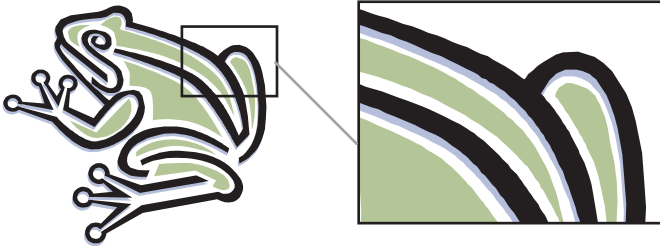


THE TWO TYPES OF GRAPHICS ON COMPUTERS

Vector

Mathematic Formulas



Vectors are used for clip-art and fonts because they don't lose quality when resized. Vector graphics often have solid fills and outlines.

Vector graphics describe shapes and lines through math. Vector graphics are *resolution independent* - the vector graphics appear as well as the device displaying them will allow. You could take a vector graphic the size of a stamp and enlarge it to the size of the moon without any quality loss!

Vector graphics can convert to raster with great accuracy, new software advances now allow vector interpretations of raster graphics but the results aren't nearly as accurate.

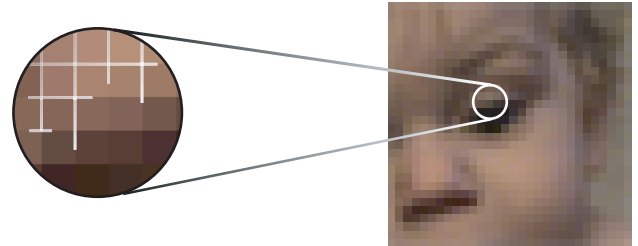
It should be pointed out that most vector formats are capable of embedding or encapsulating raster images. It's difficult to be sure of the graphic format as some programs only display a raster preview of a vector graphic. The best way to be sure is to open the graphic in a vector program and zoom in. If pixels are never apparent then the graphic is pure vector.

COMMON FILE TYPES

PDF - portable document format
EPS - encapsulated post script
EMF - enhanced meta-file
SVG - scalable vector graphic
SWF - small web format or shock wave file

Raster

Grids of Pixels



Digital photos are raster graphics. as are many of the images displayed on the web. By placing tiny adjacent squares of different colors in a fine grid we can trick the brain into seeing an image.

Raster graphics are made of of a multitude of tiny coloured squares, called pixels (from **picture elements**) . Resolution in digital images is the amount of linear pixels per inch (ppi). Raster images are commonly called bitmaps (from **map of binary units**).

Images intended for **WEB** are usually **72 ppi**. These lower resolutions keep file sizes down allowing the images to transfer faster. Pixels are equal size and equal distance apart and completely adjacent. This attribute also allows for lower resolutions on screen compared to print.

Some software and technology is pushing towards 150 ppi. This allows a viewer to zoom in 200% on screen and print a half decent image using the same graphic.

Images intended for **PRINT** are commonly **300 ppi**. Once printed, images are generally measured in dots per inch (dpi). Dots on a page can have spaces between them allowing white of a page to show through, lightening the tint of a colour.

JPG - joint photographer experts group
GIF - graphic interchange format
TIFF- tagged image file format
BMP- bitmap

RESIZING RASTER GRAPHICS WITH NO RESAMPLING

Dimension	8"x10"	>	4"x5"
Resolution	300 ppi	<	600 ppi
File Size	20 MB	=	20 MB

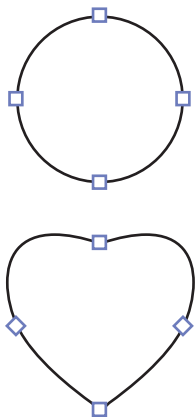
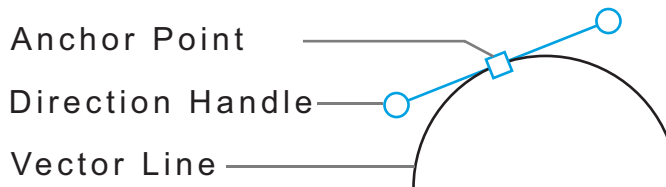
Image size is inversely proportionate to image resolution. As one goes up, the other goes down.

The more you increase a raster graphic the bigger the pixels will get. The size of a pixel can vary, unlike the size of an inch. The smaller you make an image, the more pixels you can fit in an inch, therefore increasing the resolution of an image. Using imaging software you can increase it's resolution, unfortunately you can not add details that are not present in the original.

Photoshop and like programs have the ability to resample images, allowing the increase of resolution and images size. The result is a slight blurring of the image. Microsoft Office products also blur images when increased in size to prevent the pixelation effect, but not near the quality of professional imaging software.



PARTS OF A VECTOR GRAPHIC



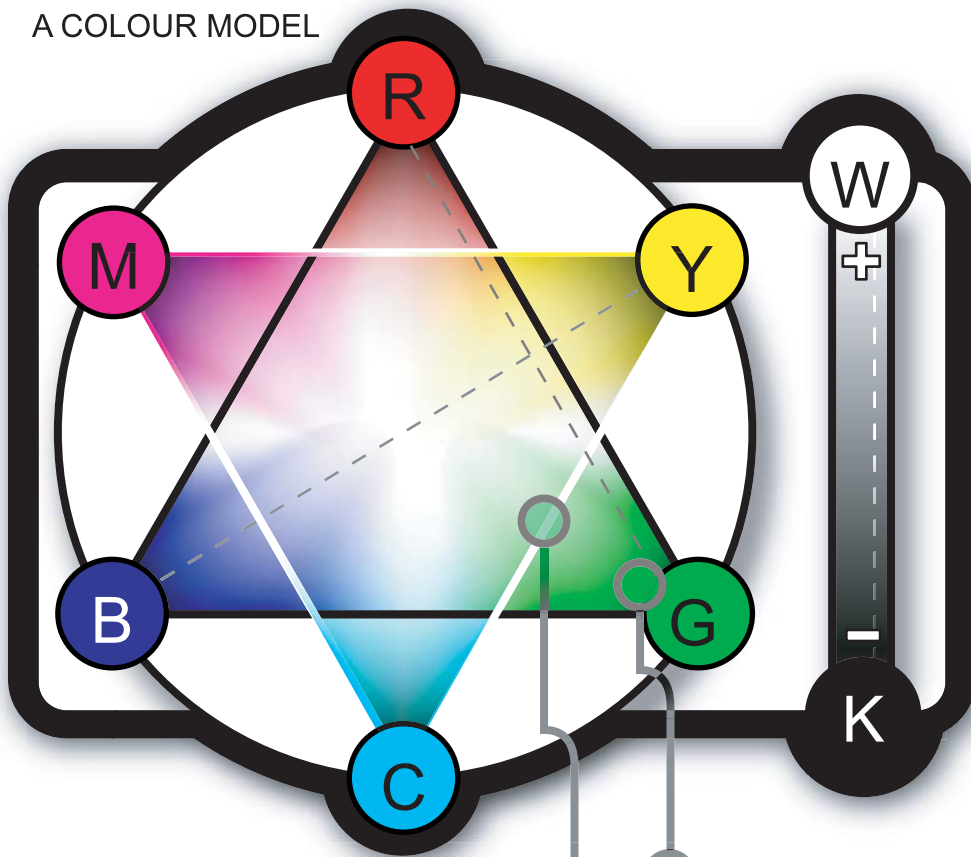
A Bézier curve is a vector path defined by mathematical equations. It was named after Pierre Bézier who developed this system in the late 1960s to assist easially describe curves between computers and humans.

A simple Bézier curve, or vector path, is made up of two end points and control handles attached to each node, or anchor point. The direction handles define the shape of the curve on either side of the common node.

Most programs use a Calligraphy Pen Tip as the symbol for its Bézier Tool. Single clicking produces straight lines while clicking and dragging produces the control handles to create curves lines.

Hearts and Circles are both great challenges to draw with the Bézier curve Tool. Most programs use 4 nodes in a circle to make editing easier even though only two are required. Practice both!

A COLOUR MODEL



RGB

Energizing red, green and blue phosphors allows TV screens, monitors and projectors to display a large and bright colour gamut.



CMYK

Mixing cyan, magenta, yellow and black inks creates a wide and accurate print spectrum. By half toning semi-transparent inks in the print process results in photo quality colour.



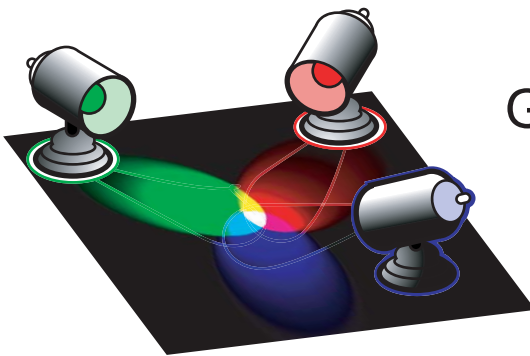
LAB

By drawing an axis from blue to yellow, and another between red and green, you have the beginning of a grid capable of charting all colours of the electromagnetic spectrum.

Creating green hues by mixing cyan, yellow and magenta inks produces a broad range of green colours.

A green light can produce a rich dark to vibrant neon range, and even more variants by adding red & blue.

Light



Green
Red
Blue



ADDITIVE COLOUR MODE:

The more lights on in a room the brighter it gets. All the colours in the rainbow added together is white. The absence of light is black.

Ink



Cyan
Yellow
Magenta
Black



SUBTRACTIVE COLOUR MODE:

The more colours of ink added, the darker the resulting mix. Absence of ink is usually a blank white page.

SCREEN	72 ppi	RGB	LIGHT
PRINT	300 dpi	CMYK	INK