## Vector and Raster graphics

### Raster graphics

Raster graphics are comprised of pixels. Pixels are small squares of colour, alongside each other arranged in a grid. It is the entire grid of pixels that make up the image, much as an impressionist artist creates an image through dabs of pure colour.

With a little distance the image is comprehensible and quite clear but up close the effect is “pixelated”, that is it appears to break up. Pixels that have adopted the background colour may give the illusion of gaps or holes in the image, but there are NO HOLES in a pixel based image. It is simply by changing the colour of the pixels that you edit the image.

Raster based programs include Photoshop, Paint Shop Pro, PhotoPaint, CorelPaint.

Raster images are used for photographic images where there is continuous tone. The computer requires the information for the description of each pixel to recreate the image on your monitor, hence raster images can have a larger file size than vector images. Raster images are also known as “bitmapped images”.

Raster image

(.jpg file)



A Raster image is made up of pixels and the clarity depends on the resolution and size that it's printed at. A Raster image file can be in bitmap (1-bit), Grayscale (8-bit), Index (8-bit), RGB (24-bit), or CMYK (32-bit) colour. See Colour Modes.

### Vector graphics

Vector Graphics are composed of objects such as circles, boxes and lines, which are arranged or layered to present an image.

Vector drawing, software programs are Adobe Illustrator or CorelDraw.

The Vector graphic's file information contains the mathematical instructions for the computer to present the objects on the screen in a specified order/arrangement, including length and direction of lines, within a defined area.

Vector graphics are usually used to create cartoons, clipart, animations or diagrams, often described as "line art". They can be stretched/resized without any loss of quality. They are used widely on the Web because of their small file size. Vector graphics are also referred to as “object orientated”.

An example of these files would be Windows Metafiles (.wmf) or Windows ClipArt.

Originally they were simple drawings that appeared in Black and White but now they can be coloured and more elaborate. When these graphics are re-sized they do not lose their colour or do not “break up”. The file size is also quite small.

Microsoft ClipArt

(.wmf Windows Metafile)

![C:\Users\H9400054\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\91S1ZPKA\MC900019306[1].wmf]()

![C:\Users\H9400054\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\91S1ZPKA\MC900019306[1].wmf]()

![C:\Users\H9400054\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\91S1ZPKA\MC900019306[1].wmf]()

## File Formats

If you have created graphics for printing you may have saved them as .tif, .eps, bmp or .pict file formats. These are simply different ways of describing the instructions for the appearance of the graphic to the computer.

When you are creating graphics for the web you can only save them in GIF or JPG.

### Common Vector Formats

.wmf Microsoft uses the .wmf or Windows Metafile for basic graphics.

.cdr CorelDRAW package produces this form by default

.cgm Computer Graphics Metafile also a common ClipArt format

Others formats include

|  |  |
| --- | --- |
| .cmx Corel Clipart .drw Micrografx Draw .dfx Autodesk .emf Windows Enhanced Metafile.hgl Hewlett-Packard Graphics Language | .eps Encapsulated PostScript .gem Ventura/GEM .pct Apple .pic Lotus Development Corp.  |

### Common Raster Formats

.bmp

Microsoft coined the term Bitmap for it’s version of a Raster graphic format. Was designed to use in Windows programs.

Has a high quality but large file size. Won’t work on the Web

**.gif A format by Compuserve Graphics Interchange**

Gifs present the graphic as an 8-bit image or less which means that it is restricted to using only 256 colours so is generally a very small file size. Because of the limited colour depth, GIF compression works best with images with large blocks of the same colour. Photographs saved in GIF format lose some of the colour quality.

Transparent gif

Sometimes you may want your graphic to appear as though it has no background or border of it’s own, as though it is a free standing object or floating on top of the page background. When a graphic is saved as a transparent gif, the pixels of the transparent section are set to a certain value and that value is associated with the colour NULL or clear. If you open a transparent gif in Paint Shop Pro you can see that the pixels which are supposed to be transparent have a grey and white checker box appearance.

For Web use,

when saving a GIF file you will be given an option of “Interlaced” or “Non-interlaced”. Interlacing displays the image gradually in increasing detail as it is downloaded onto a web page. The image sharpens gradually as it loads.

**.jpg (jpeg) an acronym for the Joint Photographic Experts Group,**

A compressed format by Huffman, the jpg format was originally designed for photographic images and work well compressing these types of images without too much loss of quality.
A JPG can be up to 24-bit images and have the capacity to display millions of colours depending on the level of compression (image quality) you choose when saving the file. They are not as suitable for line-art graphics such as cartoons because the file size is larger than with GIF files and it can cause blurring around the edges.

For Web use,

When saving an image in the .jpg format you will be given the option to save the file using either “progressive” or “Standard” encoding. Progressive encoding is similar to “interlacing” a GIF file.

Progressive encoding allows your audience to view the image as though it is slowly coming into focus.

Standard encoding means that the image will be revealed from top to bottom as it is downloaded. To view an example of this Open Internet Explorer and go to the following URL: <http://html.tucows.com/artist/tips/regvsprog.html>

**.png Portable Network Graphics**

PNG was created as an improved, non-patented replacement for gif, and is the most used lossless image compression format on the Internet.

PNG was designed for transferring images on the Internet, not for high quality print graphics, and does not support non-RGB [colour spaces](http://en.wikipedia.org/wiki/Color_space) such as [CMYK](http://en.wikipedia.org/wiki/CMYK_color_model). PNG does support transparent backgrounds. Usually the quality is good and the file size is relatively small.