



By
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Pixels and Megapixels and You

What the Digital Photog Needs to Know

Wikipedia.org defines a pixel as: pix is a 1932 abbreviation of pictures, coined by *Variety* headline writers, while the "el" comes from the word element. It is one of the many tiny dots that make up the representation of a picture. With care, pixels in an image can be reproduced at any size without the appearance of visible dots or squares; but can appear visibly distinct when not fine enough. Each pixel has typically three or four dimensions of color variability such as red, green and blue (RGB); or cyan, magenta, yellow and black (CMYK; k is for black).

A megapixel is one million pixels, and is usually used to express the resolution capabilities of a digital camera. For example, a camera that can take pictures with a resolution of 2048×1536 pixels is commonly said to have 3.1 megapixels (2048 × 1536 = 3,145,728).

Digital cameras use photosensitive

electronics, either charge coupled devices (CCDs) or CMOS (complementary metal oxide semiconductor) sensors, which record brightness levels on a per-pixel basis.

In most digital cameras, the CCD is covered with a patterned color filter having red, green and blue regions in what is called the Bayer (named after Dr. Bryce E. Bayer of Eastman Kodak) filter mosaic arrangement — a filter pattern that is 50 percent green, 25 percent red and 25 percent blue. Each sensor pixel records the brightness of a single primary color. The camera interpolates the color information of neighboring pixels, through a process called de-mosaicing, to create the final image. Thus, an *x*-megapixel image from a digital camera can have as little as one quarter the color resolution of the same image as taken by a scanner. Thus, a picture of a blue or red object will tend to look fuzzy compared to the same object displayed in shades of grey. Green objects appear less fuzzy, since green is allocated more pixels (due to the eye's increased sensitivity for

green). See <megamyth.homestead.com/imageres.html> for a more detailed discussion.

Most of the point-and-shoot (POS) digital cameras on the market today have between seven- and 12-megapixel sensors about the size of a dime (up to the size of a quarter). The more megapixels a sensor can gather, the more detail the photo image has.

All this means you can get sharper images and make larger prints because you have more information with which to work. It also means that you will need more storage space to hold this information. Today's current crop of digital cameras produce images that are often three to five mb each. These larger image files mean you need faster (allow more light) lenses to gather this information and faster computers to process this information. This means that if you modify an image file that is three to five mb in size, you need more computing power to make that modification. If you have a five year-old computer with a Pentium 3 or Pentium 4 processor and only 128 mb of

RAM you're going to have to wait a little while for the processing of your image. If you buy a new digital camera with five or more megapixel capacity, then you probably need a new, more powerful computer also. You might be able to make some adjustment to this inadequacy by adding more memory to your computer, but, just like Noah's Ark, all memory should be added in pairs.

The best analogy: if you look closely at a newspaper photograph, you can see tiny dots of black, white and grey. A newspaper is printed at 75 dpi (dots per inch). If you look at a photograph in a magazine you cannot see the little "dots" because a magazine is printed at 300 dpi. The photograph in the magazine looks better because it contains more information than the photograph in a newspaper. Dpi is NOT the same as megapixels, but the principle is comparable.

Stuart Gershon is known as "The Digital Doctor" and has given over 200 classes different venues in Nassau and Suffolk. You can get more information and the schedule of his classes at: www.DigitalDocOnline.com. If you have questions, send them to Digital-Doc50@optonline.net and he will be happy to answer them.