



A Consumer's Guide to Digital Cameras

It's More than Megapixels

A practical guide to buying a digital camera, for both the casual and the amateur photographer.

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WHY ARE YOU BUYING A DIGITAL CAMERA?

When purchasing a digital camera, as with any complex electronics product, it is important to know what you want to do with your product. What kinds of pictures you want to take, under what conditions will you take those pictures, and what do you plan to do with the pictures once you're done?

You may have heard of the saying "jack of all trades, master of none." This saying is true of digital cameras as well. While there are cameras that can take pictures under almost any condition, they will not take particularly good pictures.

TALK TO SOMEONE

People are the ultimate judge of a product – and that holds true for digital cameras as much as for anything else. Someone who is knowledgeable about digital cameras can be a great reference when planning to purchase your own camera – especially if they know to ask some key questions. Often, their experience can help you determine what you need from a camera, even if you don't exactly know it yourself.

THE QUESTIONS TO ASK

What kind of pictures are you planning on taking with your camera?

- Do you just want a point-and-shoot affair for casual pictures?
 - An inexpensive 3-5 megapixel camera with a simple interface (for example, a Kodak) would be best for the very casual photographer
- Are you planning on using your camera on a vacation?
 - Some cameras have extra settings for the types of pictures you will encounter on vacations – scenery and so forth. You also will want a camera that uses an inexpensive memory card format, as you will probably take a lot of photos on your trip without the ability to download them into your computer or print them out.
- Are you going to be in the countryside (taking lots of pictures of scenery), or will you be in an urban environment (taking lots of close-up wide-angle shots of buildings and people)?
 - A telephoto lens (one with lots of optical zoom) is good for the countryside, so you can zoom in on things. A camera with a wide-angle lens is good for urban environments, where you might not have enough space to get far enough from your subject to get it all in the picture.
- Will you be taking pictures of things that hold still (scenery, people posing for portraits) or things that move a lot (pets, children, sporting events)?
 - A camera with an "image stabilizer" will help with blur in the pictures that results from the camera moving while you take a picture.
 - A camera with the option for high ISO film settings will give clearer pictures for fast-moving subjects in bright light (or with a flash).
- Do you want to take pictures at night, with lights around (for example, in the city)? Or at night in the countryside, where there is no ambient light? Or maybe even pictures of the stars and the moon?

- A good “night mode” is important for taking pictures in low light. Many cameras will simply try to use the flash to illuminate dark pictures, which often does not look very nice.
- Look for cameras that let you adjust the shutter speed yourself. You need a slow shutter speed when taking photos in the dark.
- If you plan on taking lots of photos in the dark, invest in a good tripod. Holding the camera still is very important for taking photos in the dark.

Under what kinds of conditions will you be taking pictures?

- Will you be shooting in the weather? Do you need a water-resistant or water-proof camera?
 - Most cameras can stand a little drop of water here and there, but for anything more, get a camera that is waterproof. (Olympus makes several good cameras that are waterproof.)
 - Consider investing in a replacement plan, so that if your camera does get damaged by water (or anything else), you can get it replaced without having to buy a whole new camera. The camera’s warranty will not cover damage from water or anything else.
- Will you be shooting in a crowd, where a smaller camera would be better?
 - Some cameras are very small, and can fit easily in a shirt pocket. Sony makes a very nice small camera for this purpose.
- Do you need to take pictures quickly, without waiting for the camera to start up?
 - Try out different cameras – turn them on and see how long it takes until you can take a picture. A few seconds could mean the difference between capturing that perfect shot, or losing it forever.
- Will you be far away from your subject so that you need a large zoom lens?
 - There are many fine cameras now that have more than the typical 3x optical zoom. Some go as high as 12x or even 24x – which is quite high.
 - Remember also that with high zoom factors, any movement in the camera is magnified. Invest in a tripod if you plan on taking lots of zoom photos.
- Will you have plenty of time to compose your pictures, or do you need a camera that can switch modes (i.e. from scenery to close-up flash portrait) quickly?
 - If switching modes quickly is important, look for a camera with a rotary switch on the top or the side to switch modes. Make sure you try it out first, to see how long the camera actually takes to be ready to take a picture in a different mode.
 - Also, be sure to note how quickly you can figure out how to change modes and settings. You don’t want to have to be pulling out the manual every time you want to take a picture. Although you will probably still need the manual for advanced features (until you are very comfortable with them), you should be able to figure out some of the basic modes quickly, without help.

What do you plan to do with your pictures?

- Do you plan to post your pictures primarily on the Internet?
 - Most digital cameras today take pictures that are too large to post on the Internet. Look for something in the 3-4 megapixel range if the Internet is your primary audience.
- Will you be sending most of your pictures via email?
 - Again, most cameras take pictures that are far too large to send via email. Look for a low megapixel model with the features you need. Or just keep in mind that you will have to “shrink” your photos before you send them.

- Do you have (or want to get) a compact photo printer? Or a full-size photo printer?
 - Make sure your camera is compatible with your photo printer, especially if it is one of the “compact” photo printers.
 - If you have a full-size photo printer, make sure it can read your memory card format. Most printers today can read all the major types of memory cards, but it pays to double-check.
- If you plan to print your photos (either yourself or professionally), how large do you want the prints to be?
 - This is the one place where megapixels really come into play. More megapixels generally mean you can print larger prints. A 5 or 6 megapixel camera can comfortably print up to 8 ½ x 11 inch pictures, suitable for portraits.

PICTURE QUALITY

Everyone wants their pictures to look great – that goes without saying. But a lot of things can influence the quality of your pictures. You might have a great eye for a shot, but your camera ruins the picture by giving everyone red-eye and producing a blurry, grainy photo. Knowing a little bit about *how* your camera takes pictures can help you choose the right camera for the job.

A LITTLE BIT ABOUT MEGAPIXELS

A digital camera is a lot like your own eye. Light is focused through a lens and tiny little sensors pick up that light and put it back together to form an image. In your eye, the sensors are cells called “rods” and “cones,” and your brain does an absolutely fantastic job of putting these little blips of light information back into a cohesive picture.

In a digital camera, the lens is the same, but instead of cells, a digital camera has sensors. Each sensor, just like the rods and cones in your eye, picks up one little bit of light information. In the computer world, these bits of information are called “pixels.” Thus, “megapixels” is simply a count of how many individual little sensors are inside your camera. Think of the image like a neo-impressionist painting – made up of lots and lots of little dots. A one (1) megapixel camera has one million pixels (dots), arranged in a square.

A side effect of the picture being made up of little dots is that when you make the picture larger, you can start to see the individual dots (they show up as tiny little squares). This is because a computers (such as the one found inside a digital camera), unlike your brain, can’t “blur” the picture together to produce a seamless image. So pixels are something you have to live with – but they don’t have to rule your world.

A one (1) megapixel picture would look just fine on most computer screens, if it wasn’t zoomed in to fill the whole screen. The camera in many cell phones is less than one megapixel, and these can produce fine photos for email, web, and other small uses. However, it generally takes about 3 megapixels before you can print a 3x4 photo and have it look indistinguishable from a print made from old-fashioned 35mm film. This picture shows the relationship between megapixels and picture sizes.



So in general, more pixels equals a larger picture (both in printable size, and in how much space it takes up on your memory card or computer's hard drive). However, it's not all about megapixels.

IT'S ALL ABOUT LIGHT

Digital cameras, just like any other type of camera, are just devices that capture light. They focus it with a lens, and capture that light on a small sensor inside the camera.

Lens quality is something that mankind has been struggling with for centuries – but suffice to say, lenses can produce distortion in an image if they are asked to focus too much light. (Have you ever seen the lenses of a lighthouse? They look strange because they have to focus a lot of light.) So it is important that you not ask your lens to focus the light onto a very small spot. This is where the size of the sensor in your camera that captures the picture is important.

SENSOR SIZE

If you have a camera with a very small sensor, but a very high megapixel rating, then each pixel of that sensor is getting only a very small amount of light. Because the pixels are so closely packed together, and because there is so little light for each one, they may cause "interference," which shows up in a photo as "graininess." This is especially apparent at night or in dark photos. Keep in mind that most sensors in most mid-range digital cameras are about the size of the fingernail on your pinky finger.

In general, a bigger sensor is better – although a smaller sensor would be fine, if you didn't have a high megapixel rating. This is why small cameras (such as the ones found in cell phones or very small, stylish pocket cameras) typically have lower megapixel ratings – it is to ensure that each sensor gets ample light, without crowding and interference. This is also one of the reasons that professional photographers use such big cameras – they have very large sensors on the inside. A professional photographer might only use a 5 megapixel camera, but the sensor in the camera might be nearly an inch wide.

SO NOW WHAT?

We've covered quite a lot of information so far, and now we're going to put it to some practical use.

DO'S

- Go to a store where there are many cameras on display. Turn the cameras on; see if you can figure out how to take a few different kinds of photos within just a few moments.
- Feel how heavy the cameras are – remember how often you plan to take pictures. A camera might not seem heavy in the store, but when you are holding it up again and again during your vacation, you might think differently.
- Consider a tripod – even a small, cheap, and lightweight tripod can open up new opportunities for taking photos (and it can help take great portraits and night shots).
- Most stores secure their cameras with security sensors. If you're trying a camera out and you really like it, ask if you can hold it without the sensor. (An associate will probably stay with you while you do this, but it is worth it to know how the camera feels without being tied down to a display.)
- Find a few models that you like, and look up information on sensor size. This information may not be available in the store, or you might have to ask to see the box to get this information. (The Internet often has this information readily available.)
- Look into the price and availability of the memory cards for the cameras you like.
- If you have a few cameras you really like, look up information on the Internet for reviews by other people who've used the same camera. (Make sure these reviews are trustworthy, and from real people, not just paid corporate reviewers.)
- Look into the availability of insurance or replacement plans – digital cameras are expensive, and unlike many other electronic devices, they can break if dropped or mishandled. A replacement plan can protect you from having to buy a whole new camera if something happens. Your insurance company may even offer plans for cameras, although they may only cover the expensive high-end cameras.
- Talk to the associates at the store of your choice. Often times they will have purchased one of the cameras the store offers, and can give you real-life advice on it.

DON'TS

- Don't just buy a camera because it looks pretty.
- Don't buy a camera that you haven't turned on and used at least once.
- Don't buy a camera if you can't find memory cards for it in the same store – chances are, the memory cards aren't made anymore, and you won't be able to find any.
- Don't just pick the camera with the highest megapixel rating – you might luck out, but you might end up with a crummy camera.
- Don't buy a high megapixel camera that is very, very small – the sensor size will probably be absolutely tiny.
- Don't pay attention to "digital zoom" claims on packaging. If you need to be able to zoom in, look for "optical zoom."

- Just because one person said something bad about a camera doesn't mean that it is a bad camera – they might not know how to use it properly. Trust your own instincts instead, and get a second opinion if you can – or a third, or a fourth opinion. (The internet is great for this purpose.)

INTERNET RESOURCES

No one person can know everything about all digital cameras, but the Internet is a great place to “pool” the collective knowledge of many people. These sites can offer information about sensor size, picture quality, start up times, and user reviews. Remember also that you can use a search engine (such as Google) to find reviews of your camera, if you can't find a review on any of these sites.

Amazon.com

This site contains lots of user reviews on all sorts of products, including digital cameras. But be wary of buying your camera from here, unless you've tried it out in person!

Steve's Digicams

A great review site, with in-depth reviews of all sorts of different digital cameras. Generally, this site gives more technical information on cameras, and less of an opinion.

C/Net Reviews

A subsidiary of Ziff-Davis publishing, this site offers both professional and user reviews of digital cameras.