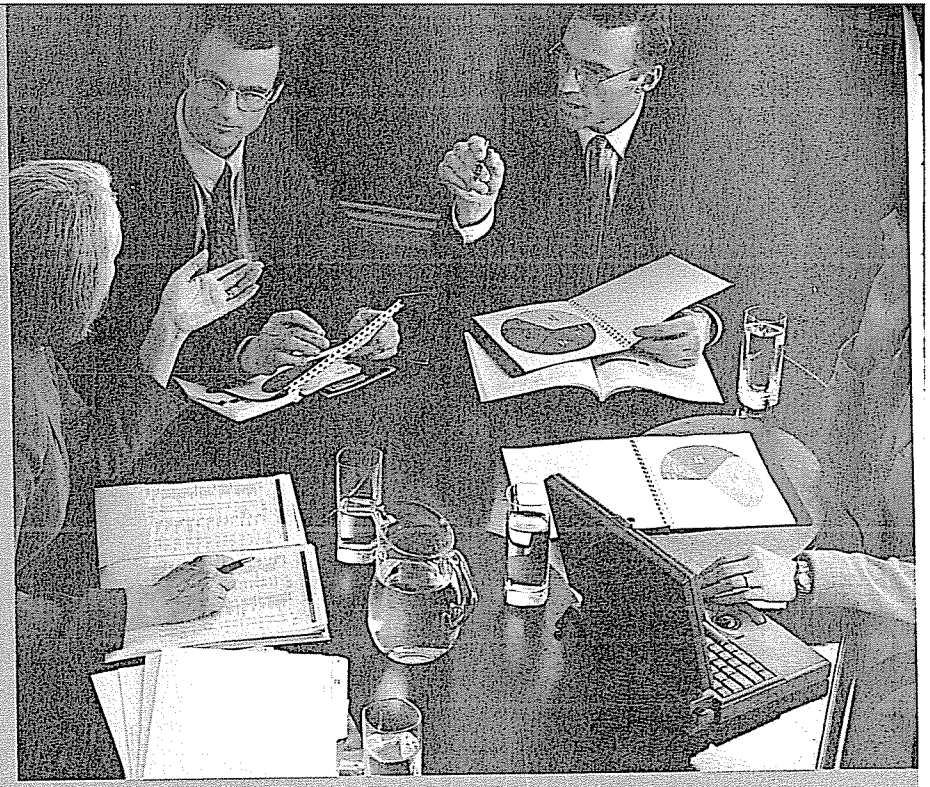
CHAPTER

19

Creating and Using Graphics



In this chapter, you will learn:

- The importance of visuals in documents and presentations.
- Four guidelines for using visuals effectively.
- How to use tables, charts, and graphs.
- Strategies for taking photographs and using them in documents and presentations.
- How drawings, icons, and clip art can be used effectively to enhance understanding.
- How to use video and audio in multimedia and Internet-based documents.

Graphics are an essential part of any technical document or presentation. Your readers will often pay more attention to the visuals in your document than to the written text. For example, think about how you began reading this chapter. More than likely, you did not begin reading at the top of this page. Instead, you probably took a quick glance at the graphics in the chapter to figure out what it is about. Then, you started reading the written text. Your readers will approach your documents the same way.

Guidelines for Using Graphics

As you draft your document, you should look for places where graphics could be used to support the text. Graphics are especially helpful in places where you want to reinforce important ideas or help your readers understand complex concepts or trends.

Graphics should be used to enhance and clarify your message—to slice through the details and numbers to make the information easier to process. In Figure 19.1, for

Written Text vs. Table

In 2007, the state of Michigan reported 16 new cases of West Nile Virus (WNV) among humans. Four of those cases resulted in death. The most cases were in Wayne County, which saw 7 total cases with 5 males and 2 females contracting the virus. Wayne County had two deaths, half of the state's total for 2007. Kent, Macomb, and Oakland Counties each had two cases apiece. Kent County reported two females (ages 19–65) with WNV, Macomb County had two females (one 19–65 and one over 65), and Oakland County counted two males (19–65). The Macomb County victim over 65 died. Kalamazoo, Lapeer, and St. Clair Counties each had one reported case. Kalamazoo County's victim, which resulted in death, was a male over 65. Lapeer County reported one male (19–65), and St. Clair County reported one female (19–65).

2007 HUMAN WNV CASES

COUNTY	AGE (YEARS)	MALE	FEMALE	TOTAL CASES	DEATHS
Kalamazoo	0–18				
	19–65				
	>65	1		1	1
Kent	0–18				
	19–65		2	2	
	>65				
Lapeer	0–18				
	19–65	1		1	
	>65				
Macomb	0–18				
	19–65		1	1	
	>65		1	1	1
Oakland	0–18				
	19–65	2		2	
	>65				
St. Clair	0–18				
	19–65		1	1	
	>65				
Wayne	0–18	1		1	
	19–65	3	1	4	
	>65	1	1	2	2
TOTALS (includes probable and confirmed cases, all clinical syndromes)		9	7	16	4

Source: State of Michigan, http://www.michigan.gov/emergingdiseases.

Figure 19.1: Putting figures into a table makes them much easier to access. The table cannot completely replace the written text, but it can reinforce it by organizing the information more effectively.

To see more examples of text-to-table conversions, go to **www.pearsonhighered.com/johnsonweb4/19.1**

example, the written text and the table provide essentially the same information. And yet, the information in the table is much easier to access.

To help you create and use graphics effectively and properly, there are four guidelines you should commit to memory.

Guideline One: A Graphic Should Tell a Simple Story

A graphic should tell the "story" about your data in a concise way. In other words, your readers should be able to figure out at a quick glance what the graphic says. If your readers need to pause longer than a moment, there is a good chance they will not understand what the graphic means.

Figure 19.2, for example, shows how a graph can tell a simple story. Almost immediately, a reader will recognize that obesity rates around the world are going up dramatically. It's also obvious that the United States is the most obese nation and growing worse.

A Graph That Tells a Simple Story

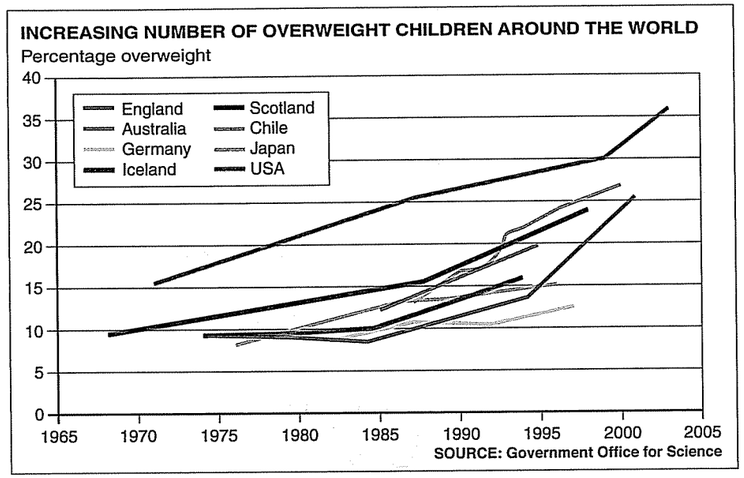


Figure 19.2: This graph tells a simple story about obesity that readers can grasp at a glance.

Source: British Broadcasting Company, http://news.bbc.co.uk/2/hi/health/7151813.stm.

This first guideline—tell a simple story—also applies to photographs in a document (Plotnik, 1982). At a glance, your readers should be able to figure out what story a photograph is telling. The photograph in Figure 19.3, for example, is not complex, but it tells a clear story about the markings on a Desert Checkerspot butterfly.

GOOD IDEAS

For websites that offer other guidelines for using graphics, go to **www.pearsonhighered.com/johnsonweb4/19.2**

A Photograph Should Tell a Simple Story, Too

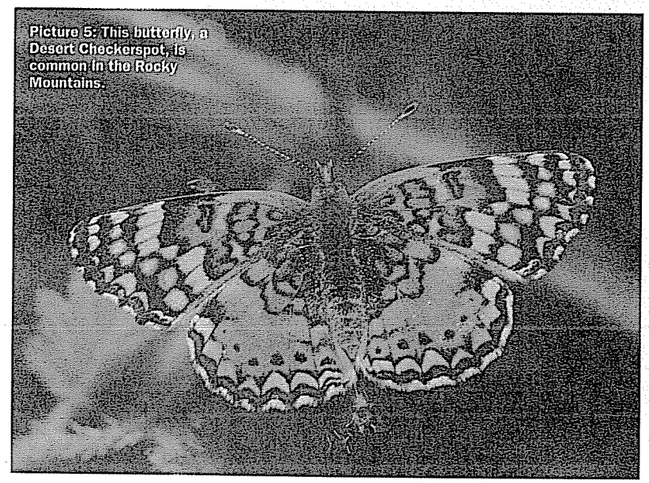


Figure 19.3: This photograph tells a simple story that reinforces the written text.

Source: Corel.

Guideline Two: A Graphic Should Reinforce the Written Text, Not Replace It

Graphics should be used to support the written text, but they cannot replace it altogether. Since technical documents often discuss complex ideas or relationships, it is tempting to simply refer the readers to a graphic (e.g., "See Chart 9 for an explanation of the data"). Chances are, though, that if you cannot explain something in writing, you won't be able to explain it in a graphic, either.

Instead, your written text and visuals should work with each other. The written text should refer readers to the graphics, and the graphics should support the written information. For example, the written text might say, "As shown in Figure 13.1, the number of high school students who report being in fights has been declining." The graph would then support this written statement by illustrating this trend (Figure 19.4).

The written text should tell readers the story that the graphic is trying to illustrate. That way, readers are almost certain to understand what the graphic is showing them.

Guideline Three: A Graphic Should Be Ethical

Graphs, charts, tables, illustrations, and photographs should not be used to hide information, distort facts, or exaggerate trends. In a bar chart, for example, the scales can be altered to suggest that more growth has occurred than is actually the case (Figure 19.5). In a line graph, it is tempting to leave out data points that won't allow a smooth line to be drawn. Likewise, with computers, photographs can be distorted or doctored.

GOOD IDEAS

To see other graphs that tell simple stories, go to **www.pearsonhighered.com/johnsonweb4/19.3**

A good rule of thumb with graphics—and a safe principle to follow in technical communication altogether—is to always be absolutely honest with the readers. Your readers are not fools, so attempts to use graphics to distort or stretch the truth will eventually be detected. Once detected, unethical graphics can erode the credibility of an entire document or presentation (Kostelnick & Roberts, 1998). Even if your readers only *suspect* deception in your graphics, they will begin to doubt the honesty of the whole text.

Link
For more information on the ethical use of data, see Chapter 4, page 87.

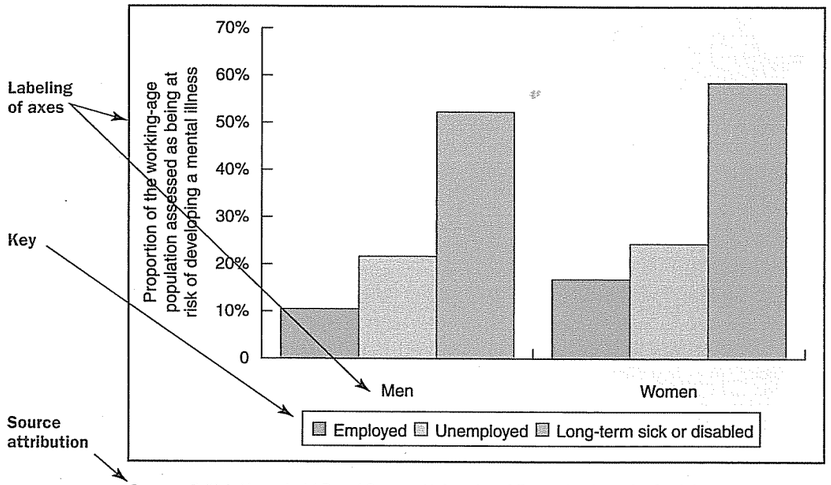
Guideline Four: A Graphic Should Be Labeled and Placed Properly

Proper labeling and placement of graphics help readers move back and forth between the main text and images. Each graphic should be labeled with an informative title (Figure 19.6). Other parts of the graphic should also be carefully labeled:

- The x- and y-axes of graphs and charts should display standard units of measurement.
- Columns and rows in tables should be labeled so readers can easily locate specific data points.
- Important features of drawings or illustrations should be identified with arrows or lines and some explanatory text.
- The source of the data used to make the graphic should be clearly identified underneath.

Link
For more information on designing page layouts, see Chapter 18, page 482.

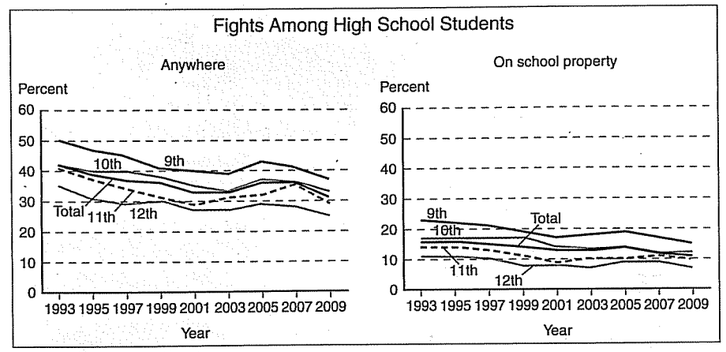
Labeling of a Graphic



Source: British Household Panel Survey, University of Essex, Institute for Social and Economic Research; the data is the average for the five years to 2005/06; updated June 2007. New Policy Institute, http://www.poverty.org.uk.

Figure 19.6: Good labeling of a graphic is important so that readers can understand it.

A Graph That Reinforces the Written Text



Source: National Center for Education Statistics, "Indicators of School Crime and Safety, 2010," http://nces.ed.gov/programs/crimeindicators/crimeindicators2010/figures/figure_13_1.asp.

Figure 19.4: A line graph typically shows a trend over time. This graph shows how fights among high school students have been declining.

Unethical and Ethical Bar Charts

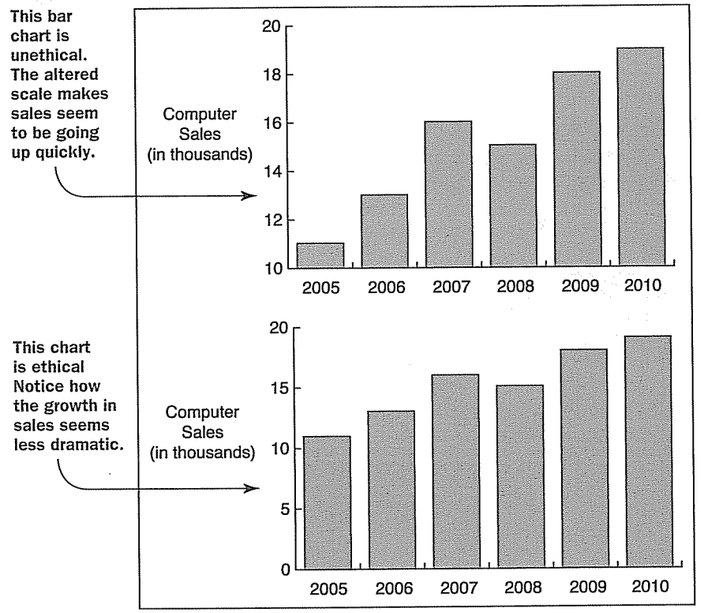


Figure 19.5: The top bar chart is unethical because the y-axis has been altered to exaggerate the growth in sales of computers. The second bar chart presents the data ethically.

Want to see other unethical graphics? Go to **www.pearsonhighered.com/johnsonweb4/19.4**

Line Graphs

Line graphs are perhaps the most familiar way to display data. They are best used to show measurements over time. Some of their more common applications include the following:

Showing trends—Line graphs are especially good at showing how quantities rise and fall over time (Figure 19.8). Whether you are illustrating trends in the stock market or charting the changes in temperature during a chemical reaction, a line graph can show how the quantity gradually increases or decreases. When two or more lines are charted on a line graph, you can show how quantities rise and fall in tandem (or don't).

Showing relationships between variables—Line graphs are also helpful when charting the interaction of two different variables. Figure 19.9, for example, shows a line graph that illustrates how a rise in the temperature of a gas is accompanied by a rise in the volume of gas.

A Line Graph Showing a Trend

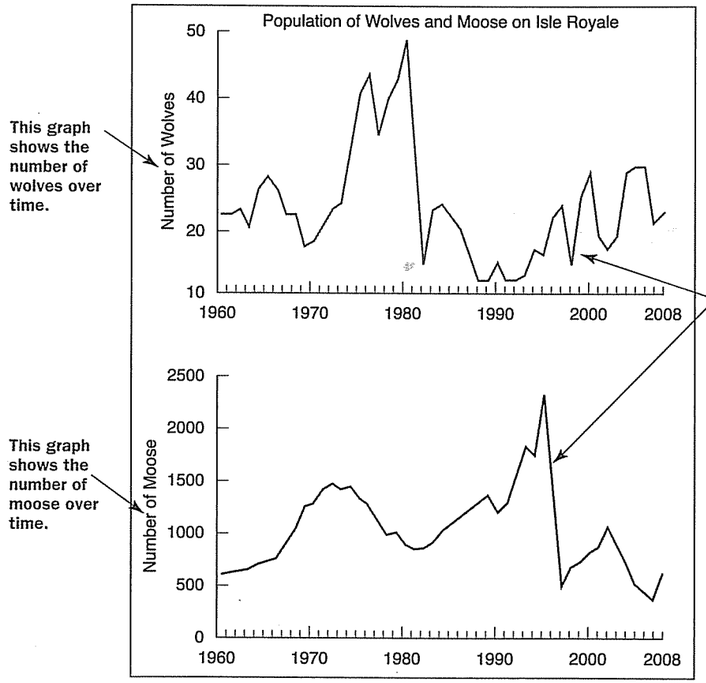


Figure 19.8: A line graph shows trends. These graphs illustrate the interdependence of wolves and moose on Isle Royale in Lake Superior.

Data Source: http://www.isleroyalewolf.org.

Guidelines for Using Graphics

AT A GLANCE

- A graphic should tell a simple story.
- A graphic should reinforce the written text, not replace it.
- A graphic should be ethical.
- A graphic should be labeled and placed properly.

If you include a title with the graph, an explanatory caption is not needed. Nevertheless, a sentence or two of explanation in a caption can often help reinforce or clarify the story the graphic is trying to tell.

When placing a graphic, put it on the page where it is referenced or, at the farthest, put it on the following page. Readers will rarely flip more than one page to look for a graphic.

Even if they *do* make the effort to hunt down a graphic that is pages away, doing so will take them out of the flow of the document, inviting them to start skimming.

Readers should be able to locate a graphic with a quick glance. Then, they should be able to quickly return to the written text to continue reading. When labeled and placed properly, graphics work seamlessly into the flow of the whole text.

Displaying Data with Graphs, Tables, and Charts

To decide which graphic is best for the data you want to display, first decide what story you want to tell. Then, choose the type of graphic that best fits that story. The chart in Figure 19.7 will help you decide which one works best.

Choosing the Appropriate Graphic

The Story to Be Told	Best Graphic	How Data Are Displayed
"I want to show a trend."	Line graph	Shows how a quantity rises and falls, usually over time
"I want to compare two or more quantities."	Bar chart	Shows comparisons among different items or the same items over time
"I need to present data or facts for analysis and comparison."	Table	Displays data in an organized, easy-access way
"I need to show how a whole is divided into parts."	Pie chart	Shows data as a pie carved into slices
"I need to show how things, people, or steps are linked together."	Flowchart	Illustrates the connections among people, parts, or steps
"I need to show how a project will meet its goals over time."	Gantt chart	Displays a project schedule, highlighting the phases of the work

Figure 19.7: Different kinds of graphics tell different stories. Think about what story you want to tell. Then, locate the appropriate graph, table, or chart for that story.

A Line Graph Showing a Relationship Between Variables

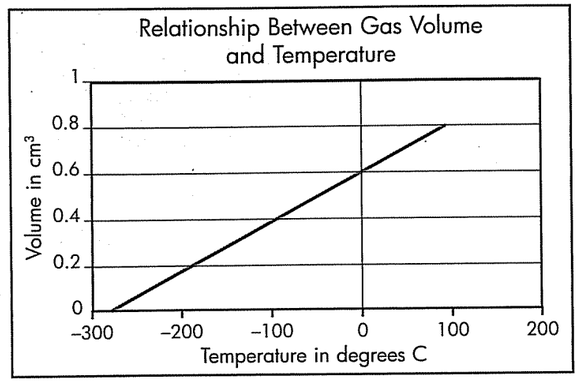


Figure 19.9: Here, the volume of a gas is plotted against the temperature. In this case, an extrapolation of the line allows us to estimate "absolute zero," the temperature at which all molecular activity stops.

Source: The Safetyline Institute, http: //www.safetyline.wa.gov.au/institute/level2/course16 /lecture47/147_02.asp.

In a line graph, the vertical axis (y-axis) displays a measured quantity such as sales, temperature, production, growth, and so on. The horizontal axis (x-axis) is usually divided into time increments such as years, months, days, or hours. As shown in Figure 19.8, in a line graph, the x- and y-axes do not need to start at zero. Often, by starting one or both axes at a nonzero number, you can better illustrate the trends you are trying to show.

The x-axis in a line graph usually represents the "independent variable," which has a consistently measurable value. For example, in most cases, time marches forward steadily, independent of other variables. So, time is often measured on the x-axis. The y-axis often represents the "dependent variable." The value of this variable fluctuates over time.

You can use more than one line to illustrate trends in a line graph. Depending on your printer, computers also give you the ability to use colors to distinguish the lines. Or, you can use dashes, dots, and solid lines to help your readers distinguish one line from the others.

The drawback of line graphs is their inability to present data in exact numbers. For example, in Figure 19.8, can you tell exactly how many wolves were counted in 2001? Line graphs are most effective when the trend you are showing is more significant than the exact figures.

Bar Charts

Bar charts are used to show quantities, allowing readers to make visual comparisons among measurements (Figure 19.10). The width of the bars is kept the same, while the length of the bars varies to represent the quantity measured.

For more examples of line graphs, go to **www.pearsonhighered.com/johnsonweb4/19.7**

A Bar Chart

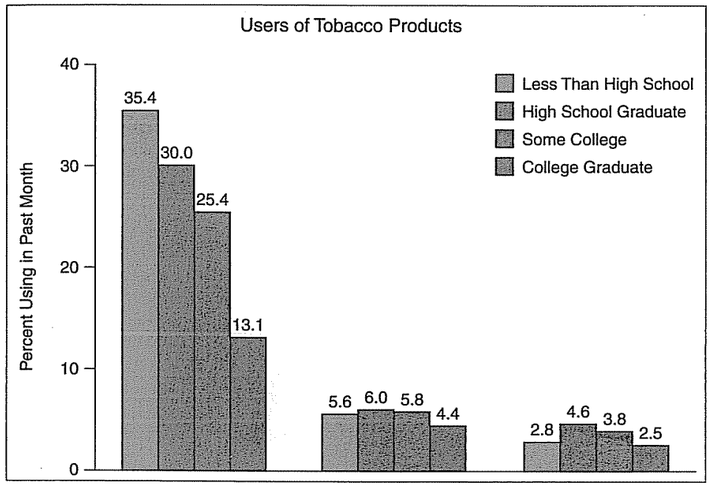


Figure 19.10: A bar chart is especially effective for making comparisons.

Source: Substance Abuse and Mental Health Services Administration, 2009 National Survey on Drug Use and Health.

Computers can be used to enhance bar charts even further. Coloring and shading the bars will enhance readers' ability to interpret the data and identify trends.

Tables

Tables provide the most efficient way to display data or facts in a small amount of space. In a table, information is placed in horizontal rows and vertical columns, allowing readers to quickly find specific numbers or words that address their needs.

Creating a table takes careful planning, but computers can do much of the hard work for you. For simpler tables, you can use the Table function on your word-processing software (Figure 19.11). It will allow you to specify how many rows and columns you need (make sure you include enough columns and rows for headings in the table). Then, you can start typing your data or information into the cells.

If the Table function in your word processor is not sufficient for your needs, spreadsheet programs like Microsoft Excel and Corel Quattro Pro also allow you to make quick tables (see the Help box in this chapter).

After creating the basic table, you should properly label it. In most cases, the table's number and title should appear above it (Figure 19.12). Down the left column, the *row headings* should list the items being measured. Along the top row, the *column headings* should list the qualities of the items being measured. Beneath the table, if needed, a citation should identify the source of the information.

To see more sample bar charts, go to **www.pearsonhighered.com/johnsonweb4/19.8**

Inserting a Table

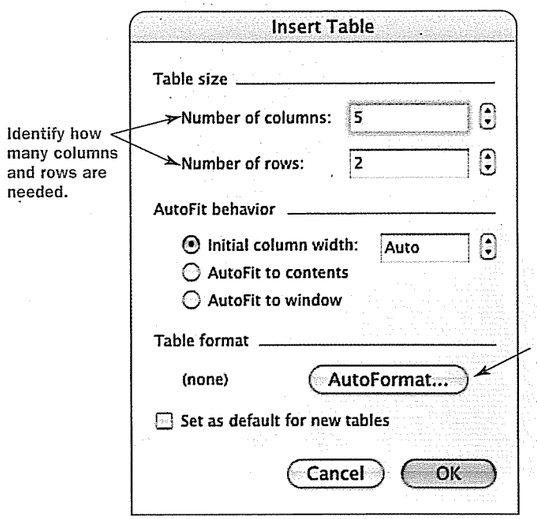
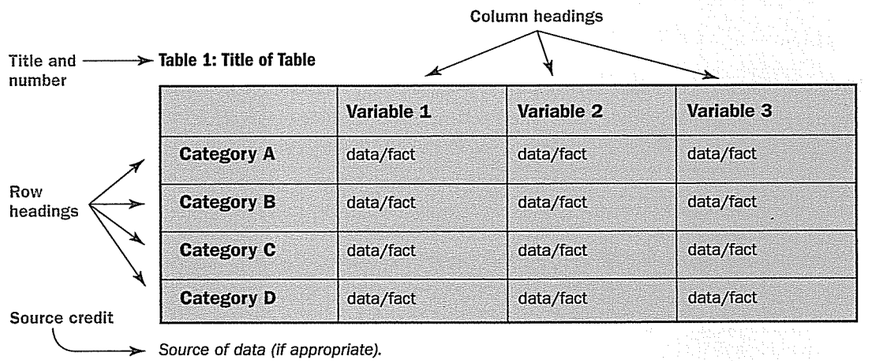


Figure 19.11: The Table function in your word processor allows you to make a simple table.

Parts of a Table



	Variable 1	Variable 2	Variable 3
Category A	data/fact	data/fact	data/fact
Category B	data/fact	data/fact	data/fact
Category C	data/fact	data/fact	data/fact
Category D	data/fact	data/fact	data/fact

Figure 19.12: The parts of a table are rather standard. Rows and columns align in ways that allow readers to locate specific pieces of information.

In some cases, tables can be used to present verbal information rather than numerical data. In Figure 19.13, for example, the table is being used to verbally provide health information. With this table, readers can quickly locate their age and find the cancer screening test they need.

A Table That Presents Verbal Information

CANCER DETECTION TEST OR PROCEDURE

Age	Frequency	Females	Males
18–20	One time	Complete Health Exam	Complete Health Exam
	Yearly	Pap smear	
	Monthly	Skin self-exam, Breast self-exam	Skin self-exam
20–40	Every 3 years	Complete Health Exam, Clinical breast exam, Pelvic exam	Complete Health Exam
	Yearly	Pap smear	
	Monthly	Skin self-exam, Breast self-exam	Skin self-exam, Testis self-exam
40–50	Every 3 years	Complete Health Exam	Complete Health Exam, Prostate specific antigen (PSA) blood test
	Yearly	Cinical breast exam, Mammogram, Endometrial biopsy, Pap smear, Pelvic exam, Digital rectal exam, Stool blood test	Digital rectal exam, Stool blood test
	Monthly	Skin self-exam, Breast self-exam	Skin self-exam, Testis self-exam
50–65	Every 5–10 years	Colonoscopy, Procto, Double-contrast barium enema (DCBE)	Colonoscopy, Procto, Double-contrast barium enema (DCBE)
	Yearly	Complete Health Exam, Cinical breast exam, Endometrial biopsy, Mammogram, Pap smear, Pelvic exam, Digital rectal exam, Stool blood test	Complete Health Exam, Prostate specific antigen (PSA) blood test, Digital rectal exam, Stool blood test
	Monthly	Skin self-exam, Breast self-exam	Skin self-exam, Testis self-exam
65+	Every 5–10 years	Colonoscopy, Procto, Double-contrast barium enema (DCBE)	Colonoscopy, Procto, Double-contrast barium enema (DCBE)
	Yearly	Complete Health Exam, Cinical breast exam, Mammogram, Endometrial biopsy, Pap smear, Pelvic exam, Digital rectal exam, Stool blood test	Complete Health Exam, Prostate specific antigen (PSA) blood test, Digital rectal exam, Stool blood test
	Monthly	Skin self-exam, Breast self-exam	Skin self-exam, Testis self-exam

Source: National Foundation for Cancer Research.

Figure 19.13: Tables can also present verbal information concisely. In this table, a great amount of information is offered in an easy-to-access format.

Need more help making a table? Go to **www.pearsonhighered.com/johnsonweb4/19.9**

When adding a table to your document, think about what your readers need to know. It is often tempting to include large tables that hold all your data. However, these large tables might clog up your document, making it difficult for readers to locate specific information. You are better off creating small tables that focus on the specific information you want to present. Move larger tables to an appendix, especially if they present data not directly referenced in the document.

Pie Charts

Pie charts are useful for showing how a whole divides into parts (Figure 19.14). Pie charts are popular, but they should be used sparingly. They take up a great amount of space in a document while usually presenting only a small amount of data. The pie chart in Figure 19.14, for instance, uses a third of a page to plot a mere eleven data points.

Pie charts are difficult to construct by hand, but your computer's spreadsheet program (Excel or Quattro Pro) can help you create a basic pie chart of your data. When labeling a pie chart, you should try to place titles and specific numbers in or near the graphic. For instance, in Figure 19.14, each slice of the pie chart is labeled and includes a measurement to show how the pie was divided. These labels and measurements help readers compare the data points plotted in the chart.

A Pie Chart

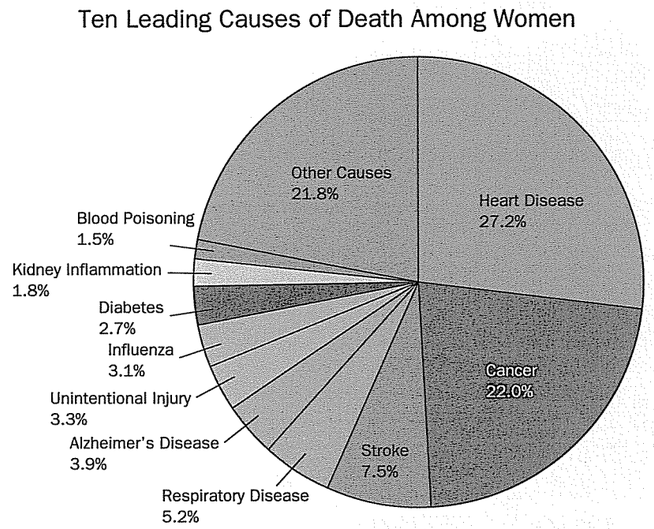


Figure 19.14: A pie chart is best for showing how a whole can be divided into parts.

Source: U.S. Department of Health and Human Services, Women's Health 2007.

Do you want to see other pie charts? Go to **www.pearsonhighered.com/johnsonweb4/19.10**

The key to a good pie chart is a clear story. For example, what story is the pie chart in Figure 19.14 trying to tell? Heart disease and cancer are the most significant causes of death among women.

Flowcharts

Flowcharts are used to visually guide readers through a series of decisions, actions, or steps. They typically illustrate a process described in the written text. Arrows are used to connect parts of the flowchart, showing the direction of the process.

As shown in Figure 19.15, flowcharts are helpful for illustrating instructions, especially when judgment calls need to be made by the user of the instructions. A flowchart

Link
For more information on writing instructions, go to Chapter 7, page 166.

A Flowchart

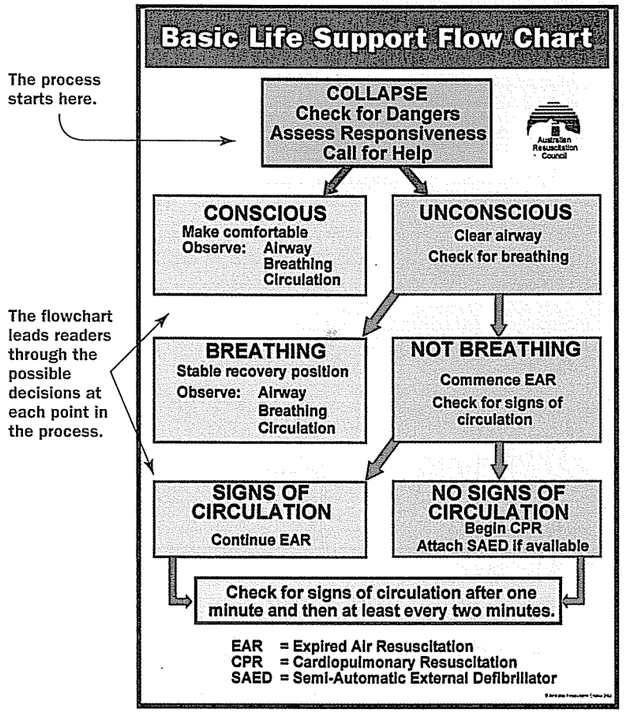


Figure 19.15: A flowchart is often useful for illustrating a process.

Source: Australian Resuscitation Council, http://www.resus.org.au/public/bls_flow_chart.pdf.

typically cannot replace written instructions, especially if the steps are complex. But it can illustrate the steps in the process to help readers understand the written text.

Flowcharts can be found in a variety of other forms, such as organization charts or circuit diagrams. An organization chart illustrates the hierarchy of decision making in an organization. In a circuit diagram, a flowchart is used to chart the path of electricity.

Gantt Charts

Gantt charts have become quite popular in technical documents, especially proposals and progress reports. Gantt charts, like the one in Figure 19.16, are used to illustrate a project schedule, showing when the phases of the project should begin and end.

Visually, these charts illustrate the interrelations among different aspects of a large project. That way, people who are working on one part of the project will know what other teams are doing. Another benefit to a Gantt chart is that it gives readers an overall sense of how the project will proceed from beginning to end.

Gantt charts are becoming increasingly simple to create, because project-planning software like ArrantSoft, Signals' Basecamp, Omnifocus, and Microsoft Project can easily generate them for use in technical documents.

A Gantt Chart

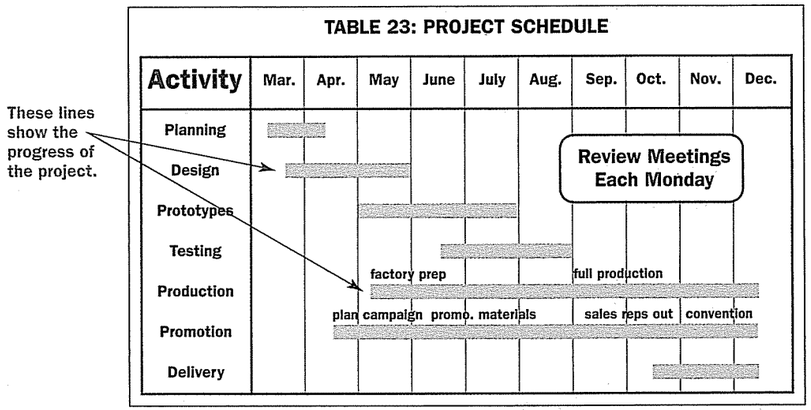


Figure 19.16: A Gannt chart is often used to show how the stages in a project interrelate. In this chart, you can easily see how the promotion of the product is started, even before the product is fully tested.

Using Pictures, Drawings, and Screen Shots

Increasingly, computers give you the ability to include pictures, drawings, and video in documents. Even if you are not artistic, you can quickly use a digital camera, a drawing program, a scanner, or a video camera to add life to your documents.

The purpose of a picture, drawing, or video is to show what something looks like. These kinds of visuals are especially helpful when your readers may not be familiar with

something, like an animal or a piece of equipment. They are also helpful for showing the condition of something, like a building under construction or damage to a car.

Photographs

Digital cameras and scanners are making the placement of photographs in technical documents easier than ever. A good first step is to ask what *story* you want the photograph to tell. Then, set up a shot that tells that story.

PHOTOGRAPHING PEOPLE If you need to include a picture of a person or a group of people standing still, take them outside and photograph them against a simple but scenic background. Photographs taken in the office tend to look dark, depressing, and dreary. Photographs taken outdoors, on the other hand, imply a sense of openness and freethinking. When photographing people working, a good strategy is to show people doing what they *actually* do (Figure 19.17).

If you need to photograph people inside, put as much light as possible on the subjects. If your subjects will allow it, use facial powder to reduce the glare off their cheeks, noses, and foreheads. Then, take their picture against a simple backdrop to reduce background clutter.

If you are photographing an individual, take a picture of his or her head and shoulders. People tend to look uncomfortable in full-body pictures.

One general photography guideline that works well in most situations, especially when photographing people, is the "Rule of Thirds." The Rule of Thirds means the focal point of a picture (e.g., a subject's eyes, the key feature of an object) will appear where the top third of the picture begins. For example, in Figure 19.17, the welder's

A Photograph of a Person in Action

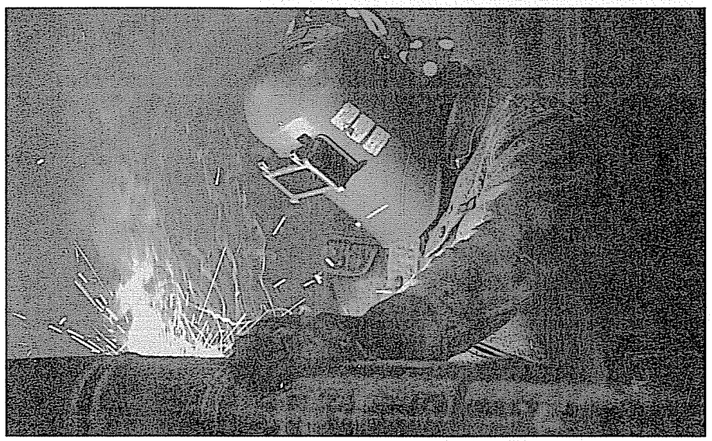


Figure 19.17: Try to capture people in action, close up.

Source: Corel.

To learn more tips about photography, go to **www.pearsonhighered.com/johnsonweb4/19.12**

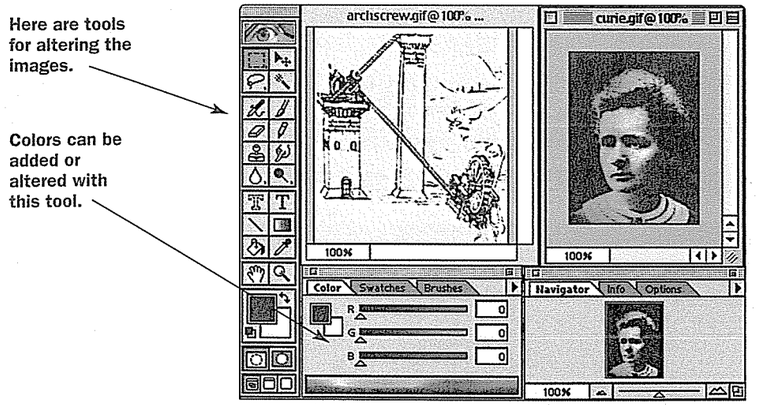


Figure 19.19: Software such as Adobe Photoshop allows you to work with photographs and other kinds of images.

Lower-resolution photographs (fewer pixels) are saved as .gif or .jpg files. Usually, .gif and .jpg files are fine for print and online documents. However, if the photograph needs to be of high quality, a .tiff file might be the best choice.

Once you have downloaded an image to your computer, you can work with it using software programs like Microsoft Paint or Adobe Photoshop (Figure 19.19). These programs will allow you to touch up the photographs or, if you want, completely alter them.

When you have finished touching up or altering the image, you can then insert it into your document or presentation. Most word-processing programs have an Insert Picture command. To insert the picture, put your cursor where you want the image to appear in the document. Then, select "Insert Picture." A box will open that allows you to locate the image on your computer's hard drive. Find and select the image you want to insert.

At this point, your computer will insert the image into your document. Usually, you can then do a few simple alterations to the file, like cropping, with the Picture toolbar in your word processor.

Illustrations

Illustrations are often better than photographs at depicting buildings, equipment, maps, and schematic designs. Whereas photographs usually include more detail than needed, a good illustration highlights only the most important features of the subject.

LINE DRAWINGS AND DIAGRAMS A line drawing or diagram is a semirealistic illustration of the subject being described. You can create simple drawings and diagrams with the Draw function of most word-processing programs. As the drawings grow more complex, however, most writers will hire professional artists to transform rough sketches into finished artwork.

Line drawings offer several advantages. They can provide a close-up view of important features or parts. They can also be easily labeled, allowing you to point out important features to the readers.

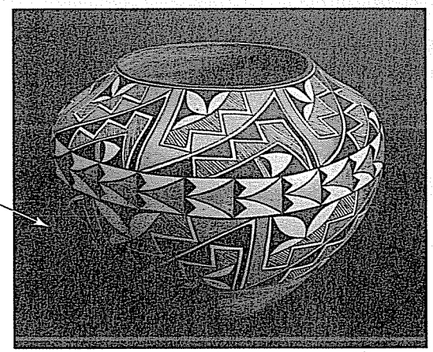


Figure 19.18: When photographing objects, try to reduce the amount of clutter around your subject.

Source: The Internet Public Library, http://www.ipl.si.umich.edu/div/pottery/image15.htm.

goggles, which are the focal point of this picture, appear where the top third of the picture meets the middle third. Similarly, in Figure 19.18, notice how the focal point of the pottery (the design and bulge) is where the top third of the picture starts.

PHOTOGRAPHING OBJECTS When taking pictures of objects, try to capture a close-up shot while minimizing any clutter in the background (Figure 19.18). It is often a good idea to put a white drop cloth behind the object to block out the other items and people in the background. Make sure you put as much lighting as possible on the object so it will show up clearly in your document.

When photographing machines or equipment, try to capture them close-up and in action. After all, a picture of equipment sitting idle on the factory floor is rather boring. But if you show the machine being used or focus on the moving parts, you will have a much more dynamic picture.

PHOTOGRAPHING PLACES Places are especially difficult to photograph. When you are at the place itself, snapping a picture seems simple enough. But the pictures often come out flat and uninteresting. Moreover, unless people are in the picture, it is often difficult to tell the scale of the place being photographed.

When photographing places, focus on people doing something in that place. For example, if you need to photograph a factory floor, you should show people doing their jobs. If you are photographing an archaeological site, include someone working on the site. The addition of people will add a sense of action and scale to your photograph.

Inserting Photographs and Other Images

A digital camera will usually allow you to save your photographs in a variety of memory sizes. High-resolution photographs (lots of pixels) require a lot of memory in the camera and in your computer. They are usually saved in a format called a .tiff file.

Common Icons

Figure 19.22: Icons are widely available on the Internet. The person in the middle is supposed to be sneezing, but, as with many icons, it could convey an unintentional meaning.

Sources: Centers for Disease Control, http://www.cdc.gov/diabetes/pubs/images/balance.gif, and International Association for Food Protection, http://www.foodprotection.org.

where a particular place fits into an overall geographic area. When including a map, zoom in on the area that is being discussed in the text.

Maps may be easier to generate than you think. Today, Internet sites like Mapquest (www.mapquest.com), Google Maps (maps.google.com), and Topozone (www.topozone.com) allow you to create very detailed maps. Instead of trying to draw your own map, you might let these Internet sites do it for you.

ICONS AND CLIP ART Icons play an important role in technical documentation. In some documents, they are used as warning symbols. They can also serve as signposts in a text to help readers quickly locate important information (Figure 19.22). If you need to use an icon, standard sets of symbols are available on the Internet for purchase or for free.

Link
For more information on copyright law, go to Chapter 4, page 85.

Clip art drawings are commercially produced illustrations that can be purchased or used for free. Usually, when you purchase a collection of clip art, you are also purchasing the rights to use that clip art in your own documents.

It is tempting to advise you not to use clip art at all. When desktop publishing first came into the workplace, clip art was an original way to enhance the message and tone of a document. But now, most readers are tired of those little pictures of people shaking hands, pointing at whiteboards, and climbing ladders. In some cases, clip art becomes decorative fluff that takes readers' attention away from the document's message. Use it sparingly and only when it *truly* contributes to your message.

Screen Shots

With a combination of keystrokes, most computers will allow you to make a *screen shot* of your computer screen. Essentially, a screen shot is a picture of whatever is on the screen (Figure 19.23). You can use screen shots to insert a variety of images into your document or presentation.

You can make screen shots quickly with a PC or a Mac. With a PC, press the Print Screen button on your keyboard. The computer will put an image of the screen on your "clipboard." Look for it there. With a Mac, press the three keys Apple-Shift-3 at the same time. You should hear a camera clicking sound. The picture will then appear on your screen's desktop.

A Diagram

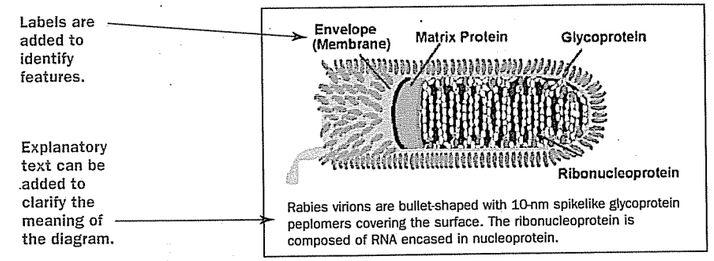


Figure 19.20: A drawing is only partially realistic. It concentrates on relationships instead of showing exactly what the subject looks like.

Source: Centers for Disease Control, http://www.cdc.gov/rabies/virus.htm.

In some ways, however, drawings and diagrams are less than realistic. For example, the diagram of the rabies virus in Figure 19.20 does not look exactly like the actual virus. Instead, it shows only how the larger parts of the virus are interconnected and work together.

MAPS Maps offer a view of the subject from above. You can use them to show geographic features like streets, buildings, or rivers. They can be used to portray the rooms in a building or illustrate a research site (Figure 19.21). In some cases, they can be used to show readers where a particular event occurred, allowing them to see

A Map

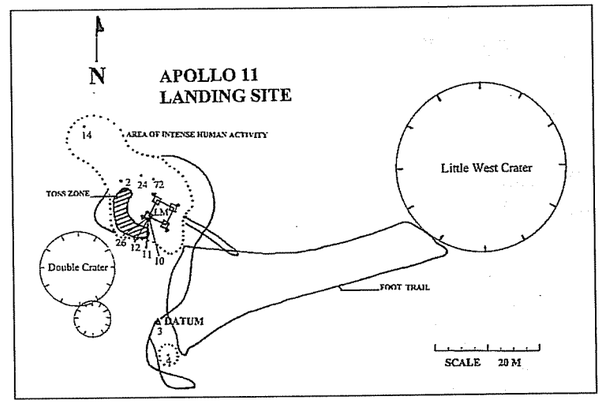


Figure 19.21: A map is useful for showing a place from above.

Source: New Mexico State University, http://www.spacegrant.nmsu.edu/lunarlegacies/images/scan2.gif.

A Screen Shot

Figure 19.23: Screen shots are a simple way to add images to your document or presentation.

Source: Office of Energy Efficiency and Renewable Energy, http://www.eere.energy.gov/solar_decathlon.

You can insert the screen shot into your document with the Insert Picture command in your word processor. Using your Drawing tools, you can then "crop" (trim) the image to remove any extra details.

Screen shots are useful in a variety of situations. For example, you can use a screen shot to put a picture of a webpage in a printed document. Or, after drawing an illustration, you can make a screen shot of it and add it to a webpage.

Using Cross-Cultural Symbols

Symbols often translate among cultures better than words. They can also be more memorable and enhance comprehension for second-language readers (Horton, 1993, p. 683).

Symbols, however, don't always translate exactly across cultures, so you need to check your use of symbols in documents and websites with readers from other cultures. Otherwise, your symbols might lead to unintended consequences. For example, international dockworkers have been known to roughly toss boxes labeled with the broken wine glass symbol (meaning "fragile"), because they assumed the boxes contained broken glass.

Mr. Yuk Versus the Skull-and-Crossbones Symbol

Figure 19.24: The poison symbol, Mr. Yuk, was intended to avoid problems with the traditional skull-and-crossbones. But the symbol has its own problems when it crosses cultures. The skull-and-crossbones shown here is from the European Union's standardized set of symbols.

In another case, the "Mr. Yuk" poison symbol has had mixed results in its bid to replace the traditional skull-and-crossbones symbol (Figure 19.24). One problem is that "Yuk" is a common name in Asia, especially Korea. Meanwhile, the use of "Mr." suggests elder status to many Asian children, implying the face deserves added respect.

In a research study, a majority of international children did not understand the Mr. Yuk image or see it as negative, and a few thought the symbol meant the product was good to eat (Jackson-Smith & Essuman-Johnson, 2002). In North America, some health organizations now prohibit the use of Mr. Yuk because of these kinds of problems. The symbol was so heavily promoted that it now has a friendly undertone for children, attracting them to dangerous products.

To avoid misunderstandings, designers have developed symbols that are intended to cross cultures. The American Institute of Graphic Arts (AIGA) created the symbol system that is familiar to North Americans and is used globally (Figure 19.25). The European Union and International Standards Organization (ISO) have also created sets of international symbols that are widely used.

International Symbols

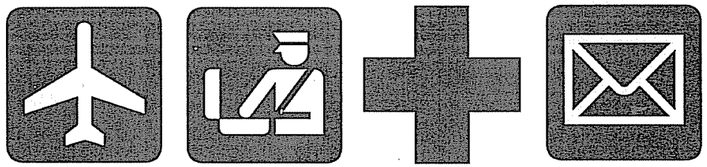


Figure 19.25: The AIGA, European Union, and International Standards Organization (ISO) have created a set of symbols that work internationally.

Symbols can be very helpful in technical documents because they enhance translation and comprehension. Your best approach is to use internationally accepted symbols whenever they are available and to always check your use of symbols with likely cross-cultural readers.

Using Video and Audio

One of the options available with computers is the use of video and audio in multimedia or Internet-based documents. With a digital video or audio recorder, you can add movies, music, and sound to any on-screen document.

Video

The ability to add video to a text is a mixed blessing. On the one hand, nothing will grab readers' attention like a video presentation. A video, for example, might show an important experiment or a current event. It might show an expert talking about a product or service (Figure 19.27). On the other hand, poorly made videos seem amateurish and quickly become tedious to watch. Another problem is that videos can take a long time to download.

If you want to add a video to your document, first decide exactly what you want the video to do. Then, write a script that achieves that goal in the least amount of time, because long videos take up lots of memory (and they can get a little boring).

As you create a video, think of it as a moving photograph in your document. Many of the same guidelines for shooting photographs will work with videos. For example, try to reduce background clutter so viewers can focus on the subject. Also, put as much light on the subject as possible. And, if you are filming people, you might want to put some powder on their foreheads, noses, and cheeks to reduce glare.

Using a Video

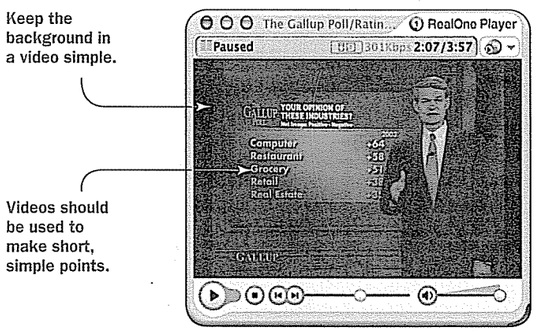


Figure 19.27: Video editing software can help you make videos to be inserted into multimedia documents, websites, or presentations.

Source: The Gallup Organization, http://www.gallup.com.

People in Symbols

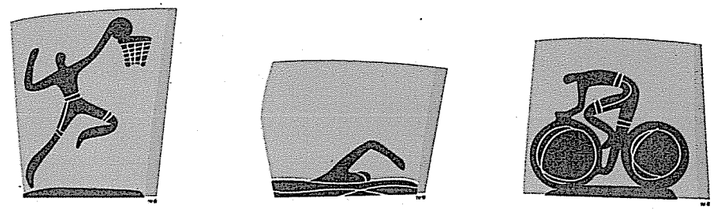


Figure 19.26: Simple pictographs are often used for human icons that need to cross cultures. These are examples of icons used at the Olympics.

Here are a few helpful guidelines for using symbols cross-culturally:

Keep human icons simple—Icons of humans should not be more than simple pictographs (Figure 19.26). Distinctive clothing or facial features could lead to unintended interpretations or confusion. Smiles, frowns, winks, or smirks can have very different meanings across cultures, so symbols that use faces are particularly problematic.

Use hand signals carefully—Just about any hand signal is considered offensive in some culture, including the thumbs-up signal, "OK" sign, V-symbol, a pointing finger, and even the palm out "halt" signal. If you can imagine an entire user's manual that uses an extended middle finger to point to things, you will get the idea about why hand signals can be problematic.

Avoid culture-specific icons—Mailboxes, phonebooths, and eating utensils, among other items, can look very different in other cultures, so symbols representing them might not translate. The typical North American mailbox on a street corner, for example, looks nothing like the canister mailboxes in England, while some cultures don't have public mailboxes at all. In another case, much of the world uses chopsticks for eating, so a fork would not properly symbolize "eat" or "food" to many readers.

Avoid religious symbols—Using crosses, crescents, stars, wings, candles, yin and yang, and other religious symbols can be interpreted very differently in other cultures. The symbol for the Red Cross, for example, is the Red Crescent in Islamic cultures, and the Red Crystal is used in Israel.

Avoid animal symbols and mascots—Animals can mean very different things in other cultures. In Western societies, the owl symbolizes wisdom, but in Southeast Asia, owls are considered unintelligent and vicious. Rats are considered clever and intelligent in many Asian countries, while in Western countries they are thought to be diseased and threatening. In some Islamic cultures, dogs are considered "unclean," making them particularly bad cartoon mascots for products. Meanwhile, the word *mouse* is not associated with computers in some cultures, so using a mouse symbol to represent a computer's pointing device would be confusing.

Link

For more information on cross-cultural readers, go to Chapter 2, page 28.

After you shoot the video, you can use video editing software like Apple iMovie, Adobe Premiere, and Microsoft Movie Maker to edit the final piece into a concise format.

When you are finished filming and editing the video, you can place it into your document, usually with the Insert Movie command. Even simple word processors like Microsoft Word and Corel WordPerfect will allow you to put a video into the text. Videos can also be inserted into presentations made with Microsoft PowerPoint, Corel Presentation, and other presentation software packages.

Audio, Podcasting, and Music

You can also add audio clips or background music to your electronic documents, including websites. Most word-processing programs, presentation software, and website design software will allow you to "insert" music or audio. The best way to insert music is from a compact disc (CD) or by downloading a song in MP3 format off the Internet.

Several software applications, like Apple iTunes or Windows Media Player, will allow you to download music and podcasts legally off the Internet, usually at minimal cost. Music and podcasts can be downloaded legally at apple.com, emusic.com, pandora.com, and rhapsody.com.

When you select Insert, the computer will usually ask you to select a file. Choose the audio track or music file to be inserted. Then, if you want the music to play continuously, tell the computer to "Loop" the music when you are in the "Audio" text box.

Podcasting is becoming a popular way to insert audio files into documents, especially websites. Podcasts are radio-like audio files that can be downloaded to computers and MP3 players (not only Apple iPods). If you have a microphone and a computer with Internet access, you can start creating podcasts right away. Software packages for making podcasts include Podcast Station, Propaganda, Audacity, and Adobe Audition. Many companies offer a "podcasting kit" that includes a microphone and software (Figure 19.28).

Podcasting

Figure 19.28: A podcasting mic, like this one from Alesis, will allow you to add professional-quality audio to websites or multimedia documents.

Source: Alesis, http://www.alesis.com.

For links to legal music download sites, go to **www.pearsonhighered.com/johnsonweb4/19.18**

CHAPTER REVIEW

- Computers have made including graphics in technical documents easier, so readers have come to expect them.
- Graphics should: (1) tell a simple story; (2) reinforce the text, not replace it; (3) be ethical; and (4) be properly labeled and placed on the page.
- Various kinds of graphs, tables, and charts allow you to tell different stories with data or facts.
- Digital cameras and scanners are making the placement of photographs in documents easier than ever.
- Use icons and clip art only when they enhance the readability and comprehension of the document. Clip art, especially, can simply clutter a document.
- Graphics need to be carefully considered when documents need to work cross-culturally. Images and symbols can have very different meanings in other cultures.
- Increasingly, computers allow you to insert video and audio into documents. Treat these items as you would treat photographs.

EXERCISES AND PROJECTS

Individual or Team Projects

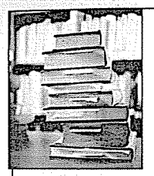
1. On the Internet, find a chart or graph that you can analyze. Using the four guidelines for graphics discussed in this chapter, critique the chart or graph by discussing its strengths and places where it might be improved. Present your findings to your class.

2. Find a set of data. Then, use different kinds of charts and graphs to illustrate trends in the data. For example, you might use a bar chart, line graph, and pie chart to illustrate the same data set. How does each type of graphic allow you to tell a different "story" with the data? What are the strengths and limitations of each kind of graphic? Which kind of chart or graph would probably be most effective for illustrating your data set?

3. Using a digital camera, practice taking pictures and inserting those pictures into documents. Take pictures of people, objects, and places. When taking pictures of people, compare pictures taken inside and outside. Take full-body pictures and head shots. When taking pictures of objects, first leave the background behind the object cluttered. Then, use a backdrop to unclutter the picture. When photographing places, try to make images that tell a story about the place.

   When you are finished, compare and contrast your photographs. Which types of photographs seem to work best in a document? What kinds of photographs tend not to work?

Sample charts, graphs, and data sets for these exercises are available at **www.pearsonhighered.com/johnsonweb4/19.19**



CASE STUDY

Looking Guilty

Thomas Helmann was recently promoted to sergeant with the campus police at Southwest Vermont University. One of his added responsibilities was mentoring Officer Sharon Brand who had been hired a couple of weeks ago. Newly hired officers were usually given the "paperwork jobs" that the other officers didn't want to do. One of those jobs was putting together the "Annual Campus Crime Statistics Report" for the university's Executive Committee.

The report was a bore to write, and generally the officers assumed it was never looked at by the Executive Committee. Criminal activities at SWVU were rare, except for the usual problems with under-aged drinking, bicycle thefts, and graffiti that happened on every college campus.

So, it wasn't a surprise when Helen Young, the captain of the campus police, gave Sharon the job of collecting all the statistics and writing the report. At their weekly mentoring session, Thomas assured Sharon it was a good opportunity to get to know the campus and the kinds of problems that she would be dealing with. He advised Sharon, "Just look at last year's report and include the same kinds of facts and figures. The secretary can give you all our activity reports and statistics from last year."

A couple of weeks later, Sharon submitted the report to Thomas. At first glance, Thomas thought Sharon did a good job. He didn't have time to read the report closely, but the figures all looked accurate, and it covered the same issues as last year. Same old boring report.

Sharon also inserted several photographs to add some life and color to the report. Most of the photos showed places where petty crimes had happened, including dorms, bike racks, and parking lots. A couple of pictures showed students drinking beer at a football tailgate party.

There were also pictures of a few students, who Sharon obviously recruited, pretending they were stealing bikes, tagging walls, and taking computers out of dorm rooms. Thomas thought the staged photos were a bit silly, but he didn't think they were a problem. Nobody would read this report anyway.

He sent a dozen copies to the Executive Committee.

A few days later, Thomas was called into Captain Young's office. She was really angry about the report. "Sergeant, we have a big problem with the Crime Statistics Report."

A bit surprised, Thomas asked her what the problem was.

"Well, a member of the University's Executive Committee pointed out that all the staged pictures of criminal activities used African-Americans and Hispanics as models."

Collaborative Project

With a group of classmates, locate a large document that has few or no visuals. Then, do a "design makeover" in which you find ways to use visuals to support and clarify the written text. Try to include at least one visual for every two pages in the document. Use graphs, photographs, and drawings to illustrate important points in the document. Then, add icons and clip art to reinforce important points or themes in the document.

When you are finished, write a brief report to your instructor in which your group discusses how you made over the document. Critique the original draft of the document, showing how the lack of adequate visuals made the information in the document hard to access. Then, discuss the ways in which your revised version improves on the original. Finally, discuss some of the following issues about the amount and types of visuals used in this kind of document:

- At what point are there too many graphics?
- Do some graphics work better than others?
- How can you balance the written text with visuals to avoid making the document too text-heavy or visual-heavy?
- How do the needs and characteristics of the expected readers of the document shape the kinds of visuals that are used?

Your report might offer some additional guidelines, beyond the ones discussed in this chapter, for using visuals more effectively.

For additional technical writing resources, including interactive sample documents, document design tutorials and guidelines, and more, go to **www.mytechcommlab.com.**

GOING ONLINE

You can find sample documents for the collaborative project assignment at **www.pearsonhighered.com/johnsonweb4/19.20**

She handed the report to Thomas. Sure enough, all the people pretending to wheel off bicycles, steal computers, and spraypaint walls were minorities. Meanwhile, the students drinking at the football tailgater were white. He was shocked he hadn't noticed the racist tone of the photographs, but now the problem was glaringly obvious.

Stunned, he tried to offer an apology. The captain snapped back, "I'm not the person you should be apologizing to, though my butt is in the fire, too. This report makes the campus police look like a bunch of racists."

Thomas knew the offensive photographs could be easily removed from the report, but he wasn't sure what to do about properly reprimanding Sharon, his mentee. Thomas also didn't know who he should apologize to and how. Even more, though, Thomas found it troubling that he hadn't noticed the problem in the first place.

How do you think Thomas should respond to this issue? What should he tell Sharon? Who should he and/or Sharon apologize to? What else do you think should happen at this point?

For examples of unethical graphs, go to **www.pearsonhighered.com/johnsonweb4/19.21**