

Software specification for *iMedia Unit 1 Digital Graphics* = **Serif PhotoPlus**

1 Use digital sourcing hardware to obtain bitmap digital graphics material

1b *Transfer and save the digital images*



Graphic file formats



Fact file 1 - Bitmap or vector?

These are the two main graphic types and though you will only be working with bitmap-editing software for this unit, it is important that you understand how it differs from vector-editing programs.

Bitmap

Bitmap or raster (computer screen) images are resolution-dependent and lose sharpness when made larger. This is because a bitmap image is composed of small coloured dots called pixels: when the image is enlarged the same amount of information has to be stretched across a greater number of pixels, resulting in fuzzy and jagged edges. A bitmap is literally a 'map' of binary digits (0 and 1), known as 'bits', which give each pixel on the screen a specific colour. One of the basic features of bitmap images is that not only do they have height and width, but also depth. This is because each pixel can have a number of bits stored to identify its colour information – the greater the number the higher the quality. A 1-bit graphic would have only two colours – black and white. With 8-bit colour a total of 256 colours are available; with 16-bit, a total of 65536 colours are available; while 24-bit colour has a total of 16777216 colours. Computer monitors also have bit-depth. One of the main benefits of bitmap images is that slight variations of colour and tone are accurately reproduced, so they are first choice when working with photographs. *Serif PhotoPlus 10* is a bitmap program.



A bitmap graphic magnified to 600%

The same bitmap graphic magnified to 1200%

Vector

Vector graphics, on the other hand, are resolution-independent, which means that they can be scaled up very large without losing any quality or increasing the file size because they are based on mathematical co-ordinates or equations. Vector drawing tools may seem a little more difficult to use than bitmap at first, as they are more precise and less intuitive. *Serif DrawPlus 8* is a vector-drawing program that has many ready-made shapes that you can combine to create your own graphics, even if you lack confidence in your drawing skills. It also has a paintbrush tool that simulates media such as acrylic, watercolour, pastel, paint and charcoal. You can import bitmap images into a vector graphic, while bitmap editing programs also have a selection of vector-drawing tools, so one format does not exclude the other. However, in general, vector drawings are first choice for hard-edged, stylised graphics, strong shapes, flat colours, and geometric forms.



A vector graphic magnified to 600%

The same vector graphic magnified to 1200%



Activity 1

Identify which format, bitmap or vector, you would choose to use for the following briefs and explain why it would be best. Use the worksheet in the Extras section to record your answers and save your work for your digital sketchbook as *1Bbitmap_vectorXXX* (replace XXX with your own initials or naming convention agreed by your ICT teacher).

Brief 1: You've been asked to design a new logo for a local taxi firm. It should work well on their stationery, their website and on the side of their cabs and in black and white, as well as in colour.

Brief 2: You have to prepare all the photos of an education visit to France for the language department web gallery.

Brief 3: Your school or college needs a map of its location for its prospectus to show prospective students and parents how to get there.

Brief 4: You want to touch up some old family photos that you've scanned to get rid of scratches, dust and other marks.



Fact file 2 - File formats and common file extensions

The number of file formats for images can be confusing. Both original bitmap and vector graphic types can be saved in different file formats, but you should also always keep a copy of the native file format for further editing. Use this fact file for reference.

A useful rule of thumb is to use JPEGs for photographs or images with a great many colours and GIFs for graphics with fewer colours. Both formats compress file sizes i.e. reduce them. This means that you lose a little quality whenever you open and change one, but unless you are a professional photographer who is producing photos for print, this is not usually a major consideration. Six of the most common graphic formats you are likely to come across are described below. However, from the File menu of Serif programs you can also export images in PDF format, which is equally suitable for electronic or paper publishing and viewing on all platforms, whether PC, Mac or Linux.

JPEG or .JPG - stands for Joint Photographic Experts Group. This format is recommended for images with subtle tonal changes such as photographs or photo-realistic artwork, as it supports 16 million colours. It is called a 'lossy' format because some picture quality is lost every time you save a JPEG after editing. But, in most cases, selecting the maximum level when saving results in an image that is indistinguishable from the original. However, to minimise deterioration, it's best to save a copy of the manipulated file in a 'lossless' format like the native formats that you use for editing e.g. SPP (Serif PhotoPlus), PDD (Photoshop), or PSP (Paint Shop Pro). Save a version as a JPEG file only when finished editing. JPEGs do not support layers: they will be merged. JPEGs are supported by all web browsers.

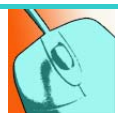
.GIF - stands for *Graphics Interchange Format*. This format is designed to compress file size and reduce electronic transfer time on the web. It is a 'lossless' format that is ideal for non-photographic images such as graphics with sharp edges and areas of flat colour, because it supports a maximum of only 256 colours. GIF format also supports transparency and is the best choice for static and animated graphics designed for web pages and multimedia presentations. It eliminates the usual rectangular frame around graphics. The format does not support layers: they will be merged. GIFs are also universally supported by web browsers.

.PNG - stands for *Portable Network Graphics*. This is a newer 'lossless' format that is recommended for web graphics, especially small bullets and text, because it allows a greater number of levels of transparency than GIFs and supports 24-bit images. Older browsers may not recognise the format, so if you save graphics as .PNGs, check them in different browsers.

.TIFF - stands for *Tagged-Image File Format*. Choose this format if you are exchanging files between different programs and computer platforms e.g. from Mac to PC. It is a bitmap image format supported by most paint, image-editing, and page-layout applications. It does not compress files, so sizes are large.

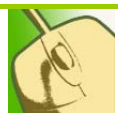
.EPS - stands for *Encapsulated PostScript*. It is a language file format that can contain both vector and bitmap graphics. It is most commonly used for transferring files between applications and for colour separation when sending work to be professionally printed.

.BMP - stands for *Bitmap*, which is not only a graphic type, but also a file format. BMP format does not compress, so file sizes are very large.



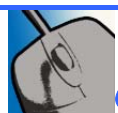
Activity 2

Open one of your own photos or scans in Serif PhotoPlus. Choose *Export* from the *File* menu and save it in turn as a JPEG, a GIF, a BMP (bitmap) and as a PNG file to your digital sketchbook or portfolio without changing the size and at the highest resolution possible. Call the versions jpegPICXXX, gifPICXXX, bitmapPICXXX and pngPICXXX (replace XXX with your own initials). Right-click on the file in your folder and choose *Properties* from the context menu. Open your *1Bbitmap_vectorXXX* document from Activity 1 and make a note of the different file sizes, dots per inch, number of bits and compare the picture quality. Can you see any difference? Save your work again.



Self-review

Complete section 1b of the **Part 1** skills and evidence checklist you started earlier. How much have you learned about getting and saving bitmap images? Save your work again.



Extras for this section

📁 Activities 1 and 2 – Bitmap or vector? File formats  