Technical
COMMUNICATION

ELEVENTH EDITION

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Designing Print and Online Documents

THE DESIGN OF a print or online document can help a writer achieve many goals: to entertain, to amaze, to intrigue, to sell. In technical communication, the goal is typically to help the reader learn something, perform a task, or accept a point of view. When you look at a well-designed page or screen, you intuitively understand how to use it.

Design refers to the physical appearance of print and online documents. For print documents, design features include binding, page size, typography, and use of color. For online documents, many of the same design elements apply, but there are unique elements, too. On a web page, for instance, there are navigation bars, headers and footers, and (sometimes) tables of contents and site maps.

The effectiveness of a document depends largely on how well it is designed, because readers *see* the document before they actually *read* it. In less than a second, the document 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 Design

In designing a document, you have five major goals:

- **To make a good impression on readers.** Your document 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, 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 every word in a print document, and they don't study every screen of an online document. In print documents, design elements (such as tabs, icons, and color), page design, and typography help readers find the information they need quickly and easily. In online documents, design elements are critically important because readers can see only what is displayed on the screen; without design elements to help them navigate, they are stranded.
- **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. An online document with a navigation bar displaying the main sections is easier to understand than an online document without one.
- **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

Your biggest challenge in thinking about how to design a document is that, more than ever, readers control how the document appears. Although

you can still write a memo, print it on a piece of 8.5 × 11-inch paper, and stick it in an interoffice envelope, that model of print-only communication is becoming increasingly rare. Most of the time, readers encounter your document online. Even if you produced it with a word processor, designed it to fit on a piece of 8.5 × 11-inch paper, and saved it as a PDF to preserve the design, your readers can still zoom in or out, altering what appears on their screen.

For documents that are intended to be viewed online, such as websites, apps, and other kinds of programs, readers can control many aspects of the design, including color and the size, shape, and location of objects on the screen. Perhaps the most significant variable that you have to consider is screen size. Some devices on which your readers will use your document will be as large as big-screen TVs, whereas others will be as small as wrist watches.

In this chapter, the term *print document* will be used to refer to documents that are designed to be printed on paper, such as letters, memos, and reports, regardless of whether readers hold pieces of paper in their hands or view the documents online. The term *online document* will be used to refer to documents that are designed to be used online, such as websites, apps, and other software programs.

Because there are so many different types of print and online documents used in so many different environments by so many different people for so many different purposes, it is impossible to provide detailed advice about "how to design" a technical document. Still, there are some powerful and durable principles that can help you design any kind of print or online document. 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: 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 says that you should consciously line up text and graphics along a real or imaginary vertical axis so that the reader can understand the relationships among elements. Figure 11.2 on page 253 shows how alignment works to help organize information.

REPETITION

The principle of repetition says that you should format the same kind of information in the same way so that readers can recognize consistent pat-

Text and graphics are clearly related by the principle of proximity. The textual descriptions are placed next to the drawings to which they refer.

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.
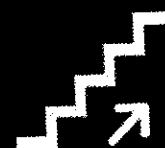
GO ▶

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 ▶

FIGURE 11.1 Effective Use of Proximity
Source: U.S. Department of State, 2011: http://future.state.gov.

terns. 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 shows an effective use of repetition.

CONTRAST

The principle of contrast says that the human eye is drawn to—and the brain interprets—differences in appearance between two items. For example, the principle of contrast explains why black print is easier to read against a white background than against a dark gray background; why 16-point type stands out

FIGURE 11.2 Effective Use of Alignment
Source: National Institutes of Health, 2013a: http://grants.nih.gov/grants/ElectronicReceipt/faq_full .htm#application.

This panel from an FAQ section of a website uses alignment to help organize the information.

The writer is using three levels of importance, each signaled by a different alignment.

Writers often use more than one technique at a time to help organize information. In this case, text size and color also indicate levels of importance.

FIGURE 11.3 Effective Use of Repetition
Source: Excerpt from A HISTORY OF WESTERN SOCIETY, Eleventh Edition (Boston: Bedford/St. Martin's, 2014). John P. McKay, Clare Haru Crowston, Merry E. Wiesner-Hanks, Joe Perry, p. 319.

This page shows repetition used effectively as a design element.

Different colors, typefaces, and type sizes are used for the headings, instructions, and text.

The two lists make use of stylized bullets and oversize numbers, both in one of the two main colors.
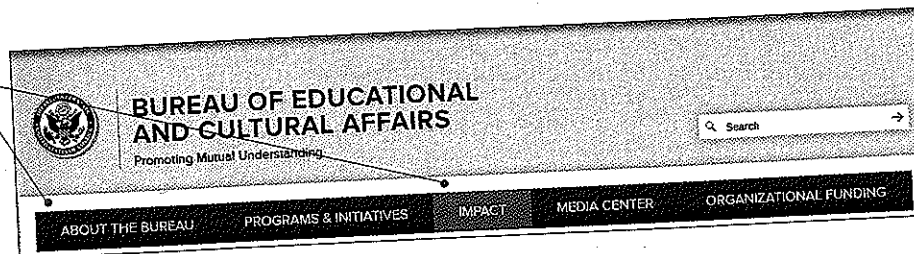
FIGURE 11.4   Effective Use of Contrast
This portion of a web page shows effective use of color contrast in the five navigation boxes. The pale blue screen behind the word "Impact" helps visitors see which portion of the site they are viewing.
Source: U.S. Department of State, 2013b: http://eca.state.gov/impact.

more clearly against 8-point type than against 12-point type; and why information printed in a color, such as red, grabs readers' attention when the information around it is printed in black. Figure 11.4 shows effective use of contrast.

Planning the Design of Print and Online Documents

In a typical day at work, you might produce a number of documents without having to worry about design at all. Blog posts, text messages, presentation slides and memos that use standard company templates—these applications and others present no design challenges either because you *cannot* design them or because you don't have the *authority* to design them.

You will, however, have a say in the design of many documents you produce or to which you contribute. In a case like this, the first step in designing the document is to plan. 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 include 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 on websites 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, 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 from right to left but others read from 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 are opening a dental office and you want to create a website. 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 to direct patients to high-quality dental information? To enable them to set up or change appointments? Ask you a question? Each of these purposes affects the design, whether the document is going to print or online.

DETERMINE YOUR RESOURCES

Think about your resources of time, money, and equipment. Short, informal documents 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? To come up with a sophisticated design you might need professionals at service bureaus or print shops or specialists in online production. These professionals can require weeks or months.
- **Money.** Can you afford professional designers, print shops, and online-content 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.

Designing Print Documents

Before you design the individual pages of a printed document, design the overall document. Decide whether you are creating a document that looks like a book, with content on both sides of the page, or a document that looks like a report, with content on only one side of the page. Decide whether to use paper of standard size (8.5 × 11 inches) or another size, choose a grade of paper, and decide how you will bind the pages together. Decide about

the accessing elements you will include, such as a table of contents, index, and tabs. You want the different elements to work together to accomplish your objectives, and you want to stay within your budget for producing and (perhaps) shipping. That is, in designing the whole document, consider these four elements: size, paper, bindings, and accessing aids.

SIZE

Size refers to two aspects of print-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 must 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 sizes, including 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 documents. Therefore, if you can design a 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. Heavier paper costs more than lighter paper but provides better resolution for text and graphics. Coated paper is stronger and more durable than non-coated paper and provides the best resolution, but some coatings can produce a glare. To deal with this problem, designers often choose paper with a slight tint.

Work closely with printing professionals. They know, for example, about UV-coated paper, which greatly reduces fading, and about recycled paper, which is continually improving in quality and decreasing in price.

BINDINGS

Although the pages of a very short document 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 on page 258 explains six common kinds of accessing aids.

▶ 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.
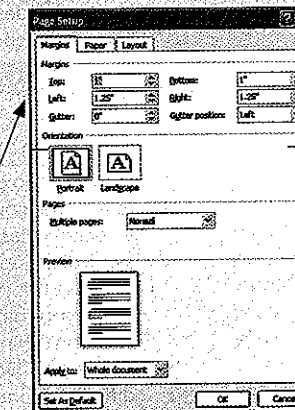
Use the **Margins, Paper,** and **Layout** tabs to specify such design elements as page margins, paper orientation, paper size, starting locations for new sections, and header and footer placement.

You can also use the drop-down menus on the **Page Setup** group to control many of the same design elements.
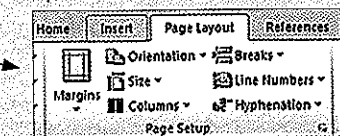
KEYWORDS: page layout tab, page setup group, page setup, margins, paper, layout

TABLE 11.1 Common Types of Binding
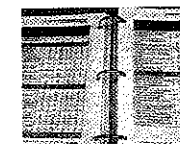
 Image Credit: © 2014 Macmillan. Photo by Regina Tavani.	**Loose-leaf binders.** Loose-leaf binders are convenient when pages must be added and removed frequently. A high-quality binder can cost as much as several dollars.
 Image Credit: © 2014 Macmillan. Photo by Regina Tavani.	**Ring or spiral binders.** The wire or plastic coils or combs that hold the pages together enable you to open the document flat 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.
 Image Credit: © 2014 Macmillan. Photo by Regina Tavani.	**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.
 Image Credit: © 2014 Macmillan. Photo by Regina Tavani.	**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.

TABLE 11.2 Typical Accessing Aids

Media

▶ YouTube
Watch, upload and share videos

📷 Books
Search the full text of books

🗞 News
Search thousands of news stories

⬤ Picasa
Find, edit and share your photos

Source: Google, 2013: http://www
.google.com/intl/en/about/products.
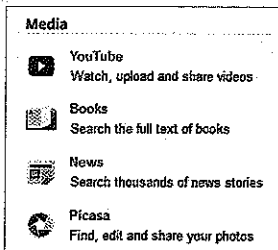
Icons. Icons are pictures that symbolize actions or ideas. Perhaps the most important icon is the stop sign, which alerts you to a warning. Icons depend on repetition: every time you see the warning icon, you know what kind of information the writer is presenting.

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 green is used to emphasize the titles of the sections, the box at the top left, and the bar along the edge of the page.

Source: Excerpt from MEDIA & CULTURE: MASS COMMUNICATION IN A DIGITAL AGE, Ninth Edition (Boston: Bedford/St. Martin's, 2014). Richard Campbell, Christopher R. Martin, Bettina Fabos, p. 113.

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 paper of a different color for each section of a document is another way to simplify access.

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.

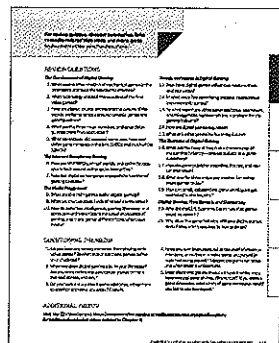*Image Credit:* © 2014 Macmillan. Photo by Regina Tavani.

TABLE 11.2 Typical Accessing Aids *(continued)*

Read...	To learn to...
Ch. 1	connect to the router
Ch. 2	set up a firewall

CARS
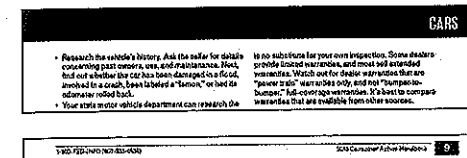
Source: General Services Administration, 2013.

Cross-reference tables. These tables, which exploit the principle of alignment, refer readers to related discussions.

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 in the document.

A | Defining Your Quest
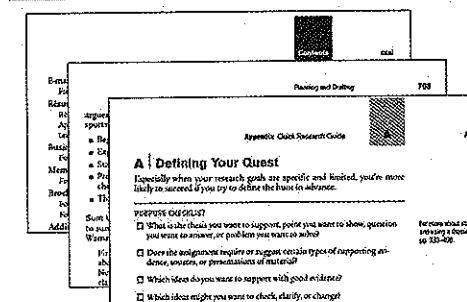
Source: Excerpt from THE BEDFORD GUIDE FOR COLLEGE WRITERS, Tenth Edition (Boston: Bedford/St. Martin's, 2014). X. J. Kennedy, Dorothy M. Kennedy, and Marcia F. Murth, pp. xxxi, 703, A-21.

Page numbering. For one-sided documents, use Arabic numerals in the upper right corner, although the first page of most documents does not have a number on it. 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. There is no number on the title page, but 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.

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 Print Pages

In a well-designed printed page of technical communication, the reader can recognize patterns, 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.

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.

The size of the type used for the various headings indicates their importance.

The largest type suggests that "Strategic Goals and Results" is a chapter heading.

The next largest type indicates that "Strategic Goal 1: Achieving Peace and Security" is an A head (the highest level within a chapter).

"Public Benefit" and "Summary of Performance and Resources" are B heads.
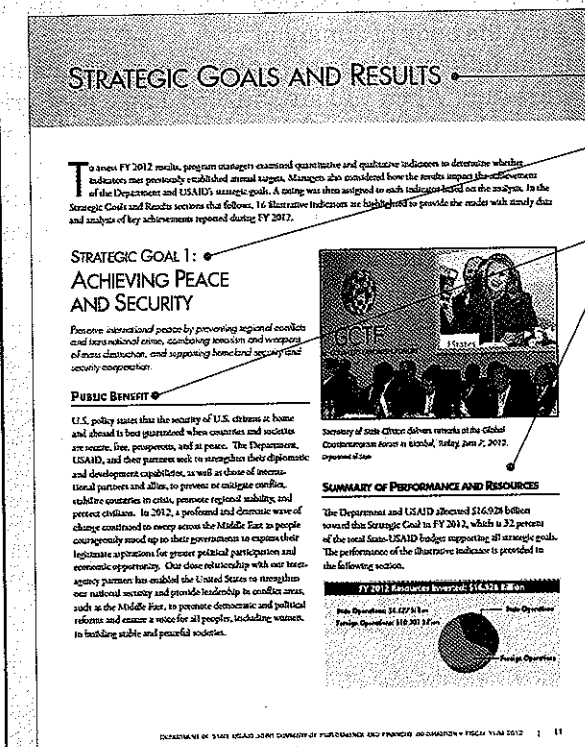
FIGURE 11.6   Queuing

Source: U.S. Department of State, 2013a: www.state.gov/documents/organization/203937.pdf.
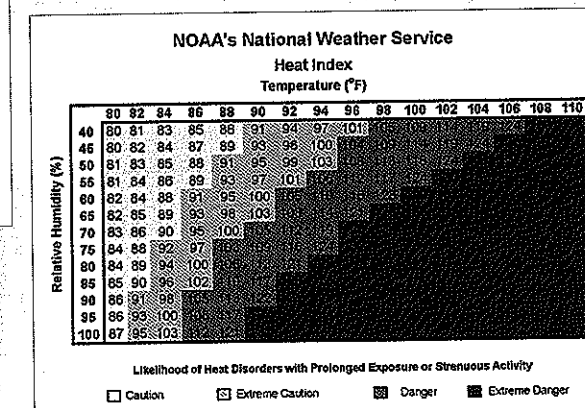
FIGURE 11.7   Filtering

Effective technical communication presents data and explains what the data mean. In this table about the heat index, the writer uses color as a filtering device. In Western cultures, red signals danger.

Source: National Weather Service, 2014: http://nws.noaa.gov/os/heat/index.shtml.

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.

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 thumbnail sketches of several options 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. On the right is an example of a page laid out using the grid in the figure.
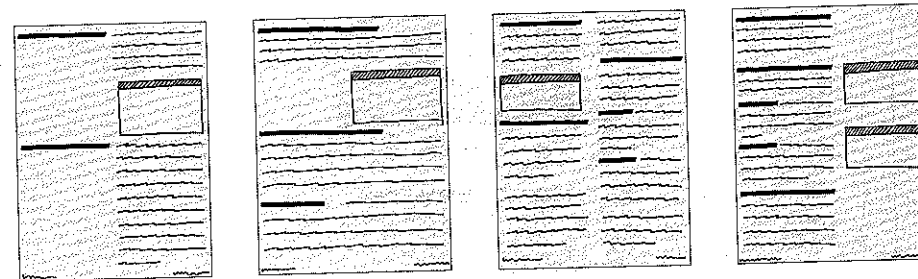
FIGURE 11.8   Thumbnail Sketches
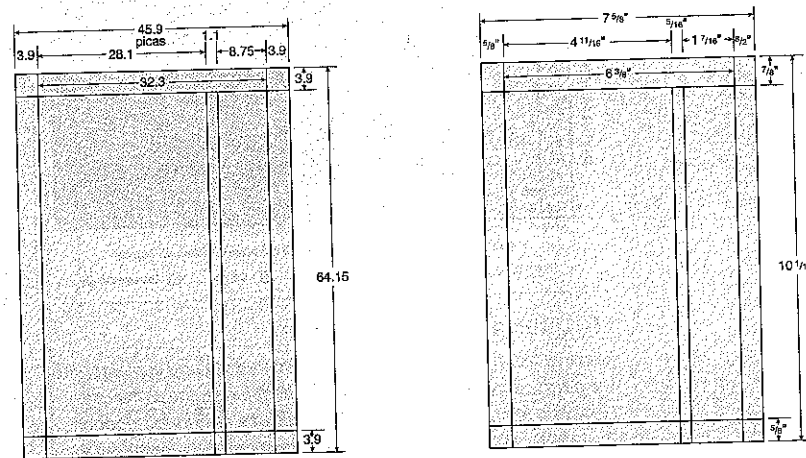
FIGURE 11.9   Sample Grids Using Picas and Inches
Source: Excerpt from LISTEN, Brief Fifth Edition (Boston: Bedford/St. Martin's, 2004). J. Kerman and G. Tomlinson, p. 388.
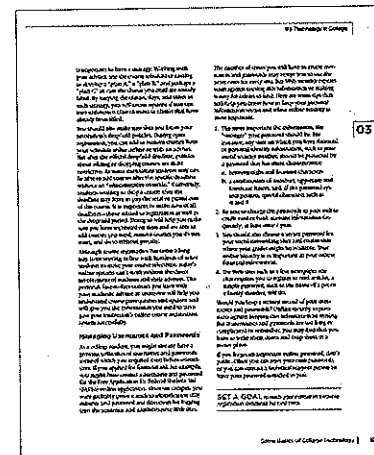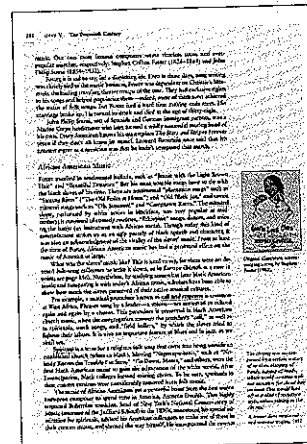
a. Double-column grid
Excerpt from Gardner and Barefoot, YOUR COLLEGE EXPERIENCE: STUDY SKILLS EDITION, 10th ed., p. 31. Copyright © 2013 Bedford/St. Martin's. Reprinted by permission.
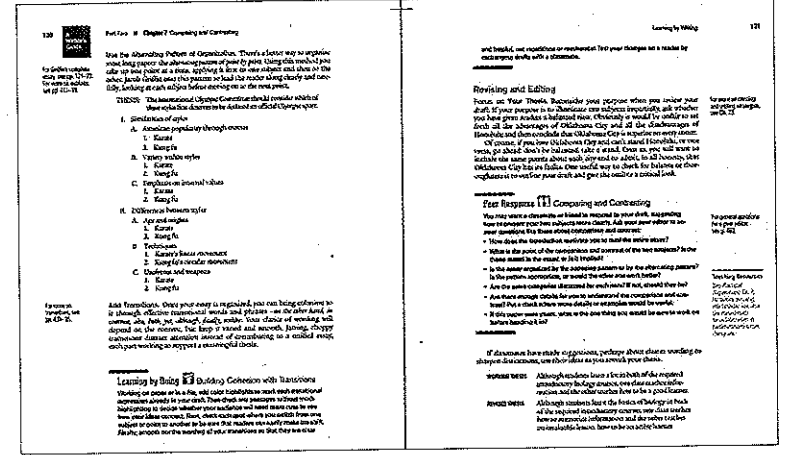
b. Two-page grid, with narrow outside columns for notes
Excerpt from Kennedy, Kennedy, and Muth, THE BEDFORD GUIDE FOR COLLEGE WRITERS WITH READER, Tenth Edition, pp. 130–131. Copyright © 2014 Bedford/St. Martin's. Reprinted by permission.
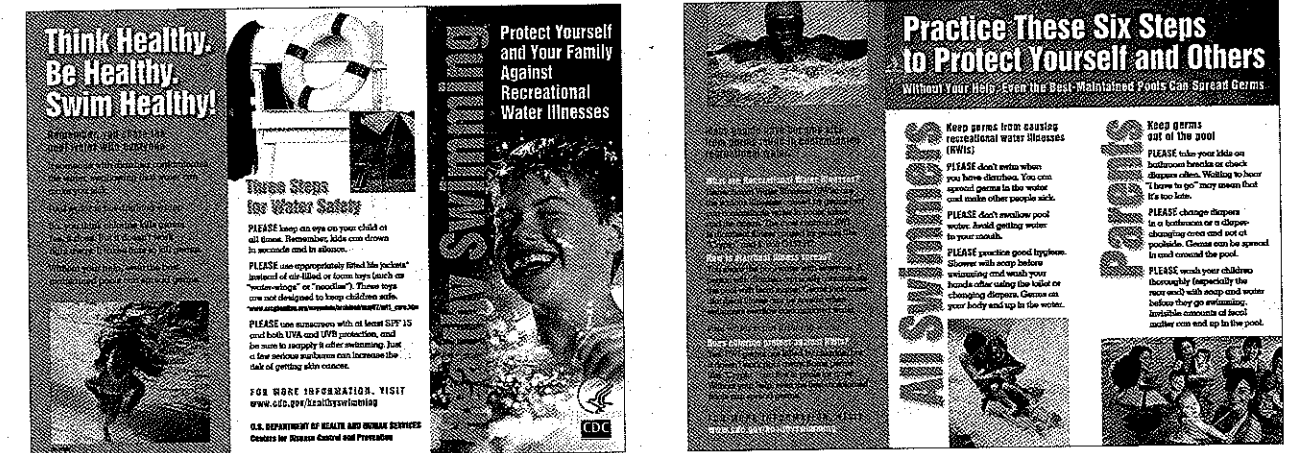
c. Three-panel brochure
Source: Centers for Disease Control and Prevention, 2014: http://www.cdc.gov/healthywater/pdf/swimming/resources/healthy-swimming-rwi-brochure.pdf.

FIGURE 11.10   Popular Grids

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 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.
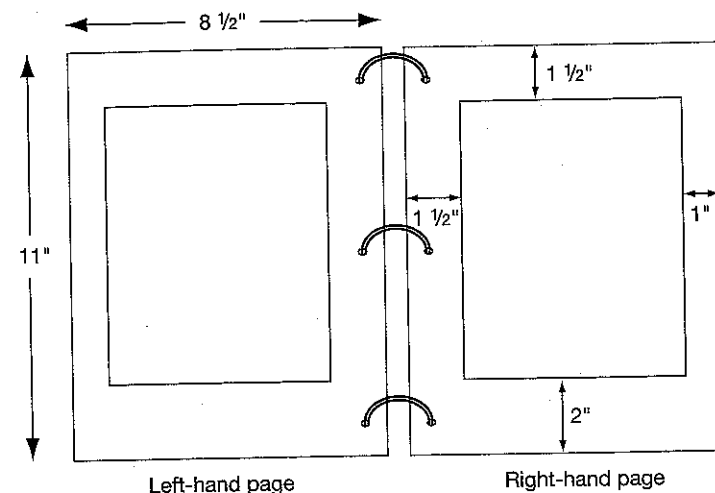
FIGURE 11.11   Typical Margins for a Document That Is Bound Like a Book

Margins, which make up close to half the area on a typical page, serve four main purposes:

- They reduce the amount of information on the page, making the document easier to read and use.
- They provide space for binding and allow readers to hold the page without covering up the text.
- 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 enables you to put more words on a page than a single-column design.

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.
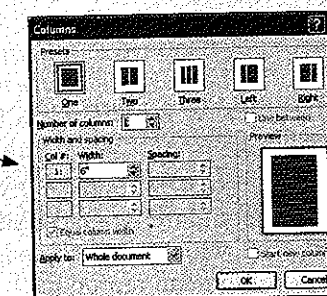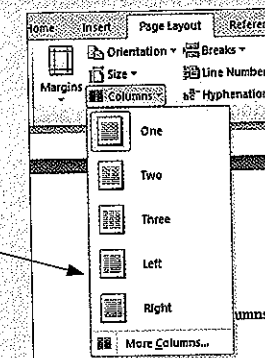
When you divide your document into columns, text flows from the bottom of one column to the top of the next column. Columns enable you to use the principle of repetition to create a visual pattern, such as text in one column and accompanying graphics in an adjacent column.

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.
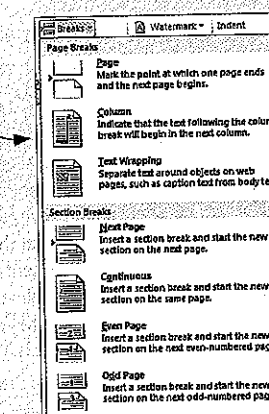
KEYWORDS: columns, breaks, column break, page setup group

- Columns enable you to 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 typefaces, type families, case, and type size, as well as factors that affect the white space of a document: line length, line spacing, and justification.

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 on page 266 shows three contrasting typefaces.

FIGURE 11.12   Three Contrasting Typefaces

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.

As Figure 11.13 illustrates, typefaces are generally classified into two categories: *serif* and *sans serif.*

Although scholars used to think that serif typefaces were 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. Readers are most comfortable with the style they see most often.
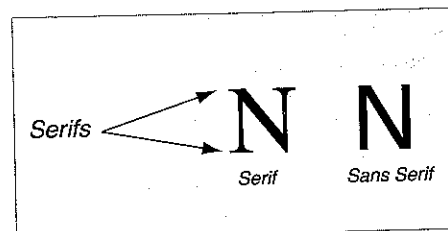
FIGURE 11.13   Serif and Sans-Serif Typefaces

Most of the time you will use a handful of standard typefaces such as Times New Roman, Cambria, Calibri, and Arial, which are included in your word-processing software and which your printer can reproduce.

Type Families   Each typeface belongs to a family of typefaces, which consists of variations on the basic style, such as italic and boldface. Figure 11.14, for example, shows the Helvetica family.

Helvetica Light	**Helvetica Bold Italic**
Helvetica Light Italic	**Helvetica Heavy**
Helvetica Regular	***Helvetica Heavy Italic***
Helvetica Regular Italic	Helvetica Regular Condensed
Helvetica Bold	*Helvetica Regular Condensed Italic*

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.
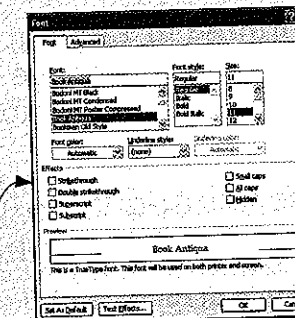
You can also specify basic font formatting such as typeface, type size, bold, italic, and underlining by using drop-down menus and buttons in the **Font** group.
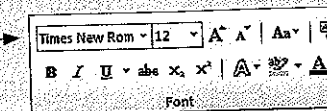
KEYWORDS: font group, font, font style

Be careful not to overload your document with too many different members of the same family. Used sparingly and consistently, these variations 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.

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). Most people require 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). If the text includes both cases, readers will find it easier to see where new sentences begin (Poulton, 1968).

Individual variations are greater in lowercase words

THAN THEY ARE IN UPPERCASE WORDS.

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.
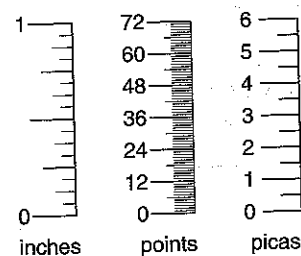
Type Size Type size is measured with a unit called a *point*. There are 12 points in a pica and 72 points in an inch. In most technical documents 10-, 11-, or 12-point type is used for the body of the text:

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.

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 for 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-point or smaller type) 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 if you discover that the low rates are guaranteed for only three months or that you are committing to a long-term contract. You *should* get annoyed. Hiding information in tiny type is 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 amount of 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 shows three variations in line spacing.

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

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.

Figure 11.17 on page 270 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 the first line in each paragraph, which is sometimes indented, the lines begin along a uniform left margin but end on an irregular right margin. 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 the right margin 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:

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.

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.

Notice that the space between words is uniform in left-justified text.

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.

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.

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.

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.

▶ 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.
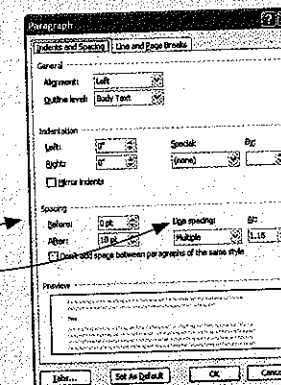
You can select **preset** line-spacing options by using the **Line Spacing** drop-down menu in the **Paragraph** group.
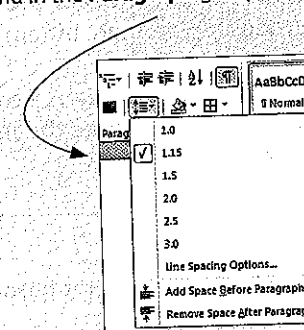
KEYWORDS: line spacing, paragraph spacing, paragraph group

▶ 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.
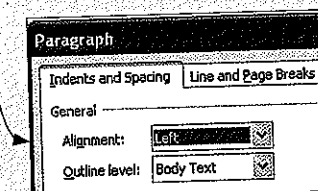
To modify justification using buttons in the **Paragraph** group, select one of the following buttons:

To left-align text

To right-align text

To center text

To justify text

KEYWORDS: alignment, justify text, justification, paragraph group

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.

TITLES AND HEADINGS

Titles and headings should stand out visually on the page because they introduce new ideas.

Titles Because the title is the most-important heading in a document, it should be displayed clearly and prominently. On a cover page or a title page, use boldface type in a large size, such as 18 or 24 points. If the title 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 an A head (a first-level heading) and a B head (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, the closer it is to the left margin: A heads usually begin at the left margin, B heads are often indented a half inch, and C heads are often indented an inch. Indented C heads 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.

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 Additional Design Features for Technical Communication

Two types of rules are used here: vertical rules to separate the columns and 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: From Institute of Scientific and Technical Communicators, "Industry News" in COMMUNICATOR (Spring 2005). Reprinted by permission of the Institute of Scientific and Technical Communicators.

Rules. *Rule* is a design term for a straight line. You can add rules to your document using the drawing tools in a word processor. 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: From J. W. Valley, "A cool early Earth?" from SCIENTIFIC AMERICAN (October 2005): 58–65. Copyright © 2005 by Scientific American, Inc. Illustrations reprinted by permission of Lucy Reading-Ikkanda. Images used by permission of J. W. Valley.

Boxes. Adding rules on all four sides of an item creates a box. Boxes can enclose graphics or special sections of text or can 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   Additional Design Features for Technical Communication (*continued*)

The different-colored screens clearly distinguish the three sets of equations.		**Screens.** The background shading used behind text or graphics for emphasis is called a *screen*. The density of a screen 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.
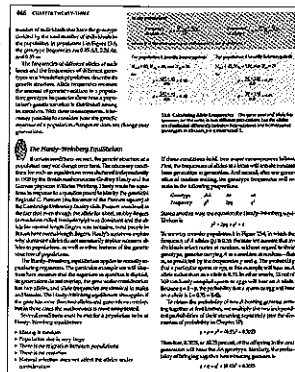
Source: Excerpt from W. K. Purves, D. Sadava, G. H. Orians, and H. C. Heller, LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, page 466. Copyright © 2004. Reprinted by permission of Sinauer Associates, Inc.

The marginal glosses present definitions of key words.		**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.

Source: Excerpt and sample marginal glosses from PSYCHOLOGY, Tenth Edition (New York: Worth Publishers, 2013). David C. Myers, page 304.

This pull quote extends into the margin, but a pull quote can go anywhere on the page, even spanning two or more columns or the whole page.		**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.

Source: Excerpt and sample pull quote from THE AMERICAN PROMISE: A HISTORY OF THE UNITED STATES, VOLUME I: TO 1877 (Boston: Bedford/St. Martin's, 2005). L. Roark, M. P. Johnson, P. C. Cohen, S. Stage, A. Lawson, and S. M. Hartman, p. 115.

▶ 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.
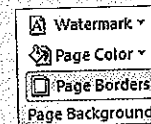
Select the **Borders** or **Page Border** tab. You can specify the type of border, line style, color, and line width.
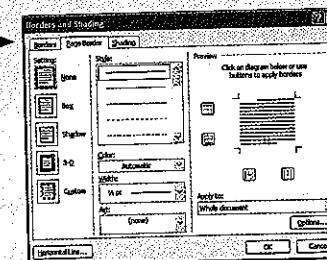
To create **shading**, also called a screen, select the area you want to format, and then select **Page Borders** on the **Page Background** group. Select the **Shading** tab.
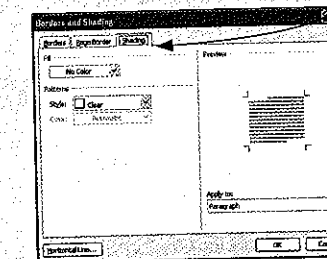
You can specify the color within the box as well as the style of the pattern.

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.
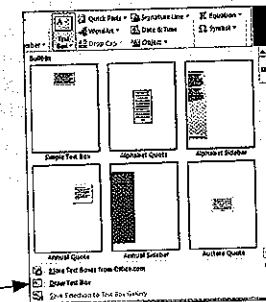
To **create** a text box, select **Draw Text Box** from the **Text Box** drop-down menu.

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.
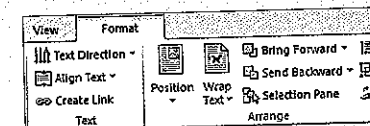
After selecting the box, you can also use buttons on the **Format** tab to specify such design elements as fill color, line color, font color, line style, and other effects.
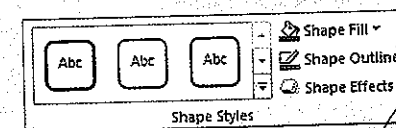
KEYWORDS: text box, drawing toolbar, fill color, line color

Analyzing Several Print-Document Designs

Figures 11.18 to 11.21 show typical designs used in print documents.

A multicolumn design enables you to present a lot of text and graphics of different sizes.

Notice how the designer has used the whole width of the page for one graphic and a single column for a smaller graphic.

Note that the alley—the space between the two columns of text—need not be wide. Nor do you need to include a vertical rule to keep the columns separate. The human brain easily understands that each column is a separate space.

In this sample, the bar graph is exactly the width of the column in which it appears. But it doesn't have to be. It could break the shape of the column and extend into the other column or even into the margin. Or it could be narrower than its column, with the text wrapping around it. The design you see here looks neat and professional. If the graph were wider or narrower than the column, the design might appear somewhat more creative.

Financial Discussion and Analysis

Financial Highlights

The USPTO received an unqualified (clean) audit opinion from the independent public accounting firm of KPMG LLP on its FY 2012 financial statements, provided in the Financial Section of this report. This is the 20th consecutive year that the USPTO received a clean opinion. Our unqualified audit opinion provides independent assurance to the public that the information presented in the USPTO financial statements is fairly presented, in all material respects, in conformity with accounting principles generally accepted in the United States of America. In addition, KPMG LLP reported no material weaknesses in the USPTO's internal control, and no instances of non-compliance with laws and regulations affecting the financial statements. Refer to the Other Accompanying Information section for the Summary of Financial Statement Audit and Management Assurances.

The summary financial highlights presented in this section provide an analysis of the information that appears in the USPTO's FY 2012 financial statements. The USPTO financial management process ensures that management decision-making information is dependable, internal controls over financial reporting are effective, and that compliance with laws and regulations is maintained. The issuance of these financial statements is a component of the USPTO's objective to continually improve the accuracy and usefulness of its financial management information.

Balance Sheet and Statement of Changes in Net Position

At the end of FY 2012, the USPTO's consolidated Balance Sheet presents total assets of $1,982.1 million, total liabilities of $1,255.2 million, and a net position of $726.9 million.

Total assets increased 20.3 percent over the last four years, resulting largely from the increase in Fund Balance with Treasury. The decrease in Fund Balance with Treasury during FY 2009 is a result of the decrease in fee income. The following graph shows the changes in assets during this period.

Composition of Assets
(Dollars in Millions)

PERFORMANCE AND ACCOUNTABILITY REPORT, FISCAL YEAR 2012

FIGURE 11.18 A Multicolumn Design
Source: U.S. Patent and Trademark Office, 2013: http://www.uspto.gov/about/stratplan/ar/USPTOFY2012PAR.pdf.

This page from a software company's white paper—a marketing document usually distributed on the web—shows one approach to a one-column design.

The main text column is relatively narrow, making the line easy to read.

PDF Page Content

Page Description Language
PDF is a page description language, i.e. it describes how a page looks so that it can be reproduced for viewing and printing. The language resembles Postscript, but is much simpler to allow for more efficient processing. For example, it does not contain control structures like loops and „if" statements.

PDF Page Content Elements
Basically PDF recognizes three types of page content elements:
- Text (fonts programs)
- Graphic paths (lines and curves)
- Images (raster samples)

The picture to the right shows examples of the three PDF content types.
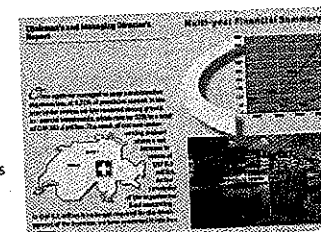
Content Objects
PDF uses objects and object types to describe the content. Every string of text and all graphics and images are defined by one or several objects, created from one or more object types.
- Text Objects. Text objects are defined by a number of attributes including font family, style and size, a string of characters, and a position on a page. PDF does not recognize nor store objects for line breaks, headers, paragraphs, indentation etc. (i.e. paragraph formatting operators used in word processing applications like Microsoft Word). Text is broken down into fragments as small as single characters but not more than one line. The fragments can be randomly stored and are like pieces of a puzzle that all have to be placed in their correct location on the page to complete its appearance.
- Graphic Path Objects. A graphic path object is an arbitrary shape made up of straight lines, rectangles, and cubic Bézier curves. A graphic path object ends with one or more painting operators that specify whether the path is stroked, filled, used as a clipping boundary or some combination of these operations.
- PDF Image Objects. A PDF-specific image format is used for embedding images in a PDF file. This format is independent of the input image format. For example, scanned pages in TIFF format or GIF images that are converted to PDF are newly packaged into PDF image format. Once an image has been converted to PDF image format, it is usually not possible to determine what the original image format was. It is however possible to export PDF images into raster image formats, provided the raster image format supports all features of the image (e.g. transparency).

Unlike word processors, text is not continuous in a paragraph.

Text is defined in fragments with attributes such as font and font size, a string of characters and a location on a page.

Images that are imported into a PDF file are converted to PDF image format. They are not stored as TIFF, GIF etc. images.

The right margin is wide enough to accommodate text boxes, small graphics, or other items.

One goal of document design is to reduce the number of pages needed—but when you design a page, you want to make the text inviting and easy to read. Figuring out how to balance these two priorities is one of the major challenges of designing a page.

FIGURE 11.19 A One-Column Design
Courtesy of PDF Tools AG.

This is a page from *State,* the magazine for employees of the U.S. State Department. Magazines for people who work together tend to include a lot of photographs, including many showing people from that organization.

The large photograph extends to the top edge and the left edge of the page. Eliminating the margins in this way would be a mistake if the graphic were crammed with information that readers needed to study; a dense table of data, for instance, would be overwhelming. But in this case, the blue sky in the background acts as a decorative frame for the "information" in the bottom half of the photo.

Although this page uses a simple three-column design, note that one photo spans all three columns, another photo spans two columns, and the caption box spans one column. This creative use of the multicolumn design enables the designer to fill the page with content while keeping it visually interesting.
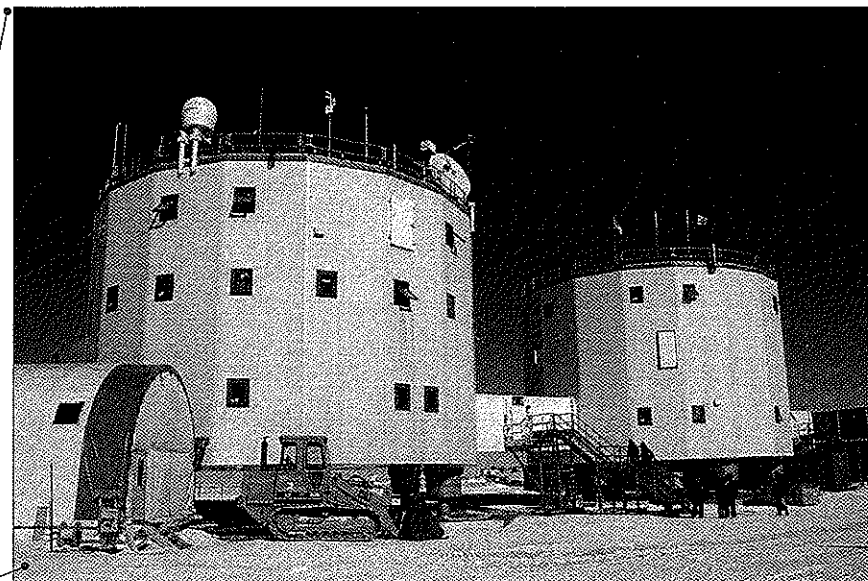
The Joint Inspection Team visits France and Italy's Concordia Station. *Photo by Evan Bloom; Below: Then-Secretary of State Clinton speaks at the 2009 Joint Session of the Antarctic Treaty Consultative Meeting. Department of State photo.*

inspections in East Antarctica required the team to travel more than 3,500 miles over six days by plane, truck, boat, helicopter, tracked vehicle and snowmobile.

The inspections, representing the first time either country had conducted a joint inspection in Antarctica, were called for in an agreement that Secretary of State Hillary Rodham Clinton signed with Russian Foreign Minister Sergey Lavrov in September 2012. The United States and Russia were architects of the Antarctic Treaty of 1959 and today conduct some of the most extensive and diverse scientific activities in Antarctica. Importantly, both countries reject territorial claims by other parties and are strong supporters of the Antarctic Treaty system. Working closely with our Russian counterparts provided an excellent opportunity to reinforce our shared objectives for the peace and science in Antarctica. The results of the inspection will be presented to all treaty parties at the May Antarctic Treaty Consultative Meeting.

Antarctica is an outstanding example of multilateral diplomatic success. Fifty years after the signing of the Antarctic Treaty, the continent is a global example of policy and scientific collaboration. The multinational science conducted in Antarctica informs global understanding of the Earth's history, processes and change, and policy and logistical cooperation there creates stronger ties among treaty parties. In the coming decades, the Antarctic Treaty system will continue to prove the resilience and value of multilateral cooperation. ◻

FIGURE 11.20   A Magazine Page Design

Source: U.S. Department of State, 2013: www.state.gov/documents/organization/205362.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—numbered and lettered—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.

DOCUMENT ANALYSIS ACTIVITY

Analyzing a Page Design

This page is from a government report. The questions below ask you to think about page design (as discussed on pp. 260–75).

1. How many levels of headings appear on this page? Are the different levels designed effectively so that they are easy to distinguish? If not, what changes would you make to the design?

2. How are rules used on this page? Are they effective? Would you change any of them?

3. Describe the design of the body text on this page, focusing on columns and alignment. Is the design of the body text effective? Would you change it in any way?

20   THE BUDGET AND ECONOMIC OUTLOOK: FISCAL YEARS 2013 TO 2023   FEBRUARY 2013

Figure 1-2.

Total Revenues and Outlays

(Percentage of gross domestic product)
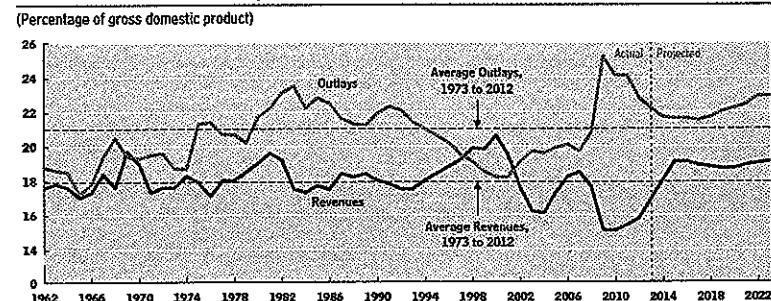
Source: Congressional Budget Office.

health care costs, and a significant expansion in eligibility for federal subsidies for health insurance, outlays for Social Security and the federal government's major health care programs are projected to rise substantially relative to the size of the economy over the next 10 years. In addition, growing debt and rising interest rates will boost net interest payments. Spending on all other programs—in the aggregate—is projected to decline relative to GDP between 2014 and 2023, primarily because of improving economic conditions and the spending limits in current law.

Revenues
CBO projects that, if current tax laws remain unchanged, revenues will rise relative to GDP over the next two years and then remain at about 19 percent of GDP through 2023. After 2015, increases in individual income tax receipts relative to GDP will roughly offset projected declines in corporate income tax receipts and declines in remittances from the Federal Reserve as a share of GDP.

Individual Income Taxes. CBO projects that, under current law, individual income tax receipts will rise from $1.3 trillion this year to $2.5 trillion in 2023—or from 7.9 percent to 9.8 percent of GDP. The projected increase in receipts relative to the economy in CBO's baseline reflects real (inflation-adjusted) bracket creep, the economic expansion, recent and scheduled changes in tax provisions, and other factors. In previous baselines,

CBO had projected that those receipts would increase to a much higher percentage of GDP by the early part of the next decade, but the American Taxpayer Relief Act's permanent extension of most of the expiring income tax reductions has significantly reduced the amount of revenues anticipated under current law.

Real Bracket Creep. Increases in real income will push more income into higher tax brackets, which boosts revenues relative to GDP in CBO's projections by 0.9 percentage points over the next decade.[11]

Economic Recovery. CBO expects that the economic expansion and related factors will cause taxable incomes to rise faster than GDP, boosting individual income tax revenues as a share of GDP by about 0.4 percentage points over the next decade; most of that effect will occur by 2017. Certain components of taxable income—including wages and salaries, capital gains realizations, interest income, and proprietors' income—declined as a share of GDP over the past several years. CBO expects that, as the economy recovers, such income will rebound more quickly than the economy as a whole, increasing

11. Roughly three-quarters of that amount is a longer-term effect that results from increases in the potential output of the economy (that is, the maximum sustainable level of economic output), and the rest results from the return of output to its potential level over the next several years.

Source: U.S. Congressional Budget Office, 2013: www.cbo.gov/sites/default/files/cbofiles/attachments/43907-BudgetOutlook.pdf.

Designing Online Documents

The previous discussion of designing printed documents focused on four components: size, paper, bindings, and accessing aids. Of these four components, size and accessing aids or tools are relevant to websites and other online documents.

Size is important in that you can control—to some extent, at least—how much information (text, graphics, animation) you assign to the screen. On all but the smallest screens, you can use multiple columns and vary column width, and you can fill screens with content (and thereby use fewer screens) or leave a lot of white space (and thereby use more screens). As people are increasingly turning to smaller screens for reading online content, you want to pay more attention to designing your information so that it is clear and attractive. You also want to be sure that you design the site so that key information is emphasized and easily accessible to users. In addition, you want to consider audience characteristics such as age (use bigger type for older people) and disabilities (for example, include text versions of images so that people with vision disabilities can use software that "reads" your descriptions of the images).

Accessing tools are vitally important, because if your audience can't figure out how to find the information they want, they're out of luck. With a print document, they can at least flip through the pages.

The following discussion focuses on seven principles that can help you make it easy for readers to find and understand the information they seek:

- Use design to emphasize important information.
- Create informative headers and footers.
- Help readers navigate the document.
- Include extra features your readers might need.
- Help readers connect with others.
- Design for readers with disabilities.
- Design for multicultural readers.

Although some of these principles do not apply to every type of online document, they provide a useful starting point as you think about designing your document.

USE DESIGN TO EMPHASIZE IMPORTANT INFORMATION

The smaller the screen, the more cluttered it can become, making it difficult for readers to see what is truly important. In documents designed to be viewed on different-sized screens, you want readers to be able to find what they want quickly and easily. As you begin planning a site, decide what types of information are most essential for your audience, and ensure that that content in particular is clearly accessible from the home screen. Give your buttons, tabs, and other navigational features clear, informative headings. For more guidance on emphasizing important information, see Chapter 9.

Once you have determined the information you want to emphasize, adhere to design principles rigorously so that users can easily identify key content. Use logical patterns of organization and the principles of proxim-

FIGURE 11.22. Screen for a Mobile Application
Sepsis Clinical Guide mobile app, Escavo, Inc. (www.escavo.com). Used by permission.
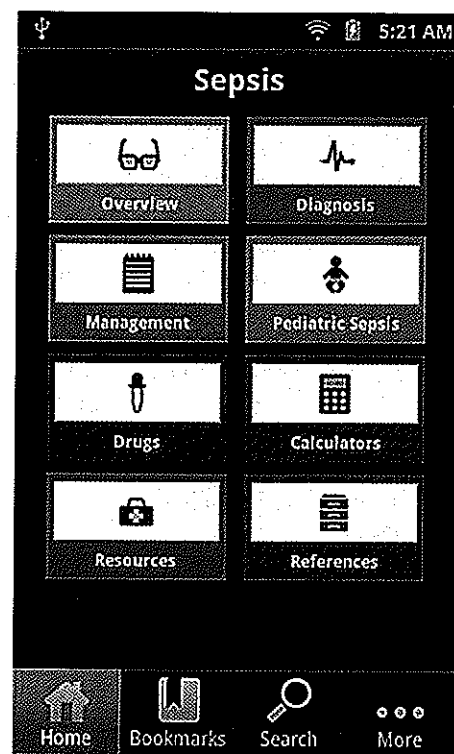
This app helps physicians diagnose sepsis quickly and effectively. The information most crucial to evaluating the condition is easily accessible on the home screen. At the top of the screen, where the reader's eyes will initially fall, is an overview of the condition and, most importantly, the diagnostic tool. Less-essential items, such as resources and references, are located at the bottom of the screen. Supplementary information, such as a call for authors and a feedback form, is deeper on the site, behind the "More" tab.

This simple screen uses the principle of contrast effectively to highlight key content. Each of the eight main content areas has its own color and its own icon to distinguish it from the seven other areas. In addition, the four navigation items at the bottom of the screen use contrast in that the screen the reader is now viewing—in this case, the home page—is presented against a blue screen, whereas the other three are presented against a black screen.

ity, alignment, repetition, and contrast so that readers know where they are and how to carry out the tasks they want to accomplish. Figure 11.22 shows a well-designed screen for a mobile phone.

CREATE INFORMATIVE HEADERS AND FOOTERS

Headers and footers help readers understand and navigate your document, and they help establish your credibility. You want readers to know that they are reading an official document from your organization and that it was created by professionals. Figure 11.23 shows a typical website header, and Figure 11.24 shows a typical footer.

FIGURE 11.23   Website Header
Notice that a header in a website provides much more accessing information than a header in a printed document. This header enables readers to search the site, as the header on almost every site does, but it also includes other elements that are particularly important to the Michael J. Fox Foundation. For instance, there is a link to drug trials that visitors might want to join, and there is a prominent link for donating to the foundation.
Reprinted by permission of the Michael J. Fox Foundation for Parkinson's Research.

The top line of the footer contains the contact information for the site.

The bottom line contains the copyright notice, as well as links to the privacy policy, the terms and conditions for using the site, and a site map.

FIGURE 11.24   Website Footer
This simply designed footer presents all the links as text. Readers with impaired vision who use text-to-speech devices will be able to understand these textual links; they would not be able to understand graphical links.
Reprinted by permission of the Michael J. Fox Foundation for Parkinson's Research.

HELP READERS NAVIGATE THE DOCUMENT

One important way to help readers navigate is to create and sustain a consistent visual design on every page or screen. 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 Document Easy To Navigate

Follow these five suggestions to make it easy for readers to find what they want in your document.

▶ **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 11.25 shows a portion of a site map.
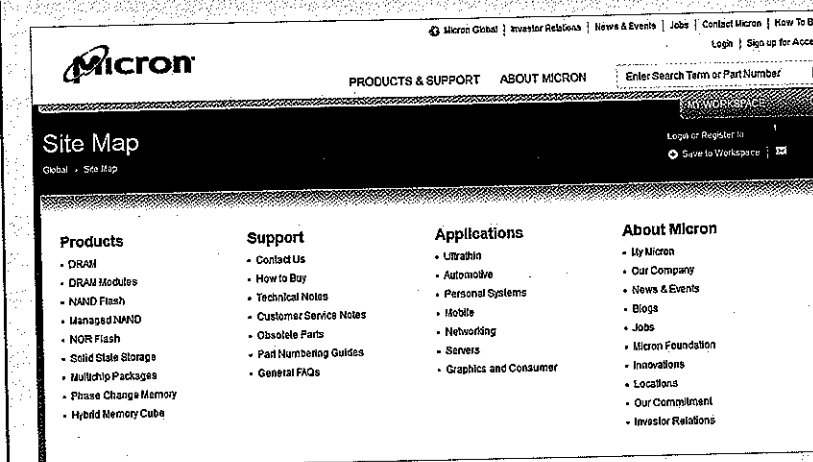
FIGURE 11.25   Site Map
For large websites, help your readers by organizing the site map rather than just presenting an alphabetical list of the pages. In this portion of a site map, Micron Technology classifies the pages in logical categories to help visitors find the pages they seek.
Copyright © Micron Technology, Inc. All rights reserved. Reprinted by permission.

▶ **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 farther down on the same page or to information on separate pages. Figure 11.26 shows an excerpt from the table of contents at the top of a frequently asked questions (FAQ) page.
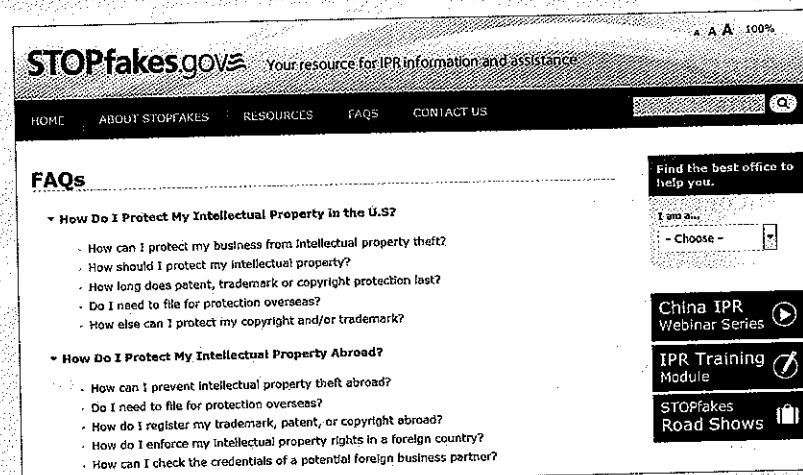
FIGURE 11.26 Table of Contents

The table of contents is classified by topic (first all the topics about protecting your intellectual property in the United States, then all the topics about protecting it outside the United States). For any online document, large or small, use the principles of organizing information presented in Chapter 8.

Source: U.S. Department of Commerce, 2013: www.stopfakes.gov/faqs.

▶ **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 use buttons or icons for links, include textual versions of those links at the bottom of the page. Readers with impaired vision might use special software that reads the information on the screen. This software interprets text only, not graphics.

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 page.** 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 enables readers to enter a keyword or phrase and find all the pages in the document that contain it.

- **Resource links.** If one of the purposes of your document is to educate readers, provide links to other sites.

- **A printable version of your site.** Online documents are designed for a screen, not a page. A printable version of your document, with black text on a white background and all the text and graphics consolidated into one big file, will save readers paper and toner.

- **A text-only version of your document.** Many readers with impaired vision rely on text because their specialized software cannot interpret graphics. Consider creating a text-only version of your document for these readers, and include a link to it on your home page.

HELP READERS CONNECT WITH OTHERS

Organizations use their online documents, in particular their websites, to promote interaction with clients, customers, suppliers, journalists, government agencies, and the general public. For this reason, most organizations use their sites to encourage their various stakeholders to connect with them through social media such as discussion boards and blogs.

Use your online document to direct readers to interactive features of your own website, as well as to your pages on social-media sites such as Facebook or Twitter. Figure 11.27 on page 286 shows a portion of NASA'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 devices, enabling them to work from home and participate in virtual communities. However, most sites on the Internet are not designed to accommodate people with disabilities.

The following discussion highlights several ways to make your online documents easier for people with disabilities to use. 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. Do not rely on color or graphics alone to communicate information—provide either a text-only version of your document or textual equivalents of all your graphics. Use the "alt" (alternate) tag to create a
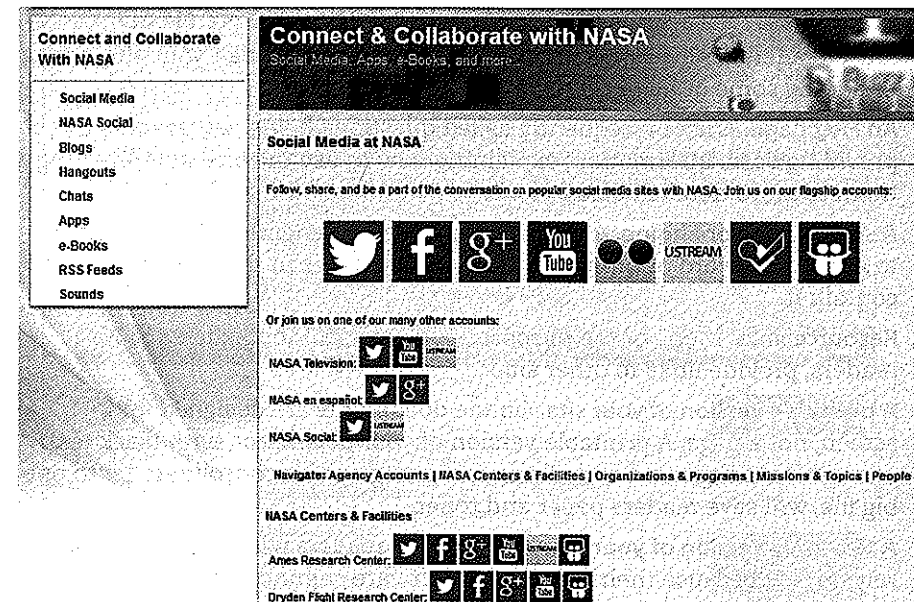
FIGURE 11.27   Maintaining Communities

As a federal agency with a mission that includes public education, NASA has a robust social-media presence. NASA has dozens of accounts on Facebook and the other popular social-media platforms, and it offers many opportunities for scientists and the general public alike to stay connected through blogs, podcasts, chat rooms, and educational programs and activities on such topics as how to view the International Space Station.
Source: National Aeronautics and Space Administration, 2013: www.nasa.gov/socialmedia/.

textual label that appears when the reader holds the mouse over the graphic. For example, if you use a red icon to signal a warning, also use the word *warning.* Use 12-point or larger type 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 on.

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, 2013). Therefore, it makes sense in planning your online documents to assume that many of your readers will not be proficient in English.

Planning for a multicultural website 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 email 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 ONLINE DOCUMENTS

You know that the words and images that you see on the Internet are covered by copyright, even if you do not see a copyright symbol. The only exception is information that is in the public domain either because it is not covered by copyright (such as information created by entities of the U.S. federal government), because copyright has expired (the author has been dead over 70 years), or because the creator of the information has explicitly stated that the information is in the public domain and you are free to copy it.

But what about the design of a 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 computer 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, and then plug in your own data? No. Your responsibility is to create your own information, then display it with your own design.

For more about copyright law, see Ch. 2, p. 24.

Designing Online Pages

Well-designed online pages are simple, with only a few colors and nothing extraneous. 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 an online document, remember that readers are increasingly likely to use it on a device with a small screen. In addition, they will likely read in noisy, distracting environments with too much light or not enough light. For these reasons, keep the design as simple as you can.

GUIDELINES Designing a Simple Site

Follow these four suggestions to make your design attractive and easy to use.

▶ **Use simple backgrounds.** A plain background is best. Avoid busy patterns that distract the reader from the words and graphics of the text.

- **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, requires a long time to download, and uses up your reader's data-download allotment, use a thumbnail that readers can click on if they wish to open a larger version.

MAKE THE TEXT EASY TO READ AND UNDERSTAND

Online pages are harder to read than paper documents because screen resolution is less sharp.

◢
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.

CREATE CLEAR, INFORMATIVE LINKS

Well-phrased links are easy to read and understand. By clearly indicating what kind of information the linked site provides, links can help readers decide whether to follow them. The following guidelines box is based on *Web Style Guide Online* (Lynch & Horton, 2011).

◢
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 — <u>Click here</u> to go to the Rehabilitation Center page, which links to research centers across the nation.

  SMOOTH — The <u>Rehabilitation Center</u> 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 <u>Rehabilitation Center</u>.

  INFORMATIVE — See the Rehabilitation Center's <u>hours of operation</u>.

- **Use standard colors for text links.** Readers are used to seeing blue for links that have not yet been clicked and purple for links that have been clicked. If you have no good reason to use other colors, stick with the ones most readers expect.

Analyzing Several Online-Document Designs

The best way to learn about designing websites and their pages is to study them. Figures 11.28 to 11.30 offer examples of good web page design.

Nobody likes user agreements, and few people read them carefully. LinkedIn, the online professional network, uses a simple table design to make its user agreement a little easier to read.

In this excerpt, the left column presents a simple overview of a portion of the agreement. The right column presents the "small print": the specific provision, including links to even more detailed information.

4. Our Rights & Obligations

A. Services Availability

We may change or discontinue Services, and in such case, we do not promise to keep showing or storing your information and materials.

For as long as LinkedIn continues to offer the Services, LinkedIn shall provide and seek to update, improve and expand the Services. As a result, we allow you to access LinkedIn as it may exist and be available on any given day and we have no other obligations, except as expressly stated in this Agreement. We may modify, replace, refuse access to, suspend or discontinue LinkedIn, partially or entirely, or change and modify prices prospectively for all or part of the Services for you or for all our Members in our sole discretion. All of these changes shall be effective upon their posting on LinkedIn or by direct communication to you unless otherwise noted. LinkedIn further reserves the right to withhold, remove or discard any content available as part of your account, with or without notice if deemed by LinkedIn to be contrary to this Agreement. For avoidance of doubt, LinkedIn has no obligation to store, maintain or provide you a copy of any content that you or other Members provide when using the Services.

B. Third Party Sites and Developers

Third parties may offer their own products and services through LinkedIn, and we are not responsible for these third-party activities.

LinkedIn may include links to third party web sites ("Third Party Sites") on www.linkedin.com, developer.linkedin.com, and elsewhere. LinkedIn also enables third party developers ("Platform Developers") to create applications ("Platform Applications") that provide features and functionality using data and developer tools made available by LinkedIn through its developer platform. You are responsible for evaluating whether you want to access or use a Third Party Site or Platform Application. You should review any applicable terms or privacy policy of a Third Party Site or Platform Application before using it or sharing any information with it, because you may give the third-party permission to use your information in ways we would not. LinkedIn is not

FIGURE 11.28 Making the Small Print a Little Larger

Source: LinkedIn, 2013: http://www.linkedin.com/legal/user-agreement.

The About NIH page on the National Institutes of Health website conveys its message simply but effectively.

The top row is reserved for the name of this government agency.

Below the agency's name is the main navigation pane, beginning with "Health Information."

Below the main navigation pane is the navigation pane for the section in which this page appears: "About NIH." The About NIH page has 18 sections, beginning with "Mission."
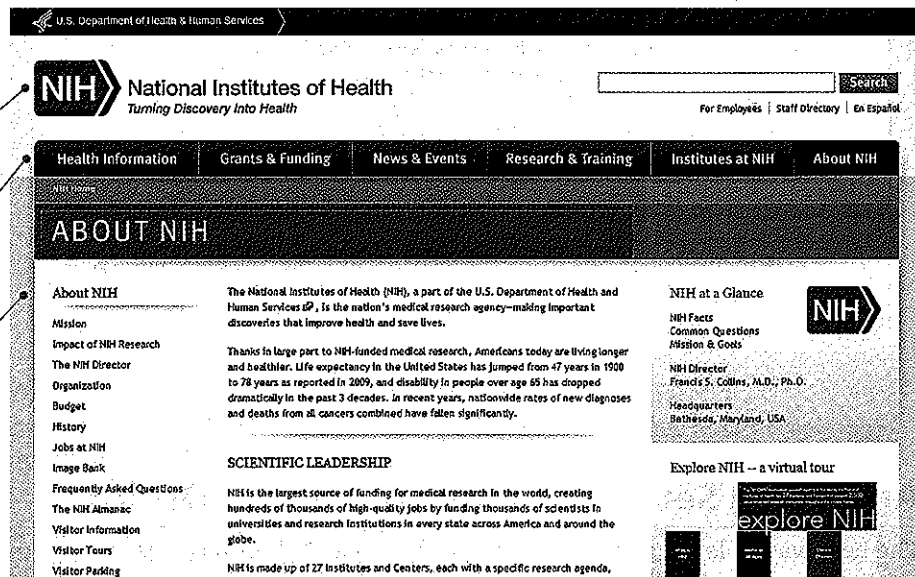

FIGURE 11.29   An About Us Page
Source: U.S. Department of Health and Human Services

Your Art, an app from the U.S. National Gallery of Art, enables museum visitors—and anyone with an Internet connection—to see and learn about many of the art treasures displayed in the museum. The app includes numerous features, including news about exhibitions, textual commentary, and audio commentary.

All of the paintings presented in the app are shown on screens with the same design, making it easy for people to learn how to find the information they seek. Note that the design of the screen is simple and familiar icons are used for manipulating the size of the text and of the image and for playing the audio. Despite the small size of the screen, users will find it easy to navigate and use the app.
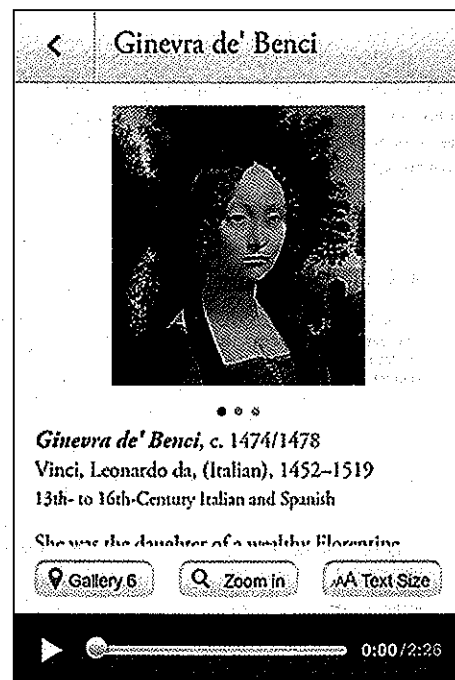

FIGURE 11.30   An App Designed for a Small Screen
Source: National Gallery of Art, 2013: http://apps.usa.gov/yourart.shtml.

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. 254)*

☐ consider the purpose or purposes you are trying to achieve? *(p. 255)*

☐ determine your resources in time, money, and equipment? *(p. 255)*

Designing Print Documents and Pages

Did you

☐ consider the best size for the document? *(p. 256)*

☐ consider the best paper? *(p. 256)*

☐ consider the best binding? *(p. 256)*

☐ think about which accessing aids would be most appropriate, such as icons, color, dividers and tabs, and cross-reference tables? *(p. 256)*

☐ use color, if available, to highlight certain items, such as warnings? *(p. 258)*

☐ devise a style for headers and footers? *(p. 259)*

☐ devise a style for page numbers? *(p. 259)*

☐ draw thumbnail sketches and page grids that define columns and white space? *(p. 262)*

☐ choose typefaces that are appropriate for your subject? *(p. 265)*

☐ use appropriate styles from the type families? *(p. 266)*

☐ use type sizes that are appropriate for your subject and audience? *(p. 268)*

☐ choose a line length that is suitable for your subject and audience? *(p. 268)*

☐ choose line spacing that is suitable for your line length, subject, and audience? *(p. 268)*

☐ consider whether to use left-justified text or full-justified text? *(p. 269)*

☐ design your title for clarity and emphasis? *(p. 272)*

☐ devise a logical, consistent style for each heading level? *(p. 272)*

☐ use rules, boxes, screens, marginal glosses, and pull quotes where appropriate? *(p. 272)*

Designing Online Documents

Did you

☐ create informative headers and footers? *(p. 282)*

☐ help readers navigate the site by including a site map, a table of contents, "Back to top" links, and textual navigation buttons? *(p. 283)*

☐ include extra features your readers might need, such as an FAQ page, a search page or engine, resource links, a printable version of your site, or a text-only version? *(p. 285)*

☐ help readers connect with others through links to interactive portions of your site and to social-media sites? *(p. 285)*

☐ design for readers with vision, hearing, or mobility impairment? *(p. 285)*

☐ design for multicultural audiences? *(p. 286)*

☐ aim for simplicity in web page design by using simple backgrounds and conservative color combinations and by avoiding decorative graphics? *(p. 287)*

☐ make the text easy to read and understand by keeping it short, chunking information, and writing simply? *(p. 288)*

☐ create clear, informative links? *(p. 288)*

EXERCISES

1. Study the first and second pages of an article in a journal in your field. Describe ten design features on these two pages. Which design features are most effective for the audience and purpose? Which are least effective?
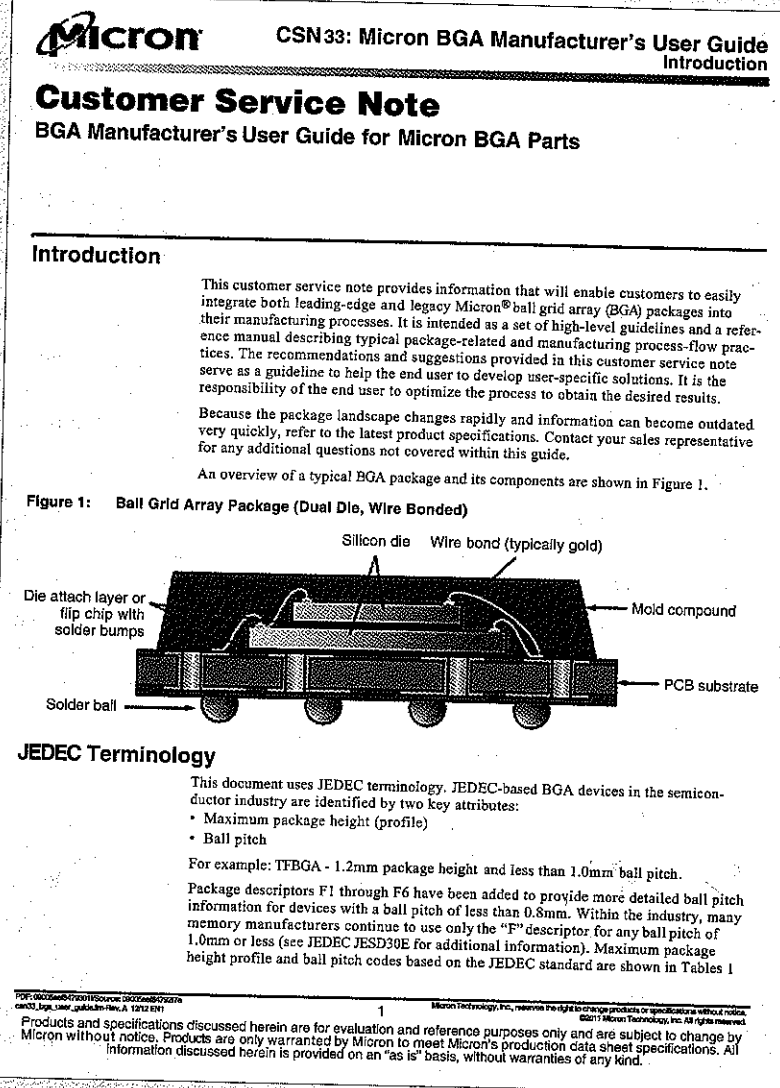
2. **TEAM EXERCISE** Form small groups for this collaborative exercise in analyzing design. Photocopy or scan a page from a book or a magazine. Choose a page that does not contain advertisements. Each person works independently for the first part of this project:

   • 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 photocopy or scan of the page with your memo.

3. Study the excerpt from this Micron data flyer (2012, p. 1). 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.

Micron
CSN33: Micron BGA Manufacturer's User Guide
Introduction

Customer Service Note
BGA Manufacturer's User Guide for Micron BGA Parts

Introduction

This customer service note provides information that will enable customers to easily integrate both leading-edge and legacy Micron® ball grid array (BGA) packages into their manufacturing processes. It is intended as a set of high-level guidelines and a reference manual describing typical package-related and manufacturing process-flow practices. The recommendations and suggestions provided in this customer service note serve as a guideline to help the end user to develop user-specific solutions. It is the responsibility of the end user to optimize the process to obtain the desired results.

Because the package landscape changes rapidly and information can become outdated very quickly, refer to the latest product specifications. Contact your sales representative for any additional questions not covered within this guide.

An overview of a typical BGA package and its components are shown in Figure 1.

Figure 1: Ball Grid Array Package (Dual Die, Wire Bonded)

JEDEC Terminology

This document uses JEDEC terminology. JEDEC-based BGA devices in the semiconductor industry are identified by two key attributes:
- Maximum package height (profile)
- Ball pitch

For example: TFBGA - 1.2mm package height and less than 1.0mm ball pitch.

Package descriptors F1 through F6 have been added to provide more detailed ball pitch information for devices with a ball pitch of less than 0.8mm. Within the industry, many memory manufacturers continue to use only the "F" descriptor for any ball pitch of 1.0mm or less (see JEDEC JESD30E for additional information). Maximum package height profile and ball pitch codes based on the JEDEC standard are shown in Tables 1

1

4. Find the websites 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
   - 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. Using a search engine, find a website 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
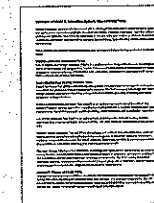
As an employee in the educational information office in the U.S. Department of Education, you have been asked by your supervisor to design a flyer for international students hoping to complete graduate school in the United States. She's given you a text document with all of the relevant information; it's your job to turn that information into a visually appealing flyer that will catch students' attention. Your supervisor has asked you to write her a memo before you begin, describing and defending the design you have in mind. To get started designing your flyer, go to "Cases" under "Additional Resources" in Ch. 11: **macmillanhighered.com/launchpad/techcomm11e.**