Knowledge Organiser (LO1): Graphic files & formats

COMPUTING & INFORMATION TECHNOLOGY

You must know file formats used for audio, video and images and to describe their features

Common bitmap (raster) image file types

File Type	Advantages	Disadvantages
.JPG (bitmap)	Compresses well, so creates smaller files sizes. Reproduces millions of colours Good for web and printing	Lossy file format; Variable picture quality Cannot be used for animation
.TIFF (bitmap)	Lossless file format Reproduces millions of colours Standard format for print publishing industry	Large files Limited compression Doesn't support transparent background
.GIF (bitmap)	Lossless file format Enables animations (very popular use) Sharp edges to images	Larger file size Only 256 colours can be reproduced
.PNG (bitmap)	Lossless file format Reproduces millions of colours Excellent transparency in images	Compresses well Not suitable for digital photos No animation
.BMP (bitmap)	Works in many devices Millions of colours Lossless file format	Uncompressed Large file formats No compression

Common vector image file types

File Type	Advantages	Disadvantages
.EPS (vector)	Most common vector type Standard for sharing in print publishing	Not widely supported in editing software Generally Adobe only software
.SVG (vector)	Scalable without image quality reduction International standard for vector graphics High quality printing possible Good web browser support	Not widely supported in software Files sizes can be large wit many elements
.PDF (vector)	Widely supported by many devices Free to view PDF files Small file size	Not free to edit PDF files Text difficult to edit, text is treated as images
.AI (vector)	Scalable without image quality reduction Industry standard for professional vector graphics	Requires Adobe software to edit Cannot be viewed on websites
.DXF (vector)	Standard format used for Computer Aided Design (CAD) Well supported in many software applications	Large file sizes Data can be lost when shared across different software.

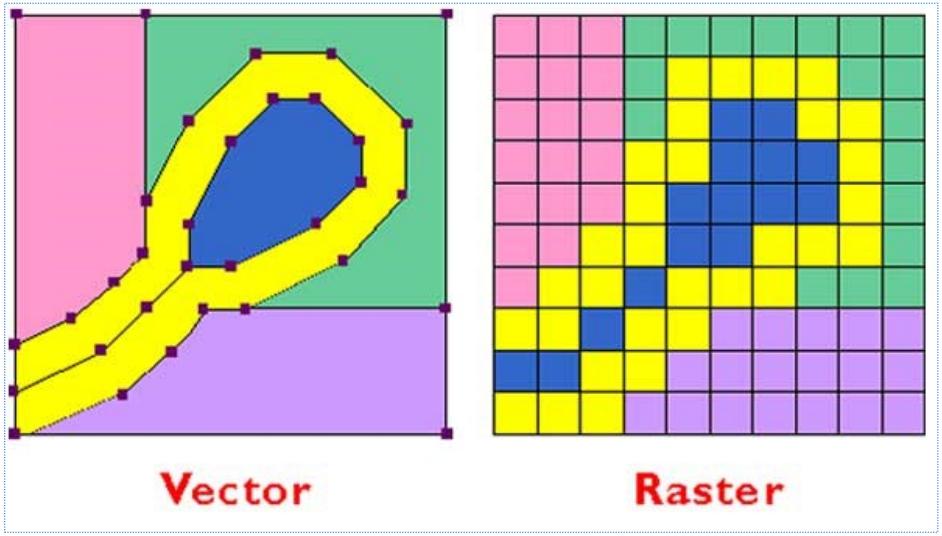
File size compression

Lossy compression

- Data is removed from the file to reduce the size of the file.
- The process cannot be reversed, data loss is permanent
- Increased compression introduces a greater reduction of image quality
- Ideal for communication over the internet and viewing on small screens

Lossless compression

- All original image quality is retained, hence no loss
- Slight decrease in file size
- Ideal for archiving images to retain original quality
- Used for large images, such as posters and billboards



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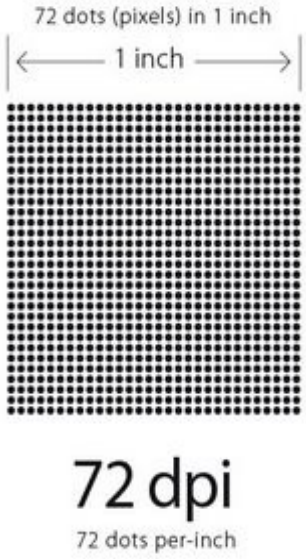


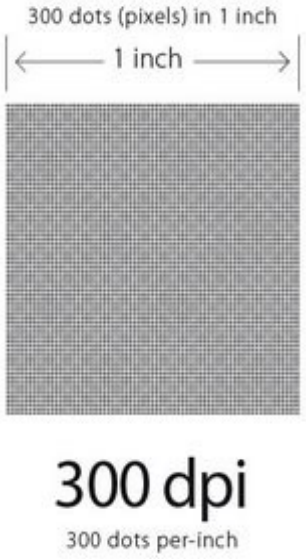


Image Resolution

Pixel dimensions	The density of pixels in an image. Normally stated as the number pixels on the horizontal and vertical axis of an image, for example HD TV is 1280 pixels wide and 720 high (1280 x 720 = 921,600 pixels = 0.92 megapixels).
DPI resolution	Dots Per Inch. How many pixels occur across one inch (2.54 cm) DPI usually refers to printed media.
PPI resolution	Pixels Per Inch. How many pixels occur across one inch (2.54 cm) DPI usually refers to screen media.
Typical resolutions	Print media typically uses 300 dpi Web media is typically 72 ppi

Question:

A monitor is 20 inches wide and it has a resolution of 1024 x 720. What is the monitors dpi?

Answer:

DPI = dots per inch = dots/inch

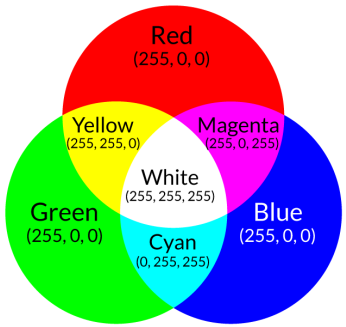
DPI = resolution / width

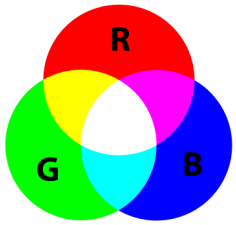
DPI = 1024/20 = **51.2 dpi**

Each pixel for a computer to TV screen is made from three values for Red, Green and Blue to determine how bright each colour is.

- R = 0 to 255 (255 is the maximum intensity)
- G = 0 to 255 (255 is the maximum intensity)
- B = 0 to 255 (255 is the maximum intensity)

These three **colour channels** are 8-bit values to determine **colour depth**.





Images are represented **pixel**s (**Pi**cture **El**ements).

TVs and monitors produce pixel colours using Red, Green and Blue light (**RGB**)

All screen colours can be produced just from RGB

Printed media pixel colours are produced from Cyan, Magenta and Yellow ink (**CMY**).

It is very difficult to colour match between CMY and RGB