FYBMM

INTRODUCTION TO COMPUTERS

INTRODUCTION OF COMPUTER GRAPHICS

There are two types of computer graphics. Vector Graphics & Raster Graphics or Bitmap.

Vector graphics are made of lines and curves, and they are generated from mathematical descriptions that determine the position, length, and direction in which lines are drawn. Bitmaps, also known as raster images, are composed of small squares called pixels; each pixel is mapped to a location in an image and has numerical color values.

Vector graphics are ideal for logos and illustrations because they are resolution-independent and can be scaled to any size, or printed and displayed at any resolution, without losing detail and quality. In addition, you can produce sharp and crisp outlines with vector graphics.

Bitmaps are excellent for photographs and digital paintings because they reproduce color gradations well. Bitmaps are resolution-dependent — that is, they represent a fixed number of pixels. They look good at their actual size, but they can appear jagged or lose image quality when scaled, or when displayed or printed at a resolution higher than their original resolution.

The most popular vector editors are **CorelDraw** and **Adobe Illustrator** & for raster graphics - **Adobe Photoshop**.

**COLOR MODELS**

**RGB color model**

The RGB color model uses the components red (R), green (G), and blue (B) to define the amounts of red, green, and blue light in a given color. In a 24-bit image, each component is expressed as a number from 0 to 255. In an image with a higher bit rate, such as a 48-bit image, the value range is greater. The combination of these components defines a single color.

In additive color models, such as RGB, color is produced from transmitted light. RGB is therefore used on monitors, where red, blue, and green lights are blended in various ways to reproduce a wide range of colors. When red, blue, and green lights are combined at their maximum intensities, the eye perceives the resulting color as white. In theory, the colors are still red, green and blue, but the pixels on a monitor are too close together for the eye to differentiate the three colors. When the value of each component is 0, signifies there is an absence of light, the eye perceives the color as black.

**White is the result of combining the three RGB colors at their maximum intensities.**

RGB is the most commonly used color model, because it allows a broad range of colors to be stored and displayed.

##### CMYK color model

The CMYK color model, which is used in printing, uses the components cyan (C), magenta (M), yellow (Y), and black (K) to define color. Values for these components range from 0 to 100 and represent percentages.

In subtractive color models, such as CMYK, color (that is, ink) is added to a surface, such as white paper. The color then “subtracts” brightness from the surface. When the value of each color component (C,M,Y) is 100, the resulting color is black. When the value of each component is 0, no color is added to the surface, so the surface itself is revealed —in this case, the white paper. Black (K) is included in the color model for printing purposes because black ink is more neutral and darker than blending equal amounts of C, M, and Y. Black ink produces sharper results, especially for printed text. In addition, black ink is usually less expensive than using colored ink.

**Black is the result of combining the three CMY colors at their highest intensities.**

##### Grayscale color model

The grayscale color model defines color by using only one component, lightness, which is measured in values ranging from 0 to 255. Each grayscale color has equal values of the red, green, and blue components of the RGB color model. Changing a color photo to grayscale creates a black-and-white photo.

**Resolution**

Resolution is the term used to describe the number of dots, or pixels, used to display an image. Higher resolutions mean that more pixels are used to create the image, resulting in a crisper, cleaner image.

The display, or *resolution* on a monitor, is composed of thousands of pixels or dots. This display is indicated by a number combination, such as 800 x 600. This indicates that there are 800 dots horizontally across the monitor, by 600 lines of dots vertically, equaling 480,000 dots that make up the image you see on the screen.

Mostly we use 72 pixels/per inch for web & onscreen presentations and color model RGB.

and for print 300 dpi,color model CMYK.