Web Technologies and Multimedia:

What is Multimedia?

As the name implies, multimedia is the **integration of multiple forms of media**. This includes text, graphics, audio, video, etc. For example, a presentation involving audio and video clips would be considered a "multimedia presentation." Educational software that involves animations, sound, and text is called "multimedia software." CDs and DVDs are often considered to be "multimedia formats"

So multimedia is all about communicating in several ways. Similarly for example the computer you are using to view this material is capable of flashing text and beeping when there is a problem. It is already a multimedia computer.

Why use Multimedia?

A multimedia program is designed to support the learning process. Multimedia offers the experience of listening, looking and doing in a computer-mediated setting. It can be interesting, motivating, exciting and help people understanding in new ways.

The use of sound, photographs and video enables the user to **observe real world situations** which is just not possible with the more conventional methods of instruction. There is also a high level of interaction. Most packages expect students to make choices about what they want to do next and the way in which they wish to work through the material. They are not passive but expect learners to actively participate.

What are the main elements of a Multimedia program?

There are six main elements which make up a typical multimedia program:

Text: This is the base to most applications - the on-screen display of words. The use of different styles, fonts and colours can be used to emphasise specific points.

Images: Seeing a picture of an object has more impact than merely reading about it. Examples include conventional artwork, computer-generated artwork, photographs or captured video frames.

Movies: You can present information which is normally outside the scope of the ordinary classroom, such as medical operations or archaeological excavations.

Animation: Animations can render a procedure more accurately than that of a movie. For instance objects which appear blurred within a movie can be represented more clearly.

Sound: Sound can be used in strategic parts of the program or during a movie to emphasise certain points. This may include speech, audio effects (e.g. applause), ambient sound (e.g. the background sound of the sea etc.) and music

User Control: There has to be some degree of user control so as to provide students with the option to leave certain parts of the application and thus prevent boredom. On-screen options should exist for them to visit other areas of the program.

Steps for Designing a Multimedia:

- Content delivery?
- Text, graphics, audio, video, motion picture, virtual reality
- What are the limitations?
  - Speed, resolution, fidelity, colour
- How are they created?
- How are they stored?
  - File formats: GIF, TIFF, JPEG, MPEG, ...
- Streaming

Pixels (Picture Cells)

- 1-bit (black or white)
- 8-bit (0 - 255)

RGB (Additive) Color Space

- R, G, B each indicated by intensity 0-255

CYMK (Cyan, Yellow, Magenta, Black) used in printing. (Subtractive)

Dithering:

Dithering is the attempt by a computer program to approximate a color from a mixture of other colors when the required color is not available. For example, dithering occurs when a color is specified for a Web page that a browser on a particular operating system can't support. The browser will then attempt to replace the requested color with an approximation composed of two or more other colors it can produce. The result may or may not be acceptable to the graphic designer. It may also appear somewhat grainy since it's composed of different pixel intensities rather than a single intensity over the colored space.

Palettes

- The palette is the range of colors available for display
- A palette is browser-safe if it can be displayed on all popular browsers

Compression

Compression means reducing encoding size

Graphics Format:

WHICH FORMAT TO CHOOSE? It depends on the complexity and range of colors in your image, the picture quality you want, and the optimal download speed. Understanding how they differ can help you get the best possible quality at the

fastest download rate. Jpegs and gifs are the most commonly used graphic formats on the web.

1. Use GIF format with graphics that you have created on your computer such as horizontal rules, buttons, or animation. Uses lossless compression. (max 256 colors)

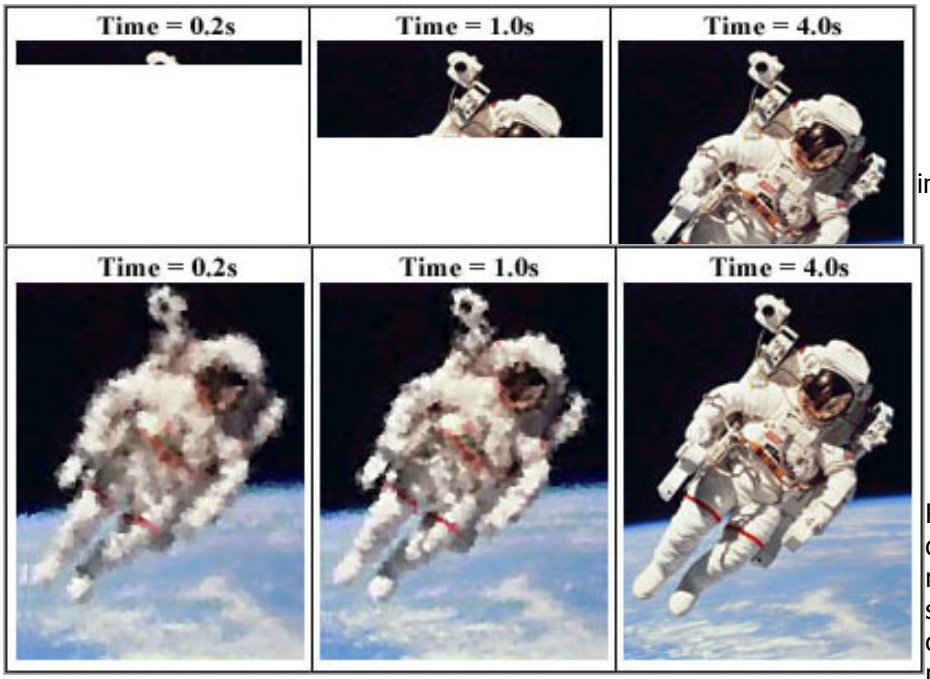
2. Use JPEG format when the images are scanned pictures or photographs. Uses lossy compression. (16.7 million colors)

Sequential Images:

Image appears from top down

Progressive Images:

Image comes in to focus.



Motion

- Capture viewer
  - Requires concentration
- Involvement
- Realism
  - Real-world object move
- Convey message
- Direct viewer's attention

Delivering Video:

- **Uncompressed video**
  - 640 x 480 resolution
  - 24-bit color = 7.37 megabits/frame
  - 30 frames per second = 210 megabits/sec.

  - 1920 x 1080 = 1.5 Gbps

- **Compressed video**
  - MPEG-2. Broadcast quality. 15 Mbps
  - AVI, QuickTime. 500 Kbps
  - RealNetworks. Designed for network speeds.
    20-200 Kbps. (At 20 Kbps, compression factor is greater than 10,000.)

Tools Used for the Multimedia Development:

- Adobe Photoshop
- Corel Draw
- Multimedia Flash
- Paint Shop pro
- Autherware
- Quark Express (Used in Printing)

Environment for Multimedia Development:

- Microsoft (Windows Based Computers)
- Apple (Macintosh Computers)
- Touch Screens (Kiosks')