

Dots per inch (DPI) and Pixels per inch (PPI)

These are two terms which are often used interchangeably, but incorrectly, when describing the output of printers and cameras.

PIXELS (*Picture Elements*)

These small picture elements exist only on the sensor in the camera or scanner. They are very tiny specs of light sensitive material which make up the sensor.

The normal small digital camera has a sensor which is about 7mm x 5mm. This very small area (about as big as a small finger nail) can contain up to 7 million (7Mega) pixels.

The resolution or ability to record fine detail in the camera is usually measured by the number of Megapixels on the sensor (array) in the camera/scanner.

This means that "In Theory" the more Megabytes that the camera has on its sensor, the bigger the possible print that can be made at the standard printing resolution of 300 ppi.

<i>Example:</i>	Camera Resolution	Sensor size (Pixels)	Size of Print at 300 ppi
	3.0 megabytes	1984 x 1488 ppi	6.6 x 5.0 inches
	4.0 megabytes	2272 x 1704 ppi	7.5 x 5.7 inches
	5.0 megabytes	2560 x 1920 ppi	8.5 x 6.4 inches
	6.0 megabytes	2848 x 2136 ppi	9.5 x 7.1 inches
	7.0 megabytes	3072 x 2304 ppi	10.2 x 7.7 inches

As you can see, to make a very sharp detailed print at A4 size (11.75 x 8.25) would require a camera with 7.0 megapixels.

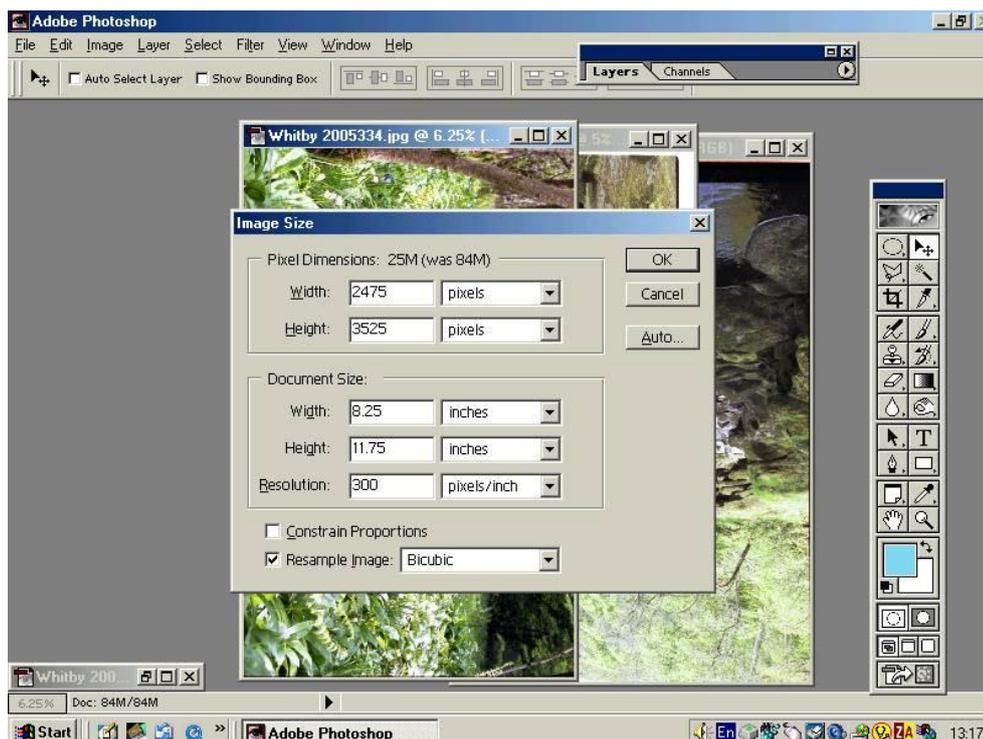
In practice, as prints get larger, and the viewing distance increases, it is possible to use a lower printing resolution of say 200ppi. This allows a 4.0 megapixel camera to make an A4 size print. However, beware! A softer picture with less detail may not suit all subjects.

Resample Image (Interpolation)

Another method of increasing the number of pixels from a camera with only say 4.0 megapixels when an A4 size print is required is to *Resample*.

With your picture on the screen, go to *image / resize* from the main menu (see below).

Tick both boxes for *Constrain Proportions* and *Resample Image*. Leave the method set to Bicubic.



The Pixel count is altered by adding or subtracting pixels from between the original ones. The new pixels match the adjacent originals.

Several methods are used to alter the pixel count.

- Bilinear
- Bicubic
- Nearest neighbour

Bicubic is the most satisfactory.

Dots per Inch

Modern ink-jet printers now give 5760 dpi at 3 picolitres of ink per dot.

This represents $\frac{5760 \text{ dpi}}{300 \text{ ppi}} = 19 \text{ dots per pixel}$

So, each pixel used to make the picture from the camera is printed with 19 dots of ink in the final photograph in this example.