

# What Do I Need to Create Multimedia?

Multimedia is the combined use of multiple elements, such as sound, video, text and graphics. Some or all of these elements can be included on both CD-ROMs and Web sites. However you must be able to create or convert your various elements into a digital form, which can be understood and manipulated by your computer.



The resources you need to produce the multimedia elements for your CD-ROM or Web site will differ depending on the complexity of your project. But even for a basic multimedia project you will need certain hardware, production equipment and software. Part Three of this book will discuss the specific resources to produce the final product, depending on whether it is a CD-ROM or a Web site.

Hardware is simply another word for the equipment needed for your multimedia project, such as a computer, monitor, sound card and so on.

Multimedia projects require a reasonably powerful computer. Get as much memory (RAM) and hard drive space as you can afford. For a fee, computer shops can add extra RAM to your existing computer. You can also buy relatively inexpensive external, portable hard drives to store your multimedia data or information.

## Multimedia Hardware and Production Equipment

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- ◆ A computer with at least 128 megabytes of RAM
- ◆ 2-6 gigabytes of hard disk
- ◆ A multi-spin CD-ROM drive
- ◆ A sound card
- ◆ A microphone and speakers or headphones
- ◆ A camera
- ◆ A scanner for digitizing photos and pictures

**If video clips are to be used you will also need:**

- ◆ A video player and/or video camera
- ◆ A video capture card

Software refers to the programs or tools that you use on the computer to create or process multimedia elements. Again, the software you will need depends on the complexity of your project. Many of these programs may already be on your computer.

**Graphics software** is used for photos, pictures, images and diagrams. Bitmap editors such as Adobe PhotoShop, Macromedia Fireworks and Fractal Design Painter are used to create or alter bitmaps, photos or painted images. Illustration or drawing programs like Paintshop Pro, Macromedia Freehand

and Adobe Illustrator feature pen, brush and even spray painting tools, along with the ability to cut, paste, clone and touch-up art and drawing. 3-D editors, Specular Infini-D, Macromedia Extreme 3-D and Discreet Logic 3D Studio Max are used to make animation with three dimensional graphics.



**Audio Editing software** is used for digitizing, recording and editing sound and music. Commonly used programs include Cool Edit and Macromedia Sound Edit 16.

**Video Software** is used to digitize and edit video. A frequently used program is Adobe Premier, in conjunction with other video utilities such as Moviestop and Moviecleaner. Adobe After effects and Media 100 are used for creating video with special effects.

**Other useful software** includes word processing and office packages, spreadsheet and database programs.

Be aware that a lavish multimedia production featuring animation, video clips, music and narration will require quite a lot of hardware, software, time, and possibly money. However don't let that deter you. Start with something simple and relatively inexpensive, such as a basic digital "photo album" or "e-book" featuring a series of slides accompanied by narration. You could, for example, make a multimedia photo album that examines a World Heritage Site in your region. Your CD-ROM or Web site would contain a series of photographs of the Site, along with a soundtrack.

If you live near the Site you could record a brief interview with the people connected with the area, such as a World Heritage Site manager, a historian, or a local elder, and use clips from the interview in your project. Read the section on “Memories and Marvels in Your Own Backyard”, starting on page 108, for more ideas.



*You could interview many people, for example a monk, about local heritage, and include their words on your Web site or CD-ROM*

In terms of resources, a simple multimedia photo album like the one described above would require:

- ◆ Photographs - if you are lucky enough to have access to a digital camera you can transfer the images straight into your computer.
- ◆ A scanner to transform regular photos into digital data the computer can read.
- ◆ A microphone to record your narration or story, along with a sound card and an audio editing program. (If you want to interview someone in their office or home you will need a portable tape or mini-disc recorder.)
- ◆ If you are creating a CD-ROM you will need a multimedia authoring program to combine your sound (narration) and graphic (photo) elements. There are many Web editing programs available.

You may not need to buy all of these pieces of hardware, software and equipment. For example, you may be able to borrow a camera from a family member or friend. Many Internet and computing shops have scanners, which you can use at a fee to scan your photographs or pictures onto a floppy disk. Schools or universities might also have a scanner, which you may be able to use at a cheaper rate. Some computers are sold complete with sound cards, microphones and speakers.



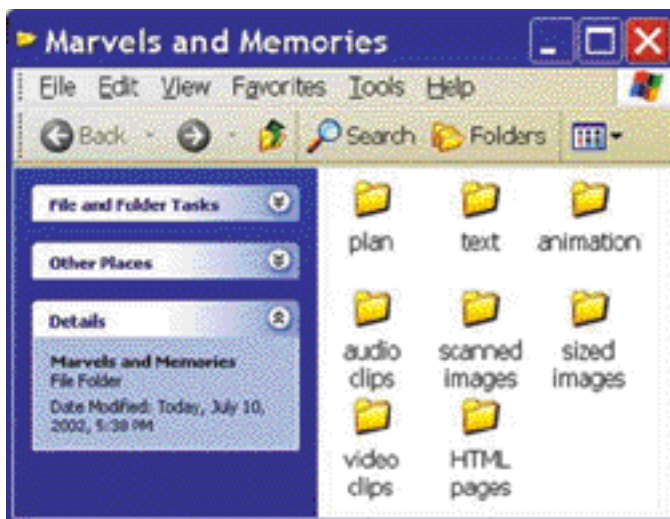
*Many Internet cafes have scanners and other multimedia equipment.*

Furthermore, you may not need to purchase very many multimedia software programs. Nowadays many computer packages are sold with graphics programs and audio editing software pre-loaded. In addition, some programs can be downloaded from the Internet free of charge (freeware) or are available for a trial period, after which you must pay for the program (shareware). To find programs like these, search for “freeware” or “shareware” on the Internet.

## Digitizing the Elements

After organizing and structuring your content, creating your storyboard and setting your style it is time to prepare the elements to be used in your multimedia project. Images, photos, video clips and sound must be turned into a digital form that the computer can read and understand.

But first of all create a folder or directory to house your multimedia elements. Proper planning and organization will make your work much easier.



It is a good idea to digitize all your elements at the highest possible quality. This will take up more memory and space than lower quality files, but it will make it much easier to edit or retouch them. After you have put the finishing touches on your files, you can compress, or make them smaller, if needed.



Keep notes on the changes you make to every sound, video or audio file. That way when you get the perfect effect, you will be able to do the same with other files quickly and easily. Always keep an original copy of each file.

## Digitizing Images

Some images can be created directly on your computer with illustration and painting software or downloaded from free clip art galleries on the Internet. These graphics are already in digital form. Photographs taken with a digital camera can also be loaded directly into your computer, ready to be edited or used immediately in your CD-ROM or Web site. Other images need to be scanned.



*You can scan photos, postcards, cartoons and other objects.*

You can scan anything that has at least one flat surface, papers, photographs, postcards, drawings and even fabric or leaves. You may also be able to scan one side of a box, a watch, jewellery and so on. Experiment with different objects to get the best results. If the item is larger than the flatbed of your scanner, consider taking a picture of it and then scanning the photo.

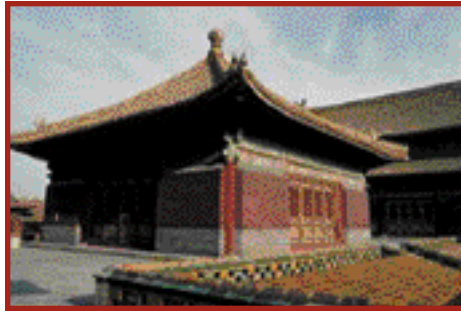
Scanners come as hand-held, flatbed or high-end drum devices. Flatbed scanners are by far the most widely used. There are many different models so always consult the instructions that come with your scanner.

Most scanners are reasonably simple to operate. Lift the lid and lay your image on the glass, flush to the side. You can do two or three photos at one time to save time. Close the cover. The controls and options depend on the scanner software and hardware. Most give you the ability to preview the image before you scan it. Check that the image is straight and crop any blank space or unwanted parts of the graphic. Cropping tools usually leave a dotted rectangle around the section of the image you want scanned. Also set the Dots Per Inch (dpi) or Pixels Per Inch (ppi). This will determine the resolution and quality of your picture. You should scan at 150 dpi or ppi at least.

After scanning give the image a file name and format. There are more than a dozen common graphic file formats. JPEG is a commonly used format, which does not require too much disk space. However some quality will be lost if you compress the file later. TIFF is a good format, as is Bitmap, but these take up much more space. Store the file in your “scanned images” folder. If using a scanner at a school or computer shop, remember to bring along several floppy disks to transfer your scanned image onto.

You can use graphic editing software packages to manipulate and touch-up your photographs. Fix overexposed or underexposed photos by using the Brightness/Contrast controls. Compare the two photos of a section of the Forbidden City in Beijing on the next page. In the lower picture, the contrast has been increased by five per cent and the brightness by ten per cent.

Most graphics software allows you to resize the image. Often you can sharpen fuzzy images. Cut and paste to create new images using parts of others. Some programs will allow you to turn coloured photos into black and white, or sepia coloured images - which give an antique look to your graphics. Save your edited images in the “Sized images” folder.



## Digitizing Sound

There are three main ways in which sound can be used in your multimedia project:

Music - sets the mood, illustrates messages

Narration - direct and effective communication

Sound effects - highlight points, i.e. drum roll

To record a narrative sound track, plug your microphone into the microphone jack, located on the sound card at the rear of the computer. Some computers have built in microphones but you will need to check whether they provide the quality you need. Alternatively, record your narration on a cassette recorder, mini-disc recorder or other device. Once finished, connect the cassette player or mini-disc to the input jack on the computer. You can also transfer music and sound effects into the computer this way.



*A young woman editing audio on her computer*

Open your audio editing software. Adjust the settings to 16 bit, 22.05 kHz - that level seems to work well on home computers. CD quality sound is defined as 44 kHz, but these files are very large and will take up a lot of disk

space and could make your computer run slower. But if you are only using a small amount of sound, the better quality may be worth it.

Many programs have similar controls to regular home stereo systems. There are play, stop, record, pause and fast forward or review buttons. Set your levels, press record and start speaking into the microphone or playing your pre-recorded music track. You may need to record a few 'takes' to get a natural and relaxed sounding narration track. After recording a track, you should have a .wav or .aiff file.

You may need to adjust the input volume. Sound that is recorded at a low level, such as that in the first picture above, can usually be boosted afterward, however background noise will also be louder. When sound is recorded too high, as in the second picture, it will distort or cut out. It is very difficult to fix over-recorded sound. In this case, it is probably best to re-record.



Many audio editors allow you to select sections of sound, cut them out and paste or copy in another section of the sound track. Sophisticated audio editors have all the functions of a professional recording studio. They will enable you to record multiple tracks and mix them into one, add special effects and change the tone and pitch of your sound. Give each file an easily recognizable name and store your finished narration, music and sound effects in your Audio Files folder.

Each piece of audio editing software is different, so consult the guide or instructions on how to record and edit your sound. Many software packages have tutorials that will take you through the whole process step by step.

## Digitizing Video

Video clips, containing both sound and moving pictures, take up a lot of disk space on your computer. You will also need lots of free hard disk space, since compressed, captured video consumes about 2MB of storage space per minute. However, a short piece of video can be a worthwhile addition to your multimedia CD-ROM, as long as your users' computer is powerful enough to run the clip smoothly. Using video on Web sites can be more problematic, as the quality will also depend on the speed of the users' Internet connection and how fast it can transmit the large video files.

Video clips can feature:

- ◆ Talking heads - one or two people talking directly to the camera
- ◆ Live action - a running race, live musical performances
- ◆ Demonstrations of how to use a tool, or perform an action
- ◆ A short play - this can be complicated, involving, actors, a director, sound and lighting.

The quality of images that you can record and display depends on the specifics of both your video card and video capture card. The video card sends pictures to your monitor, while a video capture card accepts and digitizes pictures from a VCR or portable camcorder.

Most capture systems plug right into your computer's parallel port. You will then need to attach a few more cables.

Attach a cable from the source (camcorder or VCR) video-out jack to the video-in jack on your capture card. Connect an audio cable from the source audio-out jack to the line input

of the sound card on the back of your computer. A camcorder also needs a remote control mechanism. It may be an infrared connection, a small jack labelled LANC, or in Panasonic camcorders a five-pin connector.



To create digital video, first play or import the video from your source into your computer. Depending on your system, you may need to select play on the source before using your video editing software to start and stop capturing. Digital cameras, which deliver better quality pictures, allow you to fast forward, rewind, pause, play and stop through your computer screen or interface, rather than using the buttons on your VCR or camcorder. To save time and disk space, import only the best parts on the tape, then save them as individual files or clips.

After importing the clip, use the video editing software to trim any unwanted sections. You should then place each clip in an ordered sequence. The area where you order the clips is often referred to as a time line - it may look a bit like the storyboard we created for our multimedia project. Many editing programs allow you to drag and drop a thumbnail image of your clip into the main editing window.

The time line also has space for adding sound files. You could import music directly from your CD-ROM drive, or record the audio from your videotape onto your computer. Use a microphone plugged into the audio capturing feature of your video editor to create narration. You could also create audio files by following the steps in the “digitizing sound” section of this book. Import the file into your time line, then drag and drop it under the appropriate video clip.

Your software package should let you adjust the volume or fade the sound in and out for a smoother effect. You may want to use what is known as a transition, when images change on the screen. For example you can dissolve a screen, which makes the picture fade to black, signifying that a scene has ended. Like clips, transition effects are often represented by thumbnail images you drop on the time line. Use these effects sparingly as they take time and disk space. Many video editing programs allow you to add scrolling text and create subtitles. Place the finished video file in your video clips folder.