



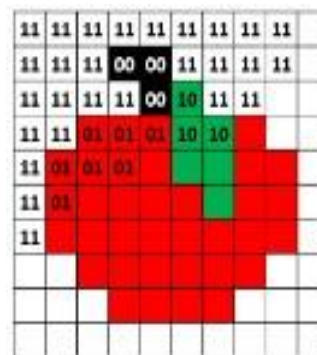
Computing Department Knowledge Organiser: Year 9 Digital Graphics

Digital Graphics

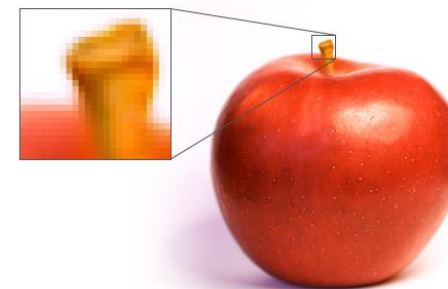
Digital graphics feature in many areas of our lives and play a very important part in today's world. Digital graphics combine text and images to present an idea or to communicate messages in an eye-catching and effective way.

Bitmap Graphics

Bitmap graphics are made from tiny individual squares of colour called pixels. Each pixel is assigned a binary value which represents a colour. They can be edited by changing the colour values of the individual pixels. Bitmap graphics lose quality when enlarged. They are used graphics for digital camera images, scanned images, magazine covers and photographs.



Example

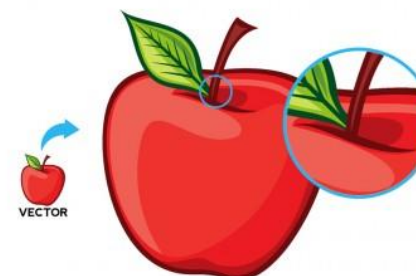


BITMAP

Vector Graphics

Vector graphics are made from scalable shapes such as straight lines and curves using coordinates and geometry. They can be edited through moving, enlarging and rotating of the individual shapes. Vector graphics can be enlarged without losing any quality. They are used in animated movies, Autoshapes in Microsoft Office and for graphics that may require rescaling such as logos.

Example



VECTOR



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Resolution

Resolution refers to the density of pixels which have been used in the creation of a bitmap image. The higher the resolution the better quality of the image and the greater the file size. It is measured in dots per inch (DPI). A graphic which is designed to be viewed on digital devices should be created with a DPI of 72, whereas a graphic designed to be printed as a magazine advert or birthday card should be created with a DPI of 300.



Colour Depth



24-bit - 16M Colors

8-bit - 256 Colors

4-bit - 16 Colors

Colour depth refers to the number of bits which are used to record the colour of each pixel in a bitmap image.

- An image with a colour depth of 1-bit means each pixel could be either black or white.
- An 8-bit image means that each pixel can consist of any one out of 256 colours (2 to the power of 8).
- A 24-bit image known as a "True colour" image means that each pixel can consist of any one out of 16.7 million colours.



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Compression

The file size of high quality graphics can be reduced using data compression. There are two main types, lossy and lossless.

Lossy Compression

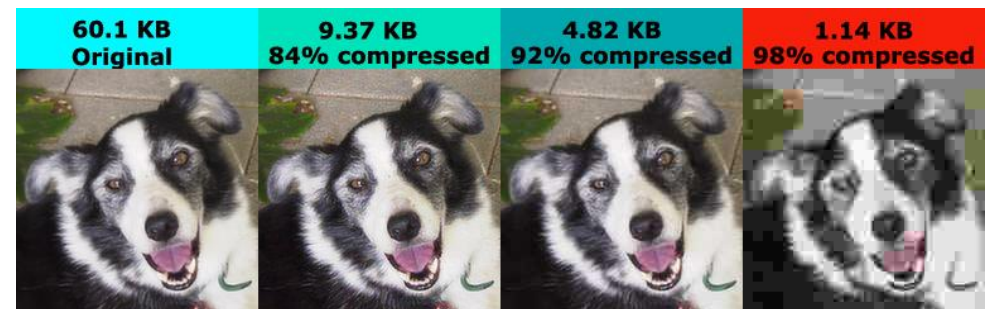
- Image data is permanently deleted
- Similar colours are made the same
- Reduction in the number of colours used
- Loss of quality is normally unnoticeable
- Can reduce the file size of JPG images

Lossless Compression

- Similar image data is grouped into one reference
- No reduction in the quality of images
- Can reduce the file size of TIFF and PNG images



Less Compression → More Compression



File Formats

The most commonly used graphics file formats are:

- JPG
- PNG
- GIF
- TIFF

Format	Advantages	Disadvantages
JPG	Millions of colours, lossy compression and usually file size is small.	Quality of image reduced after compression.
PNG	Lossless compression so no reduction in quality when compressed. Transparent background.	File size can be large.
GIF	Small file size.	Limited to 256 colours.
TIFF	Lossless compression so no reduction in quality when compressed. Very high quality.	Large file size so not ideal for web use.