

## The Strange Adventures Of A Pixel

What is a pixel?

It is a single spot which can represent any colour within the bounds of physics for the device.

How can we understand pixels?

Firstly let us think of some units of measurement:

kilo K 1 000  
mega M 1 000 000

However in Computers:

1024 is a kilobyte (kB), 1024 x 1024 is a megabyte (MB)  
(mibibytes MiB in binary  $2^{20}$  same size as a MB, not an SI measurement)

In Cameras to find the Dots per inch we use this formula:

$$\frac{\text{Resolution}}{\text{Dots Per Inch}} = \text{Print Size}$$

With colour about 250 dots per inch is about the minimum amount of dots that are needed for the human eye to see before an image begins to look a bit broken up and made of squares.  
(It might be useful to think of being close to a Monet picture.)

A Nikon chart for some cameras has some Megapixel cameras with these pixel sizes:

Megapixel	Resolution of Camera
10.75	3872 x 2592
12.9	4228 x 2848
16.9	4928 x 3264

So what can you reasonably expect with a portrait shot on the 10.75 Megapixel camera.

Can we do a 16 x 24 inch? To find out we must calculate the DPI.

$$\text{(DPI)} \frac{3872}{X} = 16 \quad (\text{Answer } X= 242)$$

$$\text{(DPI)} \frac{2048}{Y} = 24 \quad (\text{Answer } Y= 85)$$

So  $242+85 = 327\text{DPI}$  a good quality picture.

However the same camera printing to 32 x 48 inches would give 168.5 DPI you will see squares!

(Note this is printing portrait from a landscape shot, we could do better!)