

Content and Beyond

Working with graphics

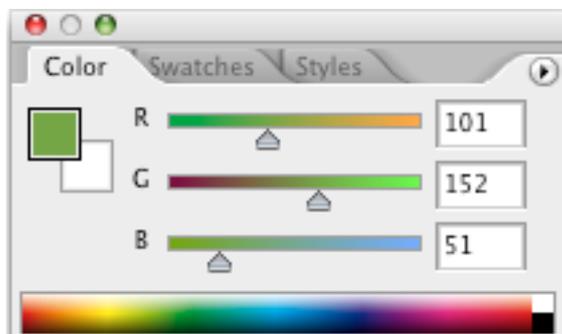
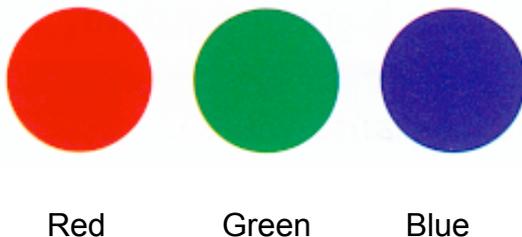
Most of you will choose to use graphics as part of the content for your web project. You will make decisions about choice of images based on appropriateness to target market and design theme (based on objectives). Once you have made these decisions you will make decisions about file optimization based on the technical constraints that surround web publishing. While it is not absolutely necessary to learn the absolute nitty-gritty of computer technology in this unit (that's a whole other course), it is important to understand some fundamental rules when optimizing your graphics, to ensure smooth download (and therefore good usability and accessibility) of your website.

Colour

In the visual design world we work with two different colour spaces – **CMYK** and **RGB**. You may be familiar with these terms from using Photoshop. **CMYK** (Cyan, Magenta, Yellow and Black) is the colour space used for print (glossy magazines, brochures and catalogues etc) and **RGB** (Red, Green, Blue) are the colours displayed on a monitor.

All graphics for the web are displayed in **RGB**

Monitors create their images on the screen by emitting red, green and blue light. Each individual colour has a value (or intensity) from 0 - 255 where 0 means 'off' and 255 means fully 'on'.



In Photoshop you can change the intensity of each of these three colours to create the colour that you want.

The range of colours displayed on a monitor is called **bit depth**. A **bit** is an electronic pulse that can be either on or off and is the smallest unit of information that a computer understands.

The most common levels of bit depth supported by computer monitors are:

- 8-bit 256 colours
- 16-bit 65,536 colours
- 24-bit 16.7 million colours

Your monitor will display the number of colours that your computer's video card supports. The computer screen is divided into tiny pixels or picture elements and these display as either on or off, black or white depending on the bits of information that are sent to them. Each bit of information can display 2 pieces of information (on/off; white/black).

If your monitor is only capable of displaying 8-bit colour (which is the more common bit depth) then it will dither any colours that exceed the 256 colours of the palette (say in a 24-bit image). 24-bit colour is the high end of image display and takes up a lot more ram (or space) on a computer to display than an 8-bit image.

See *The Non-designer's web book*, Robin Williams & John Tollett (this week's readings) for a good definition of the formula for these pixel definitions.

Resolution

Resolution means how well an image is resolved through your eyes to your brain. For those of us who have produced anything for print you know that images need to be of a high resolution – something like 300 pixels per inch (ppi). In print we are not so worried about file size, but image quality is very important.

Monitors can only display an image at 72 or 96ppi.

- Mac monitors - 72ppi
- PC monitors - 96ppi

Therefore, as websites are only viewed on monitors, we need only keep our image size (or resolution) at a resolution of 72ppi. Web graphics tend to be of a low quality (quite pixilated) if we print them out.

File formats

Every file on your computer is in a specific file format. This is the internal information that tells the computer what to do with the file - what program to open it in and how it should be displayed. Most software programs will have the native file format that is natural to that program eg: '.doc' for Word, '.ppt' for PowerPoint etc.

What graphic file formats can be used on the web?

The best file formats, and the most common, are:

- GIF
- JPG
- PNG

These are cross-platform (meaning they are readable on both Mac and PC) and are compressed.

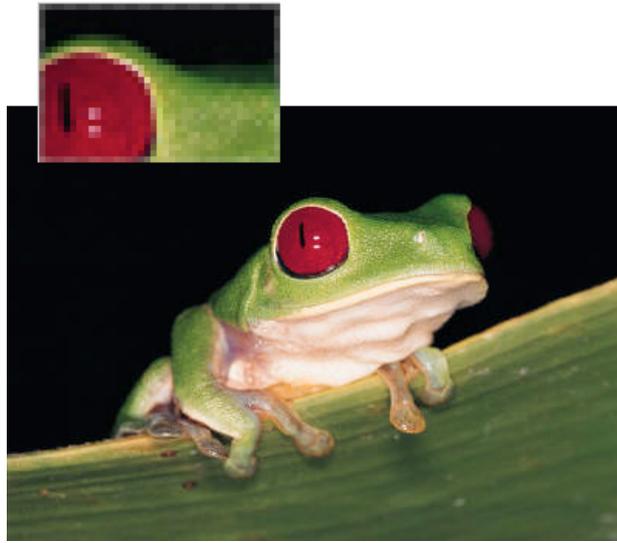
But before we talk about jpg, gif and png files we need to look at the ways graphics are created for the screen.

There are two basic kinds of graphics:

- Bitmapped
- Object oriented

Bitmapped images are created with pixels or dots. Object oriented graphics are based on mathematical formulas.

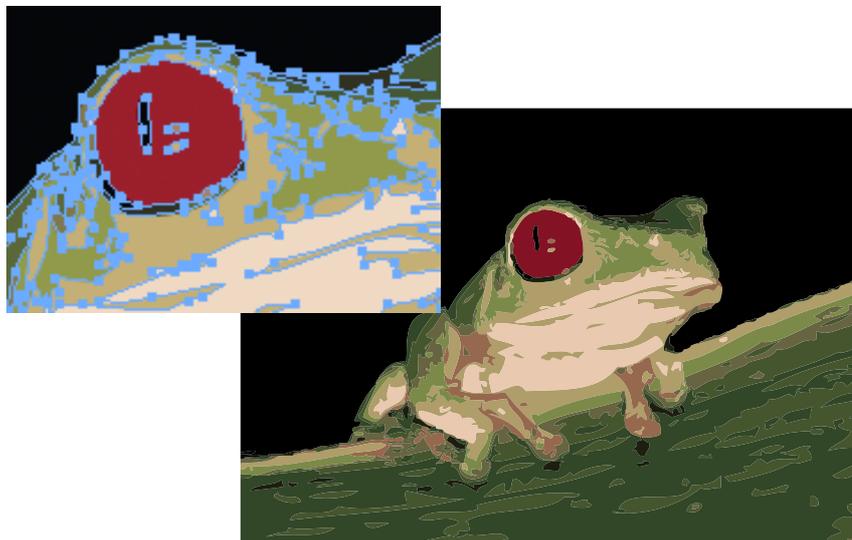
Bitmapped Graphics



Bitmapped graphics are created using grids of pixels (dots) mapped out on a canvas, assigned with information such as colour and position to make up an image. They are also called a raster image.

Bitmapped or raster images are very good for photographs, or images with lots of gradations of colour. They come from any photo manipulation program such as Photoshop, scanned images etc.

Object-oriented graphics



Object-oriented describes images using lines and curves rather than dots. These lines and curves also store colour and position information. Object-oriented graphics are also called vector images. They allow you to draw and manipulate shapes using bezier handles and are very good for graphics with flat areas of colour, and also type.

Programs such as Illustrator, Freehand, Corel Draw, Flash are vector-based software programs.

The important things to remember about these types of images are:

- Object oriented graphics are scalable - you can enlarge them and they won't lose image quality
- Bitmapped images are not scalable - if you enlarge them the pixels enlarge making the image blocky or jaggy

GIF file format

GIF stands for Graphic Interchange Format. This format was developed by CompuServe specifically for online use. It has a maximum colour palette of 256 colours, therefore you can reduce gifs down to very small file sizes. The compression scheme is described as lossless, which means that when you save an image as a gif it does not lose any image quality in the process. Of course you can overwrite the compression rate and manually reduce the number of colours as well, and some loss of image quality may occur.

The Gif file format is good for graphics that have flat areas of colour such as type, logos, and some illustrations. You can also choose to have one colour that is transparent, which makes gif a good file format to use if your graphic has a transparent background.

JPEG file format

JPG stands for Joint Photographic Experts Group.

Jpgs are used for photographs or other images where there are lots of colours that blend into each other, or when there are shades of colours, as in shadows, charcoal drawings, pencil drawings, etc.

The compression scheme that jpgs use is lossy, meaning that each time you save as a jpg, data is removed from the image to make the file size smaller. This is something to be aware of if you are continually saving a jpg file as a jpg file.

PNG file format

PNG stands for Portable Network Graphics or PNG Not Gif.

It was developed in 1995 in opposition to Gif file format. The PNG format gives a much wider range of colour depths than GIF allowing for greater colour precision and smoother fades, like JPEG.

They also give a much wider range of transparency options than GIF. On most images, PNG can achieve greater compression than GIF.

PNG images are widely supported, but not as widely supported as GIF images.

Both GIF and PNG support transparency.

Photoshop has 'Save for Web and Devices' where you can play around with the optimizing options for both jpg and gif. See the technical tutorial for Web Graphics in MySCU.

The most important things to remember are:

1. Make sure your images are saved as 72ppi
2. Always resize your images in Photoshop (not Dreamweaver)
3. When optimizing images you are always weighing up between file size and image quality.

For an explanation and history of the web safe palette go to:

<http://www.lynda.com/resources/webpalette.aspx>

References

Blatner, D (1998) *Real World Scanning and Halftones*, Peachpit Press, Berkeley, CA

George, J (2011) GIF, JPG and PNG – What's the difference?, *sitepoint*,
<http://www.sitepoint.com/gif-jpg-png-whats-difference/>

Rosu, C (2010) Web Designer's Guide to PNG Image Format, *Six Revisions*,
http://sixrevisions.com/web_design/web-designers-guide-to-png-image-format/
accessed 24 July 2012

<http://www.scantips.com/basics9j.html>, accessed 24 July, 2012

Williams, R. & Tollett, J (2006) *The Non-designer's Web Book: An Easy Guide to Creating, Designing and Posting your own Web Site*, Peachpit Press, Berkeley, CA

Wikipedia, accessed 24 July, 2012