

Digital Image Terminology

Pixels – Short for **P**icture **E**lement. A pixel is a single point (dot) in an image.

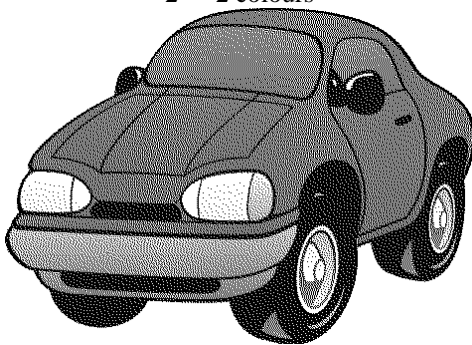
Resolution – The amount of detail in an image. Greater detail is achieved by including more dots (pixels) in the image.

For digital images this is generally measured in dots per inch (dpi). An image with 300 dpi can fit 300 dots in an inch or 90000 per square inch.

For monitors the resolution refers to the number of rows on the screen and the number of dots in each row. A screen set to a resolution of 800x600 is displaying information at 800 pixels horizontally and 600 pixels vertically.

Bit Depth – refers to the number of colours available for each pixel in an image. A higher bit depth means better quality but increased file size.

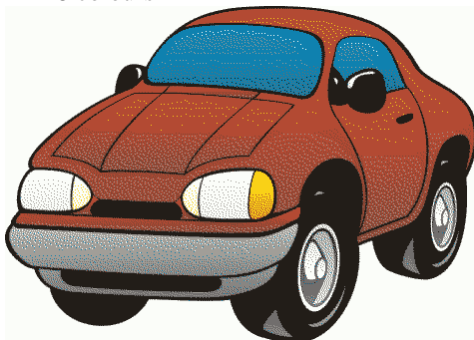
1 bit image
 $2^1 = 2$ colours



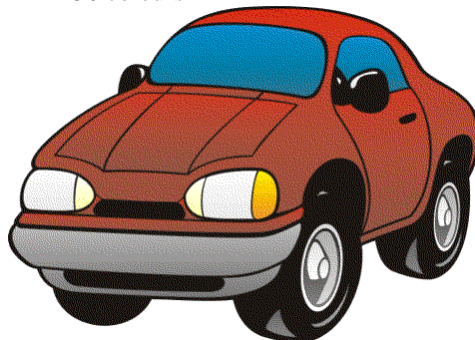
8 bit image
 $2^8 = 256$ shades of grey



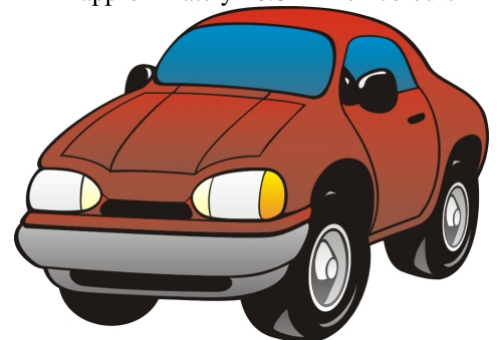
4 bit image
 $2^4 = 8$ colours



8 bit image
 $2^8 = 256$ colours



24 bit image
 $2^{24} =$ approximately 16.8 million colours



Resampling – When you enlarge or reduce a digital image, its pixel dimensions are changed and the image needs to be resampled to bring out detail. When you resample an image which has been made smaller, the number of pixels in an image decreases. Pixel information is actually deleted from the image. When you enlarge an image, the number of pixels is increased based on the colours in the image. New pixel information is added based on matching colour values of existing pixels in the image. In the examples below, both the resized images become fuzzier as pixels are added or removed.



Original image
102x103 resolution



Resampled down to
50x50 resolution



Resampled up to
200x202 resolution

Megapixels – One million pixels. The more megapixels a camera has, the higher the image resolution it is capable of printing. Here is how many megapixels are needed for standard print sizes:

Resolution	Total Pixels	Max. print size	Buy a digicam with
1600 x 1200	1920000	4x6"	2 megapixels
2048 x 1536	3145728	5x7"	3 megapixels
2560 x 1920	4915200	8x10"	5 megapixels
2816 x 2112	5947392	11x14"	6 megapixels
3264 x 2468	8055552	16 x20"	8 megapixels

Optical Zoom vs Digital Zoom – Just because your camera is digital doesn't mean your zoom lens should be! Cameras with digital zoom will not zoom in on your image at all. Instead they will merely enlarge the central portion of the image or trim (crop) the edges from the image. A camera with optical zoom has a lens where the focal length extends and retracts so that the image is actually magnified.

Some more expensive cameras have interchangeable lenses while some of the cheaper ones have no zoom at all.

Sources

www.digicamhelp.com
www.webopedia.com