

## Megapixels — What They Do (and what they don't)

There seems to be a lot of questions about megapixels like, "How many do I need?" and "Will my photos be sharper with more?" and "Will more megapixels improve the quality of my images?"

Lets break the problem down into its parts:

### First, how they are determined -

You've found a camera that has 5.0 megapixels and you're wondering exactly how they arrived at that number. They did not just grab it out of the digital ether, it is all in the math.

The term "megapixel" simply means 1 million pixels. So, that means a 5 MP camera can capture 5 million pixels at its highest quality setting. *The more of these pixels you capture, the larger you can print your image.* Re-read the red sentence! It's the main reason for wanting more megapixels.

How many MP are you going to need to print the size photos you want to print? It depends almost entirely on how large you want to print and at what resolution. Stick with me here ...

For the most part, photo-quality ink jet printers do well with 200 DPI, although 300 DPI is usually considered "photo quality". You can almost never tell the difference. There are many examples of "OK" results at lower resolutions than mentioned above, but 200 DPI or better always makes a good quality print. Using that number as the minimum, plug it into the following equation:

In order to print a 4x6 at 200 DPI, you need to take the length and multiply it by the resolution, then do the same with the width. Next multiply those results. Don't worry, this is much easier than it sounds:

$$4 \text{ (width)} \times 200 \text{ (resolution)} = 800$$

$$6 \text{ (length)} \times 200 \text{ (resolution)} = 1200$$

Those are your minimum width and length pixel counts. To print a 200 DPI photo quality 4x6, you would need an image that was 800 x 1200 pixels. Now, to determine how many MP this is:

$$800 \times 1200 = 960,000 - \text{Round up to } 1,000,000.$$

Not too bad. A 1 MP camera can make a **good 4x6 print at 200 DPI**. If you want a 300 DPI print, you'll find after re-running the numbers you'll need a 2.1 MP camera to do the same job! The size goes up fast, doesn't it?

Here are some charts to save you some number crunching:

#### 200 DPI:

|       |        |
|-------|--------|
| 3x5   | 0.6 MP |
| 4x6   | 1 MP   |
| 5x7   | 1.4 MP |
| 8x10  | 3.2 MP |
| 11x14 | 6.2 MP |

#### 300 DPI:

|     |        |
|-----|--------|
| 3x5 | 1.4 MP |
| 4x6 | 2.1 MP |

|       |         |
|-------|---------|
| 5x7   | 3.2 MP  |
| 8x10  | 7.2 MP  |
| 11x14 | 13.7 MP |

**Also, keep this in mind:**

300 DPI is generally considered photo quality. **If you go higher, it's not really going to make any difference once the results are printed.**

If you only print 4x6 photos, a 2.1 MP camera is all you'll need (only 1MP if 200 DPI works for you).

For example, take the same photo with both a 2.1 MP camera and a 8MP camera and make a 4x6 from each camera. Guess what? **You won't be able to tell the difference.** And any differences you *could* detect are probably due to sensor and lens differences. It's possible the 2.1 MP camera could give you better results if it has a better image sensor and lens than the 8MP camera!

Megapixels alone don't determine quality and sharpness. They're simply a measure of resolution—how many dots make up your image. **Picture quality and sharpness are determined by the quality of your sensor and lens.**

You can buy that new 8MP camera. Sure, it's going to capture high-resolution images, but if the lens is of poor quality, all you'll end up with is a high-resolution image that is not overly sharp and have no fine detail. If the lens isn't capturing fine detail, you can bet your sensor won't either.

In addition to the lens, the sensor must be of good quality. There are examples of 6 MP cameras where the lenses are good (it was an SLR), but the sensor left *a lot* to be desired. No matter what steps were taken, it is virtually impossible to get a high level of detail out of that camera. Some 2.1 MP cameras can do a much better job.

Your best bet to insure you have a good lens and sensor is to stick with name brand cameras. I like Canon, Nikon, and Olympus. You may see an off-brand with the same MP count for a lot less, but it may—probably does—lack in these other areas. Try to find online reviews of the camera if you have any question about it. One good place is: <http://www.dpreview.com/> Hopefully this information will help demystify megapixels and provide information to help you make an informed purchase decision when you purchase your new (or next) digital camera.