Chapter 9

Designing and Developing Resources: Projected Materials

How can I use software such as Microsoft PowerPoint to create effective presentations that aren't boring and "power-pointless?"

How can I make my presentations more interesting? Are interactive features and animation important or just fancy extras?

I'm not sure about how to lay out visuals for use on an overhead projector. For example, should I orient my transparencies vertically or horizontally?

Over the past several years, many educators have found that Microsoft PowerPoint is a great tool for producing presentations for the classroom. You can print the presentation as a handout, create transparencies, run the presentation through the television, or hook to a data projector and show the presentation on a large screen.

Although handouts are probably the most common presentation material, projected materials provide an even more effective and efficient way to present information to a class. While handouts can distract participants, projected visuals can focus audience attention. Projected visuals are used to clarify, emphasize, or add interest to your presentation. Regardless of the temptation, refrain from using visuals that are out of date or just fill time. Like the preparation of printed materials, careful consideration should be given to the design of projected materials.

This chapter will provide you with guidelines for the design of effective projected materials. You’ll begin by exploring some advantages and disadvantages of using desktop presentations. Next, you’ll learn to select information for your computer-generated project. You’ll also learn how to lay out and design a presentation. Then, you’ll select and place text and graphics as well as design tables, charts, and graphs. You’ll also explore some of the dynamic and interactive options of desktop presentations.
Finally, we’ll discuss how to produce transparencies from desktop presentations.

After completing this chapter, you’ll be able to:

- Discuss options for presentation technology.
- Discuss the advantages and disadvantages of desktop presentations.
- Select information to include on projected materials.
- Lay out text, visuals, and audio elements of presentations.
- Discuss the design and use of templates.
- Discuss the characteristics of a series of visuals.
- Select and place text and graphics on projected materials.
- Compare and contrast the contents of various tables, charts, and graphs.
- Design tables, charts, and graphs.
- Incorporate dynamic and interactive features.
- Discuss the production of transparencies.

Exploring presentation formats
There are many types of projected materials including film, slides, transparencies, video, and desktop presentations. Some of these formats require a computer or other equipment for either production or the presentation itself. Before you jump into development, consider what you have available in your classroom and school. Also, think about the purpose of your presentation. Are you showing pictures, words, or both? How big must the image be to be readable from the back of the room? Do you have a way to dim the lights in your room? Will students also have a handout to supplement your presentation? Will students be involved in using or creating presentations?

Considering desktop presentations
If you have a computer and large monitor in your room, you may want to consider developing desktop presentations for your lessons. Desktop presentations involve the planning, production, and delivery of a presentation, all on the computer’s desktop. You can design slides on any computer system using software such as Microsoft PowerPoint or AppleWorks. Then, use a cable to hook your computer to a large television monitor or data projector. The students watch the image on the monitor or projected on the large screen. You can view the computer monitor as a reference during the lesson.

There are two types of desktop presentations: display and projected. Although they are both really "projected", the display presentation stays on a standard computer monitor rather than being projected on a large screen.
Display desktop presentations are used by individuals before, after, or instead of a large group presentation. The computer and monitor sit on a table and are used by individuals or small groups. Like other types of table displays, the materials should be self-paced. In other words, the user must understand what he or she is supposed to do with the materials. Directions can be provided on the screen or as a handout. Instructions that appear on the screen may direct the user to "Click anywhere on the screen to continue." Figure 9-1a shows a presentation for use in a large group setting and Figure 9-1b shows a screen from a display presentation used by one person at a time. Designing a projected desktop presentation is like working with transparencies, while a display presentation is more like laying out print materials individuals will read.

There are many software packages available that allow maximum interaction between the computer and the user. Traditionally, popular desktop presentation packages such as Microsoft PowerPoint were designed to be used in a linear way. However, newer versions contain the ability to add buttons for movement within the presentation. You can link to the Internet, add interaction with Visual Basic, and incorporate audio and video. If you're interested in "nonlinear" or branched presentations, you'll need to go to the multimedia section of this book for information about more complex presentation formats.

Exploring advantages and disadvantages
Desktop presentations are popular because they are easy to design, produce, and deliver without the production hassles of other projected media. There are advantages and disadvantages to using desktop presentations.

An advantage is their ease of design and use. They don't require the production time and effort of video or transparencies.

**Treehouse Tip**

**Advantages of Desktop Presentations**

- Ease of production
- Simple to update
- Preview is easy
- Progressive disclosure
- Easy to produce handouts

**African Savanna**

Antelopes  
Zebras  
Black Rhinos  
Storks  
Cranes

A savanna is a flat, treeless grassland of tropical or subtropical region. Africa is known for its savannas which are full of wildlife.

Animals found in the savanna include antelopes, zebras, and black rhinos.

Click to continue.
Second, desktop presentations are easy to update and modify. You simply switch from slide show mode back to production mode, make the change, and go right back to your slide show. Third, it’s easy to preview your presentation. With transparencies, you are committed to your presentation after the transparencies are produced. With a desktop presentation, you can try it out on yourself or a friend, make changes, and try it again. Another advantage of the desktop presentation is the ease of producing materials with progressive disclosure. It’s easy to produce a series of slides that make it look like you’re adding overlays to your slides. Finally, since the information is already saved, you can easily produce handouts from your presentation.

Not all of the news is good. Cost is probably the biggest disadvantage of using a desktop presentation. Of course, you’ve already invested in the computer. However, you’ll have to invest in a data projector or a large digital television monitor. A less expensive route is called a "scan converter" that is attached to a regular television set. This will work fine, but is restricted to the size of the TV in your classroom.

Considering the audience and content
As with print materials, your first task in planning for projected materials is to examine your lesson plan. Message design is an important part of designing effective projected materials. You need to decide what you want to say, to whom, in what way, by what medium, and with what effect. Consider the audience and the setting in selecting the type of projected material. For example, transparencies are easy because most classrooms already have a projector. On the other hand, if you can find a way to have a data projector in your classroom when you need it, then desktop presentations become more realistic.

You must determine the purpose of the materials. Will they help guide the lesson? Or, will they only be used for presenting examples and illustrations? Will the learners have a print copy of what is being projected so they don’t have to take notes? The answer to these questions will help you decide the contents of your visuals.

You’ll need to “chunk” the content of your presentation into reasonable parts, then organize the information into a logical sequence. Begin by storyboarding your presentation. In other words, take the content you’ve outlined and detail the visual and audio elements you wish to include. What will the audience be seeing and hearing? Use the storyboard in Figure 9-2 as a model. After examining the “chunks” of information, you may decide you need additional visual support for some aspects. It’s not unusual to reorganize your content once you begin to see it visually. Pay close attention to the sequencing of your visuals.
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Figure 9-2. Storyboard.
Each visual should have an oral introduction. A transition statement should be used to direct the audience to the next visual. Some people like to use index cards rather than a printed storyboard for their layouts. Others like to go directly to the computer.

Let’s say the students have been reading the nonfiction book called *The Tarantula Scientist* by Sy Montgomery. The teacher wants to be reminded about the questions she will ask students as they review the main ideas presented in the book. The newest version of Microsoft PowerPoint allows teachers to see their notes while they speak. It also shows the series of slides before and after the current slide as well as the time the presentation has been running. Figure 9-3a shows what the slide looks like to the audience on the large screen, while Figure 9-3b shows what it looks like on the teacher’s computer monitor.

Microsoft PowerPoint also has options for seeing the presentation as an outline, single slide, series of slides, or slide with note area during production. This makes it easy to organize and rearrange ideas. The example in Figure 9-4 shows a class presentation on the topic of genres of books. It includes scanned pictures of book covers, clipart, and screens from the Internet, as well as text. Figure 9-4a shows the presentation outline on the left, a single slide, and the notes for that slide below. Figure 9-4b shows a single slide. Thumbnail images of each slide are show in the slide show mode (see Figure 9-4c) and the notes page mode is shown in Figure 9-4d.

**Designing projected materials**

While developing your storyboard, you’ll want to use some standard guidelines for projected materials. Only present one idea at a time, as shown in Figure 9-5. Don’t try to cram every detail of the presentation into one visual; simplify, outline or highlight the content. You can create an endless number of
Figure 9-4a,b,c,d. Layout and arrangement options in Microsoft PowerPoint.

**Favorite Toppings**

1. Pepperoni
2. Sausage
3. The Works

Figure 9-5. Present one idea at a time.
PowerPoint slides, don’t worry about the number of slides you create. Even if you’re printing them out remember that transparencies are inexpensive, so you don’t need to scrimp and save space.

Concentrate on one point at a time. The audience may be distracted if you provide too many stimuli at once. Remember that all the points on a single slide or transparency should relate to a single concept. The easiest way to accomplish this is through the use of a single heading with associated key points.

As you’re designing your project, remember that a transparency is not 8.5 x 11 inches. The standard projection stage is 10 x 10 inches. Generally, you’ll want a horizontal orientation that is 7.5 x 9.5 inches. This leaves room for a border.

The proportion of projected media varies. The proportion is sometimes called the aspect ratio. The aspect ratio determines the shape of the area where each visual should be composed. For example, the aspect ratio for a standard slide is 2 by 3 inches, whereas the aspect ratio for an overhead transparency is 4 by 5 inches. Filmstrips and videotapes are generally 3 by 4 inches. If you don’t consider aspect ratio in your design, you may become frustrated during production. For example, if you design a border that is 8 by 10 inches, it won’t project well on a transparency. It won’t fit inside a standard frame.

Regardless of whether you’ll be creating print, projected, or display materials, you’ll also want to consider the principles of design. These principles include simplicity, unity, emphasis, and balance.

**Simplicity.** When considering simplicity, remember that less is usually better. The old saying, Keep It Simple, Stupid, probably originated with this design principle. Remember, items that are suitable for text are not necessarily suitable for projection. Information that fits on one handout may need to be simplified and made into 2 or more separate slides. Simplicity is also related to the use of type faces and graphics. If you’re considering photographs or slides, think about the camera shot. If you want to discuss the position of a pitcher’s hand use a closeup of the hand, not a long shot of the player on the field. You need to eliminate irrelevant information that may be distracting.

**Unity.** Unity is another design principle. Unity involves “pulling it all together” in order to create a sense of oneness on the page. To maximize the impact of a visual, the viewer should have a feeling of cohesiveness. This can be accomplished through the use of pointers, overlapping graphics, “swooping” lines, visual elements (i.e., lines, shapes) and other related design strategies. Harmonious colors, unifying textures, and merging lines can also create unity. Remember, you need to provide unity in both the content and visuals. For example, you

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**Treehouse Tip**

**Principles of Design**

- Simplicity
- Unity
- Emphasis
- Balance
may use a consistent icon throughout the presentation to bring the content together. In addition, you may use borders and white space to create visual unity. Figure 9-6a shows an example of unity. Notice how the three overlapped circles provide a feeling of unity between the three methods of control: learner, system, and instructor. The opposite of unity is chaos. Chaos may lead to confusion rather than communication.

**Emphasis.** Emphasis is a third design principle. You need to draw attention to your visual. This may be done by selecting a particular element and making it the center of attention. Remember the “Rule of Thirds” from the print materials chapter? You can use that technique here. Rather than putting the center of interest in the center, offset it to draw attention. The upper left corner intersection can be the most dramatic for the placement of information. Use attention-getters such as distortion, flashes, and contrast. Also use direction-getters such as arrows and converging lines. Radial changes in color and texture can also provide emphasis. Figure 9-6b uses a filled pattern, arrow, and label to place emphasis on the condenser of the microscope.

**Balance.** Balance is the final principle of design. Balance involves the distribution of visual weight on either side of an invisible central axis. In other words, balance is determined by whether objects on either side of the page are of equal line, shape, space, texture, and color. You may create formal or informal balance.

Formal balance is symmetrical. In many cases you can think of formal balance as being a mirror image of items from side to side or top to bottom on a visual. The items may not be identical, but they are of equal weight. Formal balance demands exact placement of elements on the page.

Informal balance is asymmetrical and dynamic. Informal balance requires some talent on the part of the designer to give the audience a sense of balance without a formal arrangement. For example, items may be arranged on a diagonal line. In Figure 9-6c notice that the lettering in the upper left corner balances the graphic in the lower right corner. Both the upper right and lower left corners are empty.

When laying out projected visuals, you’ll want to consider the design principles. In addition, you may want to use some of the traditional visual tools to help you build an effective design. These tools include line, shape, space, texture, and color.

**Line.** Lines can be thought of as a series of points connected together. Although lines are one-dimensional, they can have a broad range of qualities. They can have varied thicknesses, be curved or straight, perpendicular or parallel. Lines can converge, diverge or intersect. They can have arrowheads to direct attention. Lines can connect elements, direct attention, or sepa-
Figure 9-6a. Unity.

Figure 9-6b. Emphasis.

Figure 9-6c. Balance.
rate key areas. Some people think diagonal lines give the feeling of movement. Loose curves provide a smooth flow, while tight curls give the feeling of tension and turmoil. Horizontal lines are peaceful and vertical lines show strength.

**Shape.** Shapes can add interest to your visual through the use of interesting, connected curves and lines. They can provide two dimensions for your work by providing both width and height. Shapes may be geometric such as a triangle or circle, biomorphic such as egg shapes and flower shapes, or abstract such as distortions and reductions. They can also be nonobjective or compound, incorporating a variety of types. Shapes may also provide three dimensions when depth is added. Depth can bring life and give the feeling of mass to objects. Be sure to match the shapes you select with your overall theme. If you’re conducting a serious presentation, what visual message do you want to convey?

**Texture.** Texture is the tactile quality that makes us perceive smoothness or roughness in objects. Texture is particularly important in visuals that you want to appear as three dimensional. The designer can provide an illusion of texture through the use of patterns, shading, and color. However don’t go overboard with the many tools available in the program such as PowerPoint. For example, it’s a good idea to stick to a simple background if you plan to use objects such as photographs in the foreground.

**Space.** Space is that area that surrounds objects. It extends upward and outward. In the print materials chapter we discussed the importance of providing adequate white space around objects on a page. Provide space for the objects to “breathe”. Space is an important tool that gives meaning to objects and provides a context for the object. Space can also help express feelings such as isolation, chaos, or order.

**Color.** Although there are other visual tools, color is the final tool we’ll discuss. The computer can generate millions of colors. Color can draw attention to your design or cause distraction. As such, color should be used with care. Use color to separate areas, provide emphasis, or establish unity. Colors may vary in hue (specific color), value or tone (lightness or darkness), and intensity (the strength of the color). Select colors that work well together. For example, a black or dark blue background with yellow lettering works well for projection.

Color charts are available that can help you select colors of equal intensity that will complement one another. If you’re unsure about selecting colors, explore and choose from the color schemes provided with the program. Figure 9.7 shows the color schemes from Microsoft **PowerPoint**. Notice that individual colors within a color scheme can be customized.
In addition to planning color into the presentation materials, it’s also possible to add color during the presentation performance. If you have a Smartboard or other interactive, electronic whiteboard, you can add color, lines, and notes to the desktop presentation (see Figure 9-8). These additions can even be saved and printed.

Felt markers are an easy way to add color and emphasis to a transparency. For example, you may want to color in some part of a diagram, underline a word, or cross items off a list. Emphasis also can be added by drawing arrows. Of course you don’t want to overdo color. Stick to two or three colors.

Consider whether you’ll be using washable or permanent markers. Washable markers are great during your lesson for directing attention and highlighting key points. You can wash off the markings after the presentation. Washable markers are
not great for permanent tasks, because they smudge easily. Permanent markers are better for drawing lines and filling in small areas of a transparency. However, use caution when trying to "color in" areas. You can apply color to a solid area, but overlapping marker strokes can leave unattractive areas of build up on your transparency.

If you're using both desktop presentations and transparencies in your classroom, be sure to keep the permanent, washable, and dry erase markers totally separate so that students or teachers don’t accidently use one on the wrong surface.

When you design materials, consider the design principles and visual tools. If you’re unsure about the placement of text and graphic elements, think about balance, simplicity, and consistency. Remember, Clutter Creates Confusion. Create unity within your visuals by making pictures and words work together.

Laying out projected materials

When laying out your project, develop and follow a template. This way your slides will have a distinct, consistent, and professional appearance. For example, you may design a simple border, standard heading area, and presentation area. A heading is an important standard element. It is helpful as an outline tool and helps to structure listening. Print “thumbnails” to get an idea of how your layout looks. Thumbnails are rough sketches of your layout.

You’ll want to use the same visual production techniques you use for print materials with projected materials. One important consideration is the use of words. Generally, presentation developers are too wordy. Use as few words as possible (6 lines with 6 words per line and/or no more than 20 words total). When possible, start each phrase with a verb to promote action.

Try to stick with phrases, not sentences. If you use sentences, your audience will be trying to read while you’re trying to talk. The slide or transparency should guide your presentation, not be a substitute for you. Provide only the key words as a guide for the audience. You can fill in with your discussion. For example, include the key words and read the statistics. It should be used as a guide, not a book. Keep it simple.

Some teachers are moving away from the use of bullet points entirely and instead using graphic, concept maps, and other ways to convey meaning in more visual ways.

In Figure 9-9, notice that the first try is simply a paragraph. It contains all the information from the presenter’s notes. In addition, the lettering is much too small to be projected. The second try gets rid of lots of words, but still includes the statistics. The
What are students requesting?

In a recent survey of school media centers, 75% of students indicated that they wanted more magazines, 60% stated they wanted audio CDs, 50% indicated they would like to see more popular videos and 25% noted that they wanted more paperback books.

Student requests for a recent media center survey

1. Magazines (75%)
2. Audio CDs (60%)
3. Popular videos (50%)
4. Paperback books (25%)

Try 1

Student Requests

1. Magazines
2. Audio CDs
3. Popular videos
4. Paperback books

Try 2

Try 3

Try 4

Figure 9-9. Development of effective visuals.

next option includes only the essential outline. The speaker can fill in the rest orally. This is an effective approach. The fourth option is more visual. Again the teacher can fill in orally. This may be the most effective because it mixed visual and verbal communication.

Another consideration relates to fonts and font sizes. Select simple fonts. Avoid the highly detailed fonts and type styles, as they’re difficult to read and don’t always project well. In particular, stay away from outline and shadow styles. Also avoid very bold or very thin fonts. Sans serif fonts are easier to read and clearer when projected than serif fonts. For example, Arial and Helvetica are good choices for transparencies.

Select large font sizes. Choose 24 point or larger. Commonly a 36-point font will be used for the heading and 24-point for the key points. Smaller font sizes can be used on charts if the audi-
enforce will have a paper copy as a reference. However, anything smaller than 18-point becomes difficult to read at a distance.

Selecting and combining type sizes and styles effectively is no simple task, so start conservatively. Limit lettering to one or two type styles and one or two sizes. Again, the key is restraint. It’s okay to make a title bold and italics, but if you add shadow and underline it’s called “tacky”. Remember, the idea behind type styles is to provide emphasis to your product. More is not necessarily better. Avoid underline text and shadow entirely. For emphasizing a specific word or phrase, try other methods. For example, use a bold or italic type style or a box enclosure.

Figure 9-10 shows three “tries” at producing a transparency. In Try 1, notice that a serif font is used. Remember that serif fonts are more difficult to read than sans serif. Also notice the mix of type styles. It seems that the key points are competing for attention. You’re much better off using type styles sparingly. Try 2 is better, but boring. A single sans serif font was selected and the type style is plain. Try 3 adds pizazz without overdoing it.

Organization of elements on the page is another important consideration in the layout. Keep your visual organized. Line things up at the left margin to create a path for the eye. Also remember the “Z” of layout. It’s a good idea to put the heading across the top. This is the first place the audience will look. Identify and emphasize the most important element in the visual. Make it the biggest and boldest. This is often a heading. Number or bullet key points. Normally, numbers indicate sequence or importance. For random lists, use bullets, check marks or other dingbats. In Try 3 of Figure 9-10c, checkmarks are used to highlight each point. Notice that the heading is across the top and is boldfaced.

The final consideration is related to white space. Separate areas of the screen with white space. White space makes the transparency seem less cluttered. You’ll want to balance your white space. In Try 3 (see Figure 9-10c), the white space next to the title balances the white space next to the car.

**Creating visuals in a series**

Rarely does a presentation require only one visual. Normally, an entire series of visuals is developed. When a visual series is being produced, you need to select a design template and color scheme that draws the separate visuals together. For example, throughout a presentation sequence, you should orient the visual, width to length, uniformly. You’ll always want to use consistent font types and styles. Consistency is the key to an effective series.

Condition the students to look for the message in the same location on each visual. For example, you may identify an area.
Car Care

Check Fluid Levels
Review Starting Procedure
Don't Pump the Accelerator
Reduce Air Conditioning Use
Maintain Steady Speeds

Try 1

Car Care

Check Fluid Levels
Review Starting Procedure
Don't Pump the Accelerator
Reduce Air Conditioning Use
Maintain Steady Speeds

Try 2

Car Care

✓ Check Fluid Levels
✓ Review Starting Procedure
✓ Don't Pump the Accelerator
✓ Reduce Air Conditioning Use
✓ Maintain Steady Speeds

Try 3

Figure 9-10. Typography in presentation slides and transparencies.
for a heading and an area for the presentation of information.

Using a style sheet that standardizes your font, type size, type style, and graphic elements will give your series of slides or transparencies a more professional look. This style sheet may be similar to the one you designed for print materials.

It’s a good idea to create a standard “look” for your presentation slide series through the use of visual tools. For example, Figure 9-11 shows two sets of three slides. The first set lacks consistency. Although each presentation slide looks fine in isolation, they lack the unity of a slide show set. The developer should select a design and stick to it. The second set could serve as a “template” for a series of presentation slides. By template, I mean a standard layout. Notice the consistent typography and graphic elements.

Many desktop presentation software packages come with a standard set of templates you can use or modify. Most packages have a master slide that can be modified and applied throughout your presentation. Figure 9-12 shows a sample template from Microsoft PowerPoint and Appleworks. Keep in mind that in a long presentation you might use a single template, but a variety of layouts. In other words, you might have a title slide, text slide, and graphics slide. Variety within your thematic template can also add interest. Figure 9-13 shows the layout options in Microsoft PowerPoint.

Let’s say you’re teaching a class in job-hunting skills. In this lesson you want students to learn about the information that may be requested on a job application. You’ll create a handout package containing actual applications, but you need a presentation to guide students through the general information found
on job applications. It's a good idea to start the session with an overview of the topic, then discuss each individual point. Remember, you want to present the information in small, easy to handle chunks and stick to one concept per slide. Although you'll want to cover the information contained in your handout, you don't need to put everything on the desktop presentation. The slides will be used as a guide for your presentation (see Figure 9-14). When you get done covering the general information found in applications, you might want to look at one specific application form in the handout packet. If you just created a slide directly from a scanned image of an application, the lettering would be too small to be seen at a distance. However, you could enlarge parts of the application such as the employment history or school data areas.
Figure 9-14. Desktop presentation for job application lesson.
Examine the visual below. The PowerPoint slide was developed for an art class.

Identify the specific design principles that are and are not being applied: simplicity, unity, emphasis, and balance. Redesign the visual using the design principles and visual tools. Also consider the overall design of the materials and the use of text.

Then create four visuals of your own, placing emphasis on each of the four design principles discussed.

Art Lab Cleanup Reminders

It is important to clean up all tools before leaving the lab. All tools must be returned to the proper location after use.

Please list supplies that need to be replaced or replenished.
Building the Treehouse
Try It!

Examine the sample presentation slide below. Identify positive and negative elements in the sample. Discuss the changes you would recommend. Create a sketch of the design.

Cardiovascular Disease Statistical Information

The most prevalent form of cardiovascular disease is hypertension in nearly 1 of 4 adults. Coronary heart disease is experienced by 4,600,000 adults, rheumatic heart disease by 2,010,000 and stroke by 1,870,000.

You need to organize the right atmosphere when planning to study.
You need to organize your notes so you can use them efficiently.
You need to establish and stick to a schedule for studying for an exam.
You need to create learning aids.
You need to attend class and take good notes.
You need to eat and sleep well before taking an examination.

Important ideas that will help you in studying for exams

Redesigning Projected Materials
Using graphics in projected materials

As with print materials, simple graphics can be used to add emphasis or draw elements together. Framing objects in boxes is a good way to create unity. However, don’t get carried away with graphics. Irrelevant graphics, such as cute clip art, can lead to confusion. Graphics in projected materials should always be tied to the idea being presented. Visuals are often more effective than words or figures in conveying a message. They provide a clear and concise method of communication.

Tables, charts, and graphs can present statistical information clearly and accurately. They are good tools for explaining, interpreting, and analyzing numerical facts. In addition, they are a simple and effective way to illustrate comparisons, trends, and relationships.

When developing a visual, there are three important ideas to keep in mind. First, each visual you produce should provide an accurate representation of the information. Second, the information presented should be clear, concise, and easy to read and interpret. Third, the visual should attract and maintain attention.

When designing any type of visual, start with a large, bold, descriptive title. The title should convey the purpose of the visual including what, where, and when. Stick to a title that is a short precise phrase.

When designing tables, charts, and graphs, it is important to balance simplicity with function. Although you want your transparency to be clear and concise, you also want it to be accurate and informative. For example, you should eliminate extra words and figures, but keep essential information.

Tables are good for presenting large sets of very precise information. Unfortunately, tables are not all that exciting. The key to an effective table lies in the clarity of the numbers and lines. Decimals should be lined up precisely, labels should be clear, and lines should be straight. Often, you’ll want your audience to examine a printed visual that matches the projected visual. However, if the printing is too small to project, don’t try. Instead, break the table into sections that can be examined separately as shown in Figure 9-15.

Charts and graphs have more visual impact than tables, but can also overdramatize an issue. Because graphs are often less precise than tables, it is essential that you portray the information accurately. In other words, it’s easy to misrepresent information on a graph. To reduce possible confusion, always identify zero on your scale. All spaces should be equal and standard units. Also, always use heavier lines for the axis on a chart or graph to provide orientation for the viewer. When selecting the most appropriate graph or chart, use the guidelines below.

Treehouse Tip

Don’t overwhelm your students with information. Stick to those facts that will help students understand the “big picture.”

Graphs & Charts
- Tables for numeric data
- Line charts for trends
- Bar charts for comparisons
- Pictorials for associations
- Pie charts for relative size
- Color for emphasis
Figure 9-15. Chart design.
Figure 9-16. Charts
Use line charts to depict trends, movement over time/space
Use bar charts to compare magnitude or size of something
Use a pictorial chart to communicate strong associations
Use pie charts to show the relative sizes of parts of a whole

When designing a chart, begin with a descriptive title. The title should answer the questions: What? Where? and When? The scale is a critical element of a chart. Make certain that the axes are clearly labeled and that the zero level is indicated. In addition, provide a key if multiple lines or bars are being used.

The first chart in Figure 9-16 is a line chart. Notice that there are two lines, one for males and one for females. The second chart is a bar chart. Notice that bars are provided for both male and female pizza consumption. Sometimes people place the actual number in the pizza chart as shown in the first set of bars. This is optional, but helps the reader see across the columns. Finally, the third chart is a pictorial chart. If you create this type of chart, make certain the picture you use relates to the topic.

Figure 9-17 shows a pie chart. Arrange sectors on a pie chart by size with no more than 5-7 sectors. If more sectors are needed, consider an expanded bar chart. On bar, line, and pie charts, use contrasting values on adjacent bars or lines. In other words, use a darker shade next to a lighter shade to provide contrast between the elements.

Color can be extra work and should be used cautiously and consistently. Just because the computer software has millions of hues available does not mean you should use all of them. Color can be used to add interest, direct attention, or add information. Shades of grey or shading can often be used instead of color.
Building the Treehouse
Try It!

Select one of the scenarios below and discuss the types of projected materials you might develop and use in your lesson. Create a sketch of a template you might use to maintain consistency in your series of materials.

Your students are learning about the age of the dinosaurs including the Triassic, Jurassic, and Cretaceous periods. They need to identify the living things present during each period including the plants, invertebrates, fishes, amphibians, reptiles, birds, and mammals. They’ll also be comparing and contrasting the two main groups of dinosaurs, the saurischian (hips like bird) and ornithischian (hips like lizard).

Your music class is studying the parts of an orchestra including the woodwind, brass, percussion, and strings sections. They’ll be comparing the functions and pitches of different instruments. Later, they’ll try to pick out the sounds in the orchestra.

Solids is the current topic in your math class. Students will need to be able to define solid shapes as three-dimensional objects with length, width, and depth. A polyhedron is a solid shape with polygons for faces, or sides. Students will need to identify the polygons that make up tetrahedrons, cubes, octahedrons, dodecahedrons, and icosahedrons.

Your students are learning creative writing techniques. Students will be writing and reading about the use of exaggeration, irony, metaphor, oxymorons, puns, sarcasm, satire, and simile. Students will need to be able to define, identify their use, and create examples of each technique.

Community helpers is the current topic in your first grade class. Students will be learning about people in the community and their jobs. They will also need to match the profession with their tools.
Adding pizzazz to desktop presentations
Progressive disclosure is a technique you may want to use to focus the attention of your students on each specific point on your transparency. Rather than revealing all the points on your transparency at once, you "disclose" them one at a time. When you show the entire slide at once, your audience will probably spend the next few minutes reading through the points rather than listening to your discussion. Progressive disclosure allows you to control the amount of information that is shown.

In addition to building ideas point by point, the technique of progressive disclosure may also be used to show a sequence of events or parts of a whole. For example, elements of a machine may be shown one at a time. In programs like Microsoft PowerPoint, the custom animation option is used to show each figure separately. The program can be set up to run automatically or moved along with a mouse click. Most teachers like to have control over the speed, so they set it up with the mouse click option.

Treehouse Tip
Progressive disclosure involves showing one idea at a time.

When you create desktop presentations, they often call these "builds".

Figure 9-18. Progressive disclosure.
Let’s create progressive disclosure for a project on the life cycle of the fly (see Figure 9-18). Notice how each slide builds on the previous slide. Additions on each slide include the name of the phase, the graphic, and the arrow pointing to the next phase.

In some presentations you may wish to apply this idea of progressive disclosure to add interactive elements such as large group questioning activities or interactive games such as Jeopardy. It’s easy to display questions and alternative answers. This can be done by showing questions and answers on the same page using animation techniques. In Microsoft PowerPoint, custom animation is used to add each element. Figure 9-19a shows the window used to set these events. Figure 9-19b shows the slide containing all of the elements.

Another option to make your presentation more dynamic is the use of hyperlinking or "action button" elements to go other slides or launch other applications such as your web browser. For example in Figure 9-20a,b, when you click a country in South America such as Brazil, PowerPoint jumps to a page on that country. When you click on a website logo, a web browser is launched (see Figure 9-20d). Figure 9-20c shows the Action Settings in Microsoft PowerPoint that can be used to jump to another slide within the program or launch another program.

Producing transparencies

If you’ve already created a desktop presentation in a program such as Microsoft PowerPoint, it’s easy to create transparencies from these electronic slides. However before sending them to the printer, examine the size and orientation of the electronic slides.
You'll also want to be sure that the slide will fit on your overhead projector. First, remember that the area of the standard overhead projector stage is 10.5 inches by 10.5 inches. Normally, you'll want to plan for a 7.5 inch by 9.5 inch opening. Then, you'll place a frame around the outside to keep the extra light from leaking around your transparency.

Second, remember to orient your presentation horizontally. This is easy if you've been using a desktop presentation package. However if you're using a tool such as Microsoft Word, be sure to change the page setup to a horizontal or landscape layout before you design your transparency. A vertical orientation is difficult to read in rooms with low hanging lights or short ceilings.

Creating the transparencies is just a matter of selecting the transparency film to match your inkjet or laser printer and replacing the paper in your printer with this plastic film. Regular acetate or thermal transparency film will not work in a laser printer, be sure to let the film dry or it will smudge. Sandwich a clear piece of plastic on top of the transparency for protection.
printer. Then, simply send the presentation to the printer like you normally do. Some print menus allow you to set the colors and quality of the printing. You may want to check these so you get the best output.

If you look closely at the transparency, you can figure out the process. Heated carbon is pressed against the transparency film to create an image. You can take your fingernail and flick off pieces of carbon. One of the problems with the laser printer process of transparency production is scratching. If you scratch the transparency, the carbon will flake. If you use an ink jet printer, the image can bleed. If you’re careful, this is not a problem. If you want your transparency to be more durable you have two options. First, you can cover the under side with a clear piece of plastic acetate. Second, you can use the thermal process for transparency production.

You don’t have to use a computer to create a transparency. For example, many teacher resource books and educational websites provide "blackline masters" that can be turned into transparencies. In this case, you’ll use one of two machines: a photocopier or thermofax machine. A photocopier works just like a laser printer. In some schools the computer laser printer and photocopier are actually the same machine (see Figure 9-21a)! Be sure to use the type of plastic film that goes with the machine.

Thermal transparencies are one of the most popular methods of transparency production. This indirect process involves running a paper original and a piece of thermal film through a thermofax machine. Figure 9-21b shows a picture of a thermofax machine. The thermal film is heat-sensitive. When you combine this film with a heat absorbing materials, such as carbon in a photocopy, a blackline master from a teacher resource book, or a laser printer original, you produce a professional quality transparency. The heat from the thermofax machine passes through the original and onto the transparency film. The image on your original absorbs heat and forms an image on the film. Although a black image on a clear background is the most popular thermal film type, you can purchase a range of colors from red on clear to yellow on blue. Remember that your original must be carbon-based. If you use felt marker or blue ink on the original, these images will not show. You can be certain the image is even by using a photocopy. Photocopies are carbon-based. If you’re using an ink jet printer, you’ll probably want to use a photocopy of the original.

Adding pizazz to transparencies
After producing your transparency, the first thing you should do is mount it. Transparencies are fragile and can be easily creased
and damaged. A frame will make your transparency more durable. In addition, if you’ll be adding overlays or masks, you need to attach these elements to the frame. Some newer transparency films come with their own frames. In addition, you can buy plastic frames and covers that can be placed in notebooks for easy storage. Tape your transparency to the under side of your mount. Masking tape is preferred over cellophane tape. It’s a good idea to tape down the entire transparency, rather than just taping the corners (see Figure 9-22). If you leave the sides or edges open, they may catch on other transparencies in a stack.

Use the techniques of masking and overlaps to create progressive disclosure in your transparencies.

**Masking.** You can use a simple piece of paper and slide it down each point, or your can create a permanent cover called a mask. A mask is often more convenient than a piece of paper. Single sheets of paper can slide off the overhead projection stage, while masks are permanent.

Let’s mask four points on a transparency about early satellite technology (see Figure 9-23). Create a transparency as usual. Then, cut a piece of cardboard into four squares. You may want to overlap the squares slightly so that light doesn’t show through. Cover the four areas and attach the mask strips to the

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**Treehouse Tip**

Transparencies are easy to use!

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**Figure 9-21a,b. Laserprinter and themofax machine.**

**Figure 9-22. Framing a transparency on the under side.**
frame of the transparency. You’ll want to tape both the top and bottom of the mask to the frame for durability.

**Overlays.** Overlays are a very effective way to build a series of points, a sequence of events, or parts of a whole. You begin with a base cell that contains just the essential information. Then cells, or overlays, are added to build the concept. Procedures, processes, and problems are all areas where overlays may be considered.

After creating each individual cell, you’re ready to mount the transparency. First, tape the base cell to the under side of the frame. Next, tape each individual cell, in order, on top of the transparency. Consider the order of the cells. You have four sides available for taping overlaps. If you tape four cells to each of the four sides, you could do your lesson in any order. This is helpful if the sequence of the overlays is not important, or if you want to be able to access each one individually. On the other hand, if you were simulating the takeoff of the shuttle, you may want the cells overlapping in sequence. In this case, you may want to tape all four cells to one side of the transparency frame. You can use masking tape to create small, numbered tabs.

You’ll want to make certain that your cells register. Registration involves the lining up of layers of your transparency. Some people will place a small plus sign in the corner of the transparency outside the viewing area to help align the cells of the transparency.
You may also want to add handwritten notes to the edge of the frame. Remember, if the transparency is masked, you won’t be able to see what is coming next. Use notes as reminders.

Conclusion
Regardless of whether you’ve got an old-fashioned overhead projector or a laptop computer and a data projector, you can build effective projected materials for your classroom.

Let’s review what types of tasks projected presentation materials do well. First, a presentation slide works well to show relationships such as spatial and temporal relationships. Organizational charts and statistical relationships are also appropriate for this medium. Second, a presentation slide can be used to show procedures and processes. For example, you could illustrate the mechanical workings of an engine, or the step-by-step process of photosynthesis. Third, a presentation slide can reinforce important points, key ideas, or sayings.

As you design materials, always keep in mind the needs of your learners. Will they be able to see your materials from their desk? Is there too much or too little information provided on the visual? Would handouts or other supplemental materials be helpful in reminding students what they’ve viewed?

As high-quality data projection equipment becomes less expensive, you’ll see more and more teachers developing desktop presentations for their classrooms.
Review the projected materials ideas you developed earlier in the chapter on the topics of dinosaurs, orchestra, solids, creative writing, or community helpers. Brainstorm ways that you could add pizazz to your materials using some of the following techniques:

Graphics
- Photographs
- Table
- Chart
- Graph

Progressive Disclosure
- Build a concept one element at a time
- Question and answer areas

Interactivity
- Action buttons within the presentation
- Launch other applications
Building the Treehouse

Try It!

Create a series of transparencies that might be used in a lesson(s). Use a graphics program or desktop presentation program to create the transparency originals.

Transparencies
Were framed, thermal transparencies + originals included?
Did at least one of the transparencies contain clipart or a scanned picture?
Was the printed outline, thumbnails, or sketches included?
Were the transparencies oriented horizontally?
Did each transparency fit inside its frame?
Were the transparencies free from extraneous marks?
Was the content, purpose, and use of the transparencies clear and appropriate?
Were the transparencies matched to a specific objective(s) in the lesson plan?
Was the content limited to short, precise key points?
Were fonts and type styles used effectively?
Were the type sizes large enough for projection with the class size described?
Did the line(s) and other visual elements isolate, draw attention, or create unity?
Did the series have a consistent layout, typography and graphic structure?

Choose at least one of the following techniques: Overlay, Mask, OR Color
Was the overlay or mask even, registered, and hinged firmly?
Did the overlay or mask serve a purpose?

Were the color elements even and within established lines?
Did the color add to and not distract from the content?
Create a series of color slides using a desktop presentation package such as Microsoft PowerPoint or Appleworks.

**Desktop Presentation Slides**
Did at least one of the slides contain clipart or a scanned image?
Was the printed outline or thumbnails included?
Was the content, purpose, and use of the slides clear and appropriate?
Were the slides matched to a specific objective(s) in the lesson plan?
Was the content limited to short, precise key points?
Were fonts and type styles used effectively?
Were the type sizes large enough for projection with the class size described?
Did the line(s) and other visual elements isolate, draw attention, or create unity?
Did the series have a consistent layout, typography and graphic structure?
Was the template, master slide, or copy/paste method used to create registration between pages?

**Color**
Were the color elements even and within established lines?
Did the color add to and not distract from the content?
Did the background and foreground colors complement each other?
Did the colors project well?

**Progressive Disclosure**
Was progressive disclosure or layering used to reveal parts of a slide?
Was progressive disclosure used effectively?

**Program Functioning**
Were the slides presented in the correct, logical order?
Was the system placed on automatic or manual based on the use?