February 8, 2007

STATE OF THE ART

Breaking the Myth of Megapixels

By DAVID POGUE

For an industry that’s built on science, the technology world sure has its share of myths. Thousands of people believe that forwarding a certain e-mail message to 50 friends will bring great riches, that the gigahertz rating of a computer is a good comparative speed score, or that Bill Gates once said “640K of RAM ought to be enough for anybody.”

But one myth is so deeply ingrained, millions of people waste money on it every year. I’m referring, of course, to the Megapixel Myth.

It goes like this: “The more megapixels a camera has, the better the pictures.”

It’s a big fat lie. The camera companies and camera stores all know it, but they continue to exploit our misunderstanding. Advertisements declare a camera’s megapixel rating as though it’s a letter grade, implying that a 7-megapixel model is necessarily better than a 5-megapixel model.

A megapixel is one million tiny colored dots in a photo. It seems logical that more megapixels would mean a sharper photo. In truth, though, it could just mean a terrible photo made of more dots. A camera’s lens, circuitry and sensor — not to mention your mastery of lighting, composition and the camera’s controls — are far more important factors.

I can show you plenty of enlargements from a 4-megapixel camera that look much sharper and better than ones from an 8-megapixel model. Meanwhile, a camera with more megapixels usually costs more, and its photos fill up your memory card and hard drive much faster. And more densely packed pixels on a sensor chip means more heat, which can introduce speckles into low-light shots.

But you can repeat this lesson until you’re blue in the newspaper column, and some people still won’t believe you. They still worry that their 5-megapixel camera from 2005 is obsolete. They still feel sales pressure when shopping for new cameras.

So as the host of a TV series (“It’s All Geek to Me,” to begin in April on Discovery HD and the Science Channel), I thought I finally had a chance to settle this thing once and for all. At the climax of the camera episode, I would test the Megapixel Myth on camera, supplying visual proof for the world to see.

I created three versions of the same photograph, showing a cute baby with spiky hair in a rowboat. One was a 5-megapixel shot, one was 8 megapixels and one was 13.

I asked 291 Digital, a New York graphic imaging company whose clients include ad agencies and fashion companies, to print each one at a posterlike 16 by 24 inches. (They were digital C prints, printed on Durst
Lambda at 400 dpi, if that means anything to you.)

We mounted the three prints on a wall in Union Square in Manhattan. Then, cameras rolling, we asked passers-by if they could see any difference.

A small crowd gathered, and several dozen people volunteered to take the test. They were allowed to mash their faces up against the print, step back and squint, whatever they liked.

Only one person correctly identified which were the low-, medium-, and high-resolution prints. Everybody else either guessed wrong or gave up, conceding that there was absolutely no difference.

I described the test on my blog (nytimes.com/pogue), confident that I would be hailed for blowing up the camera companies’ pet morsel of misinformation.

In the following days, 450 readers responded to the article. Many endorsed the test results, citing their own similar experiences.

But there was also an angry group who didn’t like my methods. They took issue with the way I produced the lower-resolution images: by using Adobe’s Photoshop software to subtract megapixels from the 13-megapixel shot.

“More ignorant rantings by the NYT,” went comment No. 206. “If you want to see the difference, take frames of the same scene using different cameras.”

These readers felt that “down-rezzing” a 13-megapixel photo tested only Photoshop’s pixel-subtraction techniques — not camera sensors.

I’m not entirely convinced. The Megapixel Myth suggests that you’ll see less detail in a 5-megapixel shot than a 13-megapixel one; how it gets down to 5 megapixels shouldn’t make much difference. Fewer dots is fewer dots.

Still, on the blog, I offered to repeat the test using more scientific methods.

The “use different cameras” suggestion, however, was out of the question. Different cameras have different lenses, sensors and circuitry — factors that do produce meaningful differences.

I challenged readers to devise a test that would isolate megapixels as the sole difference between the test photos — without involving Photoshop.

Ellis Vener came to the rescue.

“I am a professional photographer and a technical editor at Professional Photographer magazine,” his e-mail message began. “I’ll be happy to do the following test.”

Using a professional camera (the 16.7-megapixel Canon EOS-1Ds Mark II) in his studio, he would take three photos of the same subject, zooming out each time. Then, by cropping out the background until the subject filled the same amount of the frame in each shot, he would wind up with nearly identical photos at three different resolutions: 7 megapixels, 10 and 16.7. “Frankly, I’m interested in the results as well,” he wrote.
I gave him a green light for the new test.

His choice of subject also put to rest another objection to my original test. Instead of a smooth-skinned baby, Mr. Vener's model was positively bristling with detail: curly hair, textured clothing, a vividly patterned background and a spectacular multicolored tattoo on a hairy arm.

We set up the new 16-by-24-inch enlargements on identical easels at a public library. (Why the library? Because it was warm, it was flooded with natural light and its director gave me permission.) Clipboard in hand, we conducted the test again.

Surprise, surprise: the results were the same. This time, out of about 50 test subjects, only three could say which photo was which.

So is the lesson, "Megapixels don't matter?"

Not exactly.

First of all, having some extra megapixels can be extremely useful in one important situation: cropping. You can crop out unwanted background and still have enough pixels left for a decent print. (Blog comment No. 376, for example, imagines "a child’s face that looked priceless at the time the shot was taken — and it occupied 5 percent of the photo. For this rare occasion, it is worth being safe rather than sorry.")

Of course, it’s better to get your composition right when you take the photo, but this is still a great trick to fall back on.

Megapixels may matter to professionals, too, especially those who produce photos for wall-size retail displays. And even in consumer cameras, there are certainly limits to the irrelevance of megapixels; my test went only to 16 by 24 inches, which is the biggest I figured most amateurs would go.

(As one reader put it: “Why not downsample your photo to 1 pixel by 1 pixel, and then print 16-by-24-foot pictures?” Well, yes, then you’d see a difference.)

The actual lesson, then, is this: “For the nonprofessional, five or six megapixels is plenty, even if you intend to make poster-size prints.”

Or, as comment No. 370 put it: “For the average consumer trying to decide between 5 megapixels and 8 megapixels on similar cameras, Mr. Pogue’s test might save them a little bit of money and a lot of hard-drive space.”

Unfortunately, blowing up the Megapixel Myth also takes away a convenient crutch for millions of camera shoppers. If you’re torn between two camera models, you now know that you shouldn’t use the megapixel rating as a handy one-digit comparison score.

So what replaces it? What other handy comparison grade is there?

Unfortunately, there’s no such thing. Take advice from your friends, take sample shots if you get a chance, and read the reviews at nytimes.com, cnet.com, dpreview.com and dcresource.com. What can I say? Life is rarely black and white; it’s far more often filled with shades of gray.