

Choosing a Digital Camera

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06/24/2005

There are an overwhelming number of models of digital cameras available in the marketplace today. It is almost as bad as buying shoes where you can get any style you could conceivably ever wish for but can't find a pair that fits. Fortunately, there aren't many really bad choices, although, I would not recommend buying a no-brand camera from Fry's or Wal-Mart for \$29.95. So, the first piece of sage advice is do not be concerned about the brand as long as it is a recognized brand such as Sony, Hewlett Packard, Nikon, Canon, Konica, Olympus, Kodak... See what I mean about choices? Chances are I forgot your favorite. Brand is not as important as **features**. Get the features you want. That is tough enough. My camera has about fifty different possible settings. You will undoubtedly have to settle for a camera with far more setting possibilities than you want or need. The trick will be to find out how you can safely ignore the ones you don't want or need. Even the most sophisticated (i.e. complex) cameras have an "Auto" setting that works well. There is hope. So that you will know whether you are in the right pew, I will be talking about cameras in the \$200 to \$500 price range.

What do you use a camera for? What do you plan to use a camera for? Most of us use a camera for **recording** events. That is, we want to have a record of a birthday party, vacation trip or some wild flowers. We want the pictures to be pretty but they don't have to be "museum quality" or even "County fair quality." We aren't all artists. We want to be able to record sufficient detail, reasonably proper colors, action shots and candid shots. Maybe an occasional portrait but nothing too serious. This is the audience I am addressing – not the artist, professional or even advanced amateur. Further, most of us never have our pictures printed on paper larger than 4in. x 6in. That size shows us all that we wish to see and they are quite portable and affordable so we can easily show them to friends and relatives. What I am trying to do here is save you some money and keep you from falling for hype. (Probably one and the same thing.)

The first feature to consider is "Megapixels." Bigger is better, right? No, not necessarily. Too many is an expensive waste. Actually, any picture printed with 300 pixels per inch is potential museum quality. So, $(4 \times 300) \times (6 \times 300) = 2,160,000$. Therefore, you can say that a 2.1 megapixel camera can take pictures that will result in perfectly stunning 4x6 prints. Is there a reason to go for more? Yes. The first reason is that almost all of us, you included, stand too far back from our subject and get way too much background in our pictures. We recognize this when we look at the picture later and wish we could do something about it. Well, we can! Go into any photo editing program and *crop* the picture to get rid of unwanted background. You can't do that when prints come back from the developer. When you crop, you throw away some pixels so you had better have more than you thought you might need. (See the chapter on Cropping a Picture.) The second reason for purchasing more megapixels is that you *will* get the urge to make larger prints sometime. There are all kinds of 8.5x11 photo papers for sale at Wal-Mart and you will succumb. When that time comes, you will wish you had an 8.4 Megapixel camera. Here comes the compromise. Set your sights on 5 megapixels. When you get the uncontrollable urge to print on 8.5x11 paper, you can print at 231 pixels per inch and you will be quite pleased with the results. Most of us cannot detect deteriorating quality until somewhere below 200 pixels per inch.

The lesson here is simple. Assess what you want to or will do with the camera. If you, like most of us, want a quality record of events and scenes and 99% of the time will limit yourself to 4x6 prints, then think in terms of 2 to 5 megapixels. Lean toward the higher number if your budget allows for the reasons cited. Actually, I have a 1.3 MP point-and-shoot camera that was all I had left after someone stole my "good" cameras and I used it to capture a rainbow in the desert that was outstanding up to 4x6 and on my web page. So, don't go "megapixel crazy."

While we are talking sensors (that's where the megapixels are), the sensor size is an important quality feature. Modern technology is wonderful but it has made it possible to make sensors that are too small (but cheap) to take quality pictures. This subject is esoteric and arcane to the point

that maybe I shouldn't mention it at all. But, I will, anyway. If you look at the specifications for the CCD Imager (sensor) you will see a "size" listed. It will be a couple of numbers like 1/1.8" or 1/2.7". This nomenclature came from the days when Vidicon vacuum tubes were used in TV cameras and it means almost nothing now but they continue to use it to confound us, I suppose. Anyway, it is related to the size of the sensor as the table, below, shows. When you compare these sizes to the size of a 35 mm slide, you can appreciate how tiny they really are. If you crowd too many pixels into a too small space, you have quality problems.

MP	Picture Size-Pixels		Sensor Size-mm		Pixel	Designation
	W	H	W	H	Size- μ	
3.1	2048	1536	5.720	4.300	2.80	1/2.5"
3.1	2048	1536	5.270	3.960	2.58	1/2.7"
3.1	2048	1536	4.536	3.416	2.22	1/3.2"
4	2280	1712	7.176	5.319	3.13	1/1.8"
4	2272	1704	5.720	4.300	2.52	1/2.5"
4	2272	1704	5.270	3.960	2.32	1/2.7"
5	2560	1920	18.000	13.500	7.03	4/3"
5	2592	1944	7.176	5.319	2.75	1/1.8"
5	2593	1944	5.720	4.300	2.21	1/2.5"
7	3073	2304	7.176	5.319	2.32	1/1.8"
8	3264	2448	18.000	13.500	5.51	4/3"
8	3264	2448	8.800	6.600	2.70	2/3"
		35 mm film	36	24		

μ = micron (a millionth of a meter)

Where does all this lead? Well, maybe nowhere except that the larger the pixel size, the higher the quality of the picture. That is, less noise and a broader dynamic range of light values. For instance, a 4 MP camera with a size designation of 1/1.8" will probably take a better picture than one with a 1/2.5" size. Just for interest, professional camera models have pixel sizes from 6 μ to 11 μ but they cost \$1000 and way up. Shirt pocket cameras will have the smallest sensors. Enough of this!

Lenses. They are kind of important and you have several choices. You can get a fixed focal length lens or one of many zoom choices. Just an aside here on "zoom." This is an unfortunate nomenclature. It should be called a "composing" lens because that is what you use it for. You use it to compose a shot. I have found that thinking in those terms, I have been able to make better use of my zoom lenses. Most of us will want a zoom lens so we need to think about what we will use it for. I had some fun with a 10:1 zoom lens when I had it but, you know, it really wasn't too useful. I zoomed in on a mountain top and the top of El Capitan and, while the resulting photos were interesting, they weren't too beautiful. Also, extreme zoom requires a tripod for stability. It is like holding a ten foot stick by the end and trying to poke it through a small hole ten feet away. For these reasons, I recommend a 4:1 or a 3:1 optical zoom. Why did I say, "optical"? Because there is something called "digital zoom" available in most cameras. *Ignore this feature.* It is nothing more than cropping and you can do that later in the computer. Don't forget, you are hoping to purchase a camera with enough pixels so you can crop to achieve the same effect as zooming. The combination of a moderate zoom and some excess pixels will give you a large amount of freedom to be creative.

More on lenses. There is a feature called "macro" that you should consider. This feature allows you to take extreme close-ups. It is a fun thing to do and close-up pictures of bugs and flowers are kind of neat. It is a feature on most cameras so take it and have fun with it. But, don't get bogged down in numbers concerning which macro feature allows closer shots. That will put you in the advanced amateur category and I am not talking to them.

More on lenses. You are probably beginning to think they are important. The aperture range on most zoom lenses is usually confined to f2.8 to f8. I am not doing a tutorial here on aperture. Suffice it to say f2.8 is not the fastest lens in the world but it is sufficient for most purposes. My hang-up was at the other end. I wanted to be able to stop down the lens beyond f8 to get greater depth of field for my many scenery shots. I even made that one of the reasons I purchased the camera I did because it went to f11. Then I learned that this is not a problem. Since the sensors in digital cameras are so small, the depth of field is magnified many times over what it is on a 35 mm film camera. Actually, the problem might be on the other end. If you want to take a portrait or a close-up of a flower, you do not want much depth of field so the extraneous stuff will not be in focus and be a distraction. At this point, f2.8 may have too great a depth of field. Life is a compromise, isn't it?

Now let's consider *storage*. No, I am not talking about a camera bag but it is a good idea to have a padded camera bag. I got mine at Wal-Mart for \$10. I think all cameras now come with solid state storage cards to store the picture files until they are downloaded. Get a big card, 512 MB or 1 GB. My camera holds two cards and I have one of each in it. That may be over-kill. Beyond that, the storage *format* is important. Most cameras use various levels of JPEG format. And, that will suffice for most of your needs. Always use the best level since you bought the big memory card and have lots of space. However, there will come a time when you will feel arty and want a higher quality storage format. In this case RAW is best. So, if there is the least possibility of you feeling arty, be sure to get a camera with a RAW option.

Cameras are just coming on the market with image stabilization to counteract your shakiness. This is a great feature but I am sure it is not free. It is your call.

Viewfinders can be a problem. I think all digital cameras have an LCD viewer on the back. Bigger is better. Further, a swivel viewer is great. You can hold the camera overhead or on the ground and still see the viewer. LCD viewers are not great out in the sunlight no matter what the advertising says. You still need a viewfinder. These can be optical (that is best) or a little LCD inside the camera with a magnifying glass over it. The problem with optical viewers is that they often do not cover the whole frame so you will take a larger scene than you see.

I think all cameras in the range I am talking about have built-in flash. Just be sure it has at least a ten foot range.

There are a host of other features that you will need to consider to determine if you are willing to pay for them. Heft and feel are important but entirely subjective. A heavier camera is easier to hold still but more of a bother to carry. Your choice. One last piece of advice. Get a camera that connects to the computer with a USB cable, not a docking station. It is great to be able to connect to any computer with a cable and download quickly using Windows Explorer instead of being tied to some proprietary software. Also, try for a camera that will use both rechargeable batteries and regular batteries. It is very nice to pop in some AAs when your battery goes dead and the charger is at home. My camera only uses a proprietary rechargeable battery so I had to purchase an inverter at Radio Shack. I carry the inverter and charger in the car at all times so I can recharge in the field when needed.

Now this is really last. Read some reviews. There are good reviews at <http://www.imaging-resource.com/>. They are long and detailed but worth the effort. This site has a feature called "Dave's Picks" that will give you a short list to start from. This will be a great help. Also, Popular Photography magazine has reviews at <http://www.popphoto.com/>. *PC Magazine* has reviews at <http://www.pcmagazine.com/>. Others are <http://www.dcresource.com/> and <http://www.dpreview.com/>. Read some of these reviews for a tentative pick before you buy. Camera manufacturers have web sites that should be worth visiting to get the straight scoop on features. Salesmen's descriptions are sometimes suspect. Besides, if you want to purchase on the Internet to get a better price, the seller might not give you all the pertinent information on a given camera. Good luck!