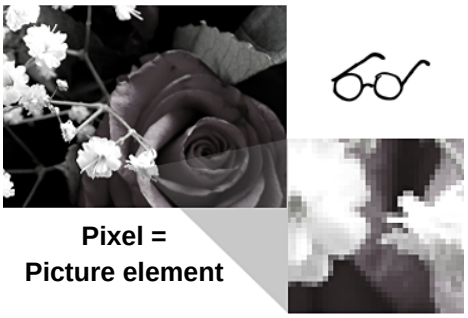
Data Representation - Part 2

Bitmaps



Pixel =
Picture element

A **pixelated** image is one where the individual pixels are clearly visible. The **image size** is described in pixels (width x height). The higher the image **resolution** the better quality the image will be. This is measured in DPI (dot's per inch). The **colour depth** is how many different colours each pixel can be represented by.

Metadata

As well as storing each pixel as binary an image file will also store metadata. That is data that is saved before and after the image to tell the computer how to decode the image. It includes:

- The file dimensions (pixels wide x pixels tall)
- The colour depth
- The resolution etc.

This meta data is mainly stored at the beginning of the file and at the end of the file is another piece of meta data telling the computer that the image has finished, a bit like a full stop at the end of a sentence.

Calculating file size of images

To work out the file size you will need to know the following:

W = image width
H= image height
D = colour depth (in bits)

As long as you know these things you can make an approximate calculation of the file size.

W x H x D = File size

Sound files

To store an analogue sound wave into digital sound wave that computers require a recording is must be taken of the sound wave at set intervals.

Sample rate = number of samples taken in a second, measured in hertz (Hz)

Bit rate = the number of bits per sample, also known as the resolution

Calculating sound file sizes

To work out the file size of a sound clip you will need to know the following:

rate = sampling rate
res = sample resolution
secs = number of seconds

As long as you know these things you can make an approximate calculation of the file size.

rate x res x secs = File size

Compression

Compressing a file is when a file is encoded so it uses fewer bits than the original file format

Lossless

Lossless data compression gets rid of unnecessary data to represent data without losing any information. This process is reversible.

Lossy

Lossy gets rid of the least essential data. For instance, some colour variants will be dropped reducing This is an irreversible process as once they have been lost, those colours cannot be brought back to the image.