Chapter 11

Designing and Developing Resources: Multimedia Materials

How can I combine text, graphics, video, audio, and animation into one project?

Is multimedia easy enough for my elementary students to use?

I’ve seen some really ugly multimedia materials, how can I create something that looks professional?

Multimedia is a fun and easy way to incorporate text, audio, and video materials into informational and instructional projects. After completing this chapter, you’ll be able to:

- Define multimedia and describe its features.
- Describe and develop different types of student interactions using multimedia.
- Describe different levels of student and teacher multimedia development.
- Apply design guidelines to multimedia projects.
- Create multimedia materials in various subject areas.

Multimedia provides educators with the tools to bring learning alive for students of all ages. Multimedia is changing our approach to the design, development, and implementation of instructional materials. No longer is an instructor faced with just chalk and a chalkboard. The classroom of today may contain an interactive presentation station, in addition to a wide area network that can convey audio, video, and data to students on- and off-site. This electronic classroom can provide a stimulating environment for teaching and learning; however, it can also cause frustration for instructors with little or no experience using advanced technology in their classrooms.

An Introduction to Multimedia
Just a decade ago the term “multimedia” was used to describe any combination of media such as a slide-tape program or a
kit containing a videotape, transparencies, and an instructor’s guide. In general, multiple delivery systems were required. These systems ran simultaneously in a sequential, linear fashion. Synchronizing a slide with an audiotape was the closest a developer could get to an integrated system.

With advancements in computer systems, video, networking, and related technologies, computer-based multimedia came on the scene and introduced more complex systems that could access, manage, combine, and control multiple media.

**Multimedia Defined**

Multimedia can be defined as access to text (words & numbers), aural (sound effects, music, & speech), and visual (still images, movies, & animation) elements as part of the teaching/learning process. Multimedia combines, synthesizes, and synchronizes various media components into a single, integrated presentation of information. These elements are usually controlled by a computer system. For example, a Macromedia Flash project, Microsoft PowerPoint presentation, or Knowledge Adventure HyperStudio stack can be used to control and present sounds, video clips, animation, and many other text, aural, and visual elements. These elements may be stored on a hard drive, CD, DVD, or any other media format. They can also be shared over the Internet.

The term hypermedia is sometimes applied when a user actively explores multimedia materials in a non-sequential and/or nonlinear manner. Users are not required to follow a predetermined organizational scheme when searching for text-, aural-, or visual-based information in a hypermedia environment. Many popular CD-ROM and websites are developed with this hypermedia environment in mind. For example, the multimedia Microsoft Encarta provides articles you can read, but you can also listen to audio clips, examine photographs, and even see video clips and animations. For example, the article in Figure 11-1a shows an animation of how a pump works and Figure 11-1b shows a video clip from the Civil Rights movement.

A variety of software types may be used in the development of multimedia. Integrated packages such as AppleWorks and some graphics packages have slide show options for limited multimedia projects. Presentation tools such as Microsoft PowerPoint can be used for multimedia projects that require both linear and nonlinear access. These tools allow users to add sounds, animations, and video to text and graphics. Figure 11-1c-f shows a nonlinear student project that includes four sections: radio history, how radio works, building a radio, and radio today. The presenter clicks on the topic they will be presenting and the software links to one of the four separate...
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11. RECIPROCATING PUMPS

Reciprocating pumps consist of a piston moving back and forth in a cylinder that has valves to regulate the flow of liquid in and out of the cylinder. These pumps may be single or double acting. In the single acting pump, the pumping action takes place on only one side of the piston, as in the case of the common oil pump, in which the piston is moved up and down by hand. In the double acting pump, the pumping action takes place on both sides of the piston, as in the electrical or chain-driven boiler feed pump, in which water is supplied to a boiler under high pressure. These pumps can be single-stage or multistaged. Multistaged reciprocating pumps have multiple cylinders in series. See Figures 11-1a to 11-1f for examples.

Figure 11-1a-f. Multimedia examples: (a-b) Microsoft Encyclopedia, and (c-f) PowerPoint project.
multimedia presentations. Multimedia features can be found throughout the project including audio and video clips from early radio broadcasts, animations showing how a radio works, still photos showing the steps in creating and testing a radio, and audio clips from live radio broadcasts from in third-world countries. Students created their own multimedia elements, as well as copied and gave credit for materials they found on the Internet.

For projects that require a high level of nonlinear access and user interaction, there are many multimedia options. Authoring tools can be used to create multimedia productions without high-level programming skills. General purpose languages are often used to develop special routines that can’t be handled by authoring systems.

Software for authoring multimedia is available for all computer formats. Some packages allow for the development of sequenced, linear presentations, while others provide resources for creating hypermedia environments. At the low end, HyperStudio is an easy-to-use authoring tool for teachers and students of all ages. Tools such as Macromedia Flash are useful tools for higher-end development. Figure 11-2 shows a ThinkQuest student web project that incorporates Flash animation to explain the functions and processes of the circulatory system. Multimedia elements can easily be built into web pages using tools such as Macromedia Dreamweaver and Microsoft FrontPage.

Hypermedia environments can be organized in a number of ways. For example, some systems contain a “mainline” of information that is organized in a chronological or alphabetical manner. Other systems are developed as hierarchies or webs. For example, a history resource may allow users to access information alphabetically, numerically or chronologically. They may also be able to access information by political issue, by geographic loca-
tion, or by subject. While one user may access the information resource to locate still images of clothing for a fashion history project, another student may use the same resource for a project dealing with political issues in a presidential campaign. Each user may access graphics, sounds, as well as, still and motion video segments related to his or her particular area of interest.

**Multimedia in the Teaching/Learning Process**

Multimedia offers instructors and students new ways to enhance the teaching/learning process. Multimedia is important in education because it holds great promise for improving the quality of education. It provides teachers and students with the tools to access multiple images and sounds. Teachers can “break free” from the constraints of textbooks and the chalkboard. Classes can experience a speech by Martin Luther King, Jr. and learn about his background. In real-time or slow motion, students can examine the phases in mitosis or the development of an unborn child. Students can control animated sequences of a bridge collapsing during an earthquake and compare that to actual footage of a bridge movement during the San Francisco earthquake.

You can enrich the teaching/learning process by actively involving students in the creation of multimedia projects. During the past two decades, dozens of new tools have been developed for the production and delivery of text-, audio-, and visual-based materials. Let’s explore a single project developed in HyperStudio and see how each of these elements was integrated. A fourth grade class developed a project on composting using worms. The project begins with an animation and a worm poem. The teacher developed the background for the project and the students helped with the animation.

Audio can play an important role in multimedia projects. Students can record their voices using a microphone, use noises from sound effect CDs, or incorporate original music. The entire class read their worm poem aloud for the first slide of this multimedia project (see Figure 11-3a).

Visual elements are also an important part of a multimedia project. Video digitizing cards, digital cameras, scanners, and graphics software can all be used for manipulating and incorporating a variety of pictures, diagrams, graphics, and other visual elements. Figure 11-3b shows a picture that was taken with a digital camera. The class used a digital camera to record their experiences creating and maintaining a worm bin for composting. Figure 11-3c shows a slide that contains QuickTime movies taken from a videotape.

Text also plays an important role in the projects. As a group, the class identified the steps in the process, then small groups
worked together on each section. Some students made their
slides interactive. For example, in Figure 11-3d users can click
on different parts of the worm and a word will appear on the
screen.

The composting project is a good example of a project that
incorporates a variety of multimedia elements and more impor-
tantly gets students actively involved in the learning process.

Students don’t have to be involved in all aspects of the proj-
et for it to be a success. For example, with only one computer
in your classroom, you may have students do some of their
work off the computer. Figure 11-3e,f shows a project that asked
students to write an advertisement for a Ramona book. The student posters were then scanned and placed on a slide. Students then recorded their voices reading the advertisement.

Figure 11-4 shows a variety of student projects. After returning from a field trip to SeaWorld, the students in Figure 11-4a,b developed a project about their adventure. They narrated the project and included pictures from the trip as well as pictures from the website.

Start with projects that will be appealing to students. For example, Figure 11-4c shows a project where each student wrote about a famous person. Rather than a traditional biography report, students each created a card for their class HyperStudio stack. It’s also fun for students to develop projects for other classes. Figure 11-4d shows a slide from a quiz that one class made for another class. They emailed the stack to their cooperating school.

Planning for Multimedia
Let's focus on the development of a multimedia project that incorporates sound, video clips, scanned images, text, and many other media elements. The project could be built in HyperStudio, PowerPoint, AppleWorks or another tool. For example,
you could create a project that reviews safety guidelines for your Chemistry lab, explores different types of folk literature, or teaches rhythm in a music class. Each project contains a specific objective, body of content, and set of instructional strategies. Like all informational and instructional materials, multimedia requires careful planning to be successful. Unlike most other formats, multimedia focuses on multiple channels of communication. This requires the planner to consider the relationship among different senses. For instance, will an animation distract from the text on the page? Will sound reinforce or irritate the user? Should the user have control over the movie segment or should it disappear after it has been played? These types of questions are always in the mind of a multimedia designer.

Figure 11-5 shows a card from a HyperStudio stack focusing on saving world treasures including natural and human-made sites. It includes text, graphics, sounds, and video clips.

The addition of the hypermedia element to a multimedia project adds even more complexity. Where should navigation be placed on the screen for easy use? Will all the parts of a graphic be labeled, or should the words appear when the graphic is clicked? Will students be able to choose the number and complexity of practice problems? Multimedia planning involves thinking about the content to be presented, as well as, how the user will interact with the information.

Whether you plan your project on paper or in your head, it’s important that you have a clear idea about what your project is to accomplish. Ask yourself: What exactly is my topic? What is the purpose of the project? You should also ask yourself about your students. Who will use the project? What are they like as learners? What are they likely to do and think as they work their way through the project? How can I meet individual needs and
interests? Your students will help determine the type of and amount of information you provide, as well as the format of your content presentation.

Ask yourself about outcomes. What do you want the students to learn? What information and explanations will be provided? Do the students know enough about the computer, multimedia learning, and the content to be successful? Does the content and instructional approach lend itself to this type of media format? In other words, if you're introducing a new topic, is there enough help provided in the program so that students get the examples and explanations they need to learn the content? If the project is intended to help students practice, is the feedback and remediation effective for all ability levels? If you want to provide a flexible environment for exploration and discovery, is the program designed so that all students get the information they need to answer their questions or accomplish their goals?

Finally, ask yourself about structure and organization. Will the project be self-explanatory? Will the student or the computer have control over the learning environment? Why? What will the finished product look like? How will the text, pictures, and sounds be presented? How will you ensure consistency of presentation to help the user feel comfortable in the multimedia environment?

As you can see, multimedia planning is much more complicated than developing a worksheet or transparency. On the other hand, the same basic skills apply. Focus on meeting the needs of your students by applying instructional strategies that you know will be effective with these learners.

Tips for Preproduction Planning
Planning on paper will help you think about how your final project will look. If you have a good plan, your time at the computer will be more productive. You can spend your time actually entering words, drawing pictures, and digitizing video rather than deciding what should go where. Some people like to draw rectangles that represent what will appear on the computer screen. They sometimes use dotted lines or arrows to show how users can move between screens. Or, use index cards or post-it notes. Then, arrange the slides in any order.

You don’t need to plan every detail of your project. However, sometimes it helps to get your ideas down on paper. Think about who will be using your project. Will they need directions? Will they know where to click? Where will your words go? What about your pictures? Where will you put your buttons for moving from screen to screen? Your project will look more professional if you plan your words, pictures, and other elements so they match in size and color from screen to screen.

Treehouse Tip
Encourage each student to use their own planning strategy.
Multimedia Basics
For the purpose of the following example, we'll focus on the development of a multimedia project that might be created in a program like Microsoft PowerPoint or Knowledge Adventure's HyperStudio. Most of these multimedia software packages use similar terminology.

A document is called a slide show or a stack. A slide or stack is a collection of cards or pages. A single show may contain as few as one slide or many slides. Think of a slide show as a merry-go-round without a beginning or end. When you reach the last slide of the slide show, going to the next card returns you to the first slide (See Figure 11-6).

The slide is the basic unit (See Figure 11-7). It’s called a card in HyperStudio. Everything you see on the screen is part of the slide. Slides can be made to fill all or part of the screen. Although slides are arranged in a linear fashion, they can be randomly accessed or located by the user through the use of action settings. In other words, you can put an action on a button, text area, or graphic that will move to another card, or play a sound, movie clip, or animation.

Each card contains a master slide that can be filled with a color or painted graphic along with text. On slides you can add objects such as buttons, text areas, and graphics. A button is an object that responds to user input. For example, a button can be created that plays music, shows a word, runs a video clip, or moves between slides. In Figure 11-7 arrow buttons take the user forward or backward through the slide show. A text area or field is an area for entering, editing, storing, and displaying text information. Think of it as a mini word processing document. You can change the color, font, size, and style of the text. You can even add action to the text area. For example, you could play a recorded sound when a word is clicked. Graphics can also be added to slides. These graphic elements can also contain actions. For example, when you click on the graphic, a movie clip could play. In Figure 11-7 when the user clicks on the graphic, it plays a video clip.

![Figure 11-6. Slides in a slide show.](image)
Designing a Slide Show

Slide shows can be organized in many ways, however most projects contain the same basic elements. Most shows begin with an introductory slide or slides that gain the attention of users. Help slides provide assistance for users throughout the program. Students make choices about their activities on menu slides. Information slides present the content of the show, while interactive slides provide opportunities for students to answer questions, get feedback, simulate problems/solutions, or simply explore ideas. Reference or credit slides provide information about the show such as authorship and materials used.

Introductory Slides

Introductory slides are used to gain the attention of the user. This might include an animated sequence that leads to a main menu or a single slide that presents title information. The purpose of the introductory slides is to grab the user’s attention. Think of it as the springboard activity in a lesson. What can you do to interest your students in the show?

Your introduction might include a graphic that represents the topic of the presentation as shown in Figure 11-8. It could also provide an oral or text overview of the purpose of the project. The introduction can also direct attention toward the main menu or help options. In many respects, this is the most important part of the show. If you don’t gain the interest of your audience here, they may not be motivated to fully explore your program. Tell the users why they should be interested in your information. What will they learn? Inform them of the objective.

Treehouse Tip

Basic Terminology

- slide show or stack
- slide or card
- master slide
- button
- text area or field
- graphics

Figure 11-7. A sample slide.
of the slide show. You may also wish to help them recall things they already know that might be applied to this lesson.

Use multimedia features in your introduction. If your project is on Edgar Allen Poe, start with some spooky mood music or a few lines from *The Raven*. A Civil War project might start with some military band music or the oral reading of a diary excerpt. Make it dynamic, make it emotional, use different channels of communication to motivate your students.

**Help Slides**

Some students have lots of experience with computers, while others may be apprehensive and unskilled in using multimedia environments. An effective learning environment should be comfortable for your students. If they feel lost or frustrated in your program, they may not be able to concentrate on the content. As a result, it's wise to include help slides for those users who need extra assistance. You may wish to include the basics on one slide as shown in Figure 11-9a. It's useful to include graphics of the buttons that will be used in the program as part of your explanation. Some developers like to create an animated audio tour of their entire slide show (see Figure 11-9b).

In addition to explaining the basic navigation of the slide show, you may also want to show how to use specific slides (see Figure 11-9c). If your project involves lots of terminology, consider a help glossary as shown in Figure 11-9d. The easier your project is to use, the less outside assistance students will need in the classroom.

Examine the icons in Figure 11-10. What do they mean to you? Someone who has used multimedia packages before will probably recognize an arrow as meaning "to continue to the next screen", but what about novice users? Again, the printer icon may be familiar to some users and not others. When you start developing your own icons, this becomes an even bigger issue. When you click on the picture of the southeastern US icon, what

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*Figure 11-8a,b. Title slides.*

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**Treehouse Tip**

**Project Elements**

introductory slides
help slides
informational slides
interactive slides
reference/credit slides
happens? Is that an inkwell or a Hershey’s kiss? What does this button do? More explanation will be needed in some programs than others depending on the complexity of your navigation and options.

Credits and Reference Slides
Just as you have acknowledgments, reference lists, and bibliographies at the end of a book, you should also provide these in a multimedia project. Many developers put a button near the beginning of the project where this card or series of slides can be accessed. You’ll want to give credit to the project authors and illustrators. In addition, you need to cite those books, video clips, CDs, DVDs, sounds, graphics, quotes, and other resources you used in developing your materials. See Figure 11-11 as an example of rolling credits at the end of a project.

Menu Slides
Your students will need help moving around in your project. This movement is called navigation. The organization of your project is critical to the success of your lesson. If you aren’t well-organized, your users may get "lost in hyperspace."
other words, if your project doesn't provide students with a way to find out where they are in the materials and how to move around, they may become confused and lose their train of thought.

Unless you plan a linear project where all students will go through the same slides in the same order, you need a plan for navigation. Many multimedia developers use menu systems. A menu is simply a list of choices. They provide users with a way to branch to various parts of the project. In other words, the student is presented with a set of options from which to choose. The discrete, but associated, categories reflect the structure of the content of the project. The menu options are often words such as democratic, bureaucratic, or totalitarian. The student would click on the government system they wish to explore.

Menus don't have to be words on the screen. For example, the user could click on a state from a graphic showing the United States, select a part of a volcano, or click on an instrument from an orchestra.

Figure 11-12 shows two different plans for the same topic.
Figure 11-12. Dinosaur stack planning.
The diagram on the top shows a main menu where students can choose to learn about birdlike or lizard-like dinosaurs. The second diagram shows how the project could be organized by time period: Triassic, Jurassic, and Cretaceous. When designing the structure of your project, consider your objective. Also think about ease of learning. Which is more important to your objective, the grouping of dinosaurs or the time periods? Would there be a way to do both? For example, organize your menu by type, but provide a timeline on each slide showing when the particular creature lived.

Many students and teachers use the tool Kidspiration or Inspiration for planning the organization of their hypermedia materials. You might even start with one of the templates provided (see Figure 11-13a,b). The Inspiration website and other associated websites (see Figure 13c,d) contain lots of examples for planning multimedia projects.

There are many ways to present menu information. For example, people can click on words or pictures. Figure 11-14 shows two options for a project on the human hand. The first menu directs users to click on a part of the hand. A transparent button covers each part of the hand. When an area is clicked, it will take the student to a specific slide with information about that bone.

The second menu uses the illustration as a guide, but asks students to select a word rather than an element of the picture. You could even add some sound. For instance if the user clicked on the carpal visual or word, the system could say "You clicked on carpal. It's another word for the wrist bones." The computer would then move to the carpal slide.

Figure 11-15 provides six examples of menu slides. Figure 11-15a shows a tree menu. Notice that no written directions are provided. The system provides oral directions to click on any green button to explore trees. If the order of choices is important, you may consider providing a starting point for students. For example, you could tell users to begin with the first option and work their way down. Figures 11-15b,c provides some written directions for students. Notice that Figures 11-15d,e include a graphic with each option. The next example uses the notebook metaphor and tabs for choices (see Figure 1-15f).

Visual menus are also helpful. Figure 11-15g,h shows two examples. Users can click on the map of Indiana to find out about a particular state park.

Visual maps don't have to be geographic. Diagrams, charts, and webs can all help a user maintain orientation in a project. While navigating through the project, users may return to the map to "get their bearings." For instance, the subject of genealogy can overwhelm users. Four family maps are used to guide users through each of the four families in the genealogy project.

Treehouse Tip
Show students lots of examples to give them ideas about different ways to organize their information.
The Human Hand

In this section, you'll learn about the parts of the hand.
Click on any part of the hand to learn more about it!

Figure 11-14. Human hand menus.

The Human Hand

In this section, you'll learn about the parts of the hand.
Click on one of the parts below to begin your exploration.

- Carpals
- Metacarpals
- Phalanges

http://www.inspiration.com

Figure 11-13a,b,c,d. Kidspiration and Inspiration planning.

http://www.strategictransitions.com/multimedia.htm
Figure 11-15a,b,c,d,e,f,g,h. Example menus.
The main map and each of the four family maps lead to nuclear families then to individual family pages. Anecdotal pages can be accessed from individual pages.

Menus are important, but they can also be overwhelming. It’s easy to provide too many choices for students. If possible, limit student options to seven. This may be difficult for a large project, but users can easily become overwhelmed by too many choices on one page. If more than ten choices are provided, make certain that users are given guidance for making selections. For example, you might say "If this is your first time through the project, I suggest that you start with 'General Info'."

### Designing Interaction

Multimedia environments allow students to explore information, discover relationships, practice skills, synthesize ideas, and formulate solutions by presenting text, graphics, still and motion pictures, and sounds on the screen. Hypermedia is the interactive aspect of the multimedia environment. In other words, students can selectively study the information that is necessary for their task. Text and pictures are linked rather than presented in a linear fashion. For example, if a student is reading about frogs, he or she could click on the word amphibian for a definition and pictures related to that category of creature. A geography student could click on a country and zoom into a state, city, and even a particular street and buildings. Language arts students could click on different parts of a poem to learn about how the poetry form is constructed.

This type of learning environment is easy to use and is flexible enough to address different learning styles and levels of complexity. For example, you could design an instructional project that lets the learner select the number and complexity of practice problems. Multimedia environments can provide multiple examples, glossaries, diagrams, and other tools to help particular types of learners.

For most students, this type of learning resource is motivating because it provides more control over the learning environment. On the other hand, this approach has been criticized by others who believe students don’t always make wise decisions about their own learning. Lamb and Myers (1990) have advocated the use of a mentor system that is designed to give a student some control of the learning environment without letting the student get in over his or her head.

When designing interactive environments, think about the purpose of the project. There’s not a right or wrong way to develop projects. However, before you choose a format for your project, consider the goal. Do you want to inform or instruct? Will the slide show be used to gather information, explore ideas,
or learn a concept? Each of these goals requires a different type of planning.

A primary consideration is learner control. Will the student or computer be directing the learning environment? If students are selecting topics and exploring information, then it makes sense to provide a series of menus or "hot words" that can be used by students to move around the slide show. However, if the project is intended to provide instruction related to a particular skill, then more computer control may be needed. For example, if students are learning Spanish verb forms, the system may give the students a pretest and use the results to present only those onscreen lessons the student needs.

Planning Interactive Slides
Although planning is important on all slides, it is even more important when developing an instructional resource. How will information and questions be presented? Where will a student enter answers? Where will the learner receive feedback? How will the student proceed from one slide to the next? The answers to these and other questions result in an overall project design.

You must keep in mind that students will be expected to use the tutorial without assistance. Therefore, you must provide students with adequate directions and instructions so they can complete your lesson without "human" assistance. For example, you can't assume that students will know "what to do" in your project. In addition to providing learners with directions, you'll also need to inform them of the objective of the lesson. In the case of a test, quiz, or practice problem, students will be reading text and examining graphics, entering or clicking a response, self-checking answers, and using buttons to proceed from one screen to another. Although this may seem simple, students will need detailed explanations of their duties in the program or they may become lost or confused.

In addition to providing adequate instructions, you must also design screens that are easy for the learner to follow and use throughout the lesson. Functional areas are used to provide learners with a consistent learning environment. In other words, students should be concentrating on achieving the objectives of the lesson rather than trying to figure out where they are and what to do next. Functional areas involve dividing the screen into a number of specific areas that are used consistently throughout the instruction. Consistency in these areas help students to maintain their orientation within the lesson and reduces the effort needed to "decide what to do next." Functional areas also ease the transition between slides, allowing the students to concentrate on the content rather than on the technical aspects of the computer program. Finally, a consistent learning
environment may eliminate some of the anxiety students experience when learning a new concept.

Many authors and researchers interested in screen design have written about the importance of establishing effective screens within lessons. Most of these experts agree that the proper use of functional areas provides clarity, consistency, and continuity within a computer-based lesson. We'll discuss the following screen areas including orientation, information, directions, student involvement, special message, and student options and navigation. Although not written in stone, these functional areas are a good place to start our discussion.

**Orientation Area.** An orientation area answers the question, "where am I?" For example, it may provide the learner with information about where he or she is in a lesson. This might take the form of a name such as "Lesson 5: Beginning Fractions" or simply a section title such as "Arachnids." The functional area for orientation may be located across the top or bottom of the screen. If your lesson is simple, the page title may be enough. However if your lesson involves many sections, you may want a lesson, section, and slide indicator. Figure 11-16 shows a slide demonstrating the use of an orientation area. It reminds the student that they are in the chronology section of the Edgar A. Poe project and the dates that are highlighted.

**Information Area.** The information area may include text, graphics, sounds, as well as still and motion video. Use this area to provide useful explanations, definitions, examples and nonexamples, models, diagrams, and any other information students might need in their learning. This area will generally cover a majority of the screen. For example the text might be on the left with the graphic on the right. You’ll want to select consistent fonts and type styles throughout the program. Use a
standard way of presenting information so students don’t have to figure out what to examine.

The area designated for information presentation will shrink or grow depending on the amount of content needed on a given slide. If it appears your information area is too full, consider chunking the content and placing it on multiple slides. A greater number of easy-to-read screens is preferred to a smaller number of cluttered screens. Figure 11-17a shows a large information area with lots of white space. Figure 11-17b shows text and graphics side by side.

**Directions Area.** The directions area is generally right below the information area and provides information for what to do next. Will students click on something? Will they make a choice from the options? Developers often put the directions in a different color or type style than the rest of the information on the slide. Figure 11-18a shows a directions area. Notice that the directions area is below the information text and is in another color and italics. If you have lots of directions, you may need a directions slide as shown in Figure 11-18b.

**Student Involvement Area.** The next functional area is the student involvement area. This includes both student response

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**Treehouse Tip**

Consistency is comforting.

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**Figure 11-17a,b. Information Area.**

**Figure 11-18a,b. Directions Areas.**
and feedback sections. This area answers that question, "Where do I answer and am I correct?" for the student. Learners may be answering multiple choice or constructed response questions, matching items, or they may be clicking on graphics in response to questions. This area is normally placed next to the information presentation area. If feedback is provided to a student’s response, it is normally placed near the student’s response.

Active participation is an important element of effective instruction. Therefore, the development and use of your student participation area is critical in developing an effective lesson. The instructions you provide students within this area must be clear and precise. A student response and feedback area is illustrated in Figure 11-19a,b,c,d. In Figure 11-19a, notice that the student is given a question and provided options. In addition, a feedback area adjacent to the response area provides knowledge of results and informative feedback. Figure 11-19b shows how a student enters the word in the box and clicks on the left to check their answer against the correct answer. In Figure 11-19c, students click on the correct type of book. When the incorrect answer is selected, a box shows informative feedback, but when the correct answer is selected, an animation is played along with a short song. Figure 11-19d shows how you can have multiple

Treehouse Tip

If users aren’t involved in each screen, they’ll often skip over information.
problems on one screen. The activity involves clicking on points in a grid to show hidden graphics.

Be careful about the form of the answer. Do you want learners to recall or recognize the answer? Is spelling important? Also, think about the format of the question. Are students used to answering questions in rows or columns? Examine Figure 11-20a. Students see visuals and a problem, then select one of three answers. This is good practice, but at some point you may want students to answer questions without the visual cues and type the answer rather than make a choice from three options. Match the interaction to the objective.

**Special Message Area.** The special message area answers the question, "What’s happening?" In other words, it is used to provide information to students who have done something unexpected or who need to provide the computer with information. For example, the system may provide a dialog box to enter the student’s name, remind students where to click on the screen, or direct them to make a particular selection. HyperStudio can launch other applications. A dialog box may appear asking a student to select a document. If the student enters a letter instead of a number in a practice problem, a message may appear, "Please answer with a number such as 1776." Or, if the student has clicked in an area by accident, the computer may produce a beep, a flash, or both.

To attract the student’s attention, it is important to highlight the functional area for the special message. Otherwise, the student may miss the message. This message area should be near the student response and feedback area because the learner is used to looking in this area for computer-generated feedback. Critical messages may be presented in dialog boxes in the center of the screen. In this case, the student must respond before the system continues. See Figure 11-20b for an example of a special message.

**Figure 11-20a,b. Student Involvement Area and Special Message Area.**
Student Option and Navigation Area. The final functional area is the student option or navigation area. This area answers the question "What are my options"? The navigation may be as simple as arrow buttons for movement forward and backward within a project, or as complicated as a "mini-map" of options. Other buttons may be used for quitting the program, returning to a main menu, printing, getting help, or going to a glossary. The area may be set up menu style with options listed down the screen, or as a series of buttons across the bottom of the screen. The placement of the student options area depends on the purpose of the buttons. If students will be using the buttons regularly, they should be easily accessible in a standard, central location. If they will be used infrequently, they can be smaller and placed in the corner of the screen. See Figure 11-21 for an example that includes two navigation areas. The navigation on the right side of the screen will take students to different sections. The navigation across the bottom will move the user between specific slides.

Putting the "Multi" in Multimedia
There are many audio, video, and graphic elements that can be added to a multimedia project. These features can add interest to the materials you and your students produce. Remember the importance of focusing on the multiple intelligences of your learners. Let them express themselves through pictures, provide musical examples, and involve students in developing materials that demonstrate their understanding of concepts discussed in class. Let's explore some of the options.

Treehouse Tip
Students love to add sound. It's an easy multimedia feature to integrate.

Figure 11-21. Navigation Area.
Digitized Audio Ideas

Digitized audio involves recording sound onto the computer. Songs, sound effects, short melodies, and verbal feedback are just a few of the possibilities. Sound doesn't take much space on your hard drive, so use it whenever you want to gain attention, provide feedback, or just add an audio element to go with text or graphics. It's nice to tell learners what's happening. For example, when a menu item is clicked, the computer might tell the user where they are going (see Figure 11-22). Figures 11-23a,b show a student project. After going on a field trip, students returned with still pictures, video, and lots of information. They developed a "virtual field trip" to a historic site in Southern Indiana. Each slide is narrated. Also consider oral histories and audio-rich electronic scrapbooks. Ask friends, family members or community leaders to talk about their memories (see Figure 11-23c,d).

Besides voices, you can also add sound effects and music. For example, you might include beeps and boings on correct or incorrect answers. Figure 11-23e uses a music clip playing America the Beautiful as an introduction to an American History lecture and Figure 11-23f uses background music. You can find lots of "music samples" on the web.

Sound is easy to add. Figure 11-24 shows the recording screen for HyperStudio, Kidspiration, and KidPix Deluxe. If you can use a tape recorder, you can record your voice on the computer. Figure 11-24 also shows a screen from the software package Sound Companion that allows users to edit sounds. Make certain you teach good microphone skills. Students often want to "eat" the microphone, when it will work best at 6 or more inches away from the mouth. Resist the urge to overuse sounds. For example, don't use sounds on every screen transition. It can get really annoying!

There are lots of multimedia projects that could incorporate sound. If you teach a language, ask students to use multimedia...
Figure 11-23a,b. Virtual field trip with narration.

Figure 11-23c,d. Oral history and electronic scrapbook projects.

Figure 11-23e,f. Music is added to a multimedia project.

Discussion Question 2:
Discuss the past performance and possible future of mutual funds.
to record words, paragraphs, or conversations. In science, students often need practice pronouncing scientific words. Have students listen to the word, then record their voice. Projects are also great for young children. Have students develop a kindergarten alphabet. Each child could draw a picture and write a sentence to go with a letter of the alphabet. They could record their voice reading a sentence.

Animal sounds, traffic sounds, and other sound effects can also be fun. You could create a weather project with the sounds of weather. What are the sounds of rain, thunder, and wind?

Another fun project involves oral directions. Can your students follow oral directions? Can they read, write, and say directions effectively? Are they good listeners? Use multimedia to help with these skills.

Graphics/Drawing Ideas
Graphics and drawings are another easy multimedia element. You don’t have to be an artist to make your multimedia materials visually pleasing. Start with easy graphics such as lines, boxes, and diagrams. Maps are also easy to draw. You can also add lines, stars, or arrows to maps (see Figure 11-25).

Provide help for nonartists by showing lots of models and examples. You may also be able to use a grid to help with drawing. Some students are good at tracing pictures with the mouse. If you don’t have a scanner or digital camera, you can still create great graphics from printed pictures. Trace the picture onto clear

Figure 11-24. Recording sound in HyperStudio (top left), Sound Companion (top right), KidPix (bottom left), and Kidspiration (bottom right).
plastic acetate with a felt marker. Tape the plastic to the computer screen and trace the picture into the program.

Use websites, clip art books, and CDs. Be sure to read the copyright notice that comes with the website tools. For example, Discovery School Clip Art Gallery lets teachers and students use their clipart in school projects. However if you search using Google Images, you need to check each image to get the proper permission because each picture comes from a different website (see Figure 11-26). Many software packages come with clip art that can be used with other programs. It’s easy to find, add, and modify. Students can label the parts of a diagram that you paste into a multimedia project. The pictures don’t have to be in color. Sometimes simple black and white drawings are exactly what you need. Or, you can always use the computer’s paint tools to add color later.

Scanners and digital cameras are also great tools for non-artists. Rather than drawing an illustration from scratch, scan a picture. For example, scan in a picture of a butterfly and ask students to transform it into a moth. How are butterflies and moths alike and different? There are many software packages that students can use to modify their pictures. Younger learners can use software such as KidPix and AppleWork. Older students may like using Adobe PhotoElements or PhotoShop. Try some of the speciality software packages to enhance your graphics. For example, you can find software that will "morph" images. Your students could morph themselves into an animal they are studying. Police departments use software for drawing composite pictures of faces. You can use a commercial version of this software called Faces to create composite drawings of characters in novels.

Scan head and shoulder pictures of your students. Ask them to create an abstract self-portrait that exaggerates one of their features! What feature will they choose? Ask them to write about their picture.
http://school.discovery.com/

http://images.google.com

Figure 11-26a,b,c Clip art resources and samples.

Figure 11-27a,b. Give credit for copied pictures.
Whether you scan pictures from books or capture them from CDs, make sure you give credit to the original artist! For example, Figure 11-27a shows a picture that was copied from Wikipedia. The student who developed this project included a complete citation on their credits slide. Figure 11-27b shows a student project on medicine that uses a photo from the Yahoo Gallery website (gallery.yahoo.com). Notice that a citation was included when the picture was copied.

Many students love to develop graphics as part of their multimedia projects. However, be careful. Encourage students to begin with information in the content area. Require them to relate the pictures to the concepts being taught in class. Otherwise, they’ll have a great time with the multimedia, but not accomplish the academic goal.

Figure 11-28a shows a student name poem that was illustrated in KidPix and Figures 11-28b shows a student science project that uses clipart in PowerPoint. Figures 11-28c,d show how you can draw around the silhouette of a student’s head and hand for the menu slides of an autobiography.
Digitized Video Stills Ideas

Digitized video stills may come from many sources. Digital cameras, and photos on CDs are just a few of the possibilities (see Figure 11-29). Digital cameras take great still images (see Figure 11-30a). Another way to get still pictures is by freezing a still image from your video camera. Some software lets you view a video and make still pictures. The results are great. Figure 11-30b shows a still picture taken off a video. The inexpensive "eyeball-type" or "web" camera can take still and motion pictures from live video.

When using still cameras or video "on location", make certain you take the powercord and extra batteries. Keep a log of your pictures. Most cameras take their best pictures outdoors at about 5-10 feet from the camera. In addition, bright colors turn out the best.

Figure 11-29. Still video pictures. Lion is from video, school is from videotape, waterfall is from photo CD.

Figure 11-30a,b. Digital camera photo and picture taken from a video.
If you take photographs on a standard 35mm camera or disposable camera, you can send in your pictures and have them placed on a CD for integration into multimedia projects. In addition to pictures you take yourself, you can also purchase CDs filled with photographs or get a subscription on an online photo collection service such as clipart.com (Figure 11-31).

Another source of digital photographs is the Internet. Figure 11-32 shows pictures taken from the Internet for multimedia projects. Again, make certain you cite sources when you use images you have not produced yourself. There are endless uses for digitized pictures. A few ideas are provided to get you started thinking about classroom applications.

**Portfolios.** It’s hard to incorporate 3-dimensional products into a student’s portfolio. With the digital camera, you can take pictures of models, dioramas, displays, and mobiles, then paste them into a word processing package or hypermedia project. Students can then describe their project and print out a black and white or full color paper copy.

**Before/After Projects.** Students often participate in projects...
that show changes over time. For example, your students might work on a community clean-up project. Before and after pictures could be taken showing the positive impact of the clean-up project.

**Seasonal Projects.** Record the changing seasons with the digital camera (see Figure 11-33a). Explore the plants and animals of different seasons. Figure 11-33b shows a project on the different types of mushrooms in a local park. Go on-location to a local river or nature area and take pictures during four different parts of the year highlighting the changing vegetation and wildlife. Add these changes to a class project that is built throughout the year. Write about the area and incorporate pictures as shown in Figure 11-34a.

**Growth Projects.** How many times have you seen those Dixie Cups with beans growing on the window sill? You can add fun to this project by having students take pictures of their projects each day as they grow.

**Sequence Projects.** Students often need to demonstrate the steps in a process. Students could then create games asking students to arrange the pictures in the correct order on paper or within a hypermedia project.

**Correct/Incorrect Projects.** Physical education teachers are always looking for ways to incorporate technology into their classes. Have students take pictures of correct and incorrect methods for particular physical activities such as holding a softball bat or golf club, starting a dance, or shooting a basketball. Students could incorporate these into their own procedures manuals.

**Illustrate Reports.** Use the digital camera to illustrate multimedia reports. For example, a report on recycling could be brought to life with pictures of items that can and can’t be recycled. A multimedia project on architecture would be much more meaningful with photographs of homes in the community.

![Treehouse Tip](image)

**Treehouse Tip**

Don’t keep the digital camera locked up. Keep it out so you can use it for that teachable moment.

![Signs of Spring](image)

_Tulips are my favorite sign of spring. I like spring because there are lots of flowers. I really like tulips. I went on a trip to Holland Michigan one time to see the tulip festival and it was really great. Sometimes tulips die because it gets too cold at night. Some can live even if there is snow._

*Figure 11-33a,b. Seasons project.*
representing various styles. Include real artifacts in your project on Native Americans (see Figure 11-34b.).

**Creative Writing Projects.** “Pictures can speak a thousand words,” and are great for story starters. Ask students to take pictures of various places and objects. Then have them write stories about the place or object. Or, take pictures of students showing various emotions and use those as story starters.

**What’s Next? Projects.** Use pictures as starting points for group discussions, interactive stories, or consequences activities. For example, the first slide could show a beer can sitting in the seat of a car. Ask students to write about the consequences on the second slide. Or, take pictures of incorrect procedures and ask students to discuss what might happen as a result.

**Community Map Projects.** Create maps of the community and with photographs of important landmarks and buildings.

**Math Projects.** Take a series of pictures and create real-world math problems.

**Careers Projects.** Ask students to spend a day with an adult in a career of interest. Take pictures throughout the day and ask students to create a project titled: A Day in the life of an Architect, Baker, or Lawyer.

**Illustration Projects.** Ask students to illustrate their favorite book with pictures they take with the digital camera. How do they visualize the setting? Who do the characters look like? It’s fun to compare student’s ideas of what book characters and settings would look like.

**Picture Background Projects.** Use still video images as backgrounds for writing projects. For example, a wooded landscape might be a nice background for a poem. A wall of graffiti would work for an article about the inner city.

**Modified Picture Projects.** Consider pasting digital pictures into a paint program and modifying them. Students could create interesting abstract, self-portraits using this technique.
Audio/Tutorial Projects. Create and narrate a series of pictures in a hypermedia project. Then ask students to provide step-by-step audio for each stage of the process.

CD/Picture Projects. Add a CD music background to a series of slides pasted into a hypermedia program. Be sure to cite the audio segments that are used.

Illustrate It Projects. Rather than just asking students to write about it, they can take pictures. For example, they could take pictures of the proper hand motions for bike safety.

Digitized Video Ideas
Digitalized videos are easy to make and integrate into your multimedia projects. To create your own movies, use a digital video camera. If you have older home movies on videotape, you can buy a box to convert the analog video to digital video. You can also find clip art DVDs with lots of preproduced digital movies. These movies may be in a number of formats including QuickTime and Windows Media files. Figure 11-35a shows an animal project that incorporates a clip art video. When the project opens, the video begins to play with a musical background.

Think about those things you teach that require motion. For example, steps in a process or procedures. Create a short clip for each step in changing a tire or conducting a science experiment. Demonstrate the correct and incorrect way to pass a basketball. Use video to show close-up activities that would not work well in a group setting. For example, if you're teaching an art skill such as sculpture or origami, a digitized video would work well. Videos are also useful for student produced projects. For example, students could create a tour of the city and incorporate video elements. Figure 11-35b shows a student project on the steps in building a Lego Robot. Users can read about each step in the process, then watch a short video clip.
It's easy to make use of existing video. For example, students might have video of themselves for use in an autobiographical project (see Figure 11-36). Figure 11-37 shows a project on advertising. It includes short video clips from television commercials.

When creating movies, consider very short segments. Video takes lots of room on the hard drive, so you can’t use very much at a time. If you have a long video, just use a DVD. When shooting video, use camera effects very slowly. Quick movements will appear jaggy on the video. Also limit the objects in the frame. Get as many close-ups as possible. Remember the image won’t be very large on the screen.

Animation Ideas

Animation can be a fun way to add interest to your multimedia program. In some cases, animation is built into the program. You can also use stand-alone animation makers that will create a file that can be added to another program. Figure 11-38 shows a volcano project. The animation came from KidPix.
Macromedia’s **Flash** has become a popular way to create animations. Many websites use these animations. For example, an animation from the **Brainpop** website (brainpop.com) could be incorporated into a multimedia project.

Most multimedia software has the ability to create single and multiple screen animation. In other words, you could create a series of slides and play them quickly to produce animation. Or, you could move an object around a single screen as shown in Figure 11-39. A hurdler runs across the screen.

If you make animation, make sure users know how to make it operate. Will it run automatically when the slide is opened or will a user need to click a button? Can learners play the animation over and over again? Also consider the audio. Will you try to match sound to the animation?

**CD-Audio Ideas**

Many multimedia packages can play sounds from CD-Audios. Rather than having to digitize the audio and store it on your computer’s hard drive, you simply access the CD by selecting audio clips to play. For example, Figure 11-40 shows a project on Shel Silverstein. The project accesses an audio CD that plays some of his poetry.

There are lots of audio CDs that can be integrated into your multimedia projects. For example, a government class might use a CD that contains famous speeches, a music teacher might use a jazz CD, and a history teacher might use Civil War music as a background for a lecture on the topic. Foreign language teachers can integrate speech and music from their language. Sound effects are another great application of audio CDs.

**Types of Multimedia Projects**

You don’t need expensive software to develop multimedia projects. The project in Figure 11-41 incorporates short videos demonstrating tying a knot. This project could have been done
in many different software packages including PowerPoint, Appleworks, Keynote, HyperStudio, and others. As a matter of fact, you probably already own some multimedia tools. Multimedia involves text, visual, and sounds elements. You might start with projects that simply involve combining text and graphics. Then, create slide shows that might move between screens. Figure 11-42 shows the development of a slide show on the parts of a flower. You don’t have to have new or fancy software. This slide show was being developed in PowerPoint and uses clipart from Discovery School’s Clipart Gallery.

Another option is children's creativity software such as KidWorks, KidPix, and The Amazing Writing Machine. Students can draw pictures, add clipart, and record sounds. Figure 11-43 shows how students use Image and Media Blender from Tech4Learning to create their project. Their website contains many student-produced samples (tech4learning.com) as well as great, copyright free images you can use in projects.

**Treehouse Tip**

Use the software that you have. Explore the features. You’ll be amazed at what you already have available.

Figure 11-42a,b. Web-based clipart and PowerPoint.

Figure 11-43a,b,c. Tech4Learning software and resources.
Building the Treehouse
Try It!

Explore multimedia CDs and DVDs as well as teacher and student produced multimedia projects that contain various multimedia elements. Did these elements attract or distract from the project? Why? Would you use the same or different techniques? Why?

What elements would be useful in your subject area and grade level? Brainstorm a project that would include at least two of the following areas:

- Digitized audio (i.e., voice, music, sound effects)
- Audio clip art
- Graphics created with a paint or draw program
- Graphics clip art
- Scanned images
- Digital camera stills
- Video captured stills
- Digitized video clips
- Animation
- CD-audio

Relate the multimedia elements above to the multiple intelligences. If you were developing a multimedia project for students to use or create, how would your awareness of the multiple intelligences impact your assignment?
Levels of Multimedia Development and Use

Before you begin with project development, consider the objective of each project carefully. Is multimedia an effective way to communicate information or teach the concept? Do you have the time to develop the project? How will students use the materials? How can you get students actively involved with the resources? There are many levels of classroom multimedia development and use. You may develop the entire project yourself,
then let students use your program. Figure 11-44 shows examples of teacher-produced materials. These early learning practice materials are designed with small children in mind. Notice that students are actively involved with the software through pointing and clicking on objects, numbers, and words. In all of the examples, the directions are read aloud to the child. In addition, the shapes project uses video clips to introduce each concept.

Figure 11-45 contains projects for many grade levels and content areas. In the dinosaur example, students review the characteristics of certain dinosaurs. The foreign language quiz includes lots of pictures and sounds. Figure 11-45c,d shows a biopoem tutorial that includes audio examples at each step.

Consider creating multimedia worksheets. Figure 11-46a,b shows a Microsoft Word document containing a videoclip from the PBS kids website for the program "Between the Lions" (pb-skids.org/lions/). Students watch the videoclip on the letter W, then add to the information on the page.

Another multimedia development option is to create the project yourself and ask students to add to the project. For example, you could start the project and direct students to expand
the project similar to the way you might use a "story starter." You could give students a template or outline complete with buttons and fields and ask students to "fill it in." Figure 11-46c-f shows an ant project. Students read a story about ants, learn about the characteristics of ants, then write a story or poem. Figure 11-47 shows other examples of active student involvement. The tour of a spider menu in Figure 11-47a was developed by a teacher. Her students created each of the sections of the tour. In
Monster Mash, students select a picture and storystarter then create their own slides and story. Figure 11-47c shows a foreign language writing activity and Figure 11-47d displays a project that is used as students read the book *Charlotte's Web.*
Finally, you could have students develop the entire project themselves, and let others use their product. Figure 11-48 shows a student project on odors and one on football.

Let's explore some subject areas where you might develop multimedia projects or ask students to use multimedia as a communication tool.

**Multimedia Across Subject Areas**

Multimedia projects are popular in all content areas from kindergarten through higher education. Let's explore project topics.

**Language Arts Ideas**

Language arts is a great place to integrate multimedia projects. Start with projects that you might traditionally do on paper or through oral reports (see Figure 11-49). For example, students can create multimedia projects on their favorite book, author, or genre of literature. Use multimedia as a tool for publishing all kinds of writing from poetry to short stories. Figure 11-50 shows a fun story about a pig named Pinkie who goes on an adventure. Have students develop nonlinear stories in an adventure story format. Historical interviews are another interesting writing project. Get students writing with story starters, pictures, or other writing prompts.

Another fun activity is for students to write alternative endings for their favorite stories including scanned pictures of characters and settings. They may even find real life people and places they think reflect the characters and settings of book. Students can then use video and digital cameras to record their ideas.

*Figure 11-49. Multimedia book report.*
Building the Treehouse
Try It!

Evaluate examples of the following types of projects. Why do you think the teacher chose this approach? Could the teacher have used a different level of development? Brainstorm some suggestions.

Teacher produces, student uses
Teacher starts, student expands
Students create, others use

Select a topic area. Brainstorm ideas for projects in each of the following areas:

Teacher produces, student uses
Teacher starts, student expands
Students create, others use

The teacher and students in a class play very different roles depending on the level of involvement of the multimedia project. Describe the role of the teacher, student, and computer at each level. Compare and contrast the levels. Describe why you would choose a particular level for a specific type of learning.

Exploring Levels of Involvement
Math Ideas
Multimedia is a great way for students to explore and express mathematical ideas. Get students involved in applying math concepts. For example, they might calculate calories, animal reproduction, or energy conservation statistics. Multimedia can be used to create and solve story problems. Figure 11-51a shows a graph that’s part of a math practice project. Have students develop math problems for each other using their favorite topic as the theme. Consider interdisciplinary math applications. Figure 11-51 shows a project related to travel, social studies, and mathematics. You could develop lots of scenarios for students to explore. Develop an endangered species park. How long will it take the animals to reproduce? How much will it cost? Ask students to take digital pictures of various architectural styles and explore the geometric figures found in the designs.

Science Ideas
Science is one of the easiest subjects for identifying multimedia projects. Teachers and students can develop projects on almost
any topic from life science to physical science. Consider projects where students can demonstrate their understanding of sequences and processes. Figure 11-52a shows a student project on the water cycle. Along with the pictures, the student narrates the process.

Multimedia is also a great way for students to show their understanding of terminology. For example, in small groups, students could build projects that explore a particular human body system and describe its function, importance, and interrelationship with other body systems.

Use multimedia to record student experimentation. For example, students could document plant growth through written logs and digital pictures (see Figure 11-52b).

Social Studies Ideas
Multimedia is a tool for students to communicate their ideas in the area of social studies. A multimedia project is a great reflection activity after a field trip. Figure 11-53 shows a project developed after a trip to White Sands, New Mexico.
Multimedia timelines, charts, graphs, historical photos, news video clips, and still photographs can all be used in projects that focus attention on important social issues and ideas. Students can trace the history of a person, place, or thing through pictures and words. Multimedia is a great tool for documenting interviews or news ideas. Many schools use multimedia in their morning "announcements" or news programs. HyperStudio can even send live video through the computer so students can design informational screens along with live video shots. In a government class, you might use a hypermedia tool to conduct a straw poll.

Use multimedia as an alternative to traditional written reports. Figure 11-54a shows a debate on the issue of tuna fishing. To develop the hypermedia debate, the class had to explore issues related to science and social studies.

Multimedia is a great way for students to explore and share ideas about states, countries, careers, and communities. Figure 11-54 shows a sample project on South Dakota.

Foreign Language Ideas
Students studying a language need skills in the structure of the language as well as the culture of the language. As a result, text, audio, and visual elements are all important in the teaching of a second language. Multimedia tools can be used to record audio and video projects. Student can interview each other and develop a multimedia project from their audio and video tapes. They can also record their voices as labels for pictures in multimedia projects.

Another project involves having students practice writing or conversing in the language using visual prompts such as photographs or scenes from DVDs. Figure 11-55 shows a project that asks students to write about a picture.
Physical Education Ideas

Motor skills such as basketball and tennis require lots of practice. To learn these skills, students need numerous examples and nonexamples of concepts related to the sport or activity. For example, to learn a golf swing, they need to see alternative hand grips and practice the one that works the best. Figure 11-56 shows a slide from a golf project. It’s fun to let students develop their own skill projects that they can share with others.

Conclusion

As you explore the use of multimedia projects, be flexible. Rather than converting your old, boring term paper assignment to an equally worthless multimedia project, develop a new project that requires students to think about their topic, explore new areas, and create meaningful projects. Figure 11-57 shows a project...
Multimedia projects are great activities for all grade levels and content areas. Explore projects in your content area. Brainstorm possible topics for multimedia projects.

Select a grade level and topic. Develop a plan for a multimedia project. Get students involved with production by expanding a project you start or developing a project from scratch.

Describe the students and their characteristics. How will this impact the project?
Describe the topic, content, and specific objectives. How does the multimedia project fit with the needs of your students and curriculum?
Highlight the preliminary activities leading up to the assignment. Where in the lesson or unit would this take place?
Describe the assignment that you would give students. What will the students be creating? Why? Will they actually be creating something unique or simply copying information? Where will they get the content? Is a multimedia project an effective way to learn or communicate this content? Why?
Describe your classroom management strategy. Will all students have computers? How will they get to the special equipment such as the scanner or video camera? Will they be working individually or in small groups?
Discuss the methods used for assessing student projects. Will students receive a checklist for evaluation? How will they be graded?

You may wish to develop a model project for students or produce a product that students will use in their learning. Plan a multimedia project that you will produce.

Sketch the slides. Be sure to include introductory, help, credits, menu, informational, and instructional slides.
Discuss the multimedia elements that will be used in the project. Why were these multimedia elements selected?
based on a middle school field trip. In Figure 11-58, a potentially boring science project on caves became an exciting fictional field trip to Mammoth Cave. It included a story segment and narration, along with scientific information.

WebQuests have become a popular way to get students involved with inquiry-based projects using Internet resources. Many of these projects use multimedia as a tool for sharing what students have learned in the project. Figure 11-59a is based on a WebQuest called "Paper or Plastic." Students in the class hold a debate about whether we should choose to carry our groceries in paper or plastic bags. This PowerPoint project follows the implications of each choice.

The project shown in Figure 11-59b is also based on a WebQuest. Titled "Outhouses, Corn Cobs, and Catalogs," students used video cameras, digital cameras, and audio recorders as a part of oral history projects. They asked older people what it was like to live on the prairie in the early 1900s. The project was shared with the senior citizens who participated in the interviews.
Incorporate multimedia projects across your curriculum. Rather than starting with the technology, consider starting with a book. For example, Figure 11-60 shows screens from a project based on the children's book "Brown Bear, Brown Bear, What Do You See?" by Bill Martin. In this case, the teacher created a template containing the pictures. Students could choose the slide they wished to complete. The student then wrote the top and bottom sentence based on the predictable book. This activity can also be done with pictures students draw or take with a digital camera. This class also completed a project based on the book "Polar Bear, Polar Bear, What Do You Hear?".

Multimedia projects are only limited by your imagination! Use multimedia tools to promote imagination and creativity in your students!
Develop a multimedia project in a program such as PowerPoint or HyperStudio. Your project should contain text, graphics, still pictures, movies, and sound. The project should contain at least ten slides.

Use the criteria below to evaluate your project:

**Planning**
- Was the role of each team member described?
- Was the objective of the project identified and met?
- Was the audience, content, purpose, and use of the project described?
- Was the storyboard or sketch complete?

**Project**
- Did the buttons/actions all work properly?
- Did an effective transition occur between slides?
- Was navigation apparent so users don’t get lost in hyperspace?
- Was a consistent layout and style used throughout the presentation?
- Were the fonts and type styles consistent, attractive, and effective?
- Did the same objects remain in “registration” between slides?
- Were the slides organized in a logical sequence?
- Was the content illustrated with examples?
- Was the information in the project current and accurate?
- Did the project look professional?

**Graphics**
- Were the draw tools used in the project?

**Scanned Images**
- Was a scanned picture used in the project?
- Was the image clear and in focus?

**Digital Video Stills or Motion**
- Were the digital pictures clear and focused?
- Were the pictures relevant and contribute to the project in a positive way?
- Were the pictures effectively placed on the slide/page?

**Digital Audio**
- As a group, incorporate sound into your project.
- At least one sound recording should be created using the microphone.
- At least one sound should use existing sounds such as a beep or click.
- Was the sound clear and without distortion?
- Was sound used in a meaningful way in the project?