

# The Robert Napier School



## Types of Graphics

### BITMAP



Bitmap graphics are made up of pixels. Each pixel is stored on the computer as a series of 1s and 0s. When you take a photo with your smart phone it stores the digital image as a bitmap.

### VECTOR



Vector graphics do not have any pixels. Instead they are made up of lines and shapes. When a vector is enlarged the lines and shapes are redrawn; making them great for resizing.

## File types

### JPG

Bitmap format that compresses digital images. Common file type used by smart phones and compact cameras.

### PNG

Bitmap format that does not compress digital images (*bigger file size than JPG*). Supports transparent background.

### GIF

Bitmap format that compresses digital images. Supports transparent background, animation and web safe colours.

### TIFF

Bitmap format that does not compress digital images (*file sizes tend to be bigger*). Great for printing good quality images.

### SVG

Vector format; not widely supported. SWF files can be viewed using a web browser, such as Internet Explorer.

## Graphics software



### ADOBE PHOTOSHOP

#### Bitmap graphics software

Adobe Photoshop is used for photo editing. This software is used in industry by graphics designers. All of the tools below and more can be found in Adobe Photoshop. Photographs and illustrations can be edited using Adobe Photoshop. For example you could restore an old digital image, create a surreal image, remove facial blemishes or unwanted objects in an image.



### ADOBE FLASH

#### Vector graphics software

Adobe Flash is used to create vector graphics. These graphics are not realistic looking; they are made up of shapes and lines. Great for drawing illustrations of dogs, people, cars or famous characters like Popeye. Some of the tools below, such as zoom in/out, layers, crop, resize and rotate can be found in Adobe Flash. Other common tools include the Line, Rectangle/Oval, Pencil and Text tool.

## Editing tools



#### Zoom in/out

Allows you to enlarge an area of the graphic (*zoom in*) to see it more clearly. Zoom out to see the whole graphic.



#### Layers

Allows you to separate parts of a graphic into different layers, making it much easier to edit the graphic.



#### Brightness/Contrast

Brightness will lighten/darken the image. Contrast makes the lights lighter and darks darker.



#### Desaturate

Desaturation turns colour photos black & white. Try 'colour splash' to enhance a desaturated photo.



#### Crop

Allows you to chop off parts of an image you don't want to see. This will also change the dimensions of the image.



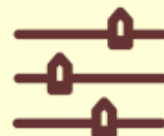
#### Resize

Allows you to change the dimensions of an image. You can also resize parts of the image if layers are used.



#### Rotate

Allows you to turn your images clockwise/anti-clockwise by a certain degrees.



#### Filters

You can apply different filters to your photo, such as Mosaic Tiles, Stained Glass and Chalk & Charcoal.

## Keywords

- photo editing
- illustration
- vector/bitmap
- file types
- image optimisation
- compression
- quality
- zoom in/out
- layers
- brightness/contrast
- desaturate
- crop, resize & rotate
- filters
- image restoration
- pixel
- binary
- resolution



## Question

What format is a jpg?

What is the difference between vector and bitmap?

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## Image Optimisation

Digital images can take up a lot of space on your computer hard drive. To make digital images smaller you can compress them, which reduces the file size (*taking you less space on your computer*). Some file types, like JPG, compress digital images without it being obvious they have been compressed. A special algorithm is used to remove some of the detail; reducing the file size along with the quality of the digital image.

## Types of compression

### **LOSSY**



Lossy compression removes some of the detail. The quality of the digital image will be reduced. Great for digital images you intend to post online, but not so great if you intend to print your digital image to put in a photo album or photo frame.

### **LOSSLESS**



Lossless compression doesn't remove any of the detail. The quality of the digital image will be really good. Great for digital images you intend to print, to put in a photo album or photo frame, but not so great if you intend to post your digital image online.

## How images are represented by binary



### What is a pixel?

The word pixel comes from 'picture element'. A pixel is a tiny coloured square. Digital images are made up of lots of pixels. Each pixel in a digital image will need to be converted into binary.



### What is binary?

Binary is a 2-base number system of 1s and 0s. The 1s and 0s represent electrical signals, 1 = on and 0 = off. All computer data (including digital images) is converted into binary in order for it to be processed.



### Representing images

Digital images are converted into binary so that the computer can process them. Each pixel in a digital image is made up of binary numbers. These binary numbers are processed by the CPU.

## How pixels are drawn on a screen

All digital images are output to the screen as pixels. This is because the screen itself is made up of loads of pixels; each pixel can be a particular colour from millions of possible colours. The digital image is drawn on the screen in the form of a grid; the computer will instruct each pixel on the screen to display a certain colour. Millions of coloured pixels create a digital image on the screen for you to view.



## Resolution

The quality of a digital image is determined by the resolution. Resolution is a measure of how many pixels are used in a given area (*e.g. 1 square inch*). The resolution of a digital image can tell you how detailed the image is and whether it's a good quality image or not.

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## Question

What is a pixel?

What does compression do to a file size?