

Computer Graphics

Output devices used with computers produce their output either as a Raster image or a Vector image.

Raster vs Vector

Raster devices display the information (text and graphics) as an array (sequence) of dots called **pixels**. A pixel (picture element) is the smallest element on the screen that the computer can handle. It is a square tiny dot that can only have one unique colour at a time.

The **colour depth** of a pixel refers to the number of colours a pixel can assume. For example if the computer system uses 8 bits for each pixel, then the number of colours available for a pixel is 256 different colours.

The colours available depend on a **colour palette** which is the range of colours from which the computer can choose to create the image. The most common colour palette used in computers is the RGB colour palette. RGB refers to red, green and blue and these colours can be combined by the computer to create a huge variety of colours. There are 256 different shades of Red (0 – 255), 256 different shades of Green (0 – 255), and 256 different shades of Blue (0 – 255). Therefore, the computer can choose from a range of 16, 777, 216 possible colours.

The **resolution** of an image is a measure of the pixel density of the image - the quality of the image (clarity). Resolution also determines the file size of the image. A high resolution image is of a good quality and takes a lot of space when saved. If the resolution of an image is lowered, the quality and the file size of the image is reduced. With regards to monitors, resolution is measured as the number of pixels in the horizontal dimension and in the vertical dimension, eg 1024 by 768.

Plotters are **vector devices** implying that they produce images not as a sequence of dots, but as sequence of continuous lines based on simple geometric shapes. They produce high quality graphical output and the type of pen and the ink are the only limits to the line thickness and colours that may be produced.

Image Files

There is a wide range of image files. However, each type has its own characteristics. The most common types of files are:

BITMAP: bitmap files are very large files but they maintain a very good picture quality

JPEG: stands for Joint Photographic Experts Group. These are files which are very small but very low in quality. Mainly used for websites to limit file size.