfill the purpose of the communication. A brochure that is reproduced on a black-and-white photocopier would be appropriate for answering a set of frequently asked questions in an office or a volunteer group, but it would not attract high-end customers for expensive technology or an exclusive organization. Similarly, a full-color brochure on glossy paper might seem inappropriately extravagant for a nonprofit organization that relies on donations. Figure 22.3 is an example of an effective brochure.

Guidelines

Creating a Brochure

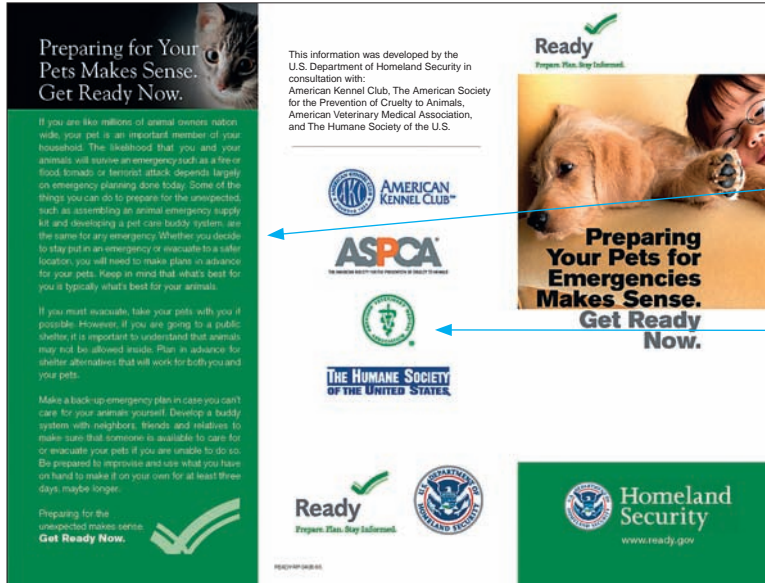
Follow these four suggestions when you create a brochure.

- ▶ **Decide where and how your brochure will be reproduced.** If you will produce your own copies, create a design that your equipment can reproduce effectively. If a print shop will produce your brochure, make sure the print shop has compatible software.
- ▶ **Design your information to fit appropriately on the brochure's panels.** Be sure each panel contains a coherent set of information. Avoid designs that separate chunks of information awkwardly. Your word-processing software includes brochure templates that you can adapt for your needs.

In This Book

For more about design, see Ch. 11.





This is the front cover of the brochure. The photograph of the puppy and the child reinforces the message that adults are responsible for ensuring the safety of the family's pets.

This panel will be folded inside. It uses the same green that is on the front panel. In our culture, green signifies safety. The design was kept simple to accommodate a lot of text.

The back of the brochure displays the logos of the organizations that support the brochure's message. Because this brochure was not designed to be mailed, it does not include a large space for the mailing address.

a. The "outside" of a three-panel brochure



The numbered steps clearly tell the reader the tasks they are urged to perform.

The simple design, which uses the green from the other side of the brochure, enables the writer to present a lot of text. Notice that the dark green is used as an accent color; a lighter shade of the green is used as a screen, so that the text can be presented in black.

The two photographs break the margins of the columns, adding visual interest to the design.

b. The "inside" of a three-panel brochure

Figure 22.3 An Effective Brochure

Source: U.S. Department of Homeland Security, 2006 <www.ready.gov/america/_downloads/pets_tagged.pdf>.

- ▶ **Use the front panel to attract attention.** Because the front panel is like the cover of a book, use it to clearly identify the subject, audience, and purpose of the brochure.
- ▶ **Avoid design clichés.** Inexperienced designers often center everything on every panel, creating a safe but boring design. Try to think of ways to use design elements such as color, rules, boxes, and screens to tie the panels of a brochure together.

White Papers

A white paper enables a company to present a longer message than will fit in a brochure. A typical white paper is 8 to 12 pages long and describes a solution to a technological or business challenge in an industry. The readers of white papers are technical experts who implement technology and managers who make purchasing decisions.

Many white papers look like reports, with an executive summary on the first page that previews the information that readers will find inside. Typically, white papers use a single-column design, although some have more than one column. Section headings help readers navigate the text, and pull quotes highlight interesting pieces of information. Some white papers also include charts, graphs, and photographs.

In This Book

For more about executive summaries, see Ch. 19, p. 526. For more about design, see Ch. 11. For more about graphics, see Ch. 12.

In This Book

For more about documentation systems, see Appendix, Part B.

In This Book

For more about writing headings, see Ch. 9, p. 206, and Ch. 11, p. 283.

In This Book

For more about definitions, see Ch. 20, p. 564. For more about glossaries, see Ch. 19, p. 530.

Guidelines

Writing a White Paper

The following seven suggestions can help you write a white paper that will connect with your readers.

- ▶ **Communicate useful information.** Readers use white papers to learn something new. If you give readers useful information about industry trends and how your company will help them adapt to changing situations, they will respond favorably.
- ▶ **Use a subtle approach.** Although readers know that a white paper likely contains marketing information, they will resent the hard-sell techniques they see in ads. Avoid sweeping claims about your company.
- ▶ **Cite your sources.** Showing that your claims are based on evidence adds credibility.
- ▶ **Make the white paper easy to skim and navigate.** Include headings to break up long blocks of text and make it easy for readers to find the information they seek.
- ▶ **Help readers who don't know all the jargon.** Although some readers will not be experts in your field, they might have influence over a purchasing decision. Provide parenthetical definitions of acronyms and initialisms, and include a glossary in highly technical papers.

- ▶ **Make sure the white paper prints well in black and white.** Although many white papers are now distributed electronically and read on-screen, some readers prefer to print paper copies. Because most printers and copiers produce black-and-white documents, ensure that your white paper will be attractive and readable in black and white.
- ▶ **End with a call to action.** If your white paper is meant to help your sales force, it should conclude with telephone numbers, e-mail addresses, and URLs that will allow prospective customers to contact you.

ETHICS NOTE

Marketing Your Organization Honestly

Communicating with the public often involves marketing: promoting a business, service, or product within a given market. The American Marketing Association's (2004) statement of ethics describes several ethical values you should practice in promoting yourself or your organization.

- *Honesty.* Tell the truth; do not mislead your readers. Keep every promise that you make to customers.
- *Responsibility.* Avoid coercive tactics; ensure that your marketing tactics do not take advantage of vulnerable groups.
- *Fairness.* Avoid conflicts of interest; state your relationships with other companies clearly. Do not cast anyone in a false light.
- *Respect.* Acknowledge the sources of information you report. Omit images or texts that perpetuate stereotypes.
- *Openness.* State prices and terms clearly. Provide thorough information; ensure your documents do not confuse readers.
- *Citizenship.* Make choices that reduce the environmental impact of your documents. Contribute to the good of your community in and outside of your work.

Figure 22.4 on page 646 shows the first page of a white paper from McAfee. The purposes of this document are to alert readers about a serious and growing cybersecurity threat and to market a set of products that responds to that threat. The authors present their message as a report, suggesting that the white paper is a serious analysis of an important subject. Toward the end of the document, the authors present their recommendations about how to use the company's products to combat the threat.

The body of the white paper ends with this note:

Credits and Acknowledgements

The preceding white paper was a collaborative effort among numerous people and entities including McAfee Foundstone Professional Services consultants, McAfee Labs, McAfee employees, executives, and researchers, HBGary and National Cyber-Forensics

The white paper begins with an executive summary, giving it the look of a serious report.

White Paper Global Energy Cyberattacks: "Night Dragon"

Executive Summary

In 2010, we entered a new decade in the world of cybersecurity. The prior decade was stained with immaturity, reactive technical solutions, and a lack of security sophistication that promoted critical outbreaks, such as Code Red, Nimda, Blaster, Sasser, SQL Slammer, Conficker, and myDoom—to name a few. The security community has evolved and grown smarter about security, safe computing, and system hardening but so have our adversaries. This decade is setting up to be the exponential jumping off point. The adversaries are rapidly leveraging productized malware toolkits that let them develop more malware than in all prior years combined, and they have matured from the prior decade to release the most insidious and persistent cyberthreats ever known.

The Google hacks ("Operation Aurora"), named by McAfee and announced in January 2010, and the WikiLeaks document disclosures of 2010 have highlighted the fact that external and internal threats are nearly impossible to prevent. Miscreants continue to infiltrate networks and exfiltrate sensitive and proprietary data upon which the world's economies depend every day. When a new attack emerges, security vendors cannot stand by idly and watch. We are obligated to share our findings to protect those not yet impacted and to repair those who have been. As such, McAfee Foundstone Professional Services and McAfee Labs decided to release the following discovery.

Starting in November 2009, coordinated covert and targeted cyberattacks have been conducted against global oil, energy, and petrochemical companies. These attacks have involved social engineering, spear-phishing attacks, exploitation of Microsoft Windows operating systems vulnerabilities, Microsoft Active Directory compromises, and the use of remote administration tools (RATs) in targeting and harvesting sensitive competitive proprietary operations and project-financing information with regard to oil and gas field bids and operations. We have identified the tools, techniques, and network activities used in these continuing attacks—which we have dubbed Night Dragon—as originating primarily in China. Through coordinated analysis of the related events and tools used, McAfee has determined identifying features to assist companies with detection and investigation. While we believe many actors have participated in these attacks, we have been able to identify one individual who has provided the crucial C&C infrastructure to the attackers. (See Appendix B for more detail on attribution.)

The section called "Anatomy of a Hack" includes a graphic that explains the stages of the cybersecurity attack that the white paper analyzes.

Anatomy of a Hack

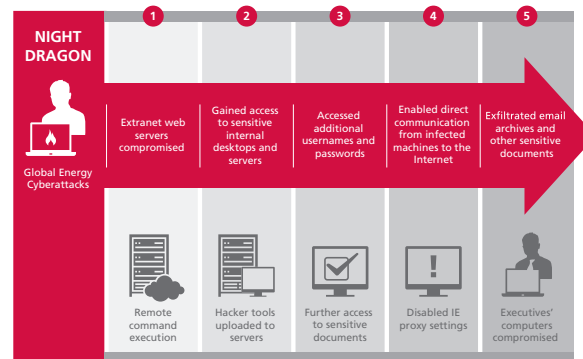


Figure 1. Anatomy of a hack.

The logo at the bottom clearly identifies the company presenting this white paper.



Figure 22.4 First Page of a White Paper

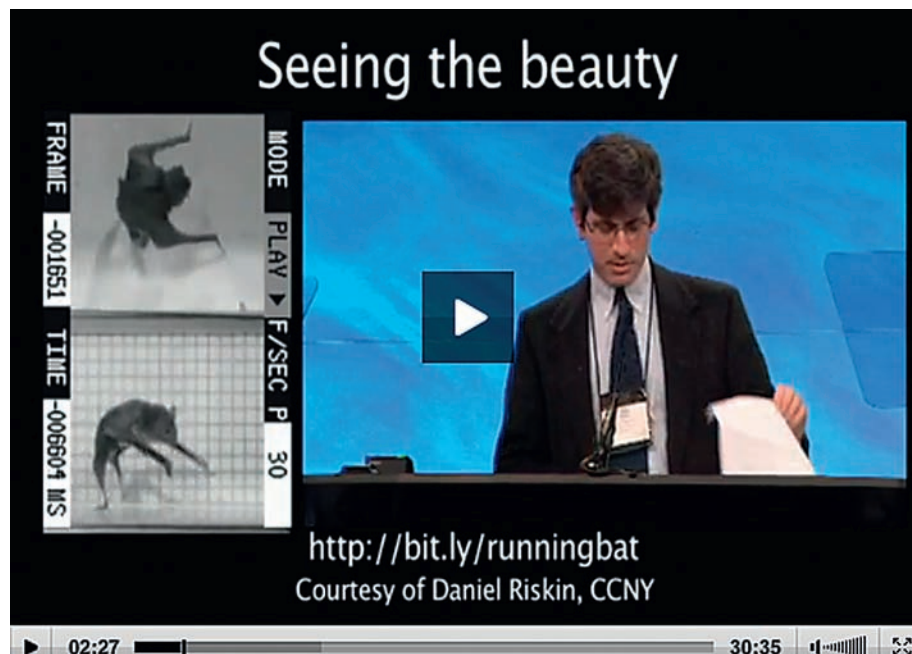
Source: McAfee Foundstone Professional Services and McAfee Labs, 2011 <www.mcafee.com/us/resources/white-papers/wp-global-energy-cyberattacks-night-dragon.pdf>.

& Training Alliance (NCFTA). Significant contributors include Shane Shook, Dmitri Alperovitch, Stuart McClure, Georg Wicherski, Greg Hoggund, Shawn Bracken, Ryan Permeh, Vitaly Zaytsev, Mark Gilbert, Mike Spohn, George Kurtz, and Adam Meyers.

This note demonstrates the company's aim to portray the white paper not merely as a marketing tool but as a valuable contribution from serious researchers.

Podcasts

Podcasting, a word that combines *iPod* and *broadcasting*, is a Web-based technology that allows people to present information electronically. A *podcast* is an audio or video file that is downloaded from a Web site and then played on a computer or an MP3 player. Some people see podcasting as a hobby that allows them to talk about their favorite subjects. Others create podcasts in their professional roles to connect with customers and to reach out to new audiences. Some professors put lectures on podcasts, and many industry professionals create podcasts to inform colleagues and customers about industry trends. For professionals in all fields—from computer science to engineering, business, the arts, and health care—downloading podcasts provides an easy way to learn new information from experts. Figure 22.5 shows a screen from a video podcast.



A researcher is presenting a paper at a professional conference. The podcast captures not only the speaker but also the video that the researcher was showing in the presentation: vampire bats running.

Figure 22.5 A Video Podcast

Source: Zimmer, 2010 <www.videopodcasts.tv/feed/602/Intimate_Strangers:_Unseen_Life_on_Earth>.

You can find podcasts by searching sites such as PodcastDirectory.com or Apple's iTunes store. You can also use a software program called an *aggregator*. Podcasters can syndicate their programs by setting up an RSS feed. Aggregators (and some Web browsers) check all of the RSS feeds you subscribe to and help you download the latest content.

The process of creating a podcast is fairly simple. If your computer has a microphone or Webcam and some sound- or video-editing software (free versions are available on the Web), you can create a podcast. Follow these four steps:

1. *Prepare for your podcast.* Develop a script. Use an outline if you know your subject well and can speak well extemporaneously. Get permission in advance if your podcast will include copyrighted material.
2. *Record the podcast.* Ensure that you will not be interrupted.
3. *Edit the podcast.* Remove any errors or extended silence (also called *dead air*). If you add music at the beginning or end, make sure that it is in the public domain or that it is your own (or your organization's) intellectual property.
4. *Publish the podcast.* Upload it to the Web, mention it on your blog or a social-media site, and set up the RSS feed for aggregators, if you haven't already. Because podcast files can be quite large (20 to 30 MB or more), check with your Web host to be sure it can support large files.

In This Book

For more about intellectual property, see Ch. 2, p. 23.

COLLABORATING WITH THE PUBLIC THROUGH SOCIAL MEDIA

The nation's largest companies—the Fortune 100—actively participate in social media. Some two-thirds of those companies have Twitter feeds; half have fan pages on Facebook, each with an average of 40,000 fans (Skepsy, 2010). Many companies are following the lead of PriceWaterhouseCoopers, which maintains a Facebook page where prospective employees can chat with current employees. To stay current with what people are writing about them, companies and other organizations are setting up Google Alerts and similar services to receive e-mail updates whenever a particular term (the name of a product or person, for example) is mentioned in a blog or a message on social media.

The government, too, is using social media to stay connected. The Centers for Disease Control uses the children's site Whyville to encourage parents to get their children vaccinated. NASA uses Twitter to announce news and puts its photos on Flickr. The National Oceanic and Atmospheric Administration (NOAA) has an island on Second Life where visitors can look at underground caves and see the effects of global warming. During the Gulf of Mexico oil spill in 2010, NOAA and NASA used Twitter and other social media to direct people to videos and photographs of the spill from underwater and

outer space. The Department of State has collected more than 20,000 posts on its Opinion Space discussion board. And the U.S. military uses chat rooms and other social media as part of its strategy for tracking Taliban fighters in Iraq and Afghanistan (Drew, 2010).

The three applications discussed in this section—discussion boards, blogs, and wikis—are social-media tools used to connect with the public. What distinguishes these three applications from the four discussed in the previous section is that they are designed to foster collaboration between the writer and the reader.

This collaboration is made simple through specific features of each application:

- On a discussion board, a reader replies to a post by clicking on the Reply button and writing a message, which is then available to all readers of the discussion board.
- On a blog, each entry is followed by a Comment button, which makes it simple for readers to send a response that will appear beneath the entry.
- On a wiki, an Edit button solicits revisions from authorized readers.

In short, all three electronic tools make it easy for a writer to solicit and present readers' views.

More important than the buttons you click, however, is that interactivity is an integral part of these applications: they are designed to invite two-way communication. A discussion board exists to create a conversation among many voices about a topic important to the community. A blog exists to offer one person (or, sometimes, several people) a forum for presenting an idea to the community, to which interested members can respond. A wiki exists to enable members of a community to create or revise documents. In other words, these three applications do not simply automate the process by which the audience responds. They are created so that the audience *can* respond. The following discussions will focus on how each application is used to encourage collaboration.

As you read about these applications, remember that the focus of the discussion is how they are used in the workplace. When you use these applications to collaborate in the workplace, act like a professional. People inside and outside your organization are likely to read what you write. Represent yourself and your organization positively. Find out whether your organization has guidelines for appropriate online behavior for employees; if it does, follow them.

Discussion Boards

A discussion board, sometimes called a *bulletin board* or an *electronic forum*, enables people to have asynchronous discussions about the topic covered by the board. You might use a discussion board to learn what people think about

THREAD	LAST POST	REPLIES	VIEWS
Announcements and FAQs			
Welcome to the Halo: Reach forum! by XboxLackeys	06-02-2009 12:18 AM	-	5,103
Game-Specific Bans and Suspensions by aka Scratch	01-19-2011 11:27 PM	-	1,402
Topics			
Halo: Reach FAQ by Mister Blint	04-05-2011 1:56 PM	59	9,545
File Hub - Map Variants, Gametypes, and More! by Bogen	Yesterday, 9:03 PM	161	8,707
Surprise! New Forums! by Bogen	03-30-2011 11:38 PM	-	481
What rank are you at now? by Cookiez N CrBam	Today, 4:31 PM	1,143	59,271
Why swordbase? by IKK Velocity	Today, 4:30 PM	-	3
How much CR do YOU have? by Take Your Kill	Today, 4:26 PM	738	30,509

This discussion board, for fans of a popular game, begins with announcements and FAQs from the site moderators and then presents threads from users.

Figure 22.6 A Discussion Board

Source: Microsoft, 2011 <<http://forums.xbox.com/1496/ShowForum.aspx>>.

a consumer product you are researching. Or if you are having a problem with a product you own, you might use a discussion board to learn whether others are having a similar problem and how they have tried to fix it. Figure 22.6 shows a screen from a discussion board.

Often, companies host discussion boards devoted to their own products. For example, Microsoft hosts a number of boards on which people post questions, answers, and gripes about the company's products. Before Microsoft released Office 2010, it released a beta version and received 2 million comments and suggestions from the 9 million people who had downloaded it (Chen, 2010). Why would Microsoft devote its own resources to hear people discuss its products? Well, if you were Microsoft, would you rather know what customers like and dislike—or not know? A discussion board tells a company what it needs to fix. In addition, it helps the company maintain a good relationship with its customers by creating a virtual community of people, all of whom want the company to improve its products and customer service.

When people participate on discussion boards, disagreements arise. Avoid the temptation to respond to one disparaging comment with another, especially if you are posting as a member of an organization and not as a private citizen.

Guidelines

Participating in Discussion Boards

The following six guidelines will help you post to discussion boards responsibly.

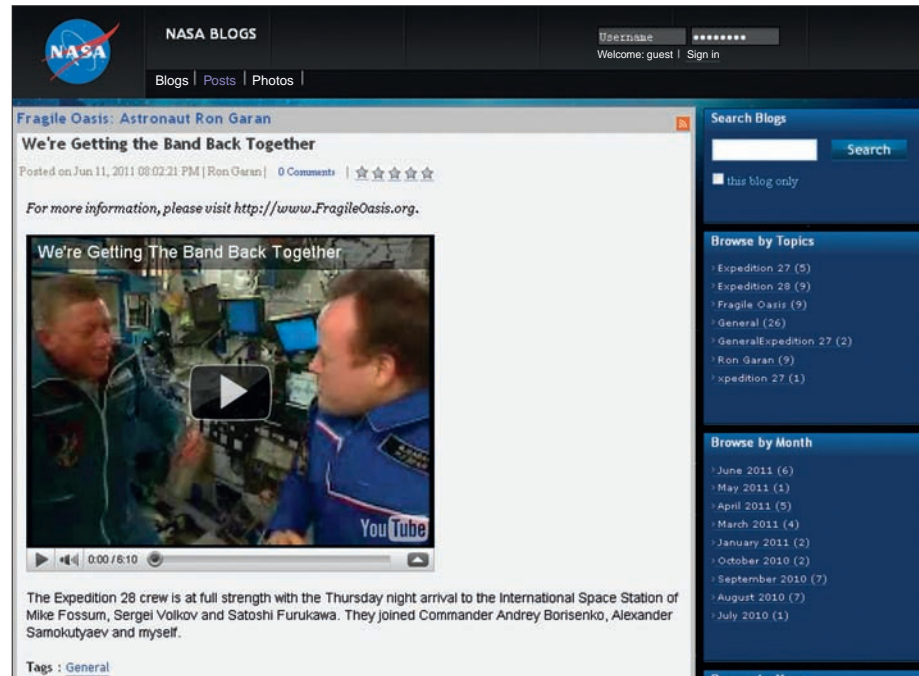
- ▶ **Share your knowledge.** Because discussion boards thrive when members share what they know, participate by posting when you can contribute useful information.
- ▶ **Do your homework before posting a question.** Before you ask a question, search the archives and check other sources to see if an answer is already available.
- ▶ **Support your claims with evidence.** Provide specific data to back up your statements. Give all pertinent background information when asking a question. See Chapter 8 for more about communicating persuasively.
- ▶ **Stay on topic.** Follow the posted guidelines and make sure that your posts are relevant to the topic.
- ▶ **Avoid personal attacks.** Avoid *flame wars* (angry exchanges on discussion boards and e-mail lists). No one benefits from them, and other forum participants tire of them quickly.
- ▶ **Disclose potential conflicts of interest.** If your connection with a person, a company, or a competitor could affect your writing or how readers interpret it, say so.

Blogs

Blogs (the word is a combination of *Web* and *logs*) enable people to post their thoughts and opinions to the Web. Many people use blogs in their personal lives to stay in touch with family and friends, to write about hobbies or interests, or to provide social commentary. Others write blogs about their professional interests by commenting on news stories that affect their industries, discussing new products coming on the market, and keeping track of new trends.

With the number of blogs approaching half a billion, the practice is redefining the way organizations connect with their publics. Most large companies host blogs written by many of their executives, as well as by typical workers. Reporters and columnists working for major newspapers such as the *New York Times*, engineers, physicians, athletes—whatever the field, people and organizations are blogging in order to present information about their workplace and to learn from the public. Organizations encourage blogging because it can make them seem less impersonal, thereby helping them build relationships.

For some people, blogging is such an important part of their workplace lives that they are expected to devote a large part of their day to it. They use their blogs to communicate about the organization's operations and plans and to test new ideas. For these people, blogging is a form of research and development and also a form of marketing. For others, blogging is less central to what they do. The organization hosts their blogs on its servers, but employees are expected to blog on their own time. Figure 22.7 on page 652 shows a blog written by a NASA astronaut.



Because NASA is a taxpayer-supported government agency, its employees blog extensively to help build and maintain public support for its missions.

Figure 22.7 A Blog

Source: National Aeronautics, 2011 <http://blogs.nasa.gov/cm/blog/fragileoasis/posts/post_1307836834103>

When employees write blogs, they sometimes make comments critical of their organizations. Some companies have responded by trying to prohibit negative comments or punish bloggers by revoking their right to blog or even by firing them. However, many organizations view such negative comments as early warning signs of trouble that they can address before the problem escalates.

Guidelines

Being a Responsible Blogger

The following six suggestions can help you blog more effectively.

- ▶ **Know and follow your company's blogging policies.** Do not start a work blog without approval from management. Ensure that your personal blogging won't jeopardize your employment.
- ▶ **Provide good content without saying too much.** Information that is current, accurate, and interesting will attract readers, but do not reveal sensitive information, such as trade secrets. Bloggers have been disciplined or fired for divulging trade secrets or revealing that the company is being investigated by a government regulatory agency, leading investors to sell their company stock.

In This Book

For more about an employee's obligations to an employer, see Ch. 2, p. 21.



- ▶ **Use an authentic voice.** Readers want to read blogs written by “real people.” If you spin the facts or insist that everything is perfect, you will lose first your credibility and then your readers.
- ▶ **Avoid conflicts of interest.** If your relationship with a person, a company, or a competitor could affect what you write or how readers interpret what they read, disclose it. Some companies try to bribe bloggers. For instance, several software manufacturers have been caught giving bloggers free software—and the hardware on which to run it.
- ▶ **Manage your time carefully.** Blogging often takes more time than you expect. Take enough time to write effectively, but don’t let blogging interfere with your other duties.
- ▶ **Follow up on negative comments.** Briefly acknowledge any negative comments made on a work-related blog, and then make sure the right people see them. Don’t let problems fall through the cracks.

An integral part of blogging is that readers can respond to blog entries. Sometimes, these responses are critical of the blogger. For instance, a General Motors blog features a video about the Chevrolet Cruze showing technicians shutting the doors, closing the hood, and doing other tasks, each of which is accompanied by a solid thinking sound. The point of the video is to show that the car is well built. The first person to comment wrote this:

Only GM would try to put a positive spin on making a noisy car. I’m beginning to lose hope that GM will ever build a decent car or truck. It seems bankruptcy would have taught them that building a product with the minimum amount of quality they think consumers will tolerate will not be successful. It’s sad.

The second person wrote, “I don’t think the Cruze is a noisy car. According to reports, the interior sound levels are lower than a Lexus ES.”

The first person then responded:

I hope it will continue to give a quiet ride after 20k miles and/or 2 years. We will see. GM will have to overcome a lot of skepticism due to its history of small cars. It might not be fair to judge GM by its older models but we don’t really have sufficient unbiased info about the new stuff to do otherwise.

As you can see, this interchange is ragged. But that is the price the company pays. If negative comments show that readers have legitimate complaints or concerns, the company knows it needs to take action.

Wikis

A *wiki* (the Hawaiian word for *fast*) is a type of Web site in which users create and edit the content. Wikis enable people to post information quickly and easily. People who work from different locations use wikis as a convenient way of storing and sharing information. Although blogs and discussion boards enable users to reply to previous posts, wiki users can create new

On this screen from Psychology Wiki, a registered user can edit the article called "Introduction to Cognitive Psychology."

The buttons at the top show the tasks the person can perform, ranging from changing text to adding lists, links, photographs, photo galleries, and videos. The visitor can also review all the changes made to this entry.

The screenshot shows the editing interface for the article "Introduction to cognitive psychology" on Psychology Wiki. At the top, there is a title bar and a toolbar with various editing options like bold, italic, link, and image. The main content area contains the following text:

Cognitive psychology is the school of psychology that examines internal mental processes such as problem solving, memory, and language. It had its foundations in the *Gestalt psychology* of [Max Wertheimer](#), [Wolfgang Köhler](#), and [Kurt Koffka](#), and in the work of [Jean Piaget](#), who studied intellectual development in children. Cognitive psychologists are interested in how people understand, diagnose, and solve problems, concerning themselves with the mental processes which mediate between stimulus and response. Cognitive theory contends that solutions to problems take the form of *algorithms*—rules that are not necessarily understood but promise a solution, or *heuristics*—rules that are understood but that do not always guarantee solutions. In other instances, solutions may be found through insight, a sudden awareness of relationships.

History

[Ulric Neisser](#) coined the term "cognitive psychology" in his book published in 1967, wherein Neisser provides a definition of cognitive psychology, emphasising that it is a *point of view* which postulates the mind as having a certain conceptual structure. Neisser's point of view endows the discipline a scope which expands beyond high-level concepts such as "reasoning", often espoused in other works as a definition of cognitive psychology. Neisser's definition of *cognition* illustrates this well:

...the term "cognition" refers to all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used. It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations . . . Given such a sweeping definition, it is apparent that cognition is involved in everything a human being might possibly do; that every psychological phenomenon is a cognitive phenomenon. But although cognitive psychology is concerned with all human activity rather than some fraction of it, the concern is from a particular point of view. Other viewpoints are equally legitimate and necessary. Dynamic psychology, which begins with motives rather than with sensory input, is a case in point. Instead of asking how a man's actions and experiences result from what he saw, remembered, or believed, the dynamic psychologist asks how they follow from the subject's goals, needs, or instincts.

Cognitive psychology is radically different from previous psychological approaches in two key ways.

- It accepts the use of the [scientific method](#), and generally rejects [introspection](#) as a valid method of investigation, unlike [phenomenological](#) methods such as [Freudian](#) psychology.
- It explicitly acknowledges the existence of internal mental states (such as [belief](#), [desire](#) and [motivation](#)) unlike [behaviorist](#) psychology.

Figure 22.8 A Wiki

Source: Psychology Wiki, 2010 <http://psychology.wikia.com/index.php?title=Introduction_to_cognitive_psychology&action=edit>.

pages, edit existing pages, add tags to identify content, and upload new files. Perhaps the most useful characteristic of wikis is that when a file is revised, the existing version is archived so that it is easy to view and to recover. Figure 22.8 shows a wiki.

Certainly, the best-known public wiki is Wikipedia, the online encyclopedia. Wikipedia has won praise for the collaborative spirit it embodies and for the breadth of the topics it covers. However, critics point out that many articles contain inaccuracies, misleading information, and biases (Gomi, 2008). Used within an organization, a wiki is more likely to be supported by a strong community of users with a shared sense of purpose.

Organizations are thinking of new ways to use wikis productively. One example is Intel, the computer chip maker. According to social-media strategist JD Lasika (2010), Intelpedia, the company wiki, consists of some 25,000 pages and has received 100 million page views. On a typical day, 500 changes are made to the site, and some 9,000 people have edited the site. The pages on Intelpedia range from the functional (lists of company and industry acronyms, explanations of how to use some exotic software) to the fun (information about the Intel Sailing Club, the Intel Classic Car Collectors Club, and neighborhood pickup football games).

Guidelines

Using and Participating in Wikis Effectively

These six suggestions can help you get the most from wikis.

- ▶ **Know your audience.** Find out what your audience needs from your wiki, and then develop a plan to provide it.
- ▶ **Keep your wiki up-to-date.** Current information is valuable. Check the wiki periodically to correct outdated and inaccurate information and to generate ideas for new content.
- ▶ **Integrate the wiki with other documentation.** A familiar look and feel will encourage participation from users, and it will help your organization maintain its image.
- ▶ **Integrate the wiki within your community.** Wikis work best when supported by a community of users who share interests and goals. Get management support to make the wiki a part of your organization's culture.
- ▶ **Make organization a high priority.** Create category pages to organize content. Contact authors of uncategorized pages to suggest potential locations for them.
- ▶ **Help reluctant users get involved.** Offer training to explain what a wiki is and how it works. Reviewers and editors are important for a successful wiki, and serving in those roles may help users develop into more active participants.

Writer's Checklist

Does your newsletter

- have a distinctive banner? (p. 639)
- provide a table of contents on the first page? (p. 639)
- present the most noteworthy story on the first page? (p. 639)
- include bylines naming the authors? (p. 639)
- use jump lines and continuation headings when needed? (p. 639)
- use photographs to add interest? (p. 639)
- use pull quotes to add interest? (p. 639)
- clearly identify the publisher? (p. 639)
- leave sufficient space for postal information? (p. 639)

Does your brochure

- present information that fits appropriately on the brochure's panels? (p. 642)
- use the front panel to attract attention? (p. 644)
- avoid design clichés? (p. 644)

Does your white paper

- communicate useful information? (p. 644)
- use a subtle approach? (p. 644)
- cite your sources? (p. 644)
- have a design that makes it easy to skim? (p. 644)
- provide help for readers unfamiliar with the technical vocabulary? (p. 644)
- print well in black and white? (p. 645)
- end with a call to action? (p. 645)

Does your podcast

- respect laws protecting intellectual property? (p. 648)
- have an RSS feed to which listeners may subscribe? (p. 648)
- reside on a server capable of hosting it successfully? (p. 648)

Does your discussion-board post

- share your knowledge with the group? (p. 651)
- show that you have already checked relevant archives for answers to your questions? (p. 651)
- use evidence to support your claims? (p. 651)
- stay on topic? (p. 651)
- avoid personal attacks? (p. 651)
- disclose potential conflicts of interest? (p. 651)

Does your blog


- adhere to company policies? (p. 652)

- provide good content without saying too much? (p. 652)
- use an authentic voice? (p. 653)
- avoid conflicts of interest? (p. 653)

Does your wiki

- show that you understand the specific needs of its audience? (p. 655)
- present up-to-date information? (p. 655)
- integrate well with other documentation? (p. 655)
- have a helpful organizational scheme? (p. 655)

Exercises

 **In This Book** For more about memos, see Ch. 14, p. 385.

1. Find three blogs on a topic that interests you, such as a hobby or your academic major. Review one recent post from each blog, as well as each blog's "About Me" information. Analyze the persona of each blogger and the nature of the blog: Does the blog provide useful information? Do readers respond with comments? Would you take the time to visit the blog again? Be prepared to share your ideas with the class.
2. Find a white paper on a subject related to your academic major. Find a passage in the white paper that communicates useful information to the audience about a trend in the industry. Then find a passage that presents a more direct marketing pitch for the organization that produced the white paper. How effectively does the white paper combine the useful information about the industry with the marketing message? Be prepared to share your ideas with the class.
3. Find three podcasts on a topic that interests you, such as a hobby or your academic major. Note who produced each podcast and where you found it. Listen to the podcast that you think will provide the best information. Write a memo to your instructor describing the process you went through to find these podcasts and summarizing what you learned from the podcast you listened to.
4. **GROUP EXERCISE** Form a group of three to five people. Assume that your group's assignment is to write


a newsletter about the skills you have learned in your technical-communication class. Have each person write one article, following this process:

- Select a specific skill to write about.
- Develop an outline of main points for an article about that skill.
- Write a headline that catches readers' attention.
- Take or find a photograph to illustrate the story.
- Write the article.

Work together as a group to revise, edit, and proofread the articles and assemble them into a newsletter.

5. **INTERNET EXERCISE** Find a discussion board sponsored by a professional organization in your field. Review the posts in the forum for the past two to four weeks. How would you describe the posts in terms of their subjects: Are they related to theoretical subjects? To practical subjects, such as tools, equipment, and procedures used in the field? To working conditions for people in that profession? Present your findings in a memo to your instructor.
6. Find a printed brochure, and evaluate how well it meets the guidelines for brochures. How effectively does it address the needs of its audience and fulfill the writers' purpose? Present your evaluation in a memo to your instructor, and attach a copy of the brochure.

Case 22: Considering a One-to-Many Model on Your Company's Site

 **In This Book** For more about memos, see Ch. 14, p. 385.

Background

You are a new member of the Infinity Computer Company's Web site development team. Infinity is an Australian computer manufacturer that is opening a sales and distribution center in the United States. The team is holding its first organizational meeting to discuss the development of a Web site for the new center.

James Ingersoll, a senior Web designer, is discussing his plan for the section on customer service that he wants to develop on the new site. He distributes a brief outline of the sections (see Document 22.1). "This looks like standard stuff," says Eileen Ben Salem, the head of the Web site development team. "Does anyone have any objections or want to suggest any other features?"

You have had experience working on Motorola's site. "I don't know if any of this would be appropriate here," you say, "but when I was at Motorola, we put a lot of resources into our Owners' Forums." You open up the Motorola XOOM Owners' Forum home page (see Document 22.2) on your laptop. "Motorola's enormous, of course, and we're not, but some of these features might be useful."

"What's the difference between what Motorola's doing and what we see in our plan?" Eileen asks you.

"All of the features in our plan are standard, and they're all useful. They're built on the principle that we want to make our information available to our customers using a lot of different media. So we make it convenient for them to download manuals, e-mail us questions, do live chat

with our customer-help people, and so on. But the features are built on a one-to-one model: the customer talks with us. The Motorola people want a one-to-many model. Customers talk with other customers just as much as they talk with the company."

James looks skeptical. "Isn't there a risk of the blind leading the blind?"

"Yes," you say, "and we had to spend some resources monitoring the forums, in particular, to be sure we weren't letting bad advice go unflagged. We decided to highlight correct answers from our customers by placing them right after the question to make it easier for our customers to find the best information. But the most important thing we learned is what our customers wanted, what they were having problems with, etc. A lot of that we couldn't have learned otherwise." (See Document 22.3.)

"Listen," Eileen says to you, "we don't have time to go into detail on this today, but would you mind writing up a little description of what Motorola did—and what you think the strengths and weaknesses of its site are?"

Your Assignment

Write a 1,000-word memo about the Motorola Owners' Forum sites. In this memo, explain the philosophy of one-to-many communication, describe the major features of the Motorola Owners' Forum sites, and discuss their apparent strengths and weaknesses. Where appropriate, include screen captures or quotations that give readers a sense of how the various features work.

Document 22.1 Plan for the Customer-Support Section of the Infinity Computer Web Site

On TechComm Web

For digital versions of case documents, click on Downloadable Case Documents on <bedfordstmartins.com/techcomm>.

Customer-Support Sections

- Product Registration—customers can register their products here without using the mail; with this info we can send important announcements and product info
- Warranty Information—copies of the warranties of every product; useful because customers often lose their printed warranties
- Downloads—form-based section where customers can download drivers and patches for known problems
- Product Support—PDFs of the user, installation, and reference manuals for each product; also, PDFs of product updates
- Contact Infinity—three ways for customers to ask questions: e-mail (free, fast), live chat (also free, wait for a product specialist), and phone support (business hours, potentially long waits)
- Infinity Answers—paid phone support, different plans available, minimal waits, knowledgeable support people who can answer questions about other manufacturers' products on our machines
- Links to Other Manufacturers' Sites—Microsoft, camera manufacturers, game manufacturers, etc.

The screenshot shows the Motorola Owners' Forum interface. At the top, there are navigation tabs for CONSUMERS, BUSINESS-READY, and a sign-up link. Below this is a main navigation bar with links for STORE, MOTOBLUR, MOBILE PHONES, ACCESSORIES, ALL PRODUCTS, and SUPPORT. The forum header includes a search bar and a welcome message. The main content area is titled 'MOTOROLA XOOM™' and features a 'Discussions' tab selected. A 'Featured Discussions' section lists several threads, including 'Tablet Model no longer shows with my post. How do I update it?' and 'Follow this thread for update news for WIFI Xoom software'. A 'Discussions' table lists recent threads with columns for Author, Subject, Views, Replies, and Last Post. A sidebar on the right contains sections for 'Things You Can Do!', 'Notifications', 'Sub-spaces', and 'Popular Discussions'.

Author	Subject	Views	Replies	Last Post
talgunner30uk	Xoom magnetometer	202	10	5 minutes ago by doctrown
woood	email apps	84	5	6 minutes ago by DensDroid
jona3	is this the Xoom2	189	7	7 minutes ago by splinter

Document 22.2 Home Page of the Motorola Owners' Forum

Source: Motorola, 2011a <<https://supportforums.motorola.com/community/tablets/xoom?view=discussions>>.

The screenshot shows a forum post titled 'Traveling overseas with a Xoom'. The post is dated May 6, 2011, 9:40 AM and has 476 views and 5 replies. The user 'Sveth008' asks a question about using their Xoom in Vietnam. A correct answer is provided by user 'rdhillon' on May 6, 2011, 10:00 AM. The answer states that a physical adapter is needed to change the US power pins to Vietnamese pins, and that the standard Xoom transformer accepts 100-240v as input. The post includes a tag 'overseas, voltage' and a 'Thanks (0)' button.

Document 22.3 A Correct Answer from a Customer

Source: Motorola, 2011b <<https://supportforums.motorola.com/message/397977#397977>>.

Appendix: Reference Handbook

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- Sentence-Level Issues 742

Part A: Skimming Your Sources and Taking Notes

To record the information that will eventually go into your document, you need to skim your potential sources and take notes. Don't try to read every potential source. A careful reading of a work that looks promising might prove disappointing. You might also get halfway through a book and realize that you must start writing immediately to submit your document on time.

Guidelines

Skimming Books and Articles

To skim effectively, read the following parts of books and articles.

In a book, skim:

- *the preface and introduction*: to understand the writer's approach and methods
- *the acknowledgments section*: to learn about help the author received from other experts in the field or about the author's use of primary research or other resources
- *the table of contents*: to understand the book's scope and organization
- *the notes at the ends of chapters or at the end of the book*: to understand the nature and extent of the author's research
- *the index*: to determine the extent of the coverage of the information you need
- *a few paragraphs from different portions of the text*: to gauge the quality and relevance of the information

In an article, skim:

- *the abstract*: to get an overview of the article's content
- *the introduction*: to understand the article's purpose, main ideas, and organization
- *the notes and references*: to understand the nature and extent of the author's research
- *the headings and several of the paragraphs*: to understand the article's organization and the quality and relevance of the information

Skimming will not always tell you whether a book or article is going to be useful, but it can tell you if a work is *not* going to be useful—because it doesn't cover your subject, for example, or because it is too superficial or too advanced. Eliminating the sources you don't need will give you more time to spend on the ones you do.

Note taking is often the first step in writing the document. The best way to take notes is electronically. If you can download files from the Internet, download bibliographic references from a CD-ROM database, and take notes on a laptop computer, you will save a lot of time and prevent many errors. If you do not have access to these electronic tools, get a pack of note cards.

Most note taking involves three kinds of activities: paraphrasing, quoting, and summarizing. Knowing how to paraphrase, quote, and summarize is important for two reasons:

- To a large extent, your note taking will determine the quality of your finished product. You want to record the information accurately and clearly. Mistakes made at this point can be hard to catch later, and they can ruin your document.
- You want to use your sources responsibly. You don't want to plagiarize unintentionally.

In This Book

For a discussion of plagiarism, see Appendix, Part B, p. 667.

Guidelines

Recording Bibliographic Information

Record the bibliographic information for each source from which you take notes.

Information to record for a book

- author
- title
- publisher
- place of publication
- year of publication
- call number or URL

Information to record for an article

- author
- title of article
- title of periodical
- volume
- number
- date of publication
- pages on which article appears
- call number or URL of periodical

For electronic sources, record any additional relevant information such as identifying numbers, database name, and retrieval data.

PARAPHRASING

A paraphrase is a restatement, in your own words, of someone else's words. If you simply copy someone else's words—even a mere two or three in a row—you must use quotation marks.

In taking notes, what kind of material should you paraphrase? Any information that you think might be useful: background data, descriptions of mechanisms or processes, test results, and so forth.

Figure A.1 on page 662 shows a paraphrased passage based on the following discussion. The author is explaining the concept of performance-centered design.

Original Passage

In performance-centered design, the emphasis is on providing support for the structure of the work as well as the information needed to accomplish it. One of the best examples is TurboTax[®], which meets all the three main criteria of effective performance-centered design:

- *People can do their work with no training on how to use the system.* People trying to do their income taxes have no interest in taking any kind of training. They want to get their taxes filled out correctly and quickly, getting all the deductions they are entitled to. These packages, over the years, have moved the interface from a forms-based one, where the user had to know what forms were needed, to an interview-based one that fills out the forms automatically as you answer questions. The design of the interface assumes no particular computer expertise.
- *The system provides the right information at the right time to accomplish the work.* At each step in the process, the system asks only those questions that are relevant based on previous answers. The taxpayer is free to ask for more detail or may proceed through a dialog that asks more-detailed questions if the taxpayer doesn't know the answer to the higher-level question. If a taxpayer is married filing jointly, the system presents only those questions for that filing status.
- *Both tasks and systems change as the user understands the system.* When I first used TurboTax 6 years ago I found myself going to the forms themselves. Doing my taxes generally took about 2 days. Each year I found my need to go to the forms to be less and less. Last year, it took me about 2 hours to do my taxes, and I looked at the forms only when I printed out the final copy.

This paraphrase is inappropriate because the three bulleted points are taken word for word from the original. The fact that the student omitted the explanations from the original is irrelevant. These are direct quotes, not paraphrases.

Lovgren, "Achieving Performance-Centered Design"
<www.reisman-consulting.com/pages/a-Perform.html>

example of performance-centered design:

TurboTax® meets three main criteria:

- People can do their work with no training on how to use the system.
- The system provides the right information at the right time to accomplish the work.
- Both tasks and systems change as the user understands the system.

a. Inappropriate paraphrase

This paraphrase is appropriate because the words are different from those used in the original.

When you turn your notes into a document, you are likely to reword your paraphrases. As you revise your document, check a copy of the original source document to be sure you haven't unintentionally reverted to the wording from the original source.

Lovgren, "Achieving Performance-Centered Design"
<www.reisman-consulting.com/pages/a-Perform.html>

example of performance-centered design:

TurboTax® meets three main criteria:

- You don't have to learn how to use the system.
- The system knows how to respond at the appropriate time to what the user is doing.
- As the user gets smarter about using the system, the system gets smarter, making it faster to complete the task.

b. Appropriate paraphrase

Figure A.1 Inappropriate and Appropriate Paraphrased Notes

Source: Adapted from Lovgren, 2000 <www.reisman-consulting.com/pages/a-Perform.html>.

Guidelines

Paraphrasing Accurately

- ▶ **Study the original until you understand it thoroughly.**
- ▶ **Rewrite the relevant portions of the original.** Use complete sentences, fragments, or lists, but don't compress the material so much that you'll have trouble understanding it later.
- ▶ **Title the information so that you'll be able to identify its subject at a glance.** The title should include the general subject and the author's attitude or approach to it, such as "Criticism of open-sea pollution-control devices."
- ▶ **Include the author's last name, a short title of the article or book, and the page number of the original.** You will need this information later in citing your source.

QUOTING

Sometimes you will want to quote a source, either to preserve the author's particularly well-expressed or emphatic phrasing or to lend authority to your discussion. Avoid quoting passages of more than two or three sentences, or your document will look like a mere compilation. Your job is to integrate an author's words and ideas into your own thinking, not merely to introduce a series of quotations.

Although you probably won't be quoting long passages in your document, recording a complete quotation in your notes will help you recall its meaning and context more accurately when you are ready to integrate it into your own work.

The simplest form of quotation is an author's exact statement:

As Jones states, "Solar energy won't make much of a difference for at least a decade."

To add an explanatory word or phrase to a quotation, use brackets:

As Nelson states, "It [the oil glut] will disappear before we understand it."

Use ellipses (three spaced dots) to show that you are omitting part of an author's statement:

ORIGINAL STATEMENT "The generator, which we purchased in May, has turned out to be one of our wisest investments."

ELLIPTICAL QUOTATION "The generator . . . has turned out to be one of our wisest investments."

According to the documentation style recommended by the Modern Language Association (MLA), if the author's original statement has ellipses, you should add brackets around the ellipses that you introduce:

In This Book

For more about formatting quotations, see "Quotation Marks," "Ellipses," and "Square Brackets" in Appendix, Part C. For a discussion of how to document quotations, see Appendix, Part B.

ORIGINAL STATEMENT	“I think reuse adoption offers . . . the promise to improve business in a number of ways.”
ELLIPTICAL QUOTATION	“I think reuse adoption offers . . . the promise to improve business [. . .] .”

SUMMARIZING

Summarizing is the process of rewriting a passage in your own words to make it shorter while still retaining its essential message. Writers summarize to help them learn a body of information or create a draft of one or more of the summaries that will go into the document.

Most long technical documents contain several kinds of summaries:

- a letter of transmittal (see page 523) that provides an overview of the document
- an abstract (see page 524), a brief technical summary
- an executive summary (see page 526), a brief nontechnical summary directed to the manager
- a conclusion (see page 522) that draws together a complicated discussion

The guidelines and examples in this section explain how to summarize the printed information you uncover in your research.

Guidelines

Summarizing

The following advice focuses on extracting the essence of a passage by summarizing it.

- ▶ **Read the passage carefully several times.**
- ▶ **Underline key ideas.** Look for them in the titles, headings, topic sentences, transitional paragraphs, and concluding paragraphs.
- ▶ **Combine key ideas.** Study what you have underlined. Paraphrase the underlined ideas. Don't worry about your grammar, punctuation, or style at this point.
- ▶ **Check your draft against the original for accuracy and emphasis.** Check that you have recorded statistics and names correctly and that your version of a complicated concept faithfully represents the original. Check that you got the proportions right; if the original devotes 20 percent of its space to a particular point, your draft should not devote 5 percent or 50 percent to that point.
- ▶ **Record the bibliographic information carefully.** Even though a summary might contain all your own words, you still must cite it, because the main ideas are someone else's. If you don't have the bibliographic information in an electronic form, put it on note cards.

Figure A.2 is a narrative history of television technology addressed to the general reader. Figure A.3 on page 666 is a summary that includes the key terms. This summary is 10 percent of the length of the original.

A BRIEF HISTORY OF TELEVISION

Although it seems as if television has been around for a long time, it's a relatively new science, younger than rocketry, internal medicine, and nuclear physics. In fact, some of the people that helped develop the first commercial TV sets and erect the first TV broadcast antennas are still living today.

The Early Years

The first electronic transmission of a picture was believed to have been made by a Scotsman, John Logie Baird, in the cold month of February 1924. His subject was a Maltese Cross, transmitted through the air by the magic of television (also called "Televisor" or "Radiovision" in those days) the entire distance of ten feet.

To say that Baird's contraption was crude is an understatement. His Televisor was made from a cardboard scanning disk, some darned needles, a few discarded electric motors, piano wire, glue, and other assorted odds and ends. The picture reproduced by the original Baird Televisor was extremely difficult to see—a shadow, at best.

Until about 1928, other amateur radiovision enthusiasts toyed around with Baird's basic design, whiling away long hours in the basement transmitting Maltese Crosses, model airplanes, flags, and anything else that would stay still long enough under the intense light required to produce an image. (As an interesting aside, the lighting for Baird's 1924 Maltese Cross transmission required 2,000 volts of power, produced by a roomful of batteries. So much heat was generated by the lighting equipment that Baird eventually burned his laboratory down.)

Baird's electromechanical approach to television led the way to future developments in transmitting and receiving pictures. The nature of the Baird Televisor, however, limited the clarity and stability of images. Most of the sets made and sold in those days required the viewer to peer through a glass lens to watch the screen, which was seldom over seven by ten inches in size. What's more, the majority of screens had an annoying orange glow that often marred reception and irritated the eyes.

Modern Television Technology

In the early 1930s, Vladimir Zworykin developed a device known as the iconoscope camera. About the same time, Philo T. Farnsworth was putting the finishing touches on the image dissector tube, a gizmo that proved to be the forerunner of the modern cathode ray tube or CRT—the everyday picture tube. These two devices paved the way for the TV sets we know and cherish today.

The first commercially available modern-day cathode ray tube televisions were available in about 1936. Tens of thousands of these sets were sold throughout the United States and Great Britain, even though there were no regular television broadcasts until 1939, when RCA started what was to become the first American television network, NBC. Incidentally, the first true network transmission was in early 1940, between NBC's sister stations WNBT in New York City (now WNBC-TV) and WRGB in Schenectady.

Figure A.2 Original Passage

Source: Based on McComb, 1991.

Postwar Growth

World War II greatly hampered the development of television, and during 1941–1945, no television sets were commercially produced (engineers were too busy perfecting radar, which, interestingly enough, contributed significantly to the development of conventional TV). But after the war, the television industry boomed. Television sets were selling like hotcakes, even though they cost an average of \$650 (based on average wage earnings, that’s equivalent to about \$4,000 today).

Progress took a giant step in 1948 and 1949 when the four American networks, NBC, CBS, ABC, and Dumont, introduced quality, “class-act” programming, which at the time included *Kraft Television Theatre*, *Howdy Doody*, and *The Texaco Star Theatre* with Milton Berle. These famous stars of the stage and radio made people want to own a television set.

Color and Beyond

Since the late 1940s, television technology has continued to improve and mature. Color came on December 17, 1953, when the FCC approved RCA’s all-electronic system, thus ending a bitter, four-year bout between CBS and RCA over color transmission standards. Television images beamed via space satellite caught the public’s fancy in July of 1962, when Telstar 1 relayed images of AT&T chairman Frederick R. Kappell from the U.S. to Great Britain. Pay-TV came and went several times in the 1950s, 1960s, and 1970s; modern-day professional commercial videotape machines were demonstrated in 1956 by Ampex; and home video recorders had appeared on retail shelves by early 1976.

Figure A.2 (continued)

Summary: A Brief History of Television

In 1924, Baird made the first electronic transmission of a picture. The primitive equipment produced only a shadow. Although Baird’s design was modified by others in the 1920s, the viewer had to look through a glass lens at a small screen that gave off an orange glow.

Zworykin’s iconoscopic camera and Farnsworth’s image dissector tube—similar to the modern CRT—led in 1936 to the development of modern TV. Regular broadcasts began in 1939 on the first network, NBC. Research stopped during WWII, but after that, sales grew, even though sets cost approximately \$650, the equivalent of \$4,000 today.

Color broadcasts began in 1953; satellite broadcasting began in 1962; and home VCRs were introduced in 1976.

Key terms: television, history of television, NBC, color television, satellite broadcasting, videocassette recorders, Baird, Zworykin, Farnsworth.

Figure A.3 Summary of the Original Passage

Part B: Documenting Your Sources

Documentation identifies the sources of the ideas and the quotations in your document. Integrated throughout your document, documentation consists of citations in the text and a reference list (or list of works cited) at the back of your document. Documentation serves three basic functions:

- *It helps you acknowledge your debt to your sources.* Complete and accurate documentation is a professional obligation, a matter of ethics. Failure to document a source, whether intentional or unintentional, is plagiarism. At most colleges and universities, plagiarism can mean automatic failure of the course and, in some instances, suspension or expulsion. In many companies, it is grounds for immediate dismissal.
- *It helps you establish credibility.* Effective documentation helps you place your document within the general context of continuing research and helps you define it as a responsible contribution to knowledge in the field. Knowing how to use existing research is one mark of a professional.
- *It helps your readers find your source in case they want to read more about a particular subject.*

Three kinds of material should always be documented:

- *Any quotation from a written source or an interview, even if it is only a few words.*
- *A paraphrased idea, concept, or opinion gathered from your reading.* There is one exception. An idea or concept so well known that it has become general knowledge, such as Einstein's theory of relativity, needs no citation. If you are unsure about whether an item is general knowledge, document it, just to be safe.
- *Any graphic from a written or an electronic source.* Cite the source for a graphic next to the graphic or in the reference list. For an online source, be sure to include a retrieval statement in the bibliographic entry. If you are publishing your work, you must also request permission to use any graphic protected by copyright.

Just as organizations have their own preferences for formatting and punctuation, many organizations also have their own documentation styles. For documents prepared in the workplace, find out your organization's style and abide by it. Check with your instructor to see which documentation system to use in the documents you write for class. The documentation systems included in this section of the appendix are based on the following style manuals:

- *Publication manual of the American Psychological Association* (6th ed.). (2010). Washington, DC: APA. This system, referred to as APA style, is used widely in the social sciences.
- *IEEE editorial style manual* [PDF]. (2007). New York: IEEE. This manual provides editorial guidelines for IEEE Transactions, Journals, and Letters, but it is

In This Book

For more about quoting and paraphrasing sources, see Appendix, Part A.

In This Book

For more about using graphics from other sources, see Ch. 12, p. 313.

often used for the production of technical documents in areas ranging from computer engineering, biomedical technology, and telecommunications to electric power, aerospace, and consumer electronics.

- Modern Language Association. (2009). *MLA handbook for writers of research papers*. New York: Author. This system, referred to as MLA style, is used widely in the humanities.

Other organizations may prefer one of the following published style guides.

GENERAL

Chicago manual of style (16th ed.). (2010). Chicago, IL: University of Chicago Press. See also <http://www.chicagomanualofstyle.org/home.html>

BUSINESS

American Management Association. (1996). *The AMA style guide for business writing*. New York, NY: AMACOM. See also <http://www.amanet.org>

CHEMISTRY

American Chemical Society. (1997). *ACS style guide: A manual for authors and editors* (2nd ed.). Washington, DC: Author. See also <http://www.acs.org>

GEOLOGY

Adkins-Heljeson, M., Bates, R. L., & Buchanan, R. (Eds.). (1995). *Geowriting: A guide to writing, editing, and printing in earth science* (5th rev. ed.). Alexandria, VA: American Geological Institute. See also <http://www.agiweb.org>

GOVERNMENT DOCUMENTS

U.S. Government Printing Office. (2000). *Style manual* (29th ed.). Washington, DC: Author. See also <http://www.gpo.gov>

JOURNALISM

Christian, D., Jacobsen, S., & Minthorn, J. (Eds.). (2008). *Associated Press style-book 2008*. New York, NY: Associated Press. See also <http://www.ap.org>

LAW

Columbia Law Review, Harvard Law Review, University of Pennsylvania Law Review, and Yale Law Journal. (2005). *The bluebook: A uniform system of citation* (18th ed.). Cambridge, MA: Harvard Law Review Association. See also <http://www.legalbluebook.com>

MATHEMATICS

Higham, N. J. (1998). *Handbook of writing for the mathematical sciences* (2nd ed.). Philadelphia, PA: Society for Industrial and Applied Mathematics. See also <http://www.siam.org>

MEDICINE

American Medical Association. (1998). *American Medical Association manual of style* (9th ed.). Baltimore, MD: Williams. See also <http://www.ama-assn.org>

NATURAL SCIENCES

Scientific style and format: The CSE manual for authors, editors, and publishers (7th ed.). New York, NY: Cambridge University Press. See also <http://www.councilscienceeditors.org>

PHYSICS

American Institute of Physics, Publication Board. (1990). *Style manual for guidance in the preparation of papers* (4th ed.). New York, NY: Author. See also <http://www.aip.org>

POLITICAL SCIENCE

American Political Science Association. (2006). *Style manual for political science* (rev. ed.). Washington, DC: Author. See also <http://www.apsanet.org>

SCIENCE AND TECHNICAL WRITING

National Information Standards Organization. (2005). *Scientific and technical reports—Preparation, presentation and preservation*. Bethesda, MD: Author. See also <http://www.niso.org>

Rubens, P. (Ed.). (2000). *Science and technical writing: A manual of style* (2nd ed.). New York, NY: Routledge.

SOCIAL WORK

National Association of Social Workers. (1995). *Writing for the NASW Press: Information for authors* (rev. ed.). Washington, DC: National Association of Social Workers Press. See also <http://www.naswpress.org>

SOCIOLOGY

American Sociological Association. (1997). *American Sociological Association style guide* (2nd ed.). Washington, DC: Author. See also <http://www.asanet.org>

 **On TechComm Web**

For help with documenting sources in CSE style, download “CSE Documentation Style Guidelines” from bedfordstmartins.com/techcomm.

APA STYLE

 **On TechComm Web**
For more information, see the APA Web site. Click on Links Library for Appendix Part B on <bedfordstmartins.com/techcomm>.

APA style consists of two elements: citations in the text and a list of references at the end of the document.

APA Style for Textual Citations

- | | |
|---|---|
| 1. Summarized or Paraphrased Material 671 | 6. Multiple Authors with the Same Last Name 673 |
| 2. Quoted Material or Specific Fact 671 | 7. Multiple Sources in One Citation 673 |
| 3. Source with Multiple Authors 672 | 8. Personal Communication 673 |
| 4. Source Issued by an Organization 672 | 9. Electronic Document 673 |
| 5. Source with an Unknown Author 672 | |

APA Style for Reference List Entries

BOOKS

10. Book by One Author 675
11. Book by Multiple Authors 675
12. Multiple Books by the Same Author 675
13. Book Issued by an Organization 677
14. Book by an Unknown Author 677
15. Edited Book 677
16. Chapter or Section in an Edited Book 677
17. Book in an Edition Other Than the First 677
18. Multivolume Work 677
19. Translated Book 677
20. Non-English Book 677
21. Entry in a Reference Work 679

PERIODICALS

22. Journal Article 679
23. Magazine Article 679
24. Newspaper Article 679
25. Newsletter Article 679

ELECTRONIC SOURCES

26. Nonperiodical Web Document 681

Journal Articles

27. Article with DOI Assigned 681
28. Article with No DOI Assigned 681
29. Preprint Version of Article 681

Electronic Books

30. Entire Book 681

Dissertations and Theses

31. Dissertation Retrieved from Database 683

Reference Materials

32. Online Encyclopedia 683
33. Online Dictionary 683
34. Wiki 683

Raw Data

35. Data Set 683
36. Graphic Representation of Data 683
37. Qualitative Data 683

Gray Literature

38. Technical or Research Report 684
39. Presentation Slides 684

APA Style for Reference List Entries

General-Interest Media and Alternative Presses	
40. Newspaper Article 684	49. Brochure or Pamphlet 685
41. Audio Podcast 684	50. Article from Conference Proceedings 685
42. Online Magazine Content Not Found in Print Version 684	51. Lecture or Speech 685
	52. Audio Recording 686
	53. Motion Picture 686
Online Communities	54. Television Program 686
43. Message Posted to an Electronic Mailing List, Online Forum, or Discussion Group 684	55. Published Interview 686
44. Weblog Post 684	56. Personal Interview 686
45. E-mail Message or Real-Time Communication 685	57. Personal Correspondence 686
46. Online Posting 685	58. Unpublished Data 687
OTHER SOURCES	
47. Technical or Research Report 685	
48. Government Document 685	

APA Textual Citations

In APA style, a textual citation typically includes the name of the source's author and the date of its publication. Textual citations vary depending on the type of information cited, the number of authors, and the context of the citation. The following models illustrate a variety of common textual citations; for additional examples, consult the *Publication Manual of the American Psychological Association*.

1. Summarized or Paraphrased Material For material or ideas that you have summarized or paraphrased, include the author's name and the publication date in parentheses immediately following the borrowed information.

This phenomenon was identified more than 50 years ago (Wilkinson, 1948).

If your sentence already includes the source's name, do not repeat it in the parenthetical notation.

Wilkinson (1948) identified this phenomenon more than 50 years ago.

2. Quoted Material or Specific Fact If the reference is to a specific fact, idea, or quotation, add the page number(s) of the source to your citation.

This phenomenon was identified more than 50 years ago (Wilkinson, 1948, p. 36).

Wilkinson (1948) identified this phenomenon more than 50 years ago (p. 36).

3. Source with Multiple Authors For a source written by two authors, cite both names. Use an ampersand (&) in the parenthetical citation itself, but use the word *and* in regular text.

(Tyshenko & Paterson, 2010)

Tyshenko and Paterson (2010) argued . . .

For a source written by three, four, or five authors, include all the names the first time you cite the reference; after that, include only the last name of the first author followed by *et al.*

First Reference

Cashman, Walls, and Thomas (2008) argued . . .

Subsequent References

Cashman et al. (2008) found . . .

For a source written by six or more authors, use only the first author's name followed by *et al.*

(Marken et al., 2007)

Marken et al. (2007) reported . . .

4. Source Issued by an Organization If the author is an organization rather than a person, use the name of the organization.

There is currently ongoing discussion of the scope and practice of nursing informatics (American Nurses Association, 2010).

In a recent publication, the American Nurses Association (2010) discusses the scope and practice of nursing informatics.

If the organization name has a common abbreviation, you may include it in the first citation and use it in any subsequent citations.

First Reference

(International Business Machines [IBM], 2011)

Subsequent References

(IBM, 2011)

5. Source with an Unknown Author If the source does not identify an author, use a shortened version of the title in your parenthetical citation.

Hawking made the discovery that under precise conditions, thermal radiation could exit black holes ("World Scientists," 2007).

If the author is identified as anonymous—a rare occurrence—treat *Anonymous* as a real name.

(Anonymous, 2011)

6. Multiple Authors with the Same Last Name Use first initials if two or more sources have authors with the same last name.

B. Porter (2007) created a more stable platform for database transfers, while A. L. Porter (2007) focused primarily on latitudinal peer-to-peer outcome interference.

7. Multiple Sources in One Citation When you refer to two or more sources in one citation, present the sources in alphabetical order, separated by a semicolon.

This phenomenon has been well documented (Houlding, 2011; Jessen, 2010).

8. Personal Communication When you cite personal interviews, phone calls, letters, memos, and e-mails, include the words *personal communication* and the date of the communication.

D. E. Walls (personal communication, April 3, 2011) provided the prior history of his . . .

9. Electronic Document Cite the author and date of the source as you would for other kinds of documents. If the author is unknown, give a shortened version of the title in your parenthetical citation. If the date is unknown, use *n.d.* (for *no date*).

Interpersonal relationships are complicated by differing goals (Hoffman, n.d.).

If the document is posted as a PDF file, include a page number in the citation. If a page number is not available but the source contains paragraph numbers, give the paragraph number.

(Tong, 2010, para. 4)

If no paragraph or page number is available and the source has headings, cite the appropriate heading and paragraph.

The CDC (2007) warns that babies born to women who smoke during pregnancy are 30% more likely to be born prematurely (The Reality section, para. 3).

The APA Reference List

A reference list provides the information your readers will need in order to find each source you have cited in the text. It should not include sources you read but did not use.



For a sample APA-style reference list, see p. 687.

Following are some guidelines for an APA-style reference list.

- *Arranging entries.* Arrange the entries alphabetically by author's last name. If two or more works are by the same author, arrange them by date, earliest to latest. If two or more works are by the same author in the same year, list them alphabetically by title and include a lowercase letter after the date: Smith 2010a, Smith 2010b, and so on. Alphabetize works by an organization by the first significant word in the name of the organization.
- *Book titles.* Italicize titles of books. Capitalize only the first word of the book's title, the first word of the subtitle, and any proper nouns.
- *Publication information.* For books, give the publisher's full name or consult your style guide for the preferred abbreviation. Include both the publisher's city and state (abbreviated) for all U.S. cities or the city and country (not abbreviated) for all non-U.S. cities; also include the province for Canadian cities.
- *Periodical titles.* Italicize titles of periodicals and capitalize all major words.
- *Article titles.* Do not italicize titles of articles or place them in quotation marks. Capitalize only the first word of the article's title and subtitle and any proper nouns.
- *Electronic sources.* Include as much information as you can about electronic sources, such as author, date of publication, identifying numbers, and retrieval information. Include the digital object identifier (DOI) when one exists. If there is the likelihood that the content could change, be sure to record the date you retrieved the information, because electronic information changes frequently.
- *Indenting.* Use a hanging indent, with the second and subsequent lines of each entry indented one-half inch:

Sokolova, G. N. (2010). Economic stratification in Belarus and Russia: An experiment in comparative analysis. *Sociological Research*, 49(3), 25–26.

Your instructor may prefer a paragraph indent, in which the first line of each entry is indented one-half inch:

Sokolova, G. N. (2010). Economic stratification in Belarus and Russia: An experiment in comparative analysis. *Sociological Research*, 49(3), 25–26.

- *Spacing.* Double-space the entire reference list. Do not add extra spacing between entries.
- *Page numbers.* When citing a range of page numbers for articles, always give the complete numbers (for example, 121–124, not 121–24 or 121–4). If an article continues on subsequent pages interrupted by other articles or advertisements, use a comma to separate the page numbers. Use the

abbreviation *p.* or *pp.* only with articles in newspapers, chapters in edited books, and articles from proceedings published as a book.

- **Dates.** Follow this format: year, month, day, with a comma after only the year (2011, October 31).

Following are models of reference list entries for a variety of sources. For further examples of APA-style citations, consult the *Publication Manual of the American Psychological Association*.

BOOKS

10. Book by One Author Begin with the author's last name, followed by the first initial or initials. If the author has a first and a middle initial, include a space between the initials. Place the year of publication in parentheses, then give the title of the book, followed by the location and name of the publisher.

Power, G. A. (2010). *Dementia beyond drugs: Changing the culture of care*. Baltimore, MD: Health Professions Press.

11. Book by Multiple Authors When citing a work by two to seven authors, separate the authors' names with a comma or commas, and use an ampersand (&) instead of *and* before the final author's name.

Tyshenko, M. G., & Paterson, C. (2010). *SARS unmasked: Risk communication of pandemics and influenza in Canada*. Montreal, Quebec, Canada: McGill-Queen's University Press.

To cite more than seven authors, list only the first six, followed by three ellipses dots and the last author's name.

12. Multiple Books by the Same Author List the entries by the author's name and then by date, with the earliest date first.

Tabloski, P. A. (2007). *Clinical handbook for gerontological nursing*. Upper Saddle River, NJ: Pearson/Prentice Hall.

Tabloski, P. A. (2010). *Gerontological nursing*. Upper Saddle River, NJ: Pearson.

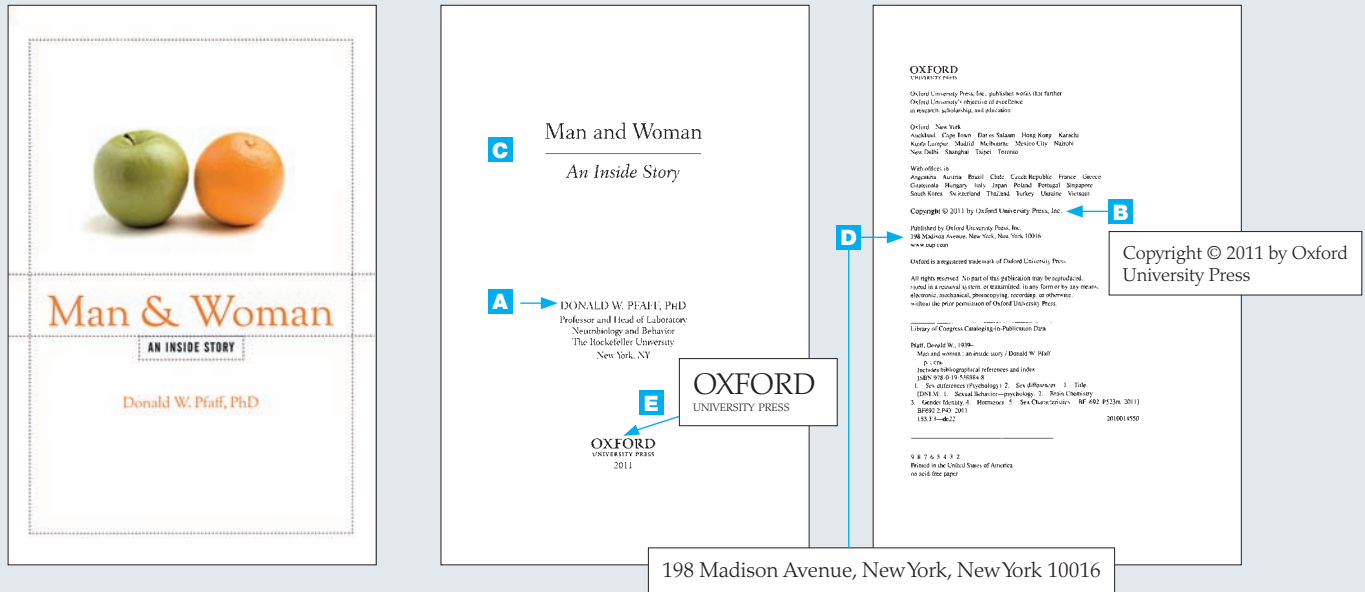
If you use multiple works by the same author written in the same year, list the books alphabetically by title and include *a*, *b*, and so forth after the year—both in your reference list and in your parenthetical citations.

Agger, B. (2007a). *Fast families, virtual children: A critical sociology of families and schooling*. Boulder, CO: Paradigm.

Agger, B. (2007b). *Public sociology: From social facts to literary acts*. Lanham, MD: Rowman & Littlefield.

APA: CITING A BOOK BY ONE AUTHOR

When citing a book, use the information from the title page and the copyright page (on the reverse side of the title page), not from the book's cover or a library catalog.



Record the following information:

- A The author.** Give the last name first, followed by a comma and initials for first and middle names. Separate initials with a space (Tufte, E. R.). Separate the names of multiple authors with a comma or commas; use an ampersand (&) before the final author's name.
- B The date of publication.** Put the most recent copyright year in parentheses and end with a period (outside the parentheses).
- C The title.** Give the full title; include the subtitle (if any), preceded by a colon. Italicize the title and subtitle, capitalizing only the first word of the title, the first word of the subtitle, and any proper nouns. End with a period.
- D The city of publication.** If more than one city is given, use the first one listed. Give the city and state (abbreviated) for all U.S. cities or the city and country (not abbreviated) for all non-U.S. cities; also include the province for Canadian cities. Insert a colon.
- E The publisher.** Give the publisher's name, omitting words such as *Inc.* and *Co.* Include and do not abbreviate terms such as *University* and *Press*. End with a period.

Pfaff, D. W. (2011). *Man and woman: An inside story*. New York, NY: Oxford University Press.

13. Book Issued by an Organization Use the full name of the organization in place of an author's name. If the organization is also the publisher, use the word *Author* in place of the publisher's name.

American Nurses Association. (2010). *Nursing's social policy statement: The essence of the profession* (3rd ed.). Silver Spring, MD: Author.

14. Book by an Unknown Author If the author of the book is unknown, begin with the title in italics.

The PDR pocket guide to prescription drugs (9th ed.). (2010). New York, NY: Pocket Books.

15. Edited Book Place the abbreviation *Ed.* (singular) or *Eds.* (plural) in parentheses after the name(s), followed by a period.

Haugen, D., Musser, S., & Lovelace, K. (Eds.). (2010). *Global warming*. Detroit, MI: Greenhaven Press.

16. Chapter or Section in an Edited Book

Jyonouchi, H. (2010). Possible impact of innate immunity in autism. In A. Chauhan, V. Chauhan, & W. T. Brown (Eds.), *Autism: Oxidative stress, inflammation, and immune abnormalities* (pp. 245–276). Boca Raton, FL: CRC Press.

17. Book in an Edition Other Than the First Include the edition number in parentheses following the title.

Quinn, G. R. (2010). *Behavioral science* (2nd ed.). New York, NY: McGraw-Hill Medical.

18. Multivolume Work Include the number of volumes after the title.

Weiner, I. B., & Craighead, W. E. (Eds.). (2010). *The Corsini encyclopedia of psychology* (Vols. 1–4). Hoboken, NJ: Wiley.

19. Translated Book Name the translator after the title.

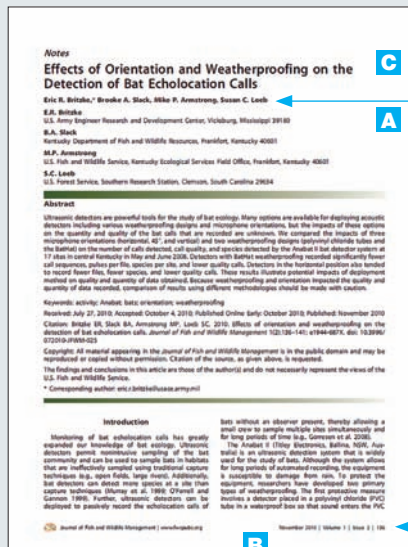
Bieler, A., & Gutmann, H.-M. (2010). *Embodying grace: Proclaiming justification in the real world* (L. M. Maloney, Trans.). Minneapolis, MN: Fortress Press.

20. Non-English Book Give the original title, then the English translation in brackets.

Hernandez, G. H., Moreno, A. M., Zaragoza, F. G., & Porras, A. C. (Eds.). (2010). *Tratado de medicina farmacéutica* [Treaty of pharmaceutical medicine]. Madrid, Spain: Editorial Médica Panamericana.

APA: CITING AN ARTICLE FROM A PERIODICAL

Periodicals include journals, magazines, and newspapers. This page gives an example of a citation for a print journal article.



Eric R. Britzke,* Brooke A. Slack,
Mike P. Armstrong, Susan C. Loeb

November 2010 | Volume 1 | Issue 2 | 136


Record the following information:

- A The author.** Give the last name first, followed by a comma and initials for first and middle names. Separate initials with a space (Tuft, E. R.). Separate the names of multiple authors with a comma or commas; use an ampersand (&) before the final author's name.
- B The date of publication.** Put the year in parentheses and end with a period (outside the parentheses). For magazines and newspapers, include the month and, if given, the day (2011, May 23).
- C The article title.** Give the full title; include the subtitle (if any), preceded by a colon. Do not underline or italicize the title or put it in quotation marks. Capitalize

only the first word of the title, the first word of the subtitle, and any proper nouns. End with a period.

- D The periodical title.** Italicize the periodical title and capitalize all major words. Insert a comma.
- E The volume number and issue number.** Include the volume number (italicized). Include the issue number in parentheses (not italicized) for magazines and for journals that begin each issue at page 1. Insert a comma.
- F Inclusive page numbers.** Give all the numbers in full (316–337, *not* 316–37). For newspapers, include the abbreviation *p.* for *page* (or *pp.* for *pages*) and the section letter, if relevant (p. D4). End with a period.

Britzke, E. R., Slack, B. A., Armstrong, M. P., & Loeb, S. C. (2010). Effects of orientation and weatherproofing on the detection of bat echolocation calls. *Journal of Fish and Wildlife Management, 1*, 136–141.

 **In This Book** For more APA-style models for citing other types of periodical articles, see p. 679.

21. Entry in a Reference Work Begin with the title of the entry if it has no author.

Kohlrabi. (2010). In R. T. Wood, *The new whole foods encyclopedia: A comprehensive resource for healthy eating* (2nd ed., pp. 178–179). New York, NY: Penguin Books.

PERIODICALS

22. Journal Article Follow the author's name and year with the article title; then give the journal title. For all journals, include the volume number (italicized). For journals that begin each issue with page 1, also include the issue number in parentheses (not italicized). Insert a comma and end with the page number(s).

Cumsille, P., Darling, N., & Martinez, M. L. (2010). Shading the truth: The pattern of adolescents' decisions to avoid issues, disclose, or lie to parents. *Journal of Adolescence*, 33, 285–296.

23. Magazine Article Include the month after the year. If it's a weekly magazine, include the day. Give the volume and issue numbers, if any, after the magazine title.

Stix, G. (2011, March). The neuroscience of true grit. *Scientific American*, 304(3), 28–33.

24. Newspaper Article Include the specific publication date following the year.

Seltz, J. (2010, December 26). Internet policies examined: Schools aim to clarify social rules. *Boston Globe*, p. 1.

25. Newsletter Article Cite a newsletter article as you would a magazine article. If the date is given as a season, include a comma then the season after the year in parentheses.

Meyerhoff, M. K. (2010, September/October). Paying attention to attention. *Pediatrics for Parents*, 26(9/10), 8–9.

ELECTRONIC SOURCES

Generally, include all the same elements for electronic sources as you would for print sources. Include any information required to locate the item. Many scholarly publishers are now assigning a digital object identifier (DOI) to journal articles and other documents. A DOI is a unique alphanumeric string assigned by a registration agency. It provides a persistent link to unchanging content on the Internet. When available, substitute the DOI for the URL. If the content is subject to change, include the retrieval date before the DOI or URL. Use the exact URL for open-source material; use the home page or menu page URL for subscription-only material or content presented in frames, which make exact URLs unworkable. Break URLs before most punctuation, and avoid punctuation after them so as not to confuse the reader.

APA: CITING A NONPERIODICAL WEB DOCUMENT

You will likely need to search the Web site to find some of the citation information you need. For some sites, all of the details may not be available; find as many as you can. Remember that the citation you provide should allow readers to retrace your steps electronically to locate the source.

The screenshot shows a Windows Internet Explorer browser window displaying a PDF document. The address bar shows the URL: http://www.sunflowernsa.com/uploads/research/439/Klosterman_BirdDamage_10.pdf. The document title is "Assessment of Bird Damage to Sunflower and Corn in North Dakota". The authors listed are Megan Klosterman¹, George Linz², Tony Slowik², and William Bleier¹. The document includes an introduction section discussing bird damage to sunflower and corn in North Dakota.

A Megan Klosterman¹, George Linz², Tony Slowik², William Bleier¹

B http://www.sunflowernsa.com/uploads/research/439/Klosterman_BirdDamage_10.pdf


C Assessment of Bird Damage to Sunflower and Corn in North Dakota

D http://www.sunflowernsa.com/uploads/research/439/Klosterman_BirdDamage_10.pdf

Record the following information:

- A The author.** Give the last name first, followed by a comma and initials for first and middle names. Separate initials with a space (Tuft, E. R.). Separate the names of multiple authors with a comma or commas; use an ampersand (&) before the final author's name.
- B The date of publication or most recent update.** Put the date in parentheses and end with a period (outside the parentheses). If there is no date, use *n.d.*
- C The document title.** Give the full title; include the subtitle (if any), preceded by a colon. Italicize the title and subtitle, capitalizing only the first word of the title, the first word of the subtitle, and any proper nouns. End with a period.
- D The URL.** Include the words *Retrieved from* before the complete URL. Insert a retrieval date before the word *from* only for material that is likely to change (e.g., wikis). Leave off final punctuation.

A Klosterman, M., Linz, G., Slowik, T., & Bleier, W. (2010). **B** *Assessment of bird damage to sunflower and corn in North Dakota*. **C** Retrieved from **D** http://www.sunflowernsa.com/uploads/research/439/Klosterman_BirdDamage_10.pdf

 **In This Book** For more APA-style models for citing other types of Web sources, see pp. 681 and 683.

26. Nonperiodical Web Document To cite a nonperiodical Web document, provide as much of the following information as possible: author's name, date of publication or most recent update (use *n.d.* if there is no date), document title (in italics), and URL for the document.

Centers for Disease Control and Prevention. (2010, June 1). *Teens behind the wheel: Graduated driver licensing*. Retrieved from http://www.cdc.gov/MotorVehicleSafety/Teen_Drivers/GDL/Teens_Behind_Wheel.html

If the author of a document is not identified, begin the reference with the title of the document. If the document is from a university program's Web site, identify the host institution and program or department, followed by a colon and the URL for the document.

Safety manual. (2011, March 18). Retrieved from Harvard University, Center for Nanoscale Systems website: http://www.cns.fas.harvard.edu/users/Forms/CNS_Safety_Manual.pdf

Journal Articles

27. Article with DOI Assigned

Iemolo, F., Cavallaro, T., & Rizzuto, N. (2010). Atypical Alzheimer's disease: A case report. *Neurological Sciences*, *31*, 643–646. doi:10.1007/s10072-010-0334-1

28. Article with No DOI Assigned

Srivastava, R. K., & More, A. T. (2010). Some aesthetic considerations for over-the-counter (OTC) pharmaceutical products. *International Journal of Biotechnology*, *11*(3–4), 267–283. Retrieved from <http://www.inderscience.com>

29. Preprint Version of Article

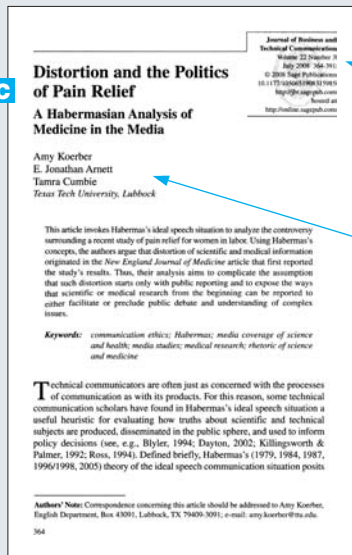
Wang, T. J., Larson, M. G., Vasan, R. S., Cheng, S., Rhee, E. P., McCabe, E., . . . Gerszten, R. E. (2011). Metabolite profiles and the risk of developing diabetes. *Nature Medicine*. Advance online publication. doi:10.1038/nm.2307

Electronic Books

30. Entire Book Use "Retrieved from" if the URL leads to the information itself and "Available from" if the URL leads to information on how to obtain the content.

Einstein, A. (n.d.). *Relativity: The special and general theory*. Retrieved from <http://www.gutenberg.org/etext/5001>

APA: CITING AN ARTICLE WITH A DOI



Journal of Business and Technical Communication
Volume 22 Number 3
July 2008 364–391
© 2008 Sage Publications
10.1177/1050651908315985


Amy Koerber
E. Jonathan Arnett
Tamra Cumbie

Record the following information:

- A The author.** Give the last name first, followed by a comma and initials for first and middle names. Separate initials with a space (Tuft, E. R.). Separate the names of multiple authors with a comma or commas; use an ampersand (&) before the final author's name.
- B The date of publication.** Put the year in parentheses and end with a period (outside the parentheses). For magazines and newspapers, include the month and, if relevant, the day (2006, May 23).
- C The article title.** Give the full title; include the subtitle (if any), preceded by a colon. Do not underline or italicize the title or put it in quotation marks. Capitalize only the first word of the title, the first word of the subtitle, and any proper nouns. End with a period.

- D The periodical title.** Italicize the periodical title and capitalize all major words. Insert a comma.
- E The volume number and issue number.** For journals and magazines, include the volume number (italicized). Include the issue number in parentheses (not italicized) for magazines and for journals that begin each issue at page 1. Insert a comma.
- F Inclusive page numbers.** Give all the numbers in full (316–337, *not* 316–37). For newspapers, include the abbreviation *p.* for *page* (or *pp.* for *pages*) and the section letter, if relevant (p. D4). End with a period.
- G The DOI.** If the DOI references a preprint, include the word *Retrieved* before the date, which is followed by a period. End with *doi* followed by a colon, no space, then the DOI. Leave off final punctuation.

Koerber, A., Arnett, E. J., & Cumbie, T. (2008). Distortion and the politics of pain relief: A Habermasian analysis of medicine in the media. *Journal of Business and Technical Communication*, 22, 364–391. doi:10.1177/1050651908315985

 **In This Book** For more APA-style models for citing other types of electronic sources, see pp. 683 and 684–90.

Dissertations and Theses

31. Dissertation Retrieved from Database Include the database name, followed by the accession number, if one is assigned, or include the URL if the dissertation can be retrieved online.

Siegel, R. S. (2010). *Mediators of the association between risk for mania and close relationship quality in adolescents* (Doctoral dissertation, University of Miami). Retrieved from <http://etd.library.miami.edu/theses/available/etd-05092010-181033>

Reference Materials

Give the home or index page URL for reference works.

32. Online Encyclopedia

Cross, M. S. (2011). Social history. In J. H. Marsh (Ed.), *The Canadian Encyclopedia*. Retrieved from <http://www.thecanadianencyclopedia.com>

33. Online Dictionary

Conductance. (n.d.). In *Merriam-Webster's online dictionary*. Retrieved from <http://www.merriam-webster.com/dictionary/conductance>

34. Wiki

Tsunami. (n.d.). Retrieved March 20, 2011, from <http://en.wikipedia.org/wiki/Tsunami>

Raw Data

35. Data Set

Department of Health and Human Services. (2010). FDA peanut product recalls [Data set]. Retrieved from http://www.data.gov/communities/node/81/data_tools/350

36. Graphic Representation of Data

U.S. Department of Labor, Bureau of Labor Statistics. (2011, April 4). Civilian unemployment rate (UNRATE) [Line graph]. Retrieved from Federal Reserve Bank of St. Louis website: <http://research.stlouisfed.org/fred2/series/UNRATE>

37. Qualitative Data

Jaques, C. (2010). They called it slums but it was never a slum to me [Audio stream]. Retrieved from StoryCorps website: <http://storycorps.org/listen/stories/category/historias>

Gray literature refers to print or electronic documents published by organizations such as businesses, government agencies, and scientific groups rather than by traditional publishers. Because gray literature is typically not cited in the popular bibliographic sources, it is often difficult to find and access.

Gray Literature

38. Technical or Research Report

Moran, R., Rampey, B. D., Dion, G. S., & Donahue, P. L. (2008). *National Indian education study 2007, Part 1. Performance of American Indian and Alaska native students at grades 4 and 8 on NAEP 2007 reading and mathematics assessments* (Report No. NCES 2008–457). Retrieved from National Center for Education Statistics website: <http://nces.ed.gov/nationsreportcard/pdf/studies/2008457.pdf>

39. Presentation Slides

Wyominginspector. (2010). *Cell phone use in the mining industry* [PowerPoint slides]. Retrieved from <http://www.slideshare.net/wyominginspector/cell-phone-use-in-the-mining-industry>

General-Interest Media and Alternative Presses

40. Newspaper Article

Applebaum, A. (2011, February 14). Channeling Egypt's energy of the crowd into positive change. *The Washington Post*. Retrieved from <http://www.washingtonpost.com>

41. Audio Podcast Include authority, if known; date; episode title; episode or show identifier in brackets, such as [*Show 13*]; show name; and retrieval information.

Cooper, Q. (Presenter). (2011, February 10). Science in Egypt. *The Material World* [Audio podcast]. Retrieved from <http://www.bbc.co.uk/podcasts/series/material#playepisode8>

42. Online Magazine Content Not Found in Print Version

Greenemeier, L. (2010, November 17). Buzz kill: FDA cracks down on caffeinated alcoholic beverages. *Scientific American*. Retrieved from <http://www.scientificamerican.com/article.cfm?id=fda-caffeinated-alcohol>

Online Communities

43. Message Posted to an Electronic Mailing List, Online Forum, or Discussion Group Use the screen name if the author's real name is not available. Provide a description of the post in brackets after the subject line or thread name.

Gomez, T. N. (2010, December 20). Food found in archaeological environments [Electronic mailing list message]. Retrieved from <http://cool.conservation-us.org/byform/mailling-lists/cdl/2010/1297.html>

44. Weblog Post

Joseph j7uy5. (2010, May 11). Another rTMS update [Web log post]. Retrieved from http://scienceblogs.com/corpuscallosum/2010/05/another_rtms_update.php

45. E-mail Message or Real-Time Communication Do not cite e-mail messages in the reference list. Instead, cite them in the text as personal communications. (See item 8 on page 673.)

46. Online Posting If an online posting is not archived and therefore is not retrievable, cite it as a personal communication and do not include it in the reference list. If the posting can be retrieved from an archive, provide the author's name or screen name, the exact date of the posting, the title or subject line, and a description in brackets. Finish with the address.

Telecom. (2011, February 22). Cellphone use tied to changes in brain activity [Web log comment]. Retrieved from <http://well.blogs.nytimes.com/2011/02/22/cellphone-use-tied-to-changes-in-brain-activity/#comment-643942>

OTHER SOURCES

47. Technical or Research Report Include identifying numbers in parentheses after the report title. If appropriate, include the name of the service used to locate the item in parentheses after the publisher.

Arai, M., & Mazuka, R. (2010). *Linking syntactic priming to language development: A visual world eye-tracking study* (TL2010-18). Tokyo: Institute of Electronics, Information and Communication Engineers.

48. Government Document For most government agencies, use the abbreviation U.S. instead of spelling out *United States*. Include any identifying document numbers after the publication title.

U.S. Department of State. (2010, June). *Trafficking in persons report* (10th ed.). Washington, DC: Government Printing Office.

49. Brochure or Pamphlet After the title of the document, include the word *Brochure* or *Pamphlet* in brackets.

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2010, October). *How to clean and disinfect schools to help slow the spread of flu* [Pamphlet]. Washington, DC: Author.

50. Article from Conference Proceedings After the proceedings title, give the page numbers on which the article appears.

Sebastianelli, R., Tamimi, N., Gnanendran, K., & Stark, R. (2010). An examination of factors affecting perceived quality and satisfaction in online MBA courses. In *Proceedings of the 41st Annual Meeting of the Decision Sciences Institute* (pp. 1641–1646). Atlanta, GA: Decision Sciences Institute.

51. Lecture or Speech

Culicover, P. W. (2010, March 3). *Grammar and complexity: Language at the intersection of competence and performance*. Lecture presented at the Ohio State University, Columbus, OH.

52. Audio Recording Give the function of the originator or primary contributor in parentheses after the name. Give the medium in brackets after the title.

Young, J. K. (Lecturer). (2007). *The building blocks of human life: Understanding mature cells and stem cells* [CD]. Prince Frederick, MD: Recorded Books.

53. Motion Picture Give the names of the primary contributors, such as the producer and director, and follow the film's title with the words *Motion picture* in brackets. List the country in which the film was produced and the studio's name. If the film was not widely distributed, give instead the distributor's name and address in parentheses.

Fincher, D. (Director). (2010). *The social network* [Motion picture]. United States: Columbia Pictures.

54. Television Program Start with the director, producer, or other principal contributor and the date the program aired. Include the words *Television broadcast* or *Television series* in brackets after the program title.

Fine, S. (Executive Producer). (2011). *NOVA scienceNOW* [Television series]. Boston, MA: WGBH.

For a single episode in a television series, start with the writer and director or other relevant editorial personnel of the episode. Include the words *Television series episode* in brackets after the episode title. Also include information about the series.

Dart, K., Evans, N., & Stubberfield, T. (Producers & Directors). (2010, October 26). Emergency mine rescue [Television series episode]. In H. Swartz (Executive Producer), *NOVA*. Boston, MA: WGBH.

55. Published Interview If it is not clear from the title, or if there is no title, include the words *Interview with* and the subject's name in brackets.

Jackson, L. (2010, December 6). The EPA is not the villain [Interview with Daniel Stone]. *Newsweek*, 156(23), 14.

56. Personal Interview Consider interviews you conduct, whether in person or over the telephone, as personal communications and do not include them in the reference list. Instead, cite them in the text. (See item 8 on page 673.)

57. Personal Correspondence Do not include personal letters, memos, and e-mails in the reference list. Instead, cite them in the text. (See item 8 on page 673.)

58. Unpublished Data Include a description of the data in brackets.

Standifer, M. (2007). [Daily temperatures, 2007, Barton Springs municipal pool, Austin, TX]. Unpublished raw data.

Sample APA Reference List

Following is a sample reference list using the APA citation system.

References	
Centers for Disease Control and Prevention. (2010, June 1). <i>Teens behind the wheel: Graduated driver licensing</i> . Retrieved from http://www.cdc.gov/MotorVehicleSafety/Teen_Drivers/GDL/Teens_Behind_Wheel.html	← Nonperiodical Web document
Cumsille, P., Darling, N., & Martinez, M. L. (2010). Shading the truth: The pattern of adolescents' decisions to avoid issues, disclose, or lie to parents. <i>Journal of Adolescence</i> , <i>33</i> , 285–296.	← Journal article, paginated by volume
Iemolo, F., Cavallaro, T., & Rizzuto, N. (2010). Atypical Alzheimer's disease: A case report. <i>Neurological Sciences</i> , <i>31</i> , 643–646. doi:10.1007/s10072-010-0334-1	← Online article with a DOI
Jyonouchi, H. (2010). Possible impact of innate immunity in autism. In A. Chauhan, V. Chauhan, & W. T. Brown (Eds.), <i>Autism: Oxidative stress, inflammation, and immune abnormalities</i> (pp. 245–276). Boca Raton, FL: CRC Press.	← Chapter in an edited book
Quinn, G. R. (2010). <i>Behavioral science</i> (2nd ed.). New York, NY: McGraw-Hill Medical.	← Book in an edition other than the first
Srivastava, R. K., & More, A. T. (2010). Some aesthetic considerations for over-the-counter (OTC) pharmaceutical products. <i>International Journal of Biotechnology</i> , <i>11</i> (3–4), 267–283. Retrieved from http://www.inderscience.com	← Online article, paginated by issue, with no DOI

IEEE STYLE

IEEE style consists of two elements: citations in the text and a reference list at the end of the document.

On TechComm Web

For more information, see the IEEE Web site. Click on Links Library for Appendix Part B on <bedfordstmartins.com/techcomm>.

IEEE Style for Reference List or Bibliography Annex Entries

BOOKS

- | | |
|---------------------------------------|--|
| 1. Book by One Author 689 | 4. Edited Book 691 |
| 2. Book by Multiple Authors 691 | 5. Chapter or Section in an Edited Book 691 |
| 3. Book Issued by an Organization 691 | 6. Book in an Edition Other Than the First 691 |

IEEE Style for Reference List or Bibliography Annex Entries

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8. Magazine Article 691
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15. Scientific or Technical Report 694
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18. Unpublished Document 695

IEEE Textual Citations

When you cite a reference in the text, you treat the citation similarly to how you would treat endnotes; however, the reference number appears on the line, in square brackets, inside the punctuation. Use *et al.* if there are three or more author names.

A recent study by Goldfinkel [5] shows that this is not an efficient solution. Murphy [8]–[10] comes to a different conclusion.

You can also treat the citation as a noun.

In addition, [5] shows that this is not an efficient solution; however, [8]–[10] comes to a different conclusion.

Note: Because references are listed in the order in which they first appear, if you cite a new reference within the text while writing or editing, you will need to renumber the reference list as well as the citations in the text. If you were to add a new reference between the first times [8]–[10] appeared, the previous example might now read:

Murphy [8], [10], [11] comes to a different conclusion.

To be more precise in citing a reference, you can provide extra information.

A recent study by Goldfinkel [5, pp. 12–19] shows that this is not an efficient solution.

The IEEE Reference List

The following guidelines will help you prepare IEEE-style references. For additional information on formatting entries, consult the latest edition of *The Chicago Manual of Style*.

- *Arranging entries.* Arrange and number the entries in the order in which they first appear in the text, much like endnotes. Place the numbers in square brackets and set them flush left in a column of their own, separate from the body of the references. Place the entries in their own column with no indents for turnovers.

In This Book

For a sample IEEE-style reference list, see p. 695.

- **Authors.** List the first initial (or initials, separated by spaces) and follow it with the last name. In the case of multiple authors, use all names; use *et al.* after the first author's name only if the other names are not given. If an editor or translator is used in place of an author, add the abbreviation *Ed.* (or *Eds.* for editors) or *Trans.*
- **Book titles.** Italicize titles of books. In English, capitalize the first word and all major words. In foreign languages, capitalize the first word of the title and subtitle, as well as any words that would be capitalized in that language.
- **Publication information.** For books, give the place (city) of publication, the country if it is not the United States, the abbreviated publisher's name, and the date (year) of publication. When two or more cities are given, include only the first. If the city is not well known, add the abbreviation of the state or province (if Canada). If the publisher's name indicates the state, no state abbreviation is necessary.
- **Periodical titles.** Italicize and abbreviate titles of periodicals. Capitalize all major words in the title.
- **Article titles.** Place titles of print articles in quotation marks; do not use quotation marks for articles found in electronic sources. Capitalize the first word. Do not capitalize the remaining words unless they are proper nouns.
- **Electronic sources.** The sequence of information for electronic sources is different from that for print material. Do not place article titles in quotation marks. In addition, give the medium and how to locate the source by including, for example, a URL. Dates are also handled differently. See the sample citations below.
- **Spacing.** The reference list is single-spaced. Do not add extra spacing between entries.
- **Page numbers.** If you are giving a range of pages for specific articles in books and periodicals, use the abbreviations *pp.* or *p.* Write numbers in full (152–159, not 152–59 or 152–9).
- **Dates.** Follow this format for print sources: month (abbreviated), day, year (Apr. 3, 2010 or Feb. 22–23, 2011). Do not abbreviate May, June, or July. Follow this format for electronic sources: year, month (abbreviated), day (2011, Oct. 14).

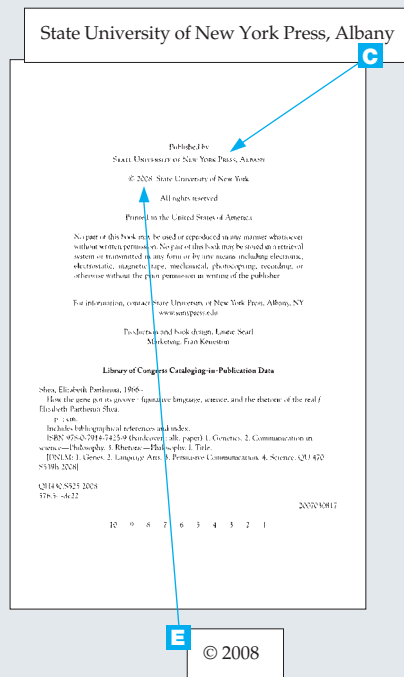
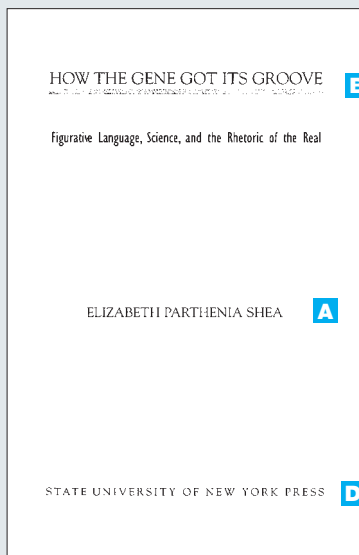
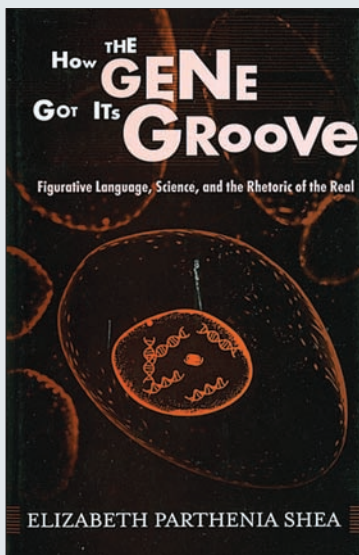
BOOKS

1. Book by One Author Include the author's first initial and middle initial (if available), the author's last name, the title (in italics), the edition (if applicable), the place of publication (city), the publisher, the year of publication, and the first and last pages of the material referenced.

[1] B. Mehlenbacher, *Instruction and Technology: Designs for Everyday Learning*. Cambridge, MA: MIT Press, 2010, pp. 22–28.

IEEE: CITING A BOOK BY ONE AUTHOR

When citing a book, use the information from the title page and the copyright page (on the reverse side of the title page), not from the book's cover or a library catalog.



Record the following information:

- A The author.** Give the initials for the first and middle names, followed by the last name. Separate initials with a space. End with a comma.
- B The title.** Give the full title in italics; include the subtitle (if any), preceded by a colon. Capitalize the first word of the title, the first word of the subtitle, and all major words. End with a period.
- C The city of publication.** If more than one city is given, use the first one listed. For a city that may be unfamiliar to your readers or confused with another city, add an abbreviation of the state or province (if Canada) or the country: Sweetwater, TX. Give the country if not the United States: Milan, Italy. Insert a colon.
- D The publisher.** Use a concise version of the publisher's name. End with a comma.
- E The date of publication.** Use the publication date, if given. Otherwise, use the copyright date. End with a comma.
- F The pages referenced.** Give the first and last pages of the material referenced.

A _____ B

[3] E. P. Shea, *How the Gene Got Its Groove: Figurative Language, Science, and the Rhetoric of*

C _____ D _____ E _____ F

***the Real*. Albany: State Univ. of New York Press, 2008, pp. 59–78.**

In This Book For more IEEE-style models for citing other types of books, see pp. 689 and 691.

2. Book by Multiple Authors List all the authors' names. Use *et al.* after the first author's name only if the other names are not given. Use the format: Name1 and Name2, or Name1, Name2, and Name3.

- [2] S.-T. Yau and S. J. Nadis, *The Shape of Inner Space: String Theory and the Geometry of the Universe's Hidden Dimensions*. New York: Basic Books, 2010, pp. 254–255.

3. Book Issued by an Organization The organization takes the place of the author.

- [3] World Bank, *World Development Report 2011: Conflict, Security, and Development*. Washington, DC: World Bank, 2011, pp. 25–31.

4. Edited Book Include the word *Ed.* (singular) or *Eds.* (plural) after the name(s).

- [4] J. Dibbell, Ed., *The Best Technology Writing 2010*. New Haven: Yale University Press, 2010, pp. 157–162.

5. Chapter or Section in an Edited Book Give the author and title of the chapter or section first, followed by the word *in*, the book title, and the book editor. Then give the publication information for the book and the page numbers on which the chapter or section appears.

- [5] E. Castronova, "The changing meaning of play," in *Online Communication and Collaboration: A Reader*, H. M. Donelan, K. L. Kear, and M. Ramage, Eds. New York: Routledge, 2010, pp. 184–189.

6. Book in an Edition Other Than the First The edition number follows the title of the book and is preceded by a comma.

- [6] L. Xinju, *Laser Technology*, 2nd ed. Boca Raton, FL: CRC Press, 2010, pp. 203–205.

PERIODICALS

7. Journal Article Include the author's name, the article title, and the abbreviated journal title, followed by the volume number, issue number, page number(s), abbreviated month, and year (or abbreviated month, day, and year for weekly periodicals).

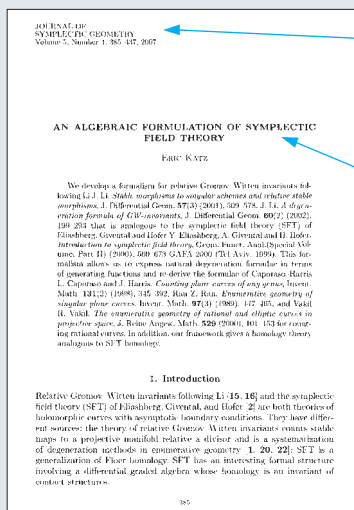
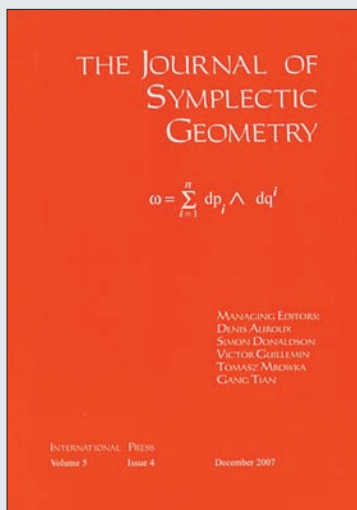
- [7] R. C. Weber, P.-Y. Lin, E. J. Garner, Q. Williams, and P. Lognonne, "Seismic detection of the lunar core," *Science*, vol. 331, no. 6015, pp. 309–312, Jan. 21, 2011.

8. Magazine Article List the author's name, the article title, and the magazine title, followed by the page number(s) and the issue date.

- [8] J. Villasenor, "The hacker in your hardware," *Scientific Amer.*, pp. 82–87, Aug. 2010.

IEEE: CITING AN ARTICLE FROM A PERIODICAL

Periodicals include journals, magazines, and newspapers. This page gives an example of a citation for a print journal article.



Journal of Symplectic Geometry
Volume 5, Number 4, 385–437, 2007

An Algebraic Formulation of Symplectic Field Theory
Eric Katz

Record the following information:

- A The author.** Give the initials for the first and middle names followed by the last name. Separate the initials with a space. End with a comma.
- B The article title.** Give the full title; include the subtitle (if any), preceded by a colon. Capitalize only the first word of the title, the first word of the subtitle, and proper nouns. End with a comma. Enclose all in quotation marks.
- C The periodical title.** Italicize, capitalize, and abbreviate titles of periodicals. End with a comma.
- D The volume number and issue number.** Include the volume and issue numbers, using the abbreviations *vol.* and *no.* End each with a comma.
- E Inclusive page numbers.** Give all the page numbers on which the article appears. End with a comma.
- F The date of publication.** Give the abbreviated month and year, or for weekly periodicals, give the abbreviated month, day, and year. End with a period.

A
B
C

[9] E. Katz, “An algebraic formulation of symplectic field theory,” *J. Symplectic Geometry*,

D
E
F

vol. 5, no. 4, pp. 385–437, 2007.

In This Book For more IEEE-style models for citing other types of periodical articles, see pp. 691 and 694.

IEEE: CITING AN ARTICLE FROM A DATABASE

G <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3069988/?tool=pmcentrez>

D *J Appl Phys.* 2010 March 15; 107(6): 063509.

F Published online 2010 March 23.

B Xuanhe Zhao,¹ Nathaniel Huebsch,^{1,2} David J. Mooney,^{1,3} and Zhigang Suo^{1,a)}

A

The screenshot shows a PubMed article page. Callout box A points to the author list. Callout box B points to the journal title and issue information. Callout box C points to the article title. Callout box D points to the journal title and issue information. Callout box E points to the publication date. Callout box F points to the online publication date. Callout box G points to the URL in the address bar.

Record the following information:

- A The author.** Give the initials for first and middle names followed by the last name. Separate initials with a space. End with a comma.
- B The date.** In parentheses, put the year followed by a comma and the abbreviated month. End with a period.
- C The article title.** Include the title and end with a period (unless the title ends with its own punctuation). Capitalize only the first word of the title, the first word of the subtitle, and proper nouns. Do not enclose the article title in quotation marks or italicize.
- D The periodical title.** Give the abbreviated journal title in italics. Do not end with punctuation if the last word is not abbreviated.
- E Medium.** Place the type of medium in square brackets and end with a period: [Online].
- F The volume number, issue number, and pages.** Italicize the volume number and issue number. Put the issue number in parentheses immediately after the volume number. Follow with a comma. Give all the page numbers on which the article appears, if known. End with a period.
- G Retrieval information.** After the expression *Available:* and a space, include the URL for the database or the article. Do not end with punctuation unless the URL does.

[22] X. Zhao, N. Huebsch, D. J. Mooney, and Z. Suo. (2010, Mar. 23). Stress-relaxation behavior in gels with ionic and covalent crosslinks. *J. App. Phys.* [Online]. 107(6). Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3069988/?tool=pmcentrez>

9. Newspaper Article List the author's name, the article title, and the newspaper name, followed by the section and the date.

- [9] M. Woolhouse, "For many, snow day is business as usual," *Boston Globe*, sec. B, Jan. 13, 2011.

ELECTRONIC SOURCES

10. Article in an Online Journal or Magazine

- [10] R. Marani and A. G. Perri. (2010). An electronic medical device for preventing and improving the assisted ventilation of intensive care unit patients. *Open Elect. Electron. Eng. J.* [Online]. 4, pp. 16–20. Available: <http://www.benthamscience.com/open/toeej/openaccess2.htm>

11. Web Site

- [11] American Institute of Physics. (2011). American Institute of Physics [Online]. Available: <http://www.aip.org>

12. Government Site

- [12] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Preparation and planning for bioterrorism emergencies [Online]. Available: <http://emergency.cdc.gov/bioterrorism/prep.asp>

OTHER SOURCES

13. Thesis or Dissertation

- [13] J. L. Beutler, "Frequency response and gain enhancement of solid-state impact-ionization multipliers (SIMs)," Ph.D. dissertation, Dept. Elect. Eng., Brigham Young Univ., Provo, UT, 2010.

14. Standard For standards, include the title in italics, the standard number, and the date.

- [14] *Testing and Evaluation Protocol for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security*, ANSI Standard T&E Protocol N42.48, 2010.

15. Scientific or Technical Report

- [15] E. G. Fernando, "Investigation of Rainfall and Regional Factors for Maintenance Cost Allocation," Texas Transportation Inst. Texas A&M, College Station, TX, Report 5-4519-01-1, Aug. 2010.

16. Paper Published in Conference Proceedings

- [16] T. O'Brien, A. Ritz, B. J. Raphael, and D. H. Laidlaw, "Gremlin: An interactive visualization model for analyzing genomic rearrangements," in *Proc. IEEE Information Visualization Conf.*, 2010, vol. 16, no. 6, pp. 918–926.

17. Government Document

- [17] W. R. Selbig and R. T. Bannerman, "Characterizing the size distribution of particles in urban stormwater by use of fixed-point sample-collection methods," U.S. Geological Survey, Open-File Report 2011–1052, 2011.

18. Unpublished Document

- [18] S. Reed, "An approach to evaluating the autistic spectrum in uncooperative adolescents," unpublished.

Sample IEEE Reference List

Following is a sample reference list using the IEEE numbered reference system. The references are listed in the order in which they might appear in a fictional document.

Reference List	
[1] S. Schmidt. (2008, June). Arthur C. Clarke, 1917–2008. <i>Analogsf.com</i> [Online]. Available: http://www.analogsf.com/0806/Obitclarke.shtml	← Article in an online magazine
[2] E. Castronova, "The changing meaning of play," in <i>Online Communication and Collaboration: A Reader</i> , H. M. Donelan, K. L. Kear, and M. Ramage, Eds. New York: Routledge, 2010, pp. 184–189.	← Chapter in an edited book
[3] L. Xinju, <i>Laser Technology</i> , 2nd ed. Boca Raton, FL: CRC Press, 2010, pp. 203–205.	← Book in an edition other than the first
[4] R. Marani and A. G. Perri. (2010). An electronic medical device for preventing and improving the assisted ventilation of intensive care unit patients. <i>Open Elect. Electron. Eng. J.</i> [Online]. 4, pp. 16–20. Available: http://www.benthamsience.com/open/toeej/openaccess2.htm	← Online article
[5] <i>Testing and Evaluation Protocol for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security</i> , ANSI Standard T&E Protocol N42.48, 2010.	← Standard
[6] A. C. Mathieson, E. J. Hehre, C. J. Dawes, and C. D. Neefus, "An historical comparison of seaweed populations from Casco Bay, Maine," <i>Rhodora</i> , vol. 110, no. 941, pp. 1–10, 2008.	← Journal article

MLA STYLE

MLA style consists of two elements: citations in the text and a list of works cited at the end of the document.

 **On TechComm Web**

For more information, see the MLA Web site. Click on Links Library for Appendix Part B on <bedfordstmartins.com/techcomm>.

MLA Style for Textual Citations

- | | |
|--|--|
| 1. Entire Work 697 | 8. Source with an Unknown Author 698 |
| 2. Specific Page(s) 697 | 9. Multiple Sources in One Citation 698 |
| 3. Work Without Page Numbers 697 | 10. Multiple Authors with the Same Last Name 699 |
| 4. Multiple Sources by the Same Author 697 | 11. Chapter or Section in an Edited Book 699 |
| 5. Source with Multiple Authors 698 | 12. Multivolume Work 699 |
| 6. Source Quoted Within Another Source 698 | 13. Entry in a Reference Work 699 |
| 7. Source Issued by an Organization 698 | 14. Electronic Source 699 |

MLA Style for Works Cited Entries

BOOKS

- | | |
|---|---|
| 15. Book by One Author 702 | 35. Short Work from a Web Site 707 |
| 16. Book by Multiple Authors 702 | 36. Online Book 707 |
| 17. Multiple Books by the Same Author 702 | 37. Article in an Online Periodical 707 |
| 18. Book Issued by an Organization 702 | 38. Article from a Database or Subscription Service 707 |
| 19. Book by an Unknown Author 702 | 39. Dissertation 707 |
| 20. Edited Book 702 | 40. CD-ROM 709 |
| 21. Chapter or Section in an Edited Book 702 | 41. E-mail Message 709 |
| 22. Book in an Edition Other Than the First 703 | 42. Online Posting 709 |
| 23. Multivolume Work 703 | 43. Other Online Sources 709 |
| 24. Book That Is Part of a Series 703 | |
| 25. Translated Book 703 | |
| 26. Book in a Language Other Than English 703 | |
| 27. Entry in a Reference Work 703 | |

PERIODICALS

28. Journal Article 705
29. Magazine Article 705
30. Newspaper Article 705
31. Unsigned Article 705
32. Article That Skips Pages 705
33. Review 705

ELECTRONIC SOURCES

34. Entire Web Site 705

OTHER SOURCES

44. Government Document 709
45. Article from Conference Proceedings 710
46. Pamphlet 710
47. Report 710
48. Interview 710
49. Letter or Memo 710
50. Lecture or Speech 711
51. Map or Chart 711
52. Photograph or Work of Art 711
53. Legal Source 711
54. Radio or Television Program 711
55. Film, Video, or DVD 712
56. Advertisement 712

MLA Textual Citations

In MLA style, the textual citation typically includes the name of the source's author and the number of the page being referred to. Textual citations vary depending on the type of information cited, the author's name, and the context of the citation. The following models illustrate a variety of common textual citations; for additional examples, consult the *MLA Handbook for Writers of Research Papers*.

1. Entire Work If you are referring to the whole source, not to a particular page or pages, use only the author's name.

Harwood's work gives us a careful framework for understanding the aging process and how it affects communication.

2. Specific Page(s) Immediately following the borrowed material, include a parenthetical reference with the author's name and the page number(s) being referred to. Do not add a comma between the name and the page number, and do not use the abbreviation *p.* or *pp.*

Each feature evolves independently, so there can't be a steady progression of fossils representing change (Prothero 27).

If your sentence already includes the author's name, include only the page number in the parenthetical notation.

Prothero explains why we won't find a steady progression of human fossils approaching modern humans, as each feature evolves independently (27).

3. Work Without Page Numbers Give a paragraph, section, or screen number, if provided. Use *par.* (singular) or *pars.* (plural) to indicate paragraph numbers. Either spell out or use standard abbreviations for other identifying words. Use a comma after the name if it begins the citation.

Under the right conditions, humanitarian aid forestalls health epidemics in the aftermath of natural disasters (Bourmah, pars. 3–6).

Maternal leave of at least three months has a significantly positive effect on the development of attachment in the infant (Ling, screen 2).

4. Multiple Sources by the Same Author If you cite two or more sources by the same author, either include the full source title in the text or add a shortened title after the author's name in the parenthetical citation to prevent confusion.

Chatterjee believes that diversification in investments can take many forms (*Diversification* 13).

Risk is a necessary component of a successful investment strategy (Chatterjee, *Fail-safe* 25).

5. Source with Multiple Authors For a source written by two or three authors, cite all the names.

Grendel and Chang assert that . . .

This phenomenon was verified in the late 1970s (Grendel and Chang 281).

For a source written by four or more authors, either list all the authors or give only the first author, followed by the abbreviation *et al.* Follow the same format as in the works cited list.

Studies show that incidences of type 2 diabetes are widespread and rising quickly (Gianarikas *et al.*).

6. Source Quoted Within Another Source Give the source of the quotation in the text. In the parenthetical citation, give the author and page number(s) of the source in which you found the quotation, preceded by *qtd. in.*

Freud describes the change in men's egos as science proved that the earth was not the center of the universe and that man was descended from animals (*qtd. in* Prothero 89–90).

Only the source by Prothero will appear in the list of works cited.

7. Source Issued by an Organization If the author is an organization rather than a person, use the name of the organization. When giving the organization's name in parentheses, abbreviate common words in the name.

In a recent booklet, the Association of Sleep Disorders discusses the causes of narcolepsy (2–3).

The causes of narcolepsy are discussed in a recent booklet (Assn. of Sleep Disorders 2–3).

8. Source with an Unknown Author If the source does not identify an author, use a shortened form of the title in your parenthetical citation.

Multidisciplinary study in academia is becoming increasingly common (“Interdisciplinary” 23).

In a Web document, the author's name is often at the end of the document or in small print on the home page. Do some research before assuming that a Web site does not have an author. Remember that an organization may be the author. (See item 7.)

9. Multiple Sources in One Citation To refer to two or more sources at the same point, separate the sources with a semicolon.

Much speculation exists about the origin of this theory (Brady 42; Yao 388).

10. Multiple Authors with the Same Last Name If two or more sources have authors with the same last name, spell out the first names of those authors in the text and use the authors' first initials in the parenthetical citation.

In contrast, Albert Martinez has a radically different explanation (29).

The economy's strength may be derived from its growing bond market (J. Martinez 87).

11. Chapter or Section in an Edited Book Cite the author of the work, not the editor of the anthology. (See item 21 on page 702.)

Wolburg and Treise note that college binge drinkers include students with both high and low GPAs (4).

12. Multivolume Work If you use only one volume of a multivolume work, list the volume number in the works cited list only. If you use more than one volume of a multivolume work, indicate the specific volume you are referring to, followed by a colon and the page number, in your parenthetical citation.

Many religious organizations opposed the Revolutionary War (Hazlitt 2: 423).

13. Entry in a Reference Work If the entry does not have an author, alphabetize it by the word or term you referenced. You do not need to cite a page number for encyclopedias and dictionaries because they are arranged alphabetically.

The term *groupism* is important to understand when preparing to communicate with Japanese business counterparts ("Groupism").

14. Electronic Source When citing electronic sources in your document, follow the same rules as for print sources, providing author names and page numbers, if available. If an author's name is not given, use either the full title of the source in the text or a shortened version of the title in the parenthetical citation. If no page numbers are used, include any other identifying numbers, such as paragraph or section numbers. (See item 3 on page 697.)

Twenty million books were in print by the early sixteenth century (Rawlins, ch. 3, sec. 2).

The MLA List of Works Cited

A list of works cited provides the information your readers will need to find each source you have cited in the text. It should not include background reading. Following are some guidelines for an MLA-style list of works cited.

- *Arranging entries.* Arrange the entries alphabetically by the author's last name. If two or more works are by the same author, arrange them alphabetically by title. Alphabetize works by an organization by the first significant word in the name of the organization.

In This Book

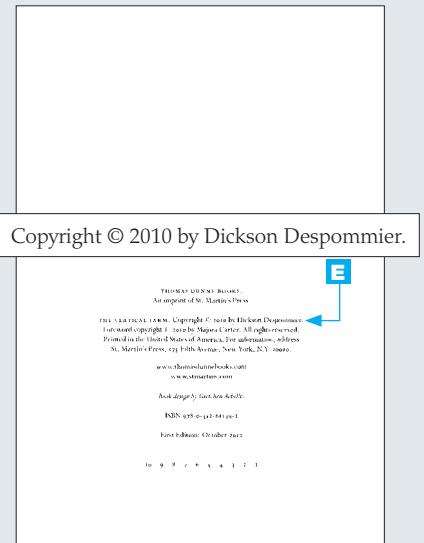
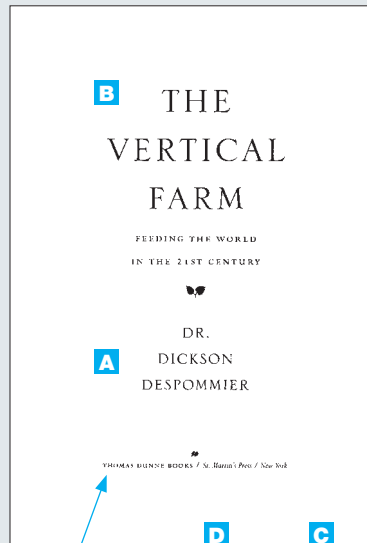
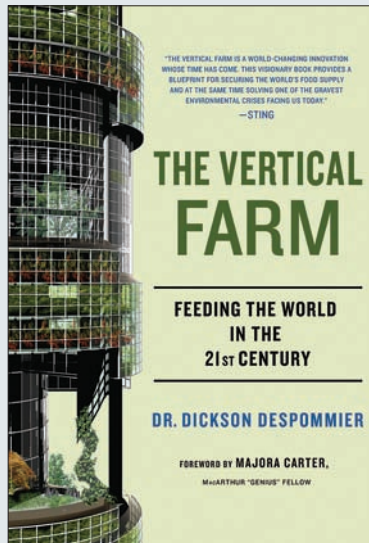
For a sample MLA-style list of works cited, see p. 712.

- **Book titles.** Italicize titles of books and follow standard capitalization rules. Note that in MLA style, prepositions are not capitalized.
- **Publication information.** Shorten the publisher's name. For cities outside the United States, include the province (if Canada) or country, abbreviated, unless the city is well known (such as Tokyo or London).
- **Periodical titles.** Italicize titles of periodicals and capitalize all major words. Omit any initial article.
- **Article titles.** Place titles of articles and other short works in quotation marks and capitalize all major words.
- **Electronic sources.** Include as much information as you can about electronic sources, such as author, date of publication, identifying numbers, and retrieval information. Also, be sure to record the date you retrieved the information, because electronic information changes frequently. If no author is known, start with the title of the Web site. Italicize titles of entire Web sites; treat titles of works within Web sites, such as articles and video clips, as in print sources. In citations for online sources, include the sponsor or publisher, as well as the date of publication or update. If this information can't be located, use *N.p.* (for *No publisher*) or *n.d.* (for *no date*). Insert the word *Web* before the date of retrieval. Include the URL only if you feel that your reader will be unable to locate the source with a search engine. Place the URL in angle brackets at the end of the entry, after the date of retrieval.
- **Indenting.** Use a hanging indent, with the second and subsequent lines of each entry indented one-half inch.
- **Spacing.** Double-space the entire works cited list. Do not add extra spacing between entries.
- **Page numbers.** Do not use the abbreviation *p.* or *pp.* when giving page numbers. For a range of pages, give only the last two digits of the second number if the previous digits are identical (for example, 243–47, not 243–247 or 243–7). Use a plus sign (+) to indicate that an article continues on subsequent pages interrupted by other articles or advertisements.
- **Dates.** Follow this format: day, month, year, with no commas (20 Feb. 2009). Spell out *May*, *June*, and *July*; abbreviate all other months by using the first three letters (except *Sept.*) plus a period.
- **Medium.** With a few exceptions, explained below, list the medium of publication, followed by a period, as the last part of any entry. (See bullet item on electronic sources above.) Examples: *Print*; *Web*; *Radio*; *Television*; *CD*; *CD-ROM*; *Audiocassette*; *Film*; *Videocassette*; *DVD*; *Performance*; *Address*; *MS* (for *manuscript*); *TS* (for *typescript*); *E-mail*; *PDF file*; *Microsoft Word file*; *JPEG file*; *MP3 file*.

Following are models of works cited list entries for a variety of sources. For further examples of MLA-style citations, consult the *MLA Handbook for Writers of Research Papers*.

MLA: CITING A BOOK BY ONE AUTHOR

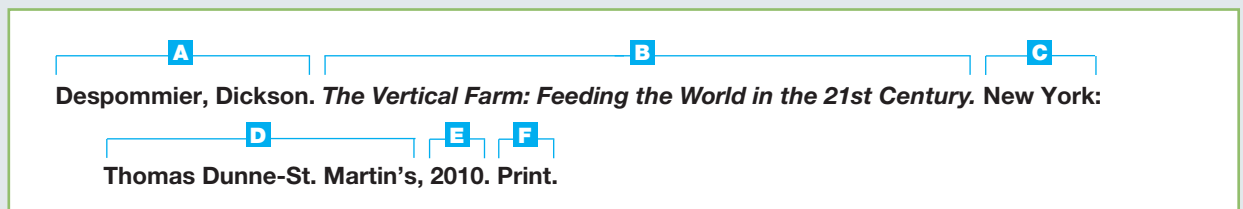
When citing a book, use the information from the title page and the copyright page (on the reverse side of the title page), not from the book's cover or a library catalog.




Thomas Dunne Books / St. Martin's Press / New York

Record the following information:

- A The author.** Give the last name first, followed by a comma, the first name, and the middle initial (if given). Don't include titles such as *MD*, *PhD*, or *Sir*; include suffixes after the name and a comma (Jones, Durham F., Jr.). End with a period.
- B The title.** Give the full title; include the subtitle (if any), preceded by a colon. Italicize the title and subtitle, capitalizing all major words. End with a period.
- C The city of publication.** If more than one city is given, use the first one listed. For a city outside the United States that may be unfamiliar to your readers or confused with another city, add the abbreviation for the province (if Canada) or country: London, ON; Plymouth, Eng. Insert a colon.
- D The publisher.** Give a shortened version of the publisher's name. If there is an imprint, give the name of the imprint and the publisher, connected with a hyphen. Do not include the words *Press*, *Publisher*, or *Inc.* Insert a comma.
- E The date of publication.** If more than one copyright date is given, use the most recent one. Use *n.d.* if no date is given. End with a period.
- F The medium of publication.** For a book, this would be *Print*.



 **In This Book** For more MLA-style models for citing other types of books, see pp. 702 and 703.

BOOKS

15. Book by One Author Include the author's full name, in reverse order, followed by the book title. Next give the location and name of the publisher, followed by the year of publication and the medium.

Gleick, James. *The Information: A History, a Theory, a Flood*. New York: Pantheon, 2011. Print.

16. Book by Multiple Authors For a book by two or three authors, present the names in the sequence in which they appear on the title page. Use reverse order for the name of the first author only. Use a comma to separate the names of the authors.

Burt, Stephen, and David Mikics. *The Art of the Sonnet*. Cambridge: Belknap-Harvard UP, 2010. Print.

For a book by four or more authors, either name all the authors or use the abbreviation *et al.* after the first author's name.

Thomas, David N., et al. *The Biology of Polar Regions*. Oxford: Oxford UP, 2008. Print.

17. Multiple Books by the Same Author For the second and subsequent entries by the same author, use three hyphens followed by a period in place of the name. Arrange the entries alphabetically by title.

Hassan, Robert. *Empires of Speed: Time and the Acceleration of Politics and Society*. Leiden: Brill, 2009. Print.

---. *The Information Society: Cyber Dreams and Digital Nightmares*. Cambridge, UK: Polity, 2008. Print.

18. Book Issued by an Organization The organization takes the position of the author.

World Bank. *Atlas of Global Development: A Visual Guide to the World's Greatest Challenges*. Washington: World Bank, 2011. Print.

19. Book by an Unknown Author If the author of the book is unknown, begin with the title.

The World Almanac Notebook Atlas. Union: Hammond, 2010. Print.

20. Edited Book List the book editor's name, followed by *ed.* (or *eds.* if more than one editor), in place of the author's name.

Levi, Scott Cameron, and Ron Sela, eds. *Islamic Central Asia: An Anthology of Historical Sources*. Bloomington: Indiana UP, 2010. Print.

21. Chapter or Section in an Edited Book Give the author and title of the article first, followed by the book title and editor. Present the editor's name in

normal order, preceded by *Ed.* (for *Edited by*). After the publication information, give the pages on which the article appears.

Marx, Karl. "Proletarians and Communists." *Marx Today: Selected Works and Recent Debates*. Ed. John F. Sitton. New York: Palgrave-Macmillan, 2010. 51–56. Print.

22. Book in an Edition Other Than the First List the edition number after the title of the book.

Geary, Patrick, ed. *Readings in Medieval History*. 4th ed. North York, ON: U of Toronto P, 2010. Print.

23. Multivolume Work If you use two or more volumes from a multivolume work, give the total number of volumes before the place of publication (4 vols.). If you use only one volume, give the volume number before the place of publication. Give the total number of volumes after the medium, if you wish.

Sophocles. *The Complete Sophocles*. Ed. Peter Burian and Alan Shapiro. Vol. 1. New York: Oxford UP, 2010. Print. 2 vols.

24. Book That Is Part of a Series End the entry with the series name as it appears on the title page (but use common abbreviations, such as *Ser.*), followed by the series number, if any. Note that the series information follows the medium.

Aune, David Edward, ed. *The Blackwell Companion to the New Testament*. Malden: Wiley-Blackwell, 2010. Print. Blackwell Companions to Religion.

25. Translated Book After the title, present the translator's name in normal order, preceded by *Trans.* (for *Translated by*).

Torre, Domingo de la, Romín Teratol, and Antzelmo Peres. *Travelers to the Other World: A Maya View of North America*. Trans. Robert M. Laughlin. Ed. Carol Karasik. Albuquerque: U of New Mexico P, 2010. Print.

26. Book in a Language Other Than English You may give a translation of the book's title in brackets.

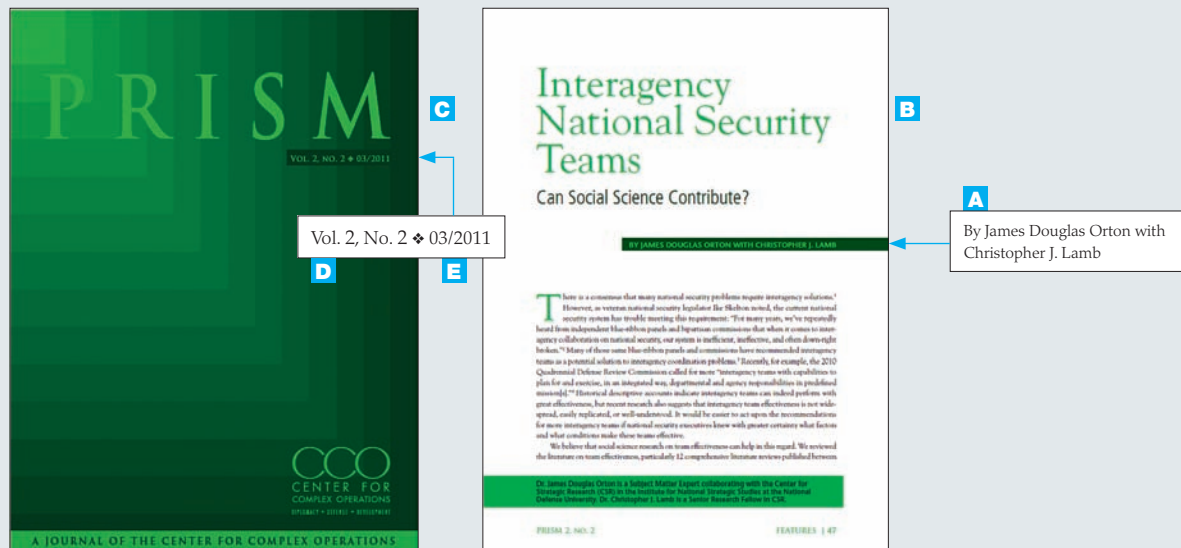
Moine, Fabienne. *Poésie et identité féminines en Angleterre: le genre en jeu, 1830–1900* [*Poetry and Female Identity in England: Genre/Gender at Play*]. Paris: Harmattan, 2010. Print.

27. Entry in a Reference Work If the work is well known, you do not need to include the publisher or place of publication. If entries are listed alphabetically, you do not need to include a page number.

"Desdemona." *Women in Shakespeare: A Dictionary*. Ed. Alison Findlay. New York: Continuum, 2010. Print.

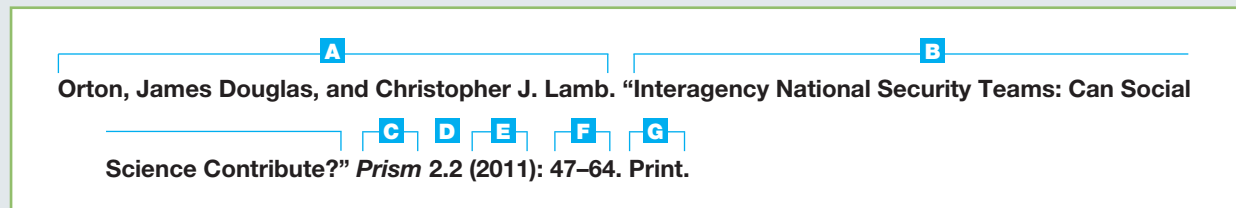
MLA: CITING AN ARTICLE FROM A PERIODICAL


Periodicals include journals, magazines, and newspapers. This page gives an example of a citation for an article from a print magazine.



Record the following information:

- A The author.** Give the last name first, followed by a comma, the first name, and the middle initial (if given). Omit titles such as *MD*, *PhD*, or *Sir*; include suffixes after the name and a comma (Jones, Durham F., Jr.). End with a period.
- B The article title.** Give the title; include the subtitle (if any), preceded by a colon. Enclose the full title in quotation marks, and capitalize all major words. Insert a period inside the closing quotation mark.
- C The periodical title.** Italicize the title. Omit any initial article and capitalize all major words.
- D The volume number and issue number.** For journals, give the volume number, followed by a period (no space) and then the issue number. Use both volume and issue regardless of how the journal is paginated.
- E The date of publication.** For journals, give the year in parentheses, followed by a colon. For monthly magazines, don't use parentheses; give the month and year. For weekly magazines and newspapers, don't use parentheses; give the day, month, and year (in that order). Abbreviate the names of all months except May, June, and July.
- F Inclusive page numbers.** For a range of page numbers 100 and above, give only the last two digits of the second number if the previous digits are identical (for example, 243–47, *not* 243–247 or 243–7). Include section letters for newspapers, if relevant. End with a period.
- G The medium of publication.** *Print*.



 **In This Book** For more MLA-style models for citing other types of periodical articles, see p. 705.

PERIODICALS

28. Journal Article List the author's name, the article title (in quotation marks), and the journal title (italicized), followed by the volume number, issue number, year, page number(s), and medium.

Mooney, William. "Sex, Booze, and the Code: Four Versions of the *Maltese Falcon*." *Literature-Film Quarterly* 39.1 (2011): 54–72. Print.

29. Magazine Article List the author's name, the article title (in quotation marks), and the magazine title (italicized), followed by the issue date, page number(s), and medium.

Seabrook, John. "Crush Point." *New Yorker* 7 Feb. 2011: 32–38. Print.

30. Newspaper Article List the author's name, the article title (in quotation marks), and the newspaper name (italicized), followed by the issue date, page number(s) (which might include the section letter), and medium. If the newspaper appears in more than one edition, add a comma after the date and cite the edition (for example, *late ed.*). If sections are numbered, add a comma after the date, the word *sec.*, and the section number.

Robertson, Campbell. "Beyond the Oil Spill, the Tragedy of an Ailing Gulf." *New York Times* 21 Apr. 2011: A17. Print.

31. Unsigned Article If the author of an article is not indicated, begin with the title. Alphabetize the work by title, ignoring any initial article.

"How Much Is Enough?" *Economist* 26 Feb. 2011: 5. Print.

32. Article That Skips Pages Give the first page on which the article appears, followed by a plus sign (+) and a period.

Kennicott, Philip. "Out-Vermeering Vermeer." *Washington Post* 10 Apr. 2011: E1+. Print.

33. Review For a book or film review, give the author of the review and the title of the review (in quotation marks), followed by the words *Rev. of* and the title of the work reviewed (italicized). Insert a comma and the word *by*, then give the name of the author of the work. (Instead of *by*, you might use *ed.*, *trans.*, or *dir.*, depending on the work.) End with the publication information for the periodical in which the review was published.

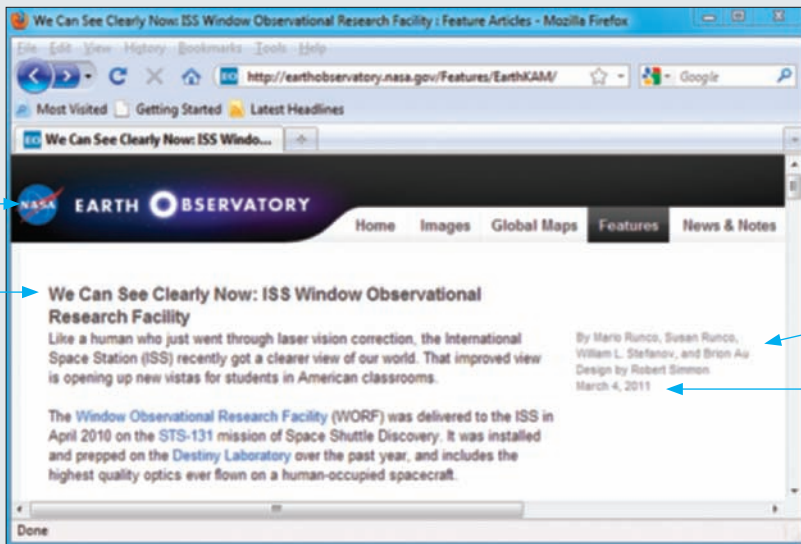
Wynne, Clive. "Our Conflicted Relationship with Animals." Rev. of *Some We Love, Some We Hate, Some We Eat*, by Hal Herzog. *Nature* 467.7313 (2010): 275–76. Print.

ELECTRONIC SOURCES

34. Entire Web Site If you are citing an entire Web site, begin with the name of the author or editor (if given) and the title of the site (italicized). Then give the name of the sponsoring institution or organization (or *N.p.*), the date of pub-

MLA: CITING A SHORT WORK FROM A WEB SITE

You will likely need to search the Web site to find some of the citation information you need. Always include the sponsor or publisher and the date of publication or most recent update.




Record the following information:

- A The author.** Give the last name first, followed by a comma, the first name, and the middle initial (if given). Omit titles such as *MD*, *PhD*, or *Sir*; include suffixes after the name and a comma (Jones, Durham F., Jr.). End with a period.
- B The document title.** Give the full title; include the subtitle (if any), preceded by a colon. Enclose the title and subtitle in quotation marks and capitalize all major words. Place a period inside the closing quotation mark.
- C The title of the Web site.** Italicize the title of the Web site. If there is no clear title and it is a personal home page, use *Home page* without italicizing it. End with a period.
- D The name of the sponsoring organization.** Look for the sponsor's name at the bottom of the home page.

If you can't identify the sponsor or publisher, use *N.p.* End with a comma.

- E The date of publication or most recent update.** Use the day, month, year format; abbreviate all months except May, June, and July. If you can't identify the date of publication or most recent update, use *n.d.* End with a period.
- F The medium of publication.** *Web.*
- G The retrieval date.** Give the most recent date you accessed the site. Provide a URL only if there is little likelihood that your reader will be able to find the information using a search engine. Give the complete URL, enclosed in angle brackets and followed by a period, after the date. If the URL is very long and complicated, however, give the URL of the site's search page instead.

Runco, Mario, Susan Runco, William L. Stefanov, and Brion Au. "We Can See Clearly Now: ISS Window Observational Research Facility." *NASA Earth Observatory*. National Aeronautics and Space Administration, 4 Mar. 2011. Web. 14 July 2011.

 **In This Book** For more MLA-style models for citing other types of Web sources, see pp. 705, 707, and 709.

lication or most recent update (or *n.d.*), the medium, and your access date. Only if necessary, add the URL in angle brackets at the end, followed by a period.

Poets.org. Academy of American Poets, 1997–2011. Web. 12 Jan. 2011.

35. Short Work from a Web Site If you are citing a portion of a Web site, begin with the author, the title of the work (in quotation marks), and the title of the site (italicized). Then include the site's sponsor, the date of publication, the medium, and your access date.

Ferenstein, Greg. "How Mobile Technology Is a Game Changer for Developing Africa." *Mashable*. Mashable, 19 July 2010. Web. 14 Jan. 2011.

36. Online Book Begin with the author's name and the title of the work, along with publication information about the print source. If the book has not been published before, include the online publication date and publisher. Include the medium. End with your access date.

Martín-Palma, Raúl J., and Akhlesh Lakhtakia. *Nanotechnology: A Crash Course*. Bellingham: SPIE, 2010. *SPIE Digital Library*. Web. 16 Jan. 2011.

37. Article in an Online Periodical Begin with the author's name and include the title of the document, the name of the periodical, and the date of publication. If the periodical is a scholarly journal, include relevant identifying numbers, such as volume, issue, and page numbers (or *n. pag.* if there are no page numbers). For abstracts of articles, include the word *Abstract*, followed by a period, after the page number(s). End with the medium and your access date.

Maas, Corey D. "Natural Law, Lutheranism, and the Public Good." *Lutheran Witness* 130.3 (2011): n. pag. Web. 14 Jan. 2011.

For magazine and newspaper articles found online, give the author, the title of the article (in quotation marks), the title of the magazine or newspaper (italicized), the sponsor or publisher of the site (use *N.p.* if there is none), the date of publication, the medium, and your date of access.

Melia, Mike. "Atlantic Garbage Patch: Pacific Gyre Is Not Alone." *Huffington Post*. HuffingtonPost.com, 15 Apr. 2010. Web. 13 Feb. 2011.

38. Article from a Database or Subscription Service After giving the print article information, give the name of the database (italicized), medium (*Web*), and your access date.

Kunnan, Anthony John. "Publishing in the Era of Online Technologies." *Modern Language Journal* 94.4 (2010): 643–45. *Academic OneFile*. Web. 12 Feb. 2011.

39. Dissertation

Zimmer, Kenyon. *The Whole World Is Our Country: Immigration and Anarchism in the United States, 1885–1940*. Diss. Pittsburgh: U of Pittsburgh, 2010. Print.

MLA: CITING AN ARTICLE FROM A DATABASE

Libraries subscribe to services such as LexisNexis, ProQuest, InfoTrac, and EBSCOhost, which provide access to databases of electronic texts.

The screenshot shows the EBSCOhost search results page. Callout G points to the search bar containing 'Academic Search Complete'. Callout B points to the search results title 'Effects of Empowerment on Performance in Open-Source Software Projects'. Callout A points to the authors 'Ke, Weiling¹ Zhang, Ping²'. Callout C points to the source information 'IEEE Transactions on Engineering Management; 05/01/2011, Vol. 58 Issue 2, p334-346, 13p'. Callouts E, D, and F point to the volume, issue, and page numbers respectively.

Record the following information:

- A The author.** Give the last name first, followed by a comma, the first name, and the middle initial (if known). For an article by multiple authors, only the name of the first author is presented in reverse order; a comma separates the names of the authors. End with a period.
- B The article title.** Give the full title; include the subtitle (if any), preceded by a colon. Insert a period. Enclose the title and period in quotation marks, and capitalize all major words.
- C The periodical title.** Italicize the title. Omit any initial article, and capitalize all major words.
- D The volume number and issue number (if appropriate).**
- E The date of publication.** For journals, give the year in parentheses. For monthly magazines, don't use parentheses; give the month and year. For weekly magazines and newspapers, don't use parentheses; give the day, month, and year (in that order).
- F Inclusive page numbers.** If only the first page number is given, follow it with a plus sign and a period.
- G The name of the database.** Italicize.
- H The medium of publication.** *Web*.
- I The retrieval date.** Use the day, month, year format. If necessary, add the URL, enclosed in angle brackets and followed by a period.

Ke, Weiling, and Ping Zhang. "Effects of Empowerment on Performance in Open-Source Software Projects." *IEEE Transactions on Engineering Management* 58.2 (2011): 334-46. *Academic Search Complete*. *Web*. 10 May 2011.

In This Book For more MLA-style models for citing other types of electronic sources, see pp. 705, 707, and 709.

40. CD-ROM Treat a CD-ROM as you would any other source. If the source is a book, treat it as a book with CD-ROM as the medium. For an article in a database, include CD-ROM after the page numbers, followed by the database title, the vendor, and the publication date of the database.

Greek-Cypriot Maritime Guide 2011. Alimos, Greece: Marine Information Services, 2011. CD-ROM.

41. E-mail Message Include the author's name and the subject line (if any) in quotation marks, then the words *Message* to followed by the name of the recipient (if you, *the author*). End with the date the e-mail was sent and the medium (*E-mail*).

Lange, Frauke. "Data for Genealogical Project." Message to the author. 26 Dec. 2010. E-mail.

42. Online Posting List the author's name, the subject line (if any) in quotation marks, the name of the discussion group or newsgroup, the sponsor, the posting date, the medium (*Web*), and your access date. If there is no subject line, use the expression *Online posting* (not in quotation marks) in its place.

Swallow, Bill. "Re: New Doc Group: FrameMaker or Flare?" *TECHWR-L*. RayComm, 5 Jan. 2010. Web. 10 Feb. 2011.

43. Other Online Sources Follow the MLA guidelines, adapting them as appropriate to the electronic medium. The following examples are for a podcast and a blog, respectively. For a podcast, the medium might be *Web*, *MP3 file*, *MPEG-4 file*, *Video file*, and so on. If the blog doesn't have a title (in quotation marks), use the expression *Weblog entry* or *Weblog comment* in its place, not in quotation marks.

"Hubble Marks 20 Years of Discovery." *NASACast Video*. NASA, 23 Apr. 2010. Web. 15 Jan. 2011.

Raymo, Chet. "Divine Particulars." *Science Musings Blog*. Chet Raymo, 21 Jan. 2011. Web. 15 Feb. 2011.

OTHER SOURCES

44. Government Document Give the government name and agency as the author, followed by the publication title, the edition or identifying number (if any), the place and publisher, the date, and the medium.

United States. National Commission on the Causes of the Financial and Economic Crisis. *The Financial Crisis Inquiry Report: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States*. Washington: GPO, 2011. Print.

For an online government publication, begin with the name of the country and the government agency. Follow with the document title and the name of the author (if known), preceded by the word *By*. If the author is not known, follow with the agency. Give the report number, the date of publication, and the medium. For an online source, include the publisher or sponsor and your date of access.

United States. Dept. of the Interior. *A Refined Characterization of the Alluvial Geology of Yucca Flat and Its Effect on Bulk Hydraulic Conductivity*. By G. A. Phelps, A. Boucher, and K. J. Halford. Open-File Report 2010-1307. US Geological Survey, 2011. Web. 12 Feb. 2011.

45. Article from Conference Proceedings List the author's name, the article title, the proceedings title, and the editor's name, followed by the publication information.

Glicksman, Robert. "Climate Change Adaptation and the Federal Lands." *The Past, Present, and Future of Our Public Lands: Celebrating the 40th Anniversary of the Public Land Law Review Commission's Report*. Ed. Gary C. Bryner. Boulder: Natural Resources Law Center, 2010. Print.

46. Pamphlet Cite a pamphlet as you would a book.

US Geological Survey. *Facing Tomorrow's Challenges: An Overview*. Denver: Habitat, 2008. Print.

47. Report Cite a report as you would a book.

Liebreich, Michael, et al. *Green Investing 2010: Policy Mechanisms to Bridge the Financing Gap*. Geneva: World Economic Forum, 2010. Print.

48. Interview For a published interview, begin with the name of the person interviewed. If the interview has a title, enclose it in quotation marks. Insert the word *Interview* and give the interviewer's name, if relevant, followed by a period and the bibliographic information for the work in which it was published.

Walcott, Derek. "Purple Prose." Interview by Alexander Newbauer. *Harper's Magazine* Feb. 2010: 24–26. Print.

If you conducted the interview yourself, give the interviewee's name, the words *Personal interview*, and the date.

Youngblood, Adelaide. Personal interview. 5 Jan. 2011.

49. Letter or Memo If the letter or memo was written to you, give the writer's name, the words *Letter* [or *Memo*] *to the author*, and the date it was written. End with the medium (e.g., MS for *manuscript* or TS for *typescript*).

Jakobiak, Ursula. Letter to the author. 27 Oct. 2010. MS.

If the letter or memo was written to someone other than you, give the recipient's name in place of the words *the author*.

50. Lecture or Speech Give the speaker's name, the title of the lecture or speech, and the place and date. If there is no title, use a descriptive label (such as *Lecture* or *Speech*), not enclosed in quotation marks. End with the medium.

Wang, Samuel. "Neuroscience and Everyday Life." Freshman Assembly, Princeton University, Princeton, NJ. 12 Sept. 2010. Lecture.

51. Map or Chart Give the author (if known), the title (in quotation marks), the word *Map* or *Chart*, the publication information, and the medium. For an online source, add the sponsor or publisher, and the date of access.

"Aftershock Map Tohoku Earthquake." Map. *Earthquake Hazards Program*. US Geological Survey, 11 Mar. 2011. Web. 14 Apr. 2011.

52. Photograph or Work of Art Give the name of the artist; the title of the artwork, italicized; the date of composition; the medium of composition; and the institution and city in which the artwork can be found. For artworks found online, omit the medium of composition and include the title of the Web site on which you found the work, the medium, and your date of access.

Smedley, W. T. *On the Beach at Narragansett Pier*. 1900. Prints and Photographs Div., Lib. of Cong. *Cabinet of American Illustration*. Web. 15 Feb. 2011.

53. Legal Source For a legal case, give the name of the first plaintiff and first defendant, the law report number, the name of the court, the year of the decision, the medium, and the date of access (if on the Web).

Natl. Assn. of Home Builders v. Defenders of Wildlife. No. 06-340. Supreme Court of the US. 2007. Supreme Court of the United States. Web. 12 Feb. 2011.

For a legislative act, give the name of the act, the Public Law number, the Statutes at Large volume and page numbers, the date it was enacted, the medium, and the date of access.

Protect America Act of 2007. Pub. L. 110-55. 5 Stat. 121.552. 5 Aug. 2007. Web. 15 Feb. 2011.

54. Radio or Television Program Give the title of the episode or segment, if applicable, and the title of the program. Include relevant information about the host, writer, director, or performers. Then give the network, the local station (if any), the broadcast date, and the medium. If on the Web, after the in-

formation about the program give the network, the title of the Web site, the medium (*Web*), and your date of access.

“Aircraft Safety.” *Nightline*. Narr. Cynthia McFadden. ABC. WCVB, Boston, 4 Apr. 2011. Television.

“Petty Tyrant.” *This American Life*. Host Ira Glass. Natl. Public Radio. WBEZ, Chicago, 12 Nov. 2010. Radio.

55. Film, Video, or DVD Give the title of the film and the name of the director. You may also give the names of major performers (*Perf.*) or the narrator (*Narr.*). Give the distributor, the year of the original release, and the medium (*Film*, *DVD*, or *Videocassette*).

The King’s Speech. Dir. Tom Hooper. Perf. Colin Firth, Geoffrey Rush, and Helena Bonham Carter. The Weinstein Co., 2010. Film.

56. Advertisement Include the name of the product, organization, or service being advertised; the word *Advertisement*; and the publication information. If accessed online, give the source, the date, the medium (*Web*), and your access date.

NeutronicEar. Advertisement. *Smithsonian* Mar. 2011: 89. Print.

Sample MLA List of Works Cited

Following is a sample list of works cited using the MLA citation system.

Works Cited	
Book in an edition other than the first	Geary, Patrick, ed. <i>Readings in Medieval History</i> . 4th ed. North York, ON: U of Toronto P, 2010. Print.
Article from a database	Kunnan, Anthony John. “Publishing in the Era of Online Technologies.” <i>Modern Language Journal</i> 94.4 (2010): 643–45. <i>Academic OneFile</i> . Web. 12 Feb. 2011.
Chapter in an edited book	Marx, Karl. “Proletarians and Communists.” <i>Marx Today: Selected Works and Recent Debates</i> . Ed. John F. Sitton. New York: Palgrave-Macmillan, 2010. 51–56. Print.
Article in an online newspaper	Melia, Mike. “Atlantic Garbage Patch: Pacific Gyre Is Not Alone.” <i>Huffington Post</i> . HuffingtonPost.com, 15 Apr. 2010. Web. 13 Feb. 2011.
Journal article	Mooney, William. “Sex, Booze, and the Code: Four Versions of the <i>Maltese Falcon</i> .” <i>Literature-Film Quarterly</i> 39.1 (2011): 54–72. Print.

Part C: Editing and Proofreading Your Documents

This part of the handbook contains advice on editing your documents for grammar, punctuation, and mechanics. If your organization or professional field has a style guide with different recommendations about grammar and usage, you should of course follow those guidelines.

Your instructor might use the following abbreviations to refer you to specific topics in Parts C and D of this Appendix.

Abbreviation	Topic	Page Number	Abbreviation	Topic	Page Number
abbr	abbreviation	737	ref	ambiguous pronoun reference	716
adj	adjective (ESL)	718, 752	rep	repeated word (ESL)	754
adv	adverb (ESL)	753	run	run-on sentence	716
agr p/a	pronoun-antecedent agreement	719	sent	sentence part (ESL)	742
agr s/v	subject-verb agreement (ESL)	719, 749	sub	subordinating clause (ESL)	745
art	article (<i>a</i> , <i>an</i> , <i>the</i>) (ESL)	751	t	verb tense	720
cap	capitalization	738	vb	verb tense (ESL)	745
comp	comparison of items	718	.	period	726
cond	conditional sentence (ESL)	750	!	exclamation point	726
coor	coordinating clause (ESL)	744	?	question mark	727
cs	comma splice	715	,	comma	721
frag	sentence fragment	714	;	semicolon	725
help	helping verb and main verb (ESL)	748	:	colon	725
inf	infinitive form of the verb (ESL)	748	—	dash	727
-ing	<i>-ing</i> form of the verb (ESL)	747	()	parentheses	728
ital	italics (underlining)	732	-	hyphen	733
num	number	735	'	apostrophe	729
omit	omitted word or words (ESL)	754	“ ”	quotation marks	730
			⋯	ellipses	731
			< >	angle brackets	733
			[]	square brackets	732

GRAMMATICAL SENTENCES

frag Avoid Sentence Fragments

A sentence fragment is an incomplete sentence, an error that occurs when a sentence is missing either a verb or an independent clause. To correct a sentence fragment, use one of the following two strategies:

1. Introduce a verb.

FRAGMENT	The pressure loss caused by a worn gasket. This example is a fragment because it lacks a verb. (The word <i>caused</i> does not function as a verb here; rather, it introduces a phrase that describes the pressure loss.)
COMPLETE	The pressure loss was caused by a worn gasket. <i>Pressure loss</i> has a verb: <i>was caused</i> .
COMPLETE	We identified the pressure loss caused by a worn gasket. <i>Pressure loss</i> becomes the object in a new main clause: <i>We identified the pressure loss</i> .
FRAGMENT	A plotting program with clipboard plotting, 3-D animation, and FFTs.
COMPLETE	It is a plotting program with clipboard plotting, 3-D animation, and FFTs.
COMPLETE	A plotting program with clipboard plotting, 3-D animation, and FFTs will be released today.

2. Link the fragment (a dependent element) to an independent clause.

FRAGMENT	The article was rejected for publication. Because the data could not be verified. <i>Because the data could not be verified</i> is a fragment because it lacks an independent clause: a clause that has a subject and a verb and could stand alone as a sentence. To be complete, it needs more information.
COMPLETE	The article was rejected for publication because the data could not be verified. The dependent element is joined to the independent clause that precedes it.
COMPLETE	Because the data could not be verified, the article was rejected for publication. The dependent element is followed by the independent clause.

FRAGMENT	Delivering over 150 horsepower. The two-passenger coupe will cost over \$32,000.
COMPLETE	Delivering over 150 horsepower, the two-passenger coupe will cost over \$32,000.
COMPLETE	The two-passenger coupe will deliver over 150 horsepower and cost over \$32,000.

CS Avoid Comma Splices

A comma splice is an error that occurs when two independent clauses are joined, or spliced together, by a comma. Independent clauses in a comma splice can be linked correctly in three ways:

1. Use a comma and a coordinating conjunction (*and, or, nor, but, for, so, or yet*).

SPLICE	The 909 printer is our most popular model, it offers an unequal blend of power and versatility.
CORRECT	The 909 printer is our most popular model, for it offers an unequal blend of power and versatility. The coordinating conjunction <i>for</i> explicitly states the relationship between the two clauses.

2. Use a semicolon.

SPLICE	The 909 printer is our most popular model, it offers an unequal blend of power and versatility.
CORRECT	The 909 printer is our most popular model; it offers an unequal blend of power and versatility. The semicolon creates a somewhat more distant relationship between the two clauses than the link created with a comma and coordinating conjunction; the link remains implicit.

3. Use a period or another form of terminal punctuation.

SPLICE	The 909 printer is our most popular model, it offers an unequal blend of power and versatility.
CORRECT	The 909 printer is our most popular model. It offers an unequal blend of power and versatility. The two independent clauses are separate sentences. Of the three ways to punctuate the two clauses correctly, this punctuation suggests the most distant relationship between them.

run Avoid Run-on Sentences

In a run-on sentence (sometimes called a *fused sentence*), two independent clauses appear together with no punctuation between them. A run-on sentence can be corrected in the same three ways as a comma splice:

1. Use a comma and a coordinating conjunction (*and, or, nor, but, for, so, or yet*).

RUN-ON The 909 printer is our most popular model it offers an unequalled blend of power and versatility.

CORRECT The 909 printer is our most popular model, for it offers an unequalled blend of power and versatility.

2. Use a semicolon.

RUN-ON The 909 printer is our most popular model it offers an unequalled blend of power and versatility.

CORRECT The 909 printer is our most popular model; it offers an unequalled blend of power and versatility.

3. Use a period or another form of terminal punctuation.

RUN-ON The 909 printer is our most popular model it offers an unequalled blend of power and versatility.

CORRECT The 909 printer is our most popular model. It offers an unequalled blend of power and versatility.

ref Avoid Ambiguous Pronoun References

Pronouns must refer clearly to their antecedents—the words or phrases they replace. To correct ambiguous pronoun references, try one of these four strategies:

1. Clarify the pronoun's antecedent.

UNCLEAR Remove the cell cluster from the medium and analyze it.
Analyze what: the cell cluster or the medium?

CLEAR Analyze the cell cluster after removing it from the medium.

CLEAR Analyze the medium after removing the cell cluster from it.

CLEAR Remove the cell cluster from the medium. Then analyze the cell cluster.

CLEAR Remove the cell cluster from the medium. Then analyze the medium.

2. Clarify the relative pronoun, such as *which*, introducing a dependent clause.

UNCLEAR She decided to evaluate the program, which would take five months.
What would take five months: the program or the evaluation?

- CLEAR She decided to evaluate the program, a process that would take five months.
By replacing *which* with *a process that*, the writer clearly indicates that it is the evaluation that will take five months.
- CLEAR She decided to evaluate the five-month program.
By using the adjective *five-month*, the writer clearly indicates that it is the program that will take five months.

3. Clarify the subordinating conjunction, such as *where*, introducing a dependent clause.

- UNCLEAR This procedure will increase the handling of toxic materials outside the plant, where adequate safety measures can be taken.
Where can adequate safety measures be taken: inside the plant or outside?
- CLEAR This procedure will increase the handling of toxic materials outside the plant. Because adequate safety measures can be taken only in the plant, the procedure poses risks.
- CLEAR This procedure will increase the handling of toxic materials outside the plant. Because adequate safety measures can be taken only outside the plant, the procedure will decrease safety risks.
Sometimes the best way to clarify an unclear reference is to split the sentence in two, drop the subordinating conjunction, and add clarifying information.

4. Clarify the ambiguous pronoun that begins a sentence.

- UNCLEAR Allophanate linkages are among the most important structural components of polyurethane elastomers. They act as cross-linking sites.
What act as cross-linking sites: allophanate linkages or polyurethane elastomers?
- CLEAR Allophanate linkages, which are among the most important structural components of polyurethane elastomers, act as cross-linking sites.
The writer has rewritten part of the first sentence to add a clear nonrestrictive modifier and has combined it with the second sentence.

If you begin a sentence with a demonstrative pronoun that might be unclear to the reader, be sure to follow it immediately with a noun that clarifies the reference.

- UNCLEAR The new parking regulations require that all employees pay for parking permits. These are on the agenda for the next senate meeting.
What are on the agenda: the regulations or the permits?

CLEAR The new parking regulations require that all employees pay for parking permits. These regulations are on the agenda for the next senate meeting.

comp Compare Items Clearly

When comparing or contrasting items, make sure your sentence communicates their relationship clearly. A simple comparison between two items often causes no problems: “The X3000 has more storage than the X2500.” Simple comparisons, however, can sometimes result in ambiguous statements:

AMBIGUOUS Trout eat more than minnows.
Do trout eat minnows in addition to other food, or do trout eat more than minnows eat?

CLEAR Trout eat more than minnows do.

If you are introducing three items, make sure the reader can tell which two are being compared:

AMBIGUOUS Trout eat more algae than minnows.

CLEAR Trout eat more algae than they do minnows.

CLEAR Trout eat more algae than minnows do.

Beware of comparisons in which different aspects of the two items are compared:

ILLOGICAL The resistance of the copper wiring is lower than the tin wiring.

LOGICAL The resistance of the copper wiring is lower than that of the tin wiring.
Resistance cannot be logically compared with tin wiring. In the revision, the pronoun that substitutes for resistance in the second part of the comparison.

adj Use Adjectives Clearly

In general, adjectives are placed before the nouns that they modify: *the plastic washer*. In technical communication, however, writers often need to use clusters of adjectives. To prevent confusion in technical communication, follow two guidelines:

1. Use commas to separate coordinate adjectives.

Adjectives that describe different aspects of the same noun are known as coordinate adjectives.

portable, programmable device

adjustable, removable housings

The comma is used instead of the word *and*.

Sometimes an adjective is considered part of the noun it describes: *electric drill*. When one adjective modifies *electric drill*, no comma is required: *a reversible electric drill*. The addition of two or more adjectives, however, creates the traditional coordinate construction: *a two-speed, reversible electric drill*.

2. Use hyphens to link compound adjectives.

A compound adjective is made up of two or more words. Use hyphens to link these elements when compound adjectives precede nouns.

a variable-angle accessory

increased cost-of-living raises

The hyphens in the second example prevent *increased* from being read as an adjective modifying *cost*.

A long string of compound adjectives can be confusing even if you use hyphens appropriately. To ensure clarity, turn the adjectives into a clause or a phrase following the noun.

UNCLEAR an *operator-initiated default-prevention* technique

CLEAR a technique *initiated by the operator to prevent default*

agr s/v Maintain Subject-Verb Agreement

The subject and verb of a sentence must agree in number, even when a prepositional phrase comes between them. The object of the preposition may be plural in a singular sentence.

INCORRECT The *result* of the tests *are* promising.

CORRECT The *result* of the tests *is* promising.

The object of the preposition may be singular in a plural sentence.

INCORRECT The *results* of the test *is* promising.

CORRECT The *results* of the test *are* promising.

Don't be misled by the fact that the object of the preposition and the verb don't sound natural together, as in *tests is* or *test are*. Here, the noun *test(s)* precedes the verb, but it is not the subject of the verb. As long as the subject and verb agree, the sentence is correct.

agr p/a Maintain Pronoun-Antecedent Agreement

A pronoun and its antecedent (the word or phrase being replaced by the pronoun) must agree in number. Often an error occurs when the antecedent is a collective noun—one that can be interpreted as either singular or plural, depending on its usage.

- INCORRECT The *company* is proud to announce a new stock option plan for *their* employees.
- CORRECT The *company* is proud to announce a new stock option plan for *its* employees.
Company acts as a single unit; therefore, the singular pronoun is appropriate.

When the individual members of a collective noun are emphasized, however, plural pronouns are appropriate.

- CORRECT The inspection team have prepared their reports.
- CORRECT The members of the inspection team have prepared their reports.
 The use of *their* emphasizes that the team members have prepared their own reports.

t Use Tenses Correctly

Two verb tenses are commonly used in technical communication: the present tense and the past perfect tense. It is important to understand the specific purpose of each.

1. The present tense is used to describe scientific principles and recurring events.

- INCORRECT In 1992, McKay and his coauthors argued that the atmosphere of Mars *was* salmon pink.
- CORRECT In 1992, McKay and his coauthors argued that the atmosphere of Mars *is* salmon pink.
 Although the argument was made in the historical past—1992—the point is expressed in the present tense because the atmosphere of Mars continues to be salmon pink.

When the date of the argument is omitted, some writers express the entire sentence in the present tense.

- CORRECT McKay and his coauthors *argue* that the atmosphere of Mars *is* salmon pink.

2. The past perfect tense is used to describe the earlier of two events that occurred in the past.

- CORRECT We *had begun* excavation when the foreman *discovered* the burial remains.
Had begun is the past perfect tense. The excavation began before the burial remains were discovered.
- CORRECT The seminar *had concluded* before I *got* a chance to talk with Dr. Tran.

PUNCTUATION

Commas

The comma is the most frequently used punctuation mark, as well as the one about whose usage writers most often disagree. Examples of common misuses of the comma are noted within the following guidelines. This section concludes with advice about editing for unnecessary commas.

1. Use a comma in a compound sentence to separate two independent clauses linked by a coordinating conjunction (*and, or, nor, but, so, for, or yet*).

INCORRECT The mixture was prepared from the two premixes and the remaining ingredients were then combined.

CORRECT The mixture was prepared from the two premixes, and the remaining ingredients were then combined.

2. Use a comma to separate items in a series composed of three or more elements.

The manager of spare parts is responsible for ordering, stocking, and disbursing all spare parts for the entire plant.

Despite the presence of the conjunction *and*, most technical-communication style manuals require a comma after the second-to-last item. The comma clarifies the separation and prevents misreading.

CONFUSING The report will be distributed to Operations, Research and Development and Accounting.

CLEAR The report will be distributed to Operations, Research and Development, and Accounting.

3. Use a comma to separate introductory words, phrases, and clauses from the main clause of the sentence.

However, we will have to calculate the effect of the wind.

To facilitate trade, the government holds a yearly international conference.

In the following example, the comma actually prevents misreading:

Just as we finished eating, the rats discovered the treadmill.

NOTE: Writers sometimes make errors by omitting commas following introductory words, phrases, or clauses. A comma is optional only if the introductory text is brief and cannot be misread.

CORRECT First, let's take care of the introductions.

- CORRECT First let's take care of the introductions.
- INCORRECT As the researchers sat down to eat the laboratory rats awakened.
- CORRECT As the researchers sat down to eat, the laboratory rats awakened.

4. Use a comma to separate a dependent clause from the main clause.

Although most of the executive council saw nothing wrong with it, the advertising campaign was canceled.

Most tablet computers use green technology, even though it is relatively expensive.

5. Use commas to separate nonrestrictive modifiers (parenthetical clarifications) from the rest of the sentence.

Jones, the temporary chairman, called the meeting to order.

NOTE: Writers sometimes introduce an error by dropping one of the commas around a nonrestrictive modifier.

- INCORRECT The data line, which was installed two weeks ago had to be disconnected.
- CORRECT The data line, which was installed two weeks ago, had to be disconnected.

6. Use a comma to separate interjections and transitional elements from the rest of the sentence.

Yes, I admit that your findings are correct.

Their plans, however, have great potential.

NOTE: Writers sometimes introduce an error by dropping one of the commas around an interjection or a transitional element.

- INCORRECT Our new statistician, however used to work for Konaire, Inc.
- CORRECT Our new statistician, however, used to work for Konaire, Inc.

7. Use a comma to separate coordinate adjectives.

The finished product was a sleek, comfortable cruiser.

The heavy, awkward trains are still being used.

The comma here takes the place of the conjunction *and*.

If the adjectives are not coordinate—that is, if one of the adjectives modifies the combined adjective and noun—do not use a comma:

They decided to go to the first general meeting.

For more about coordinate adjectives, see page 718.

In This Book

For more about restrictive and nonrestrictive modifiers, see Ch. 10, p. 237.

8. Use a comma to signal that a word or phrase has been omitted from a sentence because it is implied.

Smithers is in charge of the accounting; Harlen, the data management; Demarest, the publicity.

The commas after *Harlen* and *Demarest* show that the phrase is in *charge of* has not been repeated.

9. Use a comma to separate a proper noun from the rest of the sentence in direct address.

John, have you seen the purchase order from United?

What I'd like to know, Betty, is why we didn't see this problem coming.

10. Use a comma to introduce most quotations.

He asked, "What time were they expected?"

11. Use a comma to separate towns, states, and countries.

Bethlehem, Pennsylvania, is the home of Lehigh University.

He attended Lehigh University in Bethlehem, Pennsylvania, and the University of California at Berkeley.

Note that a comma precedes and follows *Pennsylvania*.

12. Use a comma to set off the year in a date.

August 1, 2012, is the anticipated completion date.

If the month separates the date and the year, you do not need to use commas because the numbers are not next to each other:

The anticipated completion date is 1 August 2012.

13. Use a comma to clarify numbers.

12,013,104

NOTE: European practice is to reverse the use of commas and periods in writing numbers: periods signify thousands, and commas signify decimals.

14. Use a comma to separate names from professional or academic titles.

Harold Clayton, PhD

Marion Fewick, CLU

Joyce Carnone, PE

The comma also follows the title in a sentence:

Harold Clayton, PhD, is the featured speaker.

UNNECESSARY COMMAS

Writers often introduce errors by using unnecessary commas. Do not insert commas in the following situations:

- Commas are not used to link two independent clauses without a coordinating conjunction (an error known as a “comma splice”).

INCORRECT All the motors were cleaned and dried after the water had entered, had they not been, additional damage would have occurred.

CORRECT All the motors were cleaned and dried after the water had entered; had they not been, additional damage would have occurred.

CORRECT All the motors were cleaned and dried after the water had entered. Had they not been, additional damage would have occurred.

For more about comma splices, see page 715.

- Commas are not used to separate the subject from the verb in a sentence.

INCORRECT Another of the many possibilities, is to use a “first in, first out” sequence.

CORRECT Another of the many possibilities is to use a “first in, first out” sequence.

- Commas are not used to separate the verb from its complement.

INCORRECT The schedules that have to be updated every month are, numbers 14, 16, 21, 22, 27, and 31.

CORRECT The schedules that have to be updated every month are numbers 14, 16, 21, 22, 27, and 31.

- Commas are not used with a restrictive modifier.

INCORRECT New and old employees who use the processed order form, do not completely understand the basis of the system.

The phrase *who use the processed order form* is a restrictive modifier necessary to the meaning: it defines which employees do not understand the system.

CORRECT New and old employees who use the processed order form do not completely understand the basis of the system.

INCORRECT A company, that has grown so big, no longer finds an informal evaluation procedure effective.

The clause *that has grown so big* is a restrictive modifier.

CORRECT A company that has grown so big no longer finds an informal evaluation procedure effective.

- Commas are not used to separate two elements in a compound subject.

INCORRECT	Recent studies, and reports by other firms confirm our experience.
CORRECT	Recent studies and reports by other firms confirm our experience.

;

Semicolons

Semicolons are used in the following instances:

1. **Use a semicolon to separate independent clauses not linked by a coordinating conjunction.**

The second edition of the handbook is more up-to-date; however, it is also more expensive.

2. **Use a semicolon to separate items in a series that already contains commas.**

The members elected three officers: Jack Resnick, president; Carol Wayshum, vice president; Ahmed Jamoogian, recording secretary.

Here the semicolon acts as a “supercomma,” grouping each name with the correct title.

MISUSE OF SEMICOLONS

Sometimes writers incorrectly use a semicolon when a colon is called for:

- | | |
|-----------|-------------------------------------|
| INCORRECT | We still need one ingredient; luck. |
| CORRECT | We still need one ingredient: luck. |

:

Colons

Colons are used in the following instances:

1. **Use a colon to introduce a word, phrase, or clause that amplifies, illustrates, or explains a general statement.**

The project team lacked one crucial member: a project leader.

Here is the client’s request: we are to provide the preliminary proposal by November 13.

We found three substances in excessive quantities: potassium, cyanide, and asbestos.

The week was productive: 14 projects were completed, and another dozen were initiated.

NOTE: The text preceding a colon should be able to stand on its own as a sentence:

- | | |
|-----------|---|
| INCORRECT | We found: potassium, cyanide, and asbestos. |
| CORRECT | We found the following: potassium, cyanide, and asbestos. |
| CORRECT | We found potassium, cyanide, and asbestos. |

**In This Book**

For more about constructing lists, see Ch. 10, p. 228.

2. Use a colon to introduce items in a vertical list if the sense of the introductory text would be incomplete without the list.

We found the following:

- potassium
- cyanide
- asbestos

3. Use a colon to introduce long or formal quotations.

The president began: “In the last year . . .”

MISUSE OF COLONS

Writers sometimes incorrectly use a colon to separate a verb from its complement:

INCORRECT	The tools we need are: a plane, a level, and a T square.
CORRECT	The tools we need are a plane, a level, and a T square.
CORRECT	We need three tools: a plane, a level, and a T square.

■ **Periods**

Periods are used in the following instances:

1. Use a period at the end of sentences that do not ask questions or express strong emotion.

The lateral stress still needs to be calculated.

2. Use a period after some abbreviations.

U.S.A.
etc.

For more about abbreviations, see page 737.

3. Use a period with decimal fractions.

4.056
\$6.75
75.6 percent

! **Exclamation Points**

The exclamation point is used at the end of a sentence that expresses strong emotion, such as surprise.

The nuclear plant, which was originally expected to cost \$1.6 billion, eventually cost more than \$8 billion!

In technical documents, which require objectivity and a calm, understated tone, exclamation points are rarely used.

? Question Marks

The question mark is used at the end of a sentence that asks a direct question.

What did the commission say about effluents?

NOTE: When a question mark is used within quotation marks, no other end punctuation is required.

She asked, “What did the commission say about effluents?”

MISUSE OF QUESTION MARKS

Do not use a question mark at the end of a sentence that asks an indirect question.

He wanted to know whether the procedure had been approved for use.

— Dashes

To make a dash, use two uninterrupted hyphens (--). Do not add spaces before or after the dash. Some word-processing programs turn two hyphens into a dash, but with others, you have to use a special combination of keys to make a dash; there is no dash key on the keyboard.

Dashes are used in the following instances:

1. Use a dash to set off a sudden change in thought or tone.

The committee found—can you believe this?—that the company bore full responsibility for the accident.

That’s what she said—if I remember correctly.

2. Use a dash to emphasize a parenthetical element.

The managers’ reports—all 10 of them—recommend production cutbacks for the coming year.

Arlene Kregman—the first woman elected to the board of directors—is the next scheduled speaker.

3. Use a dash to set off an introductory series from its explanation.

Wet suits, weight belts, tanks—everything will have to be shipped in.

NOTE: When a series follows the general statement, a colon replaces the dash.

Everything will have to be shipped in: wet suits, weight belts, and tanks.

MISUSE OF DASHES

Sometimes writers incorrectly use a dash as a substitute for other punctuation marks:

INCORRECT	The regulations—which were issued yesterday—had been anticipated for months.
CORRECT	The regulations, which were issued yesterday, had been anticipated for months.
INCORRECT	Many candidates applied—however, only one was chosen.
CORRECT	Many candidates applied; however, only one was chosen.

() Parentheses

Parentheses are used in the following instances:

1. Use parentheses to set off incidental information.

Please call me (x3104) when you get the information.

Galileo (1564–1642) is often considered the father of modern astronomy.

The cure rate for lung cancer almost doubled in thirty years (Capron, 2012).

2. Use parentheses to enclose numbers and letters that label items listed in a sentence.

To transfer a call within the office, (1) place the party on HOLD, (2) press TRANSFER, (3) press the extension number, and (4) hang up.

Use both a left and a right parenthesis—not just a right parenthesis—in this situation.

MISUSE OF PARENTHESES

Sometimes writers incorrectly use parentheses instead of brackets to enclose their insertion within a quotation:

INCORRECT	He said, “The new manager (Farnham) is due in next week.”
CORRECT	He said, “The new manager [Farnham] is due in next week.”

For more about square brackets, see page 732.

’ Apostrophes

Apostrophes are used in the following instances:

1. Use an apostrophe to indicate possession.

the manager’s goals the employee’s credit union
the workers’ lounge Charles’s T square

For joint possession, add an apostrophe and an s only to the last noun or proper noun:

Watson and Crick’s discovery

For separate possession, add an apostrophe and an s to each of the nouns or pronouns:

Newton’s and Galileo’s theories

NOTE: Do not add an apostrophe or an s to possessive pronouns: *his, hers, its, ours, yours, theirs*.

2. Use an apostrophe to indicate possession when a noun modifies a gerund.

We were all looking forward to Bill’s joining the company.

The gerund *joining* is modified by the proper noun *Bill*.

3. Use an apostrophe to form contractions.

I’ve shouldn’t
can’t it’s

The apostrophe usually indicates an omitted letter or letters:

can(no)t = can’t

it (i)s = it’s

NOTE: Some organizations discourage the use of contractions; others have no preference. Find out the policy your organization follows.

4. Use an apostrophe to indicate special plurals.

three 9’s
two different JCL’s
the why’s and how’s of the problem

NOTE: For plurals of numbers and abbreviations, some style guides omit the apostrophe: *9s, JCLs*. Because usage varies considerably, check with your organization.

MISUSE OF APOSTROPHES

Writers sometimes incorrectly use the contraction it's in place of the possessive pronoun its.

INCORRECT	The company does not feel that the problem is it's responsibility.
CORRECT	The company does not feel that the problem is its responsibility.



Quotation Marks

Quotation marks are used in the following instances:

1. Use quotation marks to indicate titles of short works, such as articles, essays, or chapters.

Smith's essay "Solar Heating Alternatives" was short but informative.

2. Use quotation marks to call attention to a word or phrase used in an unusual way or in an unusual context.

A proposal is "wired" if the sponsoring agency has already decided who will be granted the contract.

NOTE: Do not use quotation marks to excuse poor word choice:

INCORRECT The new director has been a real "pain."

3. Use quotation marks to indicate a direct quotation.

"In the future," he said, "check with me before authorizing any large purchases."
As Breyer wrote, "Morale *is* productivity."

NOTE: Quotation marks are not used with indirect quotations:

INCORRECT	He said that "third-quarter profits will be up."
CORRECT	He said that third-quarter profits will be up.
CORRECT	He said, "Third-quarter profits will be up."

Also note that quotation marks are not used with quotations that are longer than four lines; instead, set the quotation in block format. In a word-processed manuscript, a block quotation is usually

- indented one-half inch from the left-hand margin
- typed without quotation marks
- introduced by a complete sentence followed by a colon

Different style manuals recommend variations on these basic rules; the following example illustrates APA style.

In This Book

For more about quoting sources, see Appendix, Part A, p. 663.

McFarland (2011) writes:

The extent to which organisms adapt to their environment is still being charted. Many animals, we have recently learned, respond to a dry winter with an automatic birth control chemical that limits the number of young to be born that spring. This prevents mass starvation among the species in that locale.
(p. 49)

Hollins (2012) concurs. She writes, “Biological adaptation will be a major research area during the next decade” (p. 2).

USING QUOTATION MARKS WITH OTHER PUNCTUATION

- If the sentence contains a *tag*—a phrase identifying the speaker or writer—a comma separates it from the quotation:

Wilson replied, “I’ll try to fly out there tomorrow.”

“I’ll try to fly out there tomorrow,” Wilson replied.

Informal and brief quotations require no punctuation before a quotation mark:

She asked herself “Why?” several times a day.

- In the United States (unlike most other English-speaking nations), commas and periods at the end of quotations are placed within the quotation marks:

The project engineer reported, “A new factor has been added.”

“A new factor has been added,” the project engineer reported.

- Question marks, dashes, and exclamation points are placed inside quotation marks when they are part of the quoted material:

He asked, “Did the shipment come in yet?”

- When question marks, dashes, and exclamation points apply to the whole sentence, they are placed outside the quotation marks:

Did he say, “This is the limit”?

- When a punctuation mark appears inside a quotation mark at the end of a sentence, do not add another punctuation mark:

INCORRECT Did she say, “What time is it?”?

CORRECT Did she say, “What time is it?”

Ellipses

Ellipses (three spaced periods) indicate the omission of material from a direct quotation.

SOURCE	My team will need three extra months for market research and quality-assurance testing to successfully complete the job.
QUOTE	She responded, “My team will need three extra months . . . to successfully complete the job.”

Insert an ellipsis after a period if you are omitting entire sentences that follow:

Larkin refers to the project as “an attempt . . . to clarify the issue of compulsory arbitration. . . . We do not foresee an end to the legal wrangling . . . but perhaps the report can serve as a definition of the areas of contention.”

The writer has omitted words from the source after *attempt* and after *wrangling*. After *arbitration*, the writer has inserted an ellipsis after a period to indicate that a sentence has been omitted.

NOTE: If the author’s original statement has ellipses, MLA style recommends that you insert brackets around an ellipsis that you introduce in a quotation.

Sexton thinks “reuse adoption offers . . . the promise to improve business [. . .] worldwide.”

[] Square Brackets

Square brackets are used in the following instances:

1. Use square brackets around words added to a quotation.

As noted in the minutes of the meeting, “He [Pearson] spoke out against the proposal.”

A better approach would be to shorten the quotation:

The minutes of the meeting note that Pearson “spoke out against the proposal.”

2. Use square brackets to indicate parenthetical information within parentheses.

(For further information, see Charles Houghton’s *Civil Engineering Today* [1997].)

MECHANICS

ital Italics

Although italics are generally preferred, you may use underlining in place of italics. Whichever method you choose, be consistent throughout your document. Italics (or underlining) are used in the following instances:

1. Use italics for words used as words.

In this report, the word *operator* will refer to any individual who is in charge of the equipment, regardless of that individual's certification.

2. Use italics to indicate titles of long works (books, manuals, and so on), periodicals and newspapers, long films, long plays, and long musical works.

See Houghton's *Civil Engineering Today*.

We subscribe to the *Wall Street Journal*.

Note that *the* is not italicized or capitalized when the title is used in a sentence.

NOTE: The MLA style guide recommends that the names of Web sites be italicized.

The Library of Congress maintains *Thomas*, an excellent site for legislative information.

3. Use italics to indicate the names of ships, trains, and airplanes.

The shipment is expected to arrive next week on the *Penguin*.

4. Use italics to set off foreign expressions that have not become fully assimilated into English.

Grace's *joie de vivre* makes her an engaging presenter.

Check a dictionary to determine whether a foreign expression has become assimilated.

5. Use italics to emphasize words or phrases.

Do not press the red button.

< > Angle Brackets

Many style guides now advocate using angle brackets around URLs in print documents to set them off from the text.

Our survey included a close look at three online news sites: the *New York Times* <www.nytimes.com>, the *Washington Post* <www.washingtonpost.com>, and CNN <www.cnn.com>.

You may want to check with your instructor or organization before following this recommendation.

- Hyphens

Hyphens are used in the following instances:

1. Use hyphens to form compound adjectives that precede nouns.

general-purpose register
meat-eating dinosaur
chain-driven saw

NOTE: Hyphens are not used after adverbs that end in *-ly*.

newly acquired terminal

Also note that hyphens are not used when the compound adjective follows the noun:

The Woodchuck saw is chain driven.

Many organizations have their own preferences about hyphenating compound adjectives. Check to see if your organization has a preference.

For more about compound adjectives, see page 719.

2. Use hyphens to form some compound nouns.

once-over
go-between

NOTE: There is a trend away from hyphenating compound nouns (*vice president*, *photomicroscope*, *drawbridge*); check your dictionary for proper spelling.

3. Use hyphens to form fractions and compound numbers.

one-half
fifty-six

4. Use hyphens to attach some prefixes and suffixes.

post-1945
president-elect

5. Use hyphens to divide a word at the end of a line.

We will meet in the pavil-
ion in one hour.

Whenever possible, however, avoid such line breaks; they slow the reader down. When you do use them, check the dictionary to make sure you have divided the word between syllables. If you need to break a URL at the end of a line, do not add a hyphen. Instead, break it after a slash or before a period:

<http://www.stc.org/
ethical.asp>

num Numbers

Ways of handling numbers vary considerably. Therefore, in choosing between words and numerals, consult your organization's style guide. Many organizations observe the following guidelines:

1. **Technical quantities of any amount are expressed in numerals, especially if a unit of measurement is included.**

3 feet 43,219 square miles
12 grams 36 hectares

2. **Nontechnical quantities of fewer than 10 are expressed in words.**

three persons
six whales

3. **Nontechnical quantities of 10 or more are expressed in numerals.**

300 persons
12 whales

4. **Approximations are written out.**

approximately ten thousand people
about two million trees

5. **Round numbers over nine million are expressed in both words and numerals.**

14 million light-years
\$64 billion

6. **Decimals are expressed in numerals.**

3.14
1,013.065

Decimals of less than one should be preceded by a zero:

0.146
0.006

7. **Fractions are written out, unless they are linked to technical units.**

two-thirds of the members
3½ hp

8. Time of day is expressed in numerals if A.M. or P.M. is used; otherwise, it is written out.

6:10 A.M.
six o'clock
the nine-thirty train

9. Page numbers and titles of figures and tables are expressed in numerals.

Figure 1
Table 13
page 261

10. Back-to-back numbers are written using both words and numerals.

six 3-inch screws
fourteen 12-foot ladders
3,012 five-piece starter units

In general, the technical unit should be expressed with the numeral. If the nontechnical quantity would be cumbersome in words, use the numeral for it instead.

11. Numbers in legal contracts or in documents intended for international readers should be represented in both words and numerals.

thirty-seven thousand dollars (\$37,000)
five (5) relays

12. Street addresses may require both words and numerals.

3801 Fifteenth Street

SPECIAL CASES

- A number at the beginning of a sentence should be spelled out:

Thirty-seven acres was the size of the lot.

Many writers would revise the sentence to avoid spelling out the number:

The lot was 37 acres.

- Within a sentence, the same unit of measurement should be expressed consistently in either numerals or words:

INCORRECT On Tuesday the attendance was 13; on Wednesday, eight.

CORRECT On Tuesday the attendance was 13; on Wednesday, 8.

CORRECT On Tuesday the attendance was thirteen; on Wednesday, eight.

- In general, months should not be expressed as numbers. In the United States, 3/7/12 means March 7, 2012; in many other countries, it means July 3, 2012. The following forms, in which the months are written out, are preferable:

March 7, 2012

7 March 2012

abbr Abbreviations

Abbreviations save time and space, but you should use them carefully because your readers may not understand them. Many companies and professional organizations provide lists of approved abbreviations.

Analyze your audience to determine whether and how to abbreviate. If your readers include a general audience unfamiliar with your field, either write out the technical terms or attach a list of abbreviations. If you are new to an organization or are publishing in a field for the first time, find out which abbreviations are commonly used. If for any reason you are unsure about a term, write it out.

The following are general guidelines about abbreviations:

1. **When an unfamiliar abbreviation is introduced for the first time, the full term should be given, followed by the abbreviation in parentheses. In subsequent references, the abbreviation may be used alone. For long works, the full term and its abbreviation may be written out at the start of major units, such as chapters.**

The heart of the new system is the self-loading cartridge (SLC).

The liquid crystal display (LCD) is your control center.

2. **To form the plural of an abbreviation, an s is added, either with or without an apostrophe, depending on the style preferred by your organization.**

GNP's or GNPs

PhD's or PhDs

Most unit-of-measurement abbreviations do not take plurals:

10 in.

3 qt

3. **Most abbreviations in scientific writing are not followed by periods.**

lb

cos

dc

If the abbreviation can be confused with another word, however, a period should be used:

in.

Fig.

4. If no number is used with a measurement, an abbreviation should not be used.

INCORRECT How many sq meters is the site?

CORRECT How many square meters is the site?

cap Capitalization

For the most part, the conventions of capitalization in general writing apply in technical communication:

1. Proper nouns, titles, trade names, places, languages, religions, and organizations should be capitalized.

William Rusham

Director of Personnel

Quick-Fix Erasers

Bethesda, Maryland

Italian

Methodism

Society for Technical Communication

In some organizations, job titles are not capitalized unless they refer to specific people.

Alfred Loggins, Director of Personnel, is interested in being considered for vice president of marketing.

2. Headings and labels should be capitalized.

A Proposal to Implement the Wilkins Conversion System

Mitosis

Table 3

Section One

The Problem

Rate of Inflation, 2002–2012

Figure 6

Proofreading Symbols and Their Meanings

Mark in margin	Instructions	Mark on manuscript	Corrected type
	Delete	\$10 billion dollars	\$10 billion
	Insert	enviro me nt	environment
	Let stand	let it stand	let it stand
	Capitalize	the e nglish language	the English language
	Make lowercase	the English V language	the English language
	Italicize	<u>Technical Communication</u>	<i>Technical Communication</i>
	Transpose	recei ve	receive
	Close up space	diagnostic ultra sound	diagnostic ultrasound
	Spell out	Pres Smithers	President Smithers
	Insert space	3 amp light	3 amp light
	Start paragraph	. . . the results. ? These results	. . . the results. These results
run in	No paragraph	. . . the results. ; For this reason,	. . . the results. For this reason,
	Set in small capitals	<u>Needle-nose pliers</u>	NEEDLE-NOSE PLIERS
	Set in boldface	Needle-nose pliers	Needle-nose pliers
	Insert period	Fig. 2 1	Fig. 21
	Insert comma	the plant, which was built	the plant, which was built
	Insert hyphen	menu r driven software	menu-driven software
	Insert colon	Add the following o	Add the following:
	Insert semicolon	. . . the plan; however, the committee	. . . the plan; however, the committee
	Insert apostrophe	the users' preference	the user's preference
' with a diagonal slash through it."/>	Insert quotation marks	Furthermore, she said . . .	"Furthermore," she said . . .
	Insert parentheses	Write to us (at the Newark office)	Write to us (at the Newark office)
	Insert brackets	President [John] Smithers	President [John] Smithers
	Insert en dash	1984 - 2001	1984–2001
	Insert em dash	Our goal — victory	Our goal—victory
	Insert superscript	4,000 ft ²	4,000 ft ²
	Insert subscript	H 2 O	H ₂ O
	Align	\$123.05// \$86.95//	\$123.05 \$86.95
	Move to the left	[PVC piping	PVC piping
	Move to the right	PVC]piping]	PVC piping
	Move up	[PVC piping]	PVC piping
	Move down	[PVC piping]	PVC piping

Part D: Guidelines for Multilingual Writers (ESL)

CULTURAL AND STYLISTIC COMMUNICATION ISSUES

In This Book

For more about communicating across cultures, see Ch. 5, p. 94.

Just as native speakers of English must learn how to communicate with nonnative speakers of English in the United States and abroad, technical communicators whose first language is not English must learn how to communicate with native speakers in the United States.

If you want to communicate effectively with native speakers, you need to understand U.S. culture. Specifically, you need to understand how U.S. readers expect writers to select, organize, and present information and what writers expect from their readers. Beyond readers and writers, speakers and listeners in the United States also have expectations. Indeed, cultural values affect all styles of communication. Of course, no two communicators are exactly alike. Still, if you know how culture affects Western communicators in general, you can analyze your communication task and communicate effectively.

Readers, writers, speakers, and listeners in the United States value the following qualities:

- **Directness.** U.S. audiences expect writers and speakers to get to the point quickly and to communicate information clearly. So when you write a claim letter, for example, clearly state what you want the individual you are addressing to do to correct the situation. Related to directness is *task orientation*. Do not begin a letter with a comment about the weather or family. Instead, communicate immediately about business.
- **Independence.** In spite of the increasingly significant role of collaborative writing, U.S. audiences still value individualism and people who can work independently. Therefore, when you write a letter to an individual in an organization, be aware that the recipient sees you as one person, too, not merely as a mouthpiece of an organization. Use the pronoun *I* rather than *we*.
- **Time consciousness.** Try to meet deadlines and to arrive on time for appointments. U.S. audiences consider slowness in responding to issues a sign of disrespect.

To become familiar with the U.S. style of communication, study documents, talk to people, and ask for feedback from U.S. readers and listeners. Following are some specific guidelines for applying the preceding general cultural values as you listen, speak, and write to U.S. audiences.

In This Book

For more about claim letters, see Ch. 14, p. 382.

In This Book

For more about writing collaboratively, see Ch. 4.

Listening

Speakers in the United States expect you, their audience, to listen actively. They assume that you will ask questions and challenge their points—but not interrupt them unless you are invited to do so. To become a better listener, try the following strategies:

- *Look at the speaker's eyes or at least at the speaker's face.* Lean forward or nod your head to encourage the speaker. If you avoid looking at the speaker, he or she could think that you are not interested in the message.
- *Do not interrupt the speaker.* Interrupting shows the speaker that you do not value his or her opinion. Give the speaker enough time to complete his or her presentation.
- *Do not become indignant.* Be prepared to hear the speaker state clearly what he or she likes and dislikes, often without considering other people's personal feelings.
- *Assume that the speaker values your opinion.* Form responses and, at the appropriate time, express your opinions openly.
- *Ask questions.* If you have questions, ask them. If you do not ask questions, the speaker might assume that you not only understand but also agree with the message of the presentation. It is altogether appropriate to ask questions such as these: "Do you mean . . . ?" "Did I understand you to say . . . ?" "Would you repeat . . . ?"

Speaking

As suggested in Chapter 21, U.S. audiences expect speakers to control the situation, keep the audience interested, address listeners directly, and speak with authority. Do not apologize for problems in your content or your fluency. Doing so could diminish your credibility and make the audience think you are wasting their time. To become a better speaker, try the following strategies:

- *Start and end your presentation on time.* If you start late or speak too long, you send the message "Your time is less valuable than mine."
- *Make eye contact and smile.* If you make eye contact with people, you look friendly and confident, and you send the message "You are important."
- *Speak up.* If you speak with your head bowed or in too low a voice, audience members could become distracted or think you are hiding something.
- *Make friendly gestures.* Invite the audience to ask questions. It is appropriate to say "Please feel free to ask me questions at any time" or "If you have questions, I'd be glad to answer them at the conclusion of my talk." Also, try to break the invisible barrier between you and your audience. For example, step away from behind the podium or move toward the audience.

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For more about claims, see Ch. 8, p. 192. For more about introductions, see Ch. 19, p. 521.

In This Book

For more about organizing information, see Ch. 7. For more about writing coherent paragraphs, see Ch. 9.

In This Book

For more about persuasion, see Ch. 8.

In This Book

For more about choosing the right words and phrases, see Ch. 10, p. 240.

Writing

In the United States, technical writers generally state their claims up front and clearly. They support their claims by presenting the most important information first and by using numerical data. To become a better writer, try the following strategies:

- *State your claims directly.* In most cases, state your purpose directly in the first paragraph of a memo or letter, as well as at the start of any other document and at the start of each section within it.
- *Avoid digressions.* Focus on your task. If a piece of information is interesting but does not help you make your point, do not include it.
- *Move from one point to the next systematically.* Use an appropriate pattern of organization, and use transitions and other devices to ensure a smooth flow within a paragraph and between paragraphs.
- *Use logic and technical information rather than allusion, metaphor, or emotion.* Western readers are persuaded more by numerical data—that is, by statistics, be they raw scores, dollar amounts, or percentages—than by an argument from authority.
- *Use an appropriate level of formality.* Consider your audience, your subject, and your purpose. In the United States, e-mails and memos tend to be less formal than reports and proposals. In most cases, avoid overly formal words, such as *pursuant*, *aforementioned*, and *heretofore*, in favor of clear, concise writing.

SENTENCE-LEVEL ISSUES

sent Basic Characteristics of a Sentence

A sentence has five characteristics.

1. It starts with an uppercase letter and ends with a period, a question mark, or (rarely) an exclamation point attached to the final word.

I have a friend.

Do you have a friend?

I asked, “Do you have a friend?”

The question mark is part of the quoted question.

Did you write “Ode to My Friend”?

The question mark is part of the question, not part of the title in quotation marks.

Yes! You are my best friend!

2. It has a subject, usually a noun. The subject performs the action(s) mentioned in the sentence or exists in a certain condition according to the rest of the sentence.

SUBJECT



My friend speaks five languages fluently.

The subject performs an action—*speaks*.

SUBJECT



My friend is fluent in five languages.

The subject exists as (is) a fluent person.

3. It has a verb, which tells what the subject does or states its existence.

VERB



My friend speaks five languages fluently.

The verb tells what the subject does.

VERB



My friend is fluent in five languages.

The verb states that the subject exists.

4. It has a standard word order.

The most common sequence in English is subject-verb-object:

SUBJECT VERB OBJECT

We hired a consulting firm.

You can add information to the start of the sentence:

Yesterday we hired a consulting firm.

or to the end of the sentence:

Yesterday we hired a consulting firm: *Sanderson & Associates*.

or in the middle:

Yesterday we hired *the city's most prestigious* consulting firm: Sanderson & Associates.

In fact, any element of a sentence can be expanded.

5. It has an independent clause (a subject and verb that can stand alone—that is, a clause that does not begin with a subordinating word or phrase).



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For more about subordinating words and phrases, see p. 745.

The following is a sentence:

SUBJECT VERB
↓ ↓
The pump failed because of improper maintenance.

The following is also a sentence:

SUBJECT VERB
↓ ↓
The pump failed.

But the following is not a sentence because it lacks a subject with a verb and because it begins with a subordinating phrase:

Because of improper maintenance.

An independent clause is required to complete this sentence:

Because of improper maintenance, the pump failed.

coor Linking Ideas by Coordination

One way to connect ideas in a sentence is by coordination. Coordination means that ideas in the sentence are roughly equal in importance. There are three main ways to coordinate ideas:

1. Use a semicolon (;) to coordinate ideas that are independent clauses.

The information for bid was published last week; the proposal is due in less than a month.

2. Use a comma and a coordinating conjunction (*and*, *but*, *or*, *nor*, *so*, *for*, or *yet*) to coordinate two independent clauses.

The information for bid was published last week, but the proposal is due in less than a month.

In this example, *but* clarifies the relationship between the two clauses: the writer hasn't been given enough time to write the proposal.

3. Use transitional words and phrases to coordinate two independent clauses. You can end the first independent clause with a semicolon or a period. If you use a period, begin the transitional word or phrase with a capital letter.

The Intel 6 Series chipset has already been replaced; *as a result*, it is hard to find an Intel 6 Series in a new computer.

The Intel 6 Series chipset has already been replaced. *As a result*, it is hard to find an Intel 6 Series in a new computer.

In This Book

For more about transitional words and phrases, see Ch. 9, p. 212.

sub Linking Ideas by Subordination

Two ideas can also be linked by subordination—that is, by deemphasizing one of them. There are two basic methods of subordination:

1. Use a subordinating word or phrase to turn one idea into a subordinate clause.

after	because	since	until	while
although	before	so that	when	who
as	even though	that	where	whom
as if	if	unless	which	whose

Start with two independent clauses:

The bridge was completed last year. The bridge already needs repairs.

Then choose a subordinating word, and combine the clauses:

Although the bridge was completed last year, it already needs repairs.

Although subordinates the first clause, leaving it *already needs repairs* as the independent clause.

Note that a writer could reverse the order of the ideas:

The bridge already needs repairs *even though* it was completed last year.

Another way to subordinate one idea is to turn it into a nonrestrictive clause using the subordinating word *which*:

The bridge, which was completed last year, already needs repairs.

This version deemphasizes *was completed last year* by turning it into a nonrestrictive clause and emphasizes *already needs repairs* by leaving it as the independent clause.

2. Turn one of the ideas into a phrase modifying the other.

Completed last year, the bridge already needs repairs.

Completed last year was turned into a phrase by dropping the subject and verb from the independent clause. Here the phrase is used to modify *the bridge*.

vb Verb Tenses

The four tenses used most often in English are simple, progressive, perfect, and perfect progressive.

1. SIMPLE: An action or state that was, is, or will be static or definite

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For more about restrictive and nonrestrictive modifiers, see Ch. 10, p. 237.

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For more about verb tenses, see Appendix, Part C.

SIMPLE PAST (*VERB + ed [or irregular past]*)

Yesterday we *subscribed* to a new ecology journal.

The action of subscribing happened at a specific time. The action of subscribing definitively happened regardless of what happens today or tomorrow.

SIMPLE PRESENT (*VERB OR VERB + s*)

We *subscribe* to three ecology journals every year.

The action of subscribing never changes; it's regular, definite.

SIMPLE FUTURE (*will + VERB or simple present of be + going to + VERB*)

We *will subscribe* to the new ecology journal next year.

We *are going to subscribe* to the new ecology journal next year.

The action of subscribing next year (a specific time) will not change; it is definite.

2. PROGRESSIVE: An action in progress (continuing) at a known time

PAST PROGRESSIVE (*simple past of be + VERB + ing*)

We *were updating* our directory when the power failure occurred.

The action of updating was in progress at a known time in the past.

PRESENT PROGRESSIVE (*simple present of be + VERB + ing*)

We *are updating* our directory now.

The action of updating is in progress at a known time, this moment.

FUTURE PROGRESSIVE (*simple future of be + VERB + ing*)

We *will be updating* our directory tomorrow when you arrive.

The action of updating will be in progress at a known time in the future.

3. PERFECT: An action occurring (sometimes completed) at some indefinite time before a definite time

PAST PERFECT (*simple past of have + VERB + ed [or irregular past]*)

We *had already written* the proposal when we got your call.

The action of writing began and ended at some indefinite past time before a definite past time.

PRESENT PERFECT (*simple present of have + VERB + ed [or irregular past]*)

We *have written* the proposal and are proud to hand it to you.

The action of writing began at some indefinite past time and is being commented on in the present, a definite time.

FUTURE PERFECT (*simple future of have + VERB + ed [or irregular past]*)

We *will have written* the proposal by the time you arrive.

The action of writing will have begun and ended at some indefinite time in the future before the definite time in the future when you arrive.

4. PERFECT PROGRESSIVE: An action in progress (continuing) until a known time

PAST PERFECT PROGRESSIVE (simple past of *have + been + VERB + ing*)

We *had been working* on the reorganization when the news of the merger became public.

The action of working continued until a known time in the past.

PRESENT PERFECT PROGRESSIVE (simple present of *have + been + VERB + ing*)

We *have been working* on the reorganization for over a year.

The action of working began at some indefinite past time and is continuing in the present, when it is being commented on.

FUTURE PERFECT PROGRESSIVE (simple future of *have + been + VERB + ing*)

We *will have been working* on the reorganization for over a year by the time you become CEO.

In the future, the action of working will have been continuing before another future action.

-ing **Forming Verbs with -ing**

English uses the *-ing* form of verbs in three major ways:

1. As part of a progressive or perfect progressive verb (see numbers 2 and 4 in the “Verb Tenses” section)

We are *shipping* the materials by UPS.

We have been *waiting* for approval since January.

2. As a present participle, which functions as an adjective either by itself

the *leaking* pipe

or as part of a participial phrase

Analyzing the sample, we discovered two anomalies.

The sample *containing* the anomalies appears on Slide 14.

3. As a gerund, which functions as a noun either by itself

Writing is the best way to learn to write.

or as part of a gerund phrase

The designer tried *inserting* the graphics by hand.

inf **Infinitives**

Infinitives consist of the word *to* plus the base form of the verb (*to write*, *to understand*). An infinitive can be used in three main ways:

1. As a noun

The editor's goal for the next year is *to publish* the journal on schedule.

2. As an adjective

The company requested the right *to subcontract* the project.

3. As an adverb

We established the schedule ahead of time *to prevent* the kind of mistake we made last time.

help **Helping Verbs and Main Verbs**

Instead of a one-word verb, many English sentences contain a *verb phrase*.

The system *meets* code.

This sentence has a one-word verb, *meets*.

The new system *must meet* all applicable codes.

This sentence has a two-word verb phrase, *must meet*.

The old system *must have met* all applicable codes.

This sentence has a three-word verb phrase, *must have met*.

In a verb phrase, the verb that carries the main meaning is called the *main verb*. The other words in the verb phrase are called *helping verbs*. The following discussion explains four categories of helping verbs.

1. Modals

There are nine modal verbs: *can*, *could*, *may*, *might*, *must*, *shall*, *should*, *will*, and *would*. After a modal verb, use the base form of the verb (the form of the verb used after *to* in the infinitive).

BASE FORM



The system *must meet* all applicable codes.

2. Forms of *do*

After a helping verb that is a form of *do*—*do*, *does*, or *did*—use the base form of the verb.

BASE FORM



Do we *need* to include the figures for the recovery rate?

3. Forms of *have* plus the past participle

To form one of the perfect tenses (past, present, or future), use a form of *have* as the helping verb plus the past participle of the verb (usually the *-ed* form of the verb or the irregular past).

PAST PERFECT

We *had written* the proposal before learning of the new RFP.

PRESENT PERFECT

We *have written* the proposal according to the instructions in the RFP.

FUTURE PERFECT

We *will have written* the proposal by the end of the week.

4. Forms of *be*

To describe an action in progress, use a form of *be* (*be, am, is, are, was, were, being, been*) as the helping verb and the present participle (the *-ing* form of the verb).

We *are testing* the new graphics tablet.

The company *is considering* flextime.

To create the passive voice, use a form of *be* and the past participle.

The piping *was installed* by the plumbing contractor.

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For more about active and passive voice, see Ch. 10, p. 241.

agr s/v Agreement of Subject and Verb

The subject and the verb in a clause or sentence must agree in number. That is, if the noun is singular, the verb must be singular.

The *valve needs* replacement.

Note the *s* that marks a singular present-tense verb.

If the noun is plural, the verb must be plural.

The *valves need* replacement.

Note the *s* that marks a plural noun.

Here are additional examples of subject-verb agreement.

The new *valve is* installed according to the manufacturer's specifications.

The new *valves are* installed according to the manufacturer's specifications.

When you edit your document for subject-verb agreement, keep in mind the following guidelines:

1. Make sure the subject and verb agree when information comes between the subject and the verb.

The *result* of the tests *is* included in Appendix C.

The *results* of the test *are* included in Appendix C.

2. Certain pronouns and quantifiers always require singular verbs. Pronouns that end in *-one* or *-body*—such as *everyone*, *everybody*, *someone*, *somebody*, *anyone*, *anybody*, *no one*, and *nobody*—are singular. In addition, quantifiers such as *something*, *each*, and *every* are singular.

SINGULAR *Everybody is* invited to the preproposal meeting.

SINGULAR *Each of the members is* asked to submit billable hours by the end of the month.

3. When the clause or sentence contains a compound subject, the verb must be plural.

COMPOUND
SUBJECT *The contractor and the subcontractor want* to meet to resolve the difficulties.

4. When a relative pronoun such as *who*, *that*, or *which* begins a clause, make sure the verb agrees in number with the noun that the relative pronoun refers to.

The *numbers* that *are* used in the formula do not agree with the ones we were given at the site.

Numbers is plural, so the verb in the *that* clause (*are*) is also plural.

The *number* that *is* used in the formula does not agree with the one we were given at the site.

Number is singular, so the verb in the *that* clause (*is*) is also singular.

cond Conditions

The word *if* in English can introduce four main types of conditions:

1. Conditions of fact

Conditions of fact usually—but not always—call for the same verb tense in both clauses. In most cases, use a form of the present tense:

If rats *eat* as much as they want, they *become* obese.

If you see “Unrecoverable Application Error,” the program *has crashed*.

2. Future prediction

For prediction, use the present tense in the *if* clause. Use a modal (*can*, *could*, *may*, *might*, *must*, *shall*, *should*, *will*, or *would*) plus the base form of the verb in the independent clause.

If we *win* this contract, we *will need* to add three more engineers.

If this weather *keeps* up, we *might postpone* the launch.

3. Present-future speculation

The present-future speculation usage suggests a condition contrary to fact. Use *were* in the *if* clause if the verb is *be*; use the simple past in the *if* clause if it contains another verb. Use a modal plus the base form of the verb in the independent clause.

If I *were* president of the company, I *would be* much more aggressive.

If I *took* charge of the company, I *would be* much more aggressive.

The example sentences imply that you are not president of the company and have not taken charge of it.

The past tense in the example *if* clauses shows distance from reality, not distance in time.

4. Past speculation

Use the past perfect in the *if* clause. Use a modal plus the present perfect in the independent clause.

If we *had won* this contract, we *would have needed* to add three engineers.

This sentence implies that the condition is contrary to fact: the contract wasn't won, so the engineers were not needed.

art Articles

Few aspects of English can be as frustrating to the nonnative speaker of English as the correct usage of the articles *a*, *an*, and *the* before nouns. Although there are a few rules that you should try to learn, remember that there are many exceptions and special cases.

Here is an outline to help you look at nouns and decide whether they may or must take an article—or not. As you will see, to make the decision about an article, you must determine

- whether a noun is proper or common
- for a common noun, whether it is countable or uncountable
- for a countable common noun, whether it is specific or nonspecific, and if it is nonspecific, whether it is singular or plural
- for an uncountable common noun, whether it is specific or nonspecific

Specific in this context means that the writer and the reader can both identify the noun—“which one” it is.

1. Proper nouns

Singular proper nouns usually take no article but occasionally do take *a* or *an*:

James Smith, but not John Smith, contributed to the fund last year.

A Smith will contribute to the fund this year.

The speaker does not know which Smith will make the contribution, so an article is necessary. Assuming that there is only one person with the name *Quitkin*, the sentence “Quitkin will contribute to the fund this year” is clear, so the proper noun takes no article.

Plural proper nouns often, but not always, take *the*:

The Smiths have contributed for the past 10 years.

There are Smiths on the class roster again this year.

2. Countable common nouns

Singular and plural specific countable common nouns take *the*:

The microscope is brand-new.

The microscopes are brand-new.

Singular nonspecific countable common nouns take *a* or *an*:

A microscope will be available soon.

An electron is missing.

Plural nonspecific countable common nouns take no article but must have a plural ending:

Microscopes must be available for all students.

3. Uncountable common nouns

Specific uncountable common nouns take *the*:

The research started by Dr. Quitkin will continue.

The subject under discussion is specific research.

Nonspecific uncountable common nouns generally take no article:

Research is always critical.

The subject under discussion is nonspecific—that is, research in general.

adj Adjectives

Adjectives are modifiers. They modify—that is, describe—nouns and pronouns. Keep in mind four main points about adjectives in English:

1. Adjectives do not take a plural form.

a *complex* project

three *complex* projects

2. Adjectives can be placed either before the nouns they modify or after linking verbs.

The *critical* need is to reduce the drag coefficient.

The need to reduce the drag coefficient is *critical*.

3. Adjectives of one or two syllables take special endings to create the comparative and superlative forms.

Positive	Comparative	Superlative
big	bigger	biggest
heavy	heavier	heaviest

4. Adjectives of three or more syllables take the word *more* for the comparative form and the words *the most* for the superlative form.

Positive	Comparative	Superlative
qualified	more qualified	the most qualified
feasible	more feasible	the most feasible

adv Adverbs

Like adjectives, adverbs are modifiers. They modify—that is, describe—verbs, adjectives, and other adverbs. Their placement in the sentence is somewhat more complex than the placement of adjectives. Remember five points about adverbs:

1. Adverbs can modify verbs.

Management terminated the project *reluctantly*.

2. Adverbs can modify adjectives.

The executive summary was *conspicuously* absent.

3. Adverbs can modify other adverbs.

The project is going *very* well.

4. Adverbs that describe how an action takes place can appear in different locations in the sentence—at the beginning of a clause, at the end of a clause, right before a one-word verb, and between a helping verb and a main verb.

Carefully the inspector examined the welds.

The inspector examined the welds *carefully*.

The inspector *carefully* examined the welds.

The inspector was *carefully* examining the welds.

NOTE: The adverb should not be placed between the verb and the direct object.

INCORRECT The inspector examined *carefully* the welds.

5. Adverbs that describe the whole sentence can also appear in different locations in the sentence—at the beginning of the sentence, before an adjective, and at the end of the sentence.

Apparently, the inspection was successful.

The inspection was *apparently* successful.

The inspection was successful, *apparently*.

omit Omitted Words

Except for imperative sentences, in which the subject *you* is understood (*Get the correct figures*), all sentences in English require a subject.

The company has a policy on conflict of interest.

Do not omit the expletive *there* or *it*.

INCORRECT Are four reasons for us to pursue this issue.

CORRECT *There* are four reasons for us to pursue this issue.

INCORRECT Is important that we seek his advice.

CORRECT *It* is important that we seek his advice.

rep Repeated Words

1. Do not repeat the subject of a sentence.

INCORRECT The company we are buying from *it* does not permit us to change our order.

CORRECT The company we are buying from does not permit us to change our order.

2. In an adjective clause, do not repeat an object.

INCORRECT The technical communicator does not use the same software that we were writing in *it*.

CORRECT The technical communicator does not use the same software that we were writing in.

3. In an adjective clause, do not use a second adverb.

INCORRECT The lab where we did the testing *there* is an excellent facility.

CORRECT The lab where we did the testing is an excellent facility.

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For more about expletives, see Ch. 10, p. 235.

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