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Going Digital: Gearing Up for a Great Ride

In This Chapter

- Choosing the right digital camera
- Assessing your computer's photo-readiness
- Looking at home printers and scanners
- Picking photo software
- Getting more help along the way

Imagine trying to dance the tango wearing oversized, steel-toed work boots, playing a Beethoven sonata on a piano that has only 25 working keys, or painting a portrait with a 12-inch-wide roller. You might be able to get the job done — eventually — but working with the wrong equipment would quickly turn what should be an enjoyable pursuit into a frustrating chore.

To make sure that your experience with digital photography doesn't become a similar headache, this chapter helps you assemble the best equipment for the kind of projects that you want to do. If you're in the process of shopping for a digital camera, you can read my take on what features are "musts" and which ones you can do without. I also spell out what you need for a decent digital darkroom, discussing the minimum computer specs and offering advice about buying photo software, printers, and scanners.

Finally, because even the best-equipped digital photography studio can sometimes suffer minor breakdowns, this chapter concludes with a list of online resources where you can get help with questions that are beyond the scope of this book.

Choosing the Right Digital Camera

When I wrote the first edition of *Digital Photography For Dummies,* way back in 1997, only a few digital cameras existed, and most offered the same set of features, making shopping fairly easy. All you needed was cash — and lots of it.

The good news is that prices have come way, way down. The bad news is that choosing the right camera has gotten pretty complicated, with every manufacturer offering a broad lineup of styles, models, and feature sets. And your job is made all the more headache-inducing by the geekspeak used in camera ads and brochures: "Captures 8-megapixel images in Raw or JPEG!" "Built-in image stabilization!" "More than 20 scene modes!"

To help you narrow your choices, the following sections explain the most important digital camera features and how they impact your picture-taking possibilities. With this knowledge under your scalp, you can select a few top candidates for your purchase and then seek out detailed reviews to help finalize your decision. (See the list of online resources at the end of the chapter to track down reviews.)

When you're ready to buy, I suggest that you go to a camera store rather than a big-box electronics store. Salespeople in camera stores tend to be photography enthusiasts, which makes them better able to guide you to a camera that will suit your needs. In addition, most big-box stores charge a "restocking fee" — that is, you pay a percentage of the purchase price if you return the camera. Traditional camera stores are usually more reasonable (although you should ask to be sure). This return policy is especially important if you're buying the camera as a gift for someone else.

Megapixels: How many are enough?

In most camera ads, the feature that gets the most play is *resolution,* which is measured in *megapixels. Pixels* are the tiny squares of color used to create a digital image; Figure 1-1 gives you a close-up view. One million pixels add up to 1 megapixel, often abbreviated as 1 mp. (*Pixel* is short for *picture element,* if you care.)

Pixel count is directly related to picture quality. If you have too few pixels, your picture is lousy, as shown in Figure 1-2. I shot this photo with a first-generation digital camera, and the pixel population in those early models simply wasn't sufficient to produce good prints except at a thumbnail size. Note especially the jagged appearance of curved and diagonal lines, such as the edge of the girl's face.

So how many megapixels do you need? Well, for a good-quality print, you need at least 200 pixels per linear inch. For example, a 4 x 6-inch snapshot requires 800 x 1200 pixels, or a total of 960,000 pixels — just under 1 megapixel. Pictures for e-mail and Web pages require significantly fewer pixels; a pixel count in the 450 × 400 pixel range is appropriate for e-mail photos, for example.

Figure 1-1: Digital images are created out of tiny blocks of color known as pixels.

Figure 1-2: An inadequate pixel count causes poor picture quality.

With the exception of cell phone cameras and toy cams for kids, all new digital cameras offer a minimum resolution of 3 megapixels, so, again, you're set for snapshot prints and even 5 x 7-inch prints. For reliable 8 x 10 and 11 x 14 prints, move up to the 4- to 6-megapixel range.

An even greater pixel count comes in handy when you want to crop your original and then produce a large print of the remaining image area. For example, the top image in Figure 1-3 contains 3008 x 2000 pixels, or 6 megapixels. That high pixel count gave me the flexibility to crop away a huge portion of the image and still have enough pixels to produce a quality print of the cropped area, as you see in the lower image.

Figure 1-3: Starting with a high-resolution original enables to you crop the image tightly without sacrificing picture quality.

Unless you routinely crop photos or make large prints, though, don't spend extra for a super-megapixel camera. Put your savings into other camera features, such as a longer zoom lens, or invest in a high-capacity picture-storage card.

A look at lenses

Too many people get so caught up in megapixels and other digital specs that they don't pay enough attention to the camera's lens. But just as with a film camera, a good lens is critical to the camera's picture-taking capabilities, so the next few sections offer some lens-shopping guidance.

Focal length: What does the camera "see"?

Focal length, measured in millimeters, determines how much of a scene a lens can capture as well as how large and how far away the objects in the scene appear. Here's the scoop:

- **Short versus long:** With a short focal length, you get a wide angle of view, and subjects appear smaller and farther away. As you increase focal length, the angle of view narrows, and subjects appear closer and larger. As an example, I stood at the same spot to shoot the images you see in Figures 1-4 and 1-5 — bravely ignoring the impending thunderstorm in the name of art, I might add. But I took the first image at a focal length of 42mm; the second, 97mm.
- **Categories:** Lenses are commonly grouped into three categories based on focal length:
  - *"Normal":* A focal length of 50mm is considered "normal" and is standard on most point-and-shoot cameras. This focal length is good for capturing the type of snapshots that most people enjoy shooting.
  - *Wide-angle:* A lens with a focal length under about 35mm is considered a wide-angle lens. A wide-angle lens is great for shooting landscapes and also comes in handy for photographing a group of people from a short distance away. (The wide-angle perspective enables you to fit more people in the shot.)
  - *Telephoto:* A focal length of about 80mm or longer is referred to as a telephoto lens. A telephoto lens enables you to get close-up pictures of distant subjects, making it a favorite of travel, wildlife, and sports photographers.
- **Depth of field:** Focal length also affects the apparent *depth of field,* or the range of sharp focus. At a long focal length, objects near your subject appear sharp, but faraway objects appear blurry. At a short focal length, distant objects are more sharply focused. You can explore this issue more in Chapter 2.

42mm

Figure 1-4: At a short focal length, you capture a wider area, and objects appear smaller and farther away.

97mm

Figure 1-5: Zooming to a longer focal length narrows the angle of view and makes objects appear larger and closer.

Focal lengths: Digital versus film

Lens focal length is determined by measuring the distance between the center of the lens and the recording medium — the film negative in a film camera or the image sensor in a digital camera. But the results you get from a particular focal length depend not just on that distance but also on the size of the recording medium.

With a camera that uses 35mm film — the kind you've been putting in your film cameras for years — the size of the recording medium is consistent, as is the position of the film in the camera body. So a lens with a particular focal length provides the same view on one film camera as it does on another. This standard enables photographers to predict the capabilities of a lens based on its focal length.

The digital world is different, however. Image sensors vary widely in size, as does the location of the sensor. And because of these variations, a particular focal length on one camera may produce completely different results on another camera.

To address this issue, digital camera manufacturers describe lenses by using both the actual (digital) focal length and the equivalent focal length on a 35mm film camera. For example, a camera manual might state the lens specifications as: "5.8–23.2mm; 35mm film equivalent: 35–140mm." Don't get confused by the "35mm film" part; again, that number refers to the size of the film negative, not the focal length. And you thought computers were complex. . . .

- **Zoom:** A zoom lens enables you to capture an image at a range of focal lengths. For example, I own a zoom lens that offers a range of 28 to 200mm. In everyday lingo, we use the term *zooming in* when we shift to a longer focal length and *zooming out* when moving to a wider-angle view (shorter focal length). A few cameras instead offer a choice of two or three specific focal lengths — say, 35mm and 80mm.

  Speaking of a zoom lens, if that feature is important to you, be sure that the camera offers a true *optical zoom* and not just a *digital zoom*. Digital zoom is nothing more than some software manipulation that crops your image and enlarges the remaining area. The result is always lowered image quality.

A camera's focal length is usually printed around the outer band of the lens or, in some cases, elsewhere on the front of the camera body. Focal length is also stated in the camera manual. Be sure to see the nearby sidebar, "Focal lengths: Digital versus film," for some important information about the numbers you see.

If you have trouble remembering all this focal-length stuff when you're shopping, most camera stores have charts that offer a visual representation of what a lens sees at various focal lengths.

Lens quality: More important than megapixels?

In my opinion, yes, considering that all current digital camera models now offer enough megapixels for the average user, but lens quality varies greatly. A low-grade lens can cause all sorts of image defects, including:

- **Vignetting:** Often a problem with telephoto lenses, vignetting causes the corners of a picture to appear darker, as in Figure 1-6.
- **Barrel and pincushion distortion:** The former gives your subject a bloated look, as if it were wrapped around a barrel; the latter does the opposite, pinching the subject inward.
- **Color fringing:** Also known as *chromatic aberration,* this defect creates little halos of solid color around the edges of objects. Because the halos are usually purple, this defect is sometimes referred to as *purple fringing.*

Figure 1-6: Vignetting causes light falloff at the corners of an image.

Unfortunately, the monitors on digital cameras aren't large enough or clear enough to give a good indication of lens quality, although you may be able to spot serious distortion or vignetting. Theoretically, you could bring your own camera memory card to the store, shoot some test pictures, and then review the images on your computer — but that presumes that you already own the right type of memory card and that you can find subjects suitable for evaluating lens quality.

For a simpler solution, trust this aspect of your purchase decision to the pros who review cameras for a living. Read the latest issues of respected magazines such as *Shutterbug* and *Popular Photography* and also check out the Web sites listed at the end of the chapter. I probably shouldn't admit it, but that's exactly what I do when I'm in the market for new equipment.

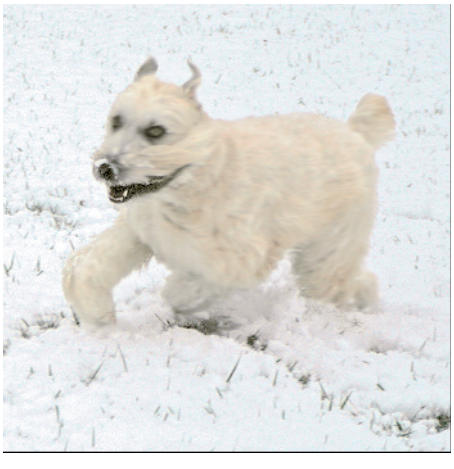
How much control do you want?

If you're a casual photographer, you're probably used to working with a fully automatic camera. You frame the shot, press the shutter button, and rely on the camera to set the focus and exposure. And that's a perfectly legitimate approach; the autofocus and autoexposure systems on most cameras work amazingly well.

However, if you'd like to develop your photography skills, consider a camera that enables you to better manipulate exposure and focus. By investing just a little more in your camera, you can enjoy the following features, which fall in the "semi-manual" category (or "semi-automatic," depending on how you look at it):

- **Aperture-priority autoexposure:** This feature enables you to specify the aperture setting, or *f-stop,* an exposure control that also affects *depth of field,* or the range of sharp focus in a picture. After you set the aperture, the camera selects the other key exposure setting, shutter speed (explained next).
- **Shutter-priority autoexposure:** This feature enables you to specify shutter speed, an exposure control that also affects whether moving objects appear blurry or sharply focused. For example, I took the top picture in Figure 1-7

1/120 second



1/500 second

Figure 1-7: By adjusting shutter speed, you can control whether moving objects appear blurry or frozen in time.

at a shutter speed of 1/120 second, which wasn't fast enough to freeze my frolicking snow baby in mid romp. To capture the action without a blur, I upped the shutter speed to 1/500 second. In shutter-priority AE, the camera selects the appropriate aperture to properly expose the image.

- **Flexible (or variable) autofocus:** This feature enables you to choose from a variety of autofocusing schemes, with each option locking focus at a different distance or on a different area of the frame.

For even more creative flexibility, you can move up to a model that offers complete manual exposure and focus control. Of course, that level of control adds to the camera price.

Before you pay more for manual focusing, find out how the feature is implemented. With an SLR (single-lens reflex) camera, you adjust focus by twisting the lens barrel, as you might expect, and with some practice, you can focus in no time. But with most point-and-shoot models, you must select a specific focusing distance from a camera menu, as illustrated in Figure 1-8. This system is a little cumbersome, to say the least.

Figure 1-8: On most point-and-shoot cameras, manual focus mode requires you to select a focusing distance from a scale displayed on the monitor.

Here's one more bit of potential money-saving advice: Most cameras now offer something called *creative shooting modes* or *scene modes*. With this feature, you choose a type of picture — portrait, landscape, action, and so on — and the camera then selects the aperture, shutter speed, and, sometimes, focus mode that is considered appropriate for that type of shot. For many people, scene modes provide the best of all worlds: a little more creative control without the necessity of becoming a photography expert or spending more for the camera.

Usually, scene modes are represented by little symbols like the ones you see in Figure 1-9. Some cameras offer more than a dozen of these scene modes, giving you everything from a fireworks mode to a museum mode (which disables flash and mutes all camera sounds). Most cameras provide access to the main modes via a camera dial or button on the camera body; you have to dig through menus to choose the other modes. The more modes you can get to without going to menus, the better.

Chapter 2 provides more details about manipulating focus and exposure.

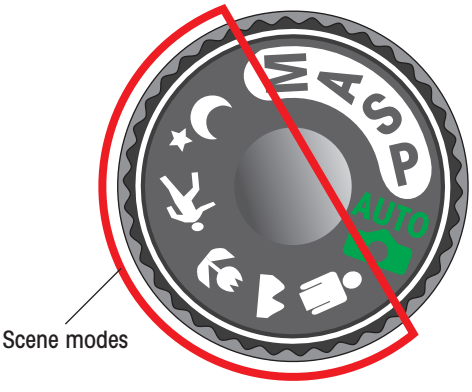


Figure 1-9: Creative scene modes simplify the task of shooting better portraits, landscapes, and action shots.

Raw capture: Worth the hype?

Are you the type of photographer who would enjoy going into a darkroom and developing your own film negatives? Do you demand the absolute top image quality? If so, you may want a camera that offers *Raw capture*.

A little background: The data in a digital camera file, as in any computer file, is nothing more than a series of numbers. In the case of a digital photo, those numbers represent the pixel brightness values that the camera records when you snap the picture.

At some point, those numbers have to be translated into an actual photo. Traditionally, this work is done by software built into the camera. Think of this system as the equivalent of in-camera developing of film negatives, if such a thing were possible. After the camera processes the data, the final image file is recorded to the camera memory card. In most cases, the data is stored using a file format known as JPEG (say it *jay-peg*).

File format simply refers to a type of computer data file. Many formats have been developed for storing digital art, but JPEG is the most prevalent for photographs.

A few years ago, camera manufacturers introduced another alternative, known generically as *Raw capture, Camera Raw,* or simply *Raw.* With this system, the camera writes the original, unprocessed — uncooked — data onto the memory card. Then the photographer opens the file on a computer, using special software known as a Raw converter, and takes over the process of translating the image data into a picture. Figure 1-10 offers a look at the Photoshop Elements Camera Raw converter. This process takes some time but gives the photographer the ultimate control over how the picture ingredients are baked into an image pie.

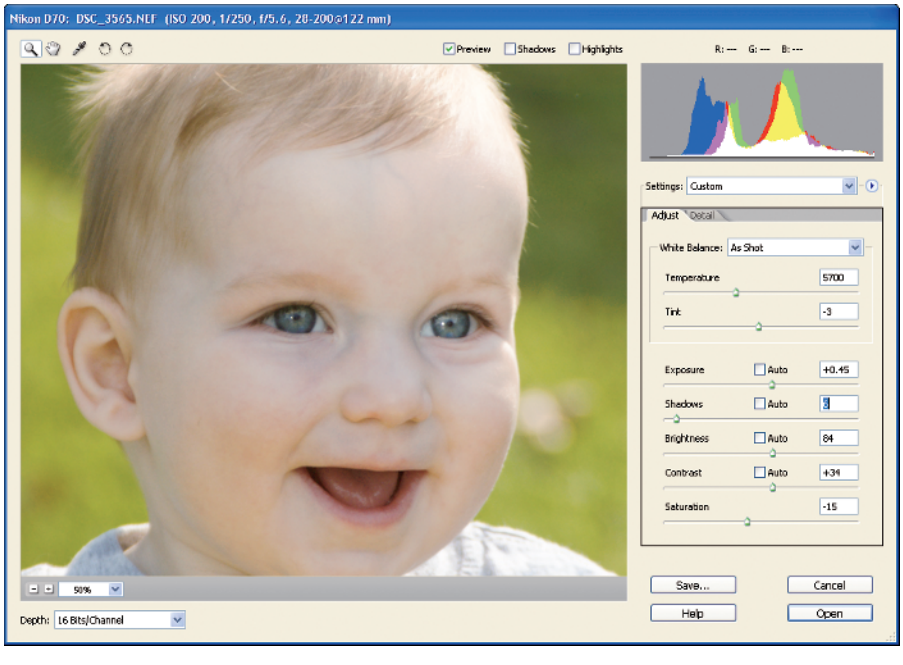


Figure 1-10: Photoshop Elements offers its own tool for processing Camera Raw files.

One other important distinction exists between Camera Raw and JPEG: JPEG uses a process known as *lossy compression,* in which some image data is dumped in the name of creating smaller files. Shrunken files are good because they eat up less space on your camera memory card. But when too much compression is applied, so much image data can be lost that you can wind up with an ugly, blocky-looking image like the one you see in Figure 1-11.

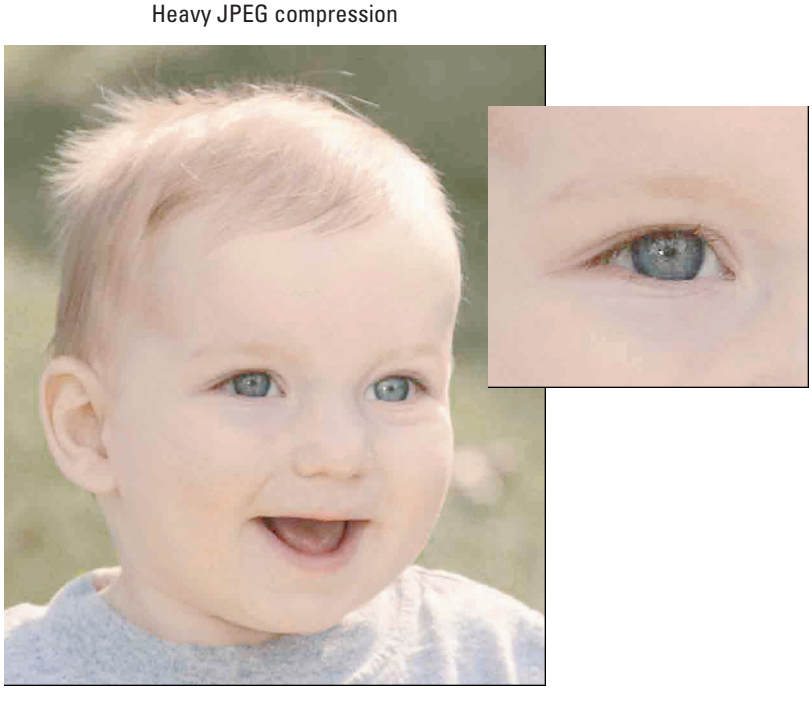


Figure 1-11: Heavy JPEG compression results in a small image file, but horrible picture quality.

Don't panic and assume that you must have Raw capture to get good digital images, though. All cameras that record JPEG photos offer a high-quality JPEG option. At this setting, the camera applies a minimum amount of compression, providing a good trade-off between image quality and file size.

Whether your eyes can tell the difference between a lightly compressed JPEG and a Raw image depends on the image, how much you enlarge the photo, and of course, how well you see. For snapshots, you're not likely to be able to tell the two apart. In fact, even when enlarged, you may not be able to spot any quality loss in the JPEG version. As proof, Figure 1-12 shows a lightly compressed JPEG image together with an uncompressed version created from a Raw capture; Figure 1-13 offers a closer inspection of both images.

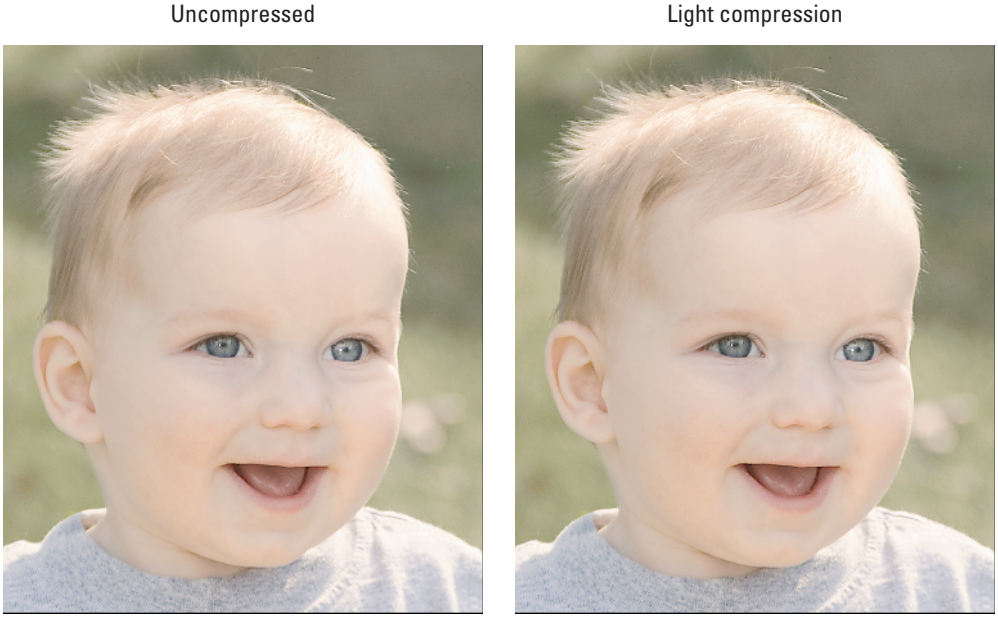


Figure 1-12: Most people can't see a quality difference between a lightly compressed JPEG image and an uncompressed Raw image.

My take: If you answered "yes" to the two questions posed at the start of this section, Raw capture is a worthwhile feature, assuming that you're willing to put in the extra time to process all your Raw files. Otherwise, you'll be perfectly happy with JPEG. (And don't listen to the photo snobs who insist that Raw is the only way to go.)

A few other points on the issue:

- Each manufacturer has its own flavor of the Raw format, so the file formats have different names. Nikon Raw files go by the moniker NEF; Canon, CRW; and so forth.
- As an alternative to Raw capture, some cameras offer a third format option, called TIFF (*tiff,* as in a little spat). In this format, the data goes through the in-camera picture processing like a JPEG photo, but lossy compression isn't applied. So there's no possibility of JPEG compression defects, and you don't have to run your files through a Raw converter but your picture files are much larger.

- Before you can share a Raw or TIFF file online, whether via e-mail or on a Web site, you must convert it to a JPEG file. Chapter 3 shows you how.
- You can, however, immediately use TIFF files in word-processing programs, publishing programs, and so on. (In fact, TIFF is the preferred format for pictures destined for publication.)
- Some high-end cameras offer a handy option known as JPEG+Raw. In this mode, the camera creates both a JPEG file and a Raw file every time you press the shutter button. This option is a nice convenience; you can share your JPEG files online immediately and then process your Raw files when you have time. Of course, saving two copies of each image requires more storage space on your camera memory card, but the JPEG files don't create a huge burden because of their small size.

Uncompressed

Light compression

Figure 1-13: Here you can see a close-up comparison of the images in Figure 1-12.

Viewfinder, monitor, or both?

Many digital cameras sold today don't have a viewfinder; instead, you frame your picture by using the camera's monitor.

Using the monitor to compose your pictures can present two problems. First, you have to hold the camera away from your body to take the picture, as shown on the left side of Figure 1-14. This posture increases the odds that your hands — and, by extension, the camera — may move slightly during the exposure, which leads to blurry photos. With a viewfinder, you can brace the camera against your face and tuck your elbows into your sides to steady the camera, as shown in the right image in the figure.

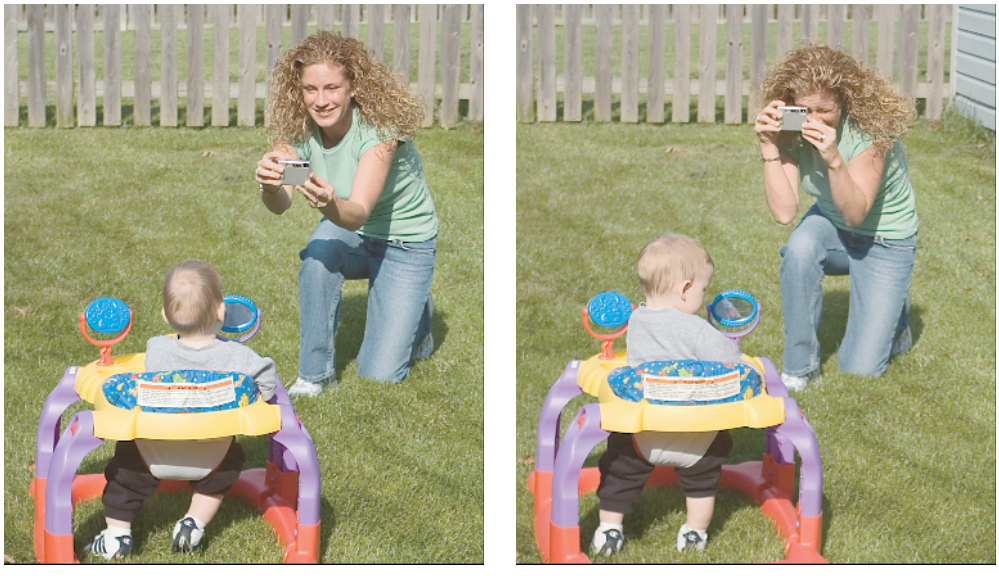


Figure 1-14: Framing shots via a monitor (left) can lead to camera shake; using a viewfinder enables you to brace the camera against your face (right).

What's more, some monitors wash out in bright light. So if you're considering a viewfinder-less camera, take the camera outside for a test run so that you know that composing pictures in bright sunlight won't be too much of a challenge. If you do decide you want a viewfinder — which is my recommendation, in case you couldn't guess — be aware that viewfinders come in two forms, optical and electronic. Here's the scoop:

- **Optical viewfinder:** An optical viewfinder is a standard viewfinder, the kind you have on your old film camera. On most point-and-shoot cameras, an optical viewfinder doesn't show you exactly what the lens is seeing. Instead, the viewfinder's perspective is slightly above and to the left of the lens. So the image that the camera records doesn't exactly match what you see through the viewfinder.

  To deal with this issue — called *parallax error* — you can look for a *through-the-lens* (TTL) viewfinder, which puts viewfinder and lens much more in sync, although no optical viewfinder is 100 percent accurate. Note that the camera monitor *does* provide an accurate preview, which is the one upside of using it to frame your shots. Most digital SLRs, however, do not enable you to frame shots via the monitor; the monitor is for reviewing pictures only.

- **Electronic viewfinder:** An electronic viewfinder is like a miniature monitor; it displays the current camera settings along with the scene in front of the lens. In other words, you see everything you would if you were using the monitor to compose your shot. Unfortunately, the clarity of the display on some electronic viewfinders isn't so hot; all cameras are not created equal in this regard. In addition, you can't see anything through an electronic viewfinder while the camera is powered off. For this reason, I prefer optical viewfinders, but this is a personal choice.

One final note about viewfinders: Be sure that the viewfinder isn't so tiny that you have to work hard to even see through it. On cameras that have tiny bodies, I find that the viewfinders are often way too small for easy viewing.

Still more features to consider

After sorting through the camera qualities covered so far, use the following feature list to narrow down your camera choices even more. These features, presented in no particular order, may seem insignificant now but can play a big role in your long-term satisfaction:

- **Physical fit:** Hold the camera and take some test shots to try out the position of the shutter button, viewfinder, and so on. Also be sure that the camera is a comfortable size and weight. Those pocket-sized cameras are great for portability, but if they're *too* small, using them can be difficult. The dials and buttons are by necessity also small, and it's easy to inadvertently cover a bit of the lens or flash with your finger. On the other hand, some models are so bulky and heavy that you wouldn't want to carry them around on a long day of sightseeing.
- **Ease of use:** Are the controls that you're likely to use most often easily accessible? Having a bunch of buttons and dials on the outside of the camera seems intimidating at first, but they actually make life simpler in the long run. Features accessible only via menus take more time to implement, which means that you're less likely to use them.
- **Image stabilization:** This feature, which goes by different names depending on the manufacturer, is designed to eliminate the blur that can occur if you move the camera slightly during the image exposure. If you choose a camera without a viewfinder, this feature is especially helpful; see my earlier rant about this issue in the "Viewfinder, monitor, or both?" section. But find out how the manufacturer implements the feature. In some cases, turning on image stabilization simply shifts the camera to a faster shutter speed, which shortens the time you need to keep the camera still.

Memory cards: "Film" for the digital age

Instead of recording images on film, digital cameras store your picture data on small cards known generically as *memory cards* or *picture cards.* Here are a few important factoids about your so-called "digital film":

- **Type:** Cards come in several flavors: CompactFlash (CF), Secure Digital (SD), Memory Stick, and xD are the most common. No one type is better than the other — they're all based pretty much on the same concept. But most cameras can accept only one type of card, so check your camera manual before buying more cards. Note, too, that if you own a media player or other device that uses the same type of card as your camera, you can use your cards for both purposes.
- **Capacity:** Cards also come in different capacities, with the most common sizes ranging from 512MB (megabytes) to 2GB (gigabytes). How many pictures you can store on a particular size of memory card depends on the size of the picture file, which in turn is dependent on the file format (JPEG, TIFF, or Camera Raw) and image resolution (pixel count) that you use when you take the picture. See Chapter 2 for more details about these settings.
- **Speed:** Some cards are advertised as *high-speed cards,* which means that they enable your camera to record and access picture data more quickly. However, before you pay more for a high-speed card, be sure that your camera can take advantage of this feature; many can't.

- **Speed:** Some cameras take several seconds to come to life after you press the power button. Others are slow to record an image to the memory card, requiring you to wait several seconds after you take one shot before you can take another. And on some cameras, the autofocus and autoexposure mechanisms are slow operators. Take some test shots at various picture settings, with and without the flash, to be sure that you won't be frustrated with the camera's speed, especially if you enjoy sports or action photography.
- **Battery type:** Some cameras use proprietary batteries, whereas others accept standard, rechargeable AA- or AAA-size batteries. Either is fine, but with a proprietary battery, you can't carry spare batteries with you (unless, of course, you buy a second battery from the manufacturer, which can be expensive).

Checking Your Computer Setup

You don't need the latest greatest computer to do the kind of projects presented in this book. But you do need a relatively fast processor, a healthy

supply of system memory (RAM), and a hard drive that has plenty of free storage space. Otherwise, your computer may run your photo software at a pace that's frustratingly slow or, if you're working with very large digital files, be unable to handle the load at all.

Here are my recommendations for the minimum computer requirements:

- **Processor:** The processor, or CPU (central processing unit), is the part of your computer that does the, er, computing. The faster the processor, the better. If you run Windows, I suggest a Pentium 4 or Celeron 1.3 Ghz processor or better; on the Mac side, a PowerPC G3 or better.
- **System operating software (OS):** To work on a Windows-based machine, most new photo programs require Windows XP (with Service Pack 2) or later. On a Mac, most programs require OS 10.4 or later. Again, check the system requirements for the software you want to use, especially if your computer runs the very latest operating system; some software may not yet be fully compatible with Windows Vista, for example.
- **System memory (RAM):** At a bare minimum, you need 512MB of RAM. The more, the merrier; adding RAM typically increases the speed of all your programs.
- **Hard drive:** The hard drive is the internal storage device that holds your programs and data files. The computer also needs some empty hard drive space to use as a temporary data-storage tank when you work on your pictures.

  If you see an alert box saying that your *scratch disk* is full, as shown in Figure 1-15, you don't have enough free hard drive space. You'll need to delete some files or programs in order to go forward. (You may see the term *virtual memory* instead of *scratch disk* depending on the program you're using.)

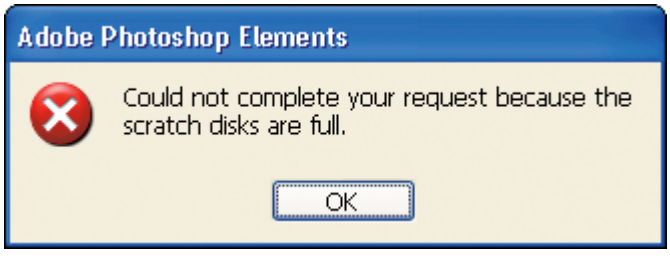


Figure 1-15: The scratch disk is empty space on your hard drive that your software needs to operate properly.

If needed, you can add a second hard drive to your system. Adding an internal drive isn't hard, but if you're squeamish about opening up your computer case, you can get an external drive that connects via a USB or FireWire cable.

I do *not* recommend using a hard drive, either internal or external, for long-term archiving of your important picture files. Hard drives do fail, and when they do, your data is usually lost. Instead, look at your hard drive as temporary storage for your working files; back up important pictures to a CD or DVD (see next bullet).

- **CD or DVD burner:** At present, the best way to safeguard your image files is to "burn them" — that is, record them — to a CD or DVD. My personal preference is CD because the jury is still out on which DVD-recording format will be around ten years from now. However, a CD-ROM holds only 650MB of data, which isn't very much in the modern era of high-resolution digital photos, whereas a DVD holds about 4.7GB.

  The good news is that most computers now ship with a DVD burner, which can produce either DVDs or CDs, so you have choice. Personally, I burn my most precious family pictures to a CD-ROM and copy my other photos to a DVD.

  Chapter 3 offers more tips on protecting your picture files.

Selecting a Photo Printer

In the market for a new printer? As with cameras, you have a wide range of choices. Your first decision relates to the print technology. You have three options: dye-sub, laser, and inkjet. Here's my take on each:

- **Dye-sub:** Most dye-sub (short for *dye sublimation*) printers can produce only snapshot-size prints. More important, you must use special, dye-sub compatible paper, usually sold together with the actual dye ribbons or cartridges. You can't print on plain paper, textured photo papers, and other specialty papers, as you can with a laser or inkjet printer. So if you want to print greeting cards, advertising flyers, and the like, a dye-sub printer isn't a good solution.
- **Laser:** If you need to print large volumes of regular documents as well as photos, a laser printer is a good choice. For plain-paper printing, laser printers usually are cheaper and faster than inkjets. On the down-side, laser printers tend to be bulkier than inkjets, and you need to read reviews carefully because not all lasers do a great job with photos.

No fuss, no muss: Retail photo printing

When you have more than a few images to print, consider letting the local photo pros do the job. You can drop off your camera memory card at any retail photo lab and pick up your prints as soon as an hour later, just as you used to do with your film pictures. In most cases, you'll get better prints than you can make at home, with less hassle, less time, and for less money.

If you have a high-speed Internet connection and are computer-comfortable, you can even send your image files directly to the lab via the Web, and then pick up your prints when you're ready. To find a lab in your area, check out the Web site www.prints-are-memories.com. You just enter the zip code where you want the prints made, and the site returns a list of all the area labs. This is a great way to get prints to far-off friends and relatives, too; you can have prints made at labs near their homes.

- **Inkjet:** Inkjet printers are the best all-around choice for most digital photographers, offering excellent photo printing and the capability for printing on a wide variety of paper stocks. The printers themselves are usually inexpensive, but you need to factor the cost of ink into your purchase decision. You can save money by choosing a model that has separate ink cartridges for each color. With models that use a single cartridge, you often wind up throwing away ink because not all colors are depleted at the same rate.

Whichever print technology you choose, give extra points to models that offer slots that can read your camera memory cards, as shown in Figure 1-16, which features a model from HP. This feature gives you the option of printing directly from the card; you don't even have to fire up your computer. In addition, you can transfer image files to your computer via the card slot instead of cabling the camera to the computer. See Chapter 3 for more on this topic.

If you need a scanner as well as a printer, look at an all-in-one inkjet or laser machine. In the old days — a few years ago — all-in-ones didn't do a great job on photos, but now many manufacturers use the same print heads in their all-in-one machines as in their photo printers. (Again, it pays to read reviews to ensure top quality.) Check out the next section, which offers scanner-buying tips, to make sure that both the printer and scanner part of the machine offer the specs you need.

Courtesy HP

Figure 1-16: A printer with memory card slots offers the choice of computer-free printing.

Considering Your Scanning Options

Before you can work with your existing film prints or slides, you need to have them digitized, or, in layman's terms, *scanned*. You can go about this in two ways: You can take your prints, slides, or negatives to a local lab for scanning, or you can buy a scanner and do the job yourself.

If you're new to the whole imaging game, to computers, or both, I *highly* recommend letting a professional handle the job. Yes, you'll pay for the service, but the results are likely to be much better than you can produce yourself because the equipment is better than what's found in home scanners. Most labs also do the job of cleaning your originals before scanning, which is essential to a good result. In most cases, your scanned images are put on an archival CD or DVD.

If you want to tackle the job yourself, Chapter 6 has scanning guidelines, and the following tips will help you buy a good scanner:

- **Flatbed versus sheetfed scanners:** For scanning prints, get a flatbed scanner rather than a sheetfed scanner. The latter takes your original on a curved path past the scanner head, which can damage photographic prints. With a flatbed, you lay the original on a flat sheet of glass, and the scanner head moves underneath the print.

- **Film scanners:** To scan film negatives, slides, or transparencies, you have two choices. You can get a flatbed scanner that offers an adapter for those originals, or you can get a dedicated film scanner. Film scanners typically produce better results than the flatbed-with-adapter setup, but they're pricey and can't scan prints.
- **Optical resolution:** Like a digital camera, a scanner creates pixel-based images. And just as with a digital camera, pixel count determines how large you'll be able to print your scanned image and still enjoy good image quality. To determine the pixel capabilities of a scanner, look for a specification called *optical resolution*.

  Most scanners state resolution using two numbers, such as 2400 x 1200. Without going into detail, the "real" resolution number is the lower of the two. All other things being equal, higher is better. But again, be sure that you pay attention only to the optical resolution; claims such as "maximum resolution *up to* 9600" usually indicate a resolution that's achievable only through a software process called *interpolation,* which doesn't add to image quality.

- **Bit depth:** One other scanner spec to consider is *bit depth,* which determines how many possible colors the scanner can reproduce. Look for a model that delivers between 36 and 48 bits. Technically, 48 is better, but you're not likely to see a difference with most pictures, and your photo software may not be able to open 48-bit files. See Chapter 6 for more details on bit depth.

As with buying a printer or digital camera, you should check out print and online reviews of the scanner models you're considering. Image quality varies greatly, and just knowing the resolution and bit depth isn't enough to ensure that you're buying a good machine.

Choosing Photo Software

To complete your digital darkroom, you need some capable photo software. This book features the leading consumer photo software, Adobe Photoshop Elements. I chose this program because it's reasonably priced, it's one of the few options available for both Windows and Mac computers, and it offers all the tools that most digital photographers need. Elements also has a user-friendly interface, offering you on-screen guidance, as shown in Figure 1-17. The figure shows you Elements 5.0 for Windows; if you use another version of the program, it appears much the same. (As I write this, the most current version available for Mac users is 4.0.)

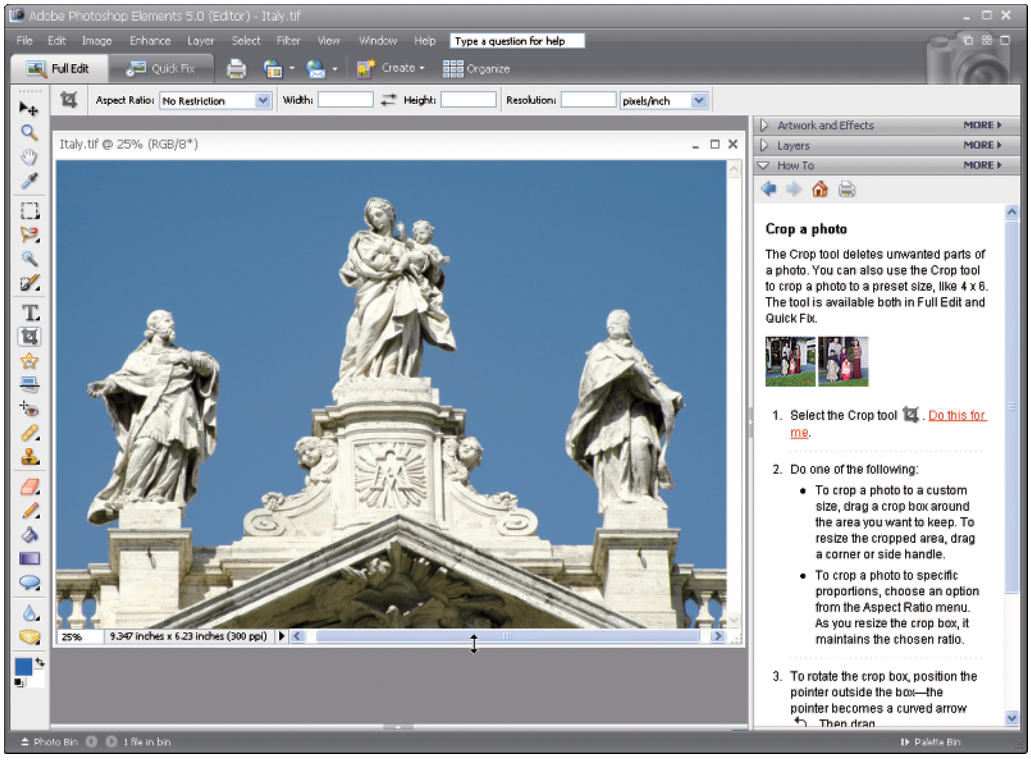


Figure 1-17: Photoshop Elements offers on-screen help for the novice.

Elements isn't the only good product on the market, however. If you haven't yet invested in photo software, you may also want to consider programs such as Corel Snapfire Plus and ArcSoft PhotoImpression. Like Elements, these programs are aimed at the novice user and offer lots of on-screen help. If you watch the sale ads, you can get any of them for under $100.

What about that granddaddy of all photo programs, Adobe Photoshop? It's the program the pros use, so shouldn't you? Well, assume for a moment that price is no object: Your budget can easily handle the $650 price tag. (Will you adopt me?) I still encourage you to start your photoediting career with something a little less intense. As you can see from Figure 1-18, Photoshop isn't designed for beginners — you won't find the friendly, helpful interface you get in Elements and other entry-level programs. In addition, you'll likely be paying for a lot of high-end features that you'll never use: tools for creating CMYK separations, manipulating image channels, drawing clipping paths, and so on. Wait, you say that you don't know what any of that means? Now you get my point.

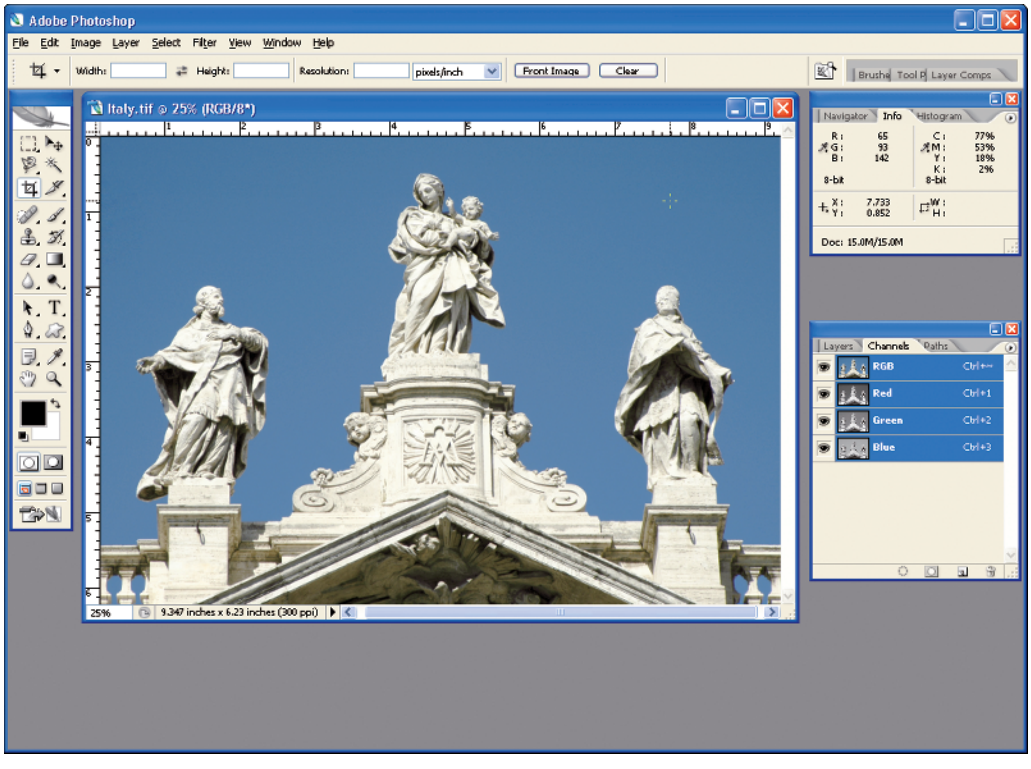


Figure 1-18: Photoshop is a great program, but it's not designed for beginners.

So that you can do your own software evaluations, the DVD that comes with this book offers tryout versions of a variety of photo-editing programs.

Getting Help from the Experts

In this chapter, I have room to give you only a starting point for buying digital photography equipment and software. For in-depth reviews and additional tips, visit your local bookstore and pick up the latest photography magazines. Also check out the following Web sites, all of which offer reviews as well as problem-solving advice and tips for taking better pictures:

- www.imaging-resource.com
- www.dpreview.com

- www.photographyreview.com
- www.cnet.com
- www.scantips.com

Finally, after buying, don't forget to check the Web site of your equipment manufacturer for updated software, technical support, electronic copies of user manuals, and other helpful content.