# What is Adobe Photoshop

In simplest terms Photoshop is  raster based image editing program. It has very powerful tools which can analyze and allow you to modify these pixels. Raster or bitmapped graphics are defined by a grid of pixels to Photoshop. Each pixel has a specific color value assigned to it depending what color mode you are working in it is defined differently. A pixel is usually very small so you don't notice the individual pixels, they all combine to make up you image.

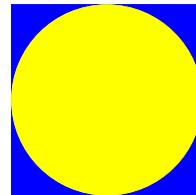**Differences between raster and vector image formats**

A computer screen generally displays 72 pixels per inch and most printers work with 600-2400 pixels per inch. The terms PPI, pixels/inch, dpi, dots/inch and  spi, samples/inch all are different terms for describing how the grid is laid out which is it's  resolution. The only difference between the terms are the devices being used. Scanners and monitors generally use PPI or spi. Output devices use dpi or lpi. Lpi is lines per inch which we will talk about in the future.

Drawing programs like Freehand and Illustrator are vector based which is very different.  They use math to describe the shapes that make up an image. The advantage of using math to describe a shape is it doesn't have a set resolution. The shape will display/print at the highest resolution the output device supports. This is very different then raster images which have a fixed resolution. Also fonts and therefore text is usually vector based.
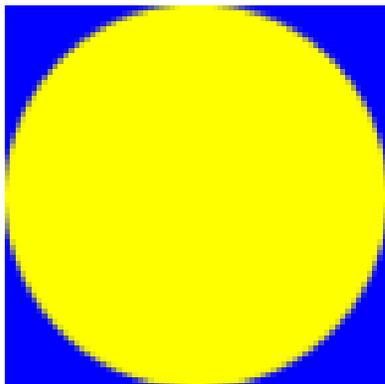
The way each format handles resolution is very important. In Photoshop to achieve the highest quality you need to work at the correct resolution from the beginning. Each time you resize or alter the resolution the quality suffers.
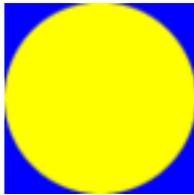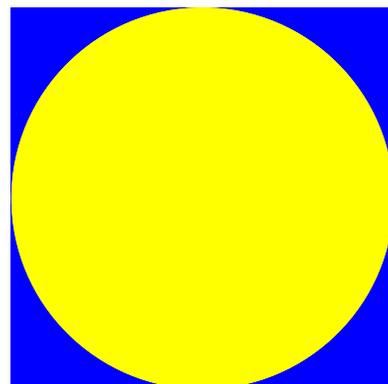
**Raster based image at 100%**                    **Vector based image at 100%**

**Raster based image at 200%**                    **Vector based image at 200%**

 As you can see a raster based image at 72 dpi has fairly jagged edges. When increasing the size to 200% the resolution drops to 36 dpi and it is really jagged. On the other hand a vector based image looks much less jagged since the curves are defined mathematically and resizing the image has no effect on quality.

Vector based images do have several advantages since they are describe mathematically and are resolution independent. But they do have one major disadvantage. Most photographs can' t be described math        matically. To achieve a continuous tone image for example a photograph the most efficient way to describe it is by using a raster image format.

Below is the same image one raster based and the other vector based. The raster based image is much easier to color correct and modify, looks much better and is about one quarter the size of the vector based image. This is a very simple image, a picture of a person would be unrecognizable if it was vector based.

**Raster Image**                    **Vector Image**

**Common uses for raster image formats**

1. Continuous tone images like photographs
2. Used on the web where there are no vector formats currently supported

**Common uses for vector image formats**

1. Logos which are generally a few solid colors and need to be shown at a variety of sizes
2. Creating specialized text effects
3. 3D and CAD programs

**Vector image formats advantages**

1. Resolution independent
2. Smooth curves
3.  Small file sizes

**Raster image formats advantages**

1. Only format that will show smooth gradients and subtle detail necessary in photographic images
2. Allow for color correction much easier then vector images

Both file formats are used incorrectly by many people. Lots of people use Photoshop for doing work which would be much better suited for a drawing program. You can use the wrong file format but it is much more efficient to understand the differences between the two and use the correct one.