LEARNING MADE EASY

9th Edition

Digital Photography

for dummies®

A Wiley Brand

Develop a better eye for composition and lighting

Apply your photo know-how to creating better images

Get pro tips on shooting portraits and action shots

Julie Adair King

Bestselling author of all previous editions of *Digital Photography For Dummies*

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9th Edition

by Julie Adair King

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Introduction

A few months ago, while cleaning my office in an attempt to put off sitting down to write, I came across the first edition of *Digital Photography For Dummies*, published in 1997. Flipping through the pages, I was struck by how much digital photography has changed in the intervening years. Consider these snippets from that first edition:

> "For $800 to $1,000, you get a pixel count in the 1280 x 960 range." Pixel count refers to resolution, which determines how large you can print a digital image. With a resolution of 1280 x 960 pixels — about 1 million pixels altogether, or 1 *megapixel* in today's terminology — the maximum print size is 4 x 6 inches. If you needed more resolution back then, a Kodak/Canon hybrid model offered a 6-megapixel resolution for $29,000. (No, that figure is not a typo.) Today, even sub-$100 cameras offer resolutions of way more than 6 megapixels.
>
> "Some cameras suck the life out of a set of batteries in just a few hours." This issue was a huge problem, and one that manufacturers did a good job of resolving. Most modern cameras can survive an entire day, or even days, without needing a recharge.
>
> "On cameras that have LCD screens, battery consumption is even higher." Wait — what? Digital cameras didn't have monitors back then? Well, some higher-priced cameras did, but the monitors then were nowhere near as large or as crisp as the stunning displays we now enjoy. And touchscreens weren't even in the picture, pardon the pun.

I could go on, but I think you get the point: Digital photography has come a long way since its early years. What remains the same, however, is that figuring out how to use all the features on your camera can be intimidating. How many megapixels do you really need, for example? What's ISO? And are your pro photographer friends right when they insist that you shoot in the Raw format (whatever that means)?

The other thing that hasn't changed is that *Digital Photography For Dummies* has the answers to these questions and more. Completely updated to cover the latest technology, this ninth edition spells out everything you need to know to make the most of your digital camera.

About This Book

Digital Photography For Dummies, 9th Edition, covers all aspects of digital photography. It helps you assess your photography needs, determine the best gear to suit your style, and combine the latest digital-camera innovations with tried-and-true photography techniques. In addition, this book explains what happens after you get the shot, detailing the steps you need to take to download your pictures and share your favorite images online and in print.

Unlike other books on the topic, this one does not assume that you have any knowledge about photography, whether digital or film. Everything is explained in easy-to-understand language, with a little humor thrown in to make learning a bit more enjoyable.

I do assume, though, that if you're into photography enough to pick up this book, you probably own a "regular" camera — that is, one designed solely to take pictures, as opposed to a smartphone or tablet camera. For that reason, the book concentrates on helping you take advantage of features that are common to standard cameras but aren't available on most mobile devices. A lot of the stuff I cover applies no matter what kind of camera you use, however — composition, for example, is key to a photo taken with any device, as is understanding lighting and focus.

How This Book Is Organized

As much as possible, this book is put together in a way that doesn't require you to read it in order, from front to back, to make sense of things. Instead, you can dip in and out of various chapters to get help with a specific topic. However, if you're brand-new to digital photography or to photography in general, you may find it easier to explore the early chapters, which provide some important basics, before moving onto advanced topics I cover later. The next sections preview the information in each part of the book.

Part 1: Fast Track to Super Snaps

As the part name implies, chapters in Part 1 are designed to make it easy to get better results from your camera, even if you're a complete novice:

- Chapter 1 helps you decide whether your current camera has the features you need to shoot the kinds of pictures you want to take. If the answer is no, I offer advice to help you choose your next camera.

- Chapter 2 explains critical camera options, including shooting mode, shutter-release mode, resolution, and file type. Although the default settings for these options work well in most cases, you may need to adjust them for some shots.
- Chapter 3 offers tips for getting the best results when you shoot in your camera's fully automatic exposure modes and also covers the basics of making digital movies.

Part 2: Taking Your Photography to the Next Level

When you're ready to advance your photography knowledge and skills, dig into Part 2.

- Chapter 4 provides an introduction to photographic composition and explains which camera features affect characteristics such as how much of a scene is in sharp focus.
- Chapters 5 and 6 are all about light. Chapter 5 explains exposure fundamentals and offers solutions for over- or underexposed photos. Chapter 6 helps you get better results when you use flash and introduces you to some alternative lighting solutions.
- Chapter 7 explains how to achieve tack-sharp images and to use focus to artistic advantage. This chapter also color-related settings.

Part 3: Pro Tips for Capturing Specific Subjects

Chapters in this part of the book provide insider tips related to portraits, action shots, and landscapes.

- Chapter 8 is all about photographing people, showing you camera features, lighting setups, and other tools that help you capture portrait subjects in the most flattering ways.
- Chapter 9 moves on to action photography. Whether you want to shoot athletic events, birds on the wing, or any other moving subject, this chapter offers keys to success.
- Chapter 10 covers tips for improving your landscape photos. It also details how to shoot special scenes such as fireworks displays.

Part 4: After the Shot

Visit this part of the book for information about picture playback and help with getting pictures off your camera's memory card and out into the world.

- Chapter 11 introduces you to cool playback features, many of which tend to be buried in camera menus and thus too often overlooked.
- Chapter 12 explains options for downloading and storing photos. I also explain how to prep images for printing and online sharing.

Part 5: The Part of Tens

In the time-honored *For Dummies* tradition, information in this part is presented in easily digestible, bite-size nuggets:

- Chapter 13 provides a troubleshooting guide, discussing ten common picture problems and how to avoid or repair them.
- Chapter 14 shows you ten accessories that can make your photography life easier, more fun, or both.

Beyond the Book

When you have time to go online, visit `www.dummies.com` and enter the text *Digital Photography For Dummies Cheat Sheet* in the Search box. The Cheat Sheet offers a quick reference guide to important camera settings.

Icons Used in This Book

Here's a quick guide to the icons used in this book:

REMEMBER

This icon represents information that you should commit to memory. Doing so can make your life easier and less stressful.

TECHNICAL STUFF

Text marked with this icon breaks technical gobbledygook into plain English. In many cases, you don't need to know this stuff, but boy, will you sound impressive if you repeat it at a party.

TIP

The Tip icon points you to shortcuts that help you avoid doing more work than necessary. This icon also highlights ideas for creating better pictures and working around common problems.

WARNING

Read the text next to a Warning icon to keep yourself out of trouble and to find out how to fix things if you leaped before you looked.

Where to Go from Here

The answer depends on you. You can start with Chapter 1 and read straight through to the index, if you like. Or you can flip to whatever section of the book interests you most and start there.

The one thing this book isn't designed to do, however, is insert its contents magically into your head. You can't just put the book under your pillow and expect to acquire the information by osmosis — you have to put eyes to page and do some actual reading. With our hectic lives, finding the time and energy to read is easier said than done; but if you spend just a few minutes a day with this book, you'll soon able to capture any subject, from a newborn baby to a towering monument, like a pro.

1

Fast Track to Super Snaps

IN THIS PART . . .

Discover which camera features make it easier to take different types of photos. If you're ready for a new camera, get the information you need to find just the right model.

Get the scoop on essential (and sometimes confusing) camera settings, including the shooting mode, shutter-release mode, resolution, and file type (JPEG or Raw).

Find out how to get the best results when you rely on your camera's fully automatic shooting mode. Also take a look at scene modes, which automatically select settings considered best for specific categories of pictures, such as portraits and action shots.

Explore settings related to video-recording features and get help shooting your first movies.

IN THIS CHAPTER

» Finding the best camera for your photography style

» Understanding critical camera specs

» Deciding what camera features you *really* need

» Considering convenient extras

Chapter 1
Choosing the Right Camera

You've probably heard the saying "It's a poor carpenter who blames his tools." Well, the same is true for photography: A knowledgeable photographer can produce a masterful image from even the most basic camera. That said, certain camera features make photographing some subjects easier. A fast autofocusing system improves your odds of snapping a sharp shot of a lacrosse game, for example, and a lens that can capture subjects from a distance enables you to photograph a wild cougar without getting dangerously close.

This chapter helps you figure out whether your current camera offers the features you need for the type of photography you want to do, and, if not, guides you toward more suitable gear. At the end of the chapter, I provide some tips for getting the biggest bang for your buck if you go camera or lens shopping.

Choosing the Right Level of Camera

Digital cameras come in a variety of sizes, styles, and even colors. Later sections in this chapter provide details to help you narrow your shopping list to a few contenders. But first, it helps to consider whether you're best suited to a basic, intermediate, or advanced camera. Here's how I define these categories:

- **Basic models:** I use this term to describe entry-level cameras that offer few (or no) controls over exposure, focus, and so on. Smartphone and tablet cameras also fall into this category.

  A basic model is perfect if you're a casual photographer. That is, you enjoy taking selfies, shooting pictures of the gang at special occasions, and sharing photos of your kids or pets online. Or perhaps your work requires photographic documentation of some sort. For example, an insurance adjuster needs to include pictures of hail damage in order to process a claim. Either way, you want your pictures to be as good as possible, but you aren't interested in taking classes or otherwise learning advanced photography techniques.

- **Intermediate models:** By *intermediate,* I mean a camera that offers both automatic and manual picture-taking controls. Go this route if you want to explore photography but don't know much about the topic yet. That way, you can rely on automatic shooting modes while you're learning, and gradually step up to manual options. You can find a wide range of models in this category, some of which provide only a handful of advanced options and others that offer nearly pro-level controls.

- **Advanced models:** Cameras in this category are designed for photographers who want more sophisticated controls than intermediate cameras provide. For example, with some high-end cameras, you can use the built-in flash to trigger off-camera flash units, providing lighting flexibility that's often required for professional portrait photography. You also get substantially more ways to customize your camera, from tweaking autofocus performance to changing the function of camera buttons.

  WARNING

  Often *not* included on cameras in this category are automatic shooting modes or other make-it-easy features that you find on basic and intermediate cameras. Some models don't even offer a built-in flash, requiring you to buy a separate flash unit. This leads me to offer the following caution: No matter how much the camera salesperson (or your professional photographer friend) tries to convince you to "start at the top," don't buy an advanced camera until you master an intermediate model. The added complexity will likely overwhelm you, not to mention make a larger dent in your bank account. Step up to this level only if you start doing projects that require features not found on your intermediate-level model.

Of course, you may have multiple-photography personality, as I do, and need more than one option at your disposal. For example, for wildlife and travel photography, I lug around the large, advanced body and telephoto lens shown on the far left of Figure 1-1. (This type of camera is called a dSLR, which stands for *digital Single Lens Reflex;* see the section "Interchangeable-lens cameras," later in this chapter, for details.) I get awesome shots with this setup, but it's too large to carry all the time. For casual shots on the go, I use my smartphone — it's great for snapping scenes that catch my eye while I'm walking the dog, for example. As a point of reference, the phone in the figure measures about 5½ inches tall and about 3 inches wide.

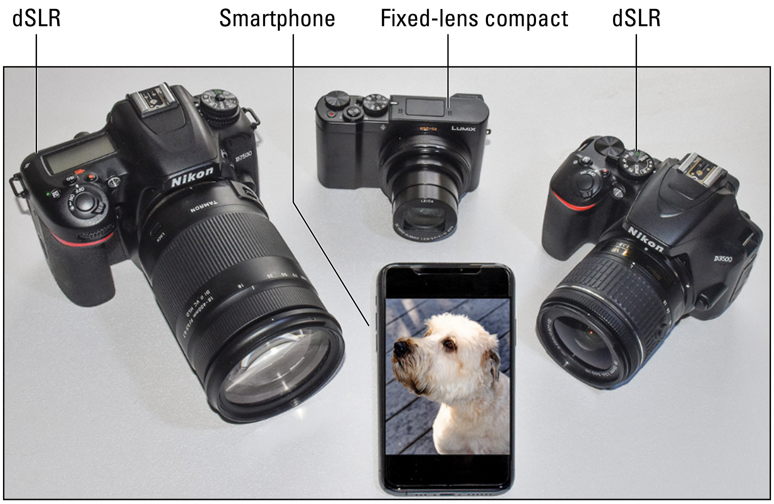


FIGURE 1-1: Each of these cameras plays a different role in my photography life.

Then there are times when I don't need all the bells and whistles of my "big rig" but want more features than my phone provides – a zoom lens, for example, or, if I'm shooting outdoors, a viewfinder that makes framing my shots easier than relying on the phone's screen, which can wash out in the sun. For those outings, I pick up one of the two smaller models in the figure, both of which sport intermediate-level controls. The one in the middle of the picture is a fixed-lens model (meaning you can't swap out lenses), but it has a pretty long-range zoom lens and fits easily into my purse. The other dSLR model (the far-right camera) isn't really purse material, but it works with the same lenses and flash I can attach to my advanced model, and the body is considerably smaller and lighter than my other dSLR.

All of which is to say that it's okay to put more than one camera on your next birthday wish list. In fact, I highly recommend it. But you still need to make sure that each model you buy suits the type of photography you want to do.

To get you started down that path, the next sections pose questions that I ask anyone who comes to me for buying advice. Your answers will guide you closer to the perfect camera(s) for *you.*

How much control do you want?

Unless you've taken photography classes, you may not be aware of how much creative input a photographer can have over a picture, so Figures 1-2 through 1-4 offer a few examples.

Each figure shows two variations of the same scene, both shot with an intermediate-level camera. The first image in each pair shows the result of shooting in the camera's fully automatic shooting mode. In Auto mode, the camera makes all the decisions for you, determining characteristics such as the brightness of the scene, whether moving objects appear sharp or blurry, and how much of the scene appears in focus. The second example in each figure shows a variation that I created by switching out of Auto mode and adjusting camera settings that modify these aspects of a photo.

Here's a brief explanation of which camera controls enabled me to produce the variations:

- **Controlling exposure (picture brightness):** In Figure 1-2, the Auto mode version of the image is okay, but what I had in mind was the darker, more dramatic shot on the right. To get that result, I used *exposure compensation,* a setting that tells the camera that you want a darker or brighter picture for your next shot. (It's much simpler to use than its name suggests; see Chapter 5 for details.) Most cameras offer exposure compensation, but how much control you have over the amount of exposure shift varies, with intermediate and advanced models offering greater flexibility.

  Keep in mind, too, that for very precise exposure control, you may need access to other options not available on basic cameras, such as the choice to enable or disable flash.

Original exposure, Auto mode | Result after exposure adjustment

FIGURE 1-2: The shot produced in Auto mode (left) lacked drama, so I used an exposure-adjustment control to produce the darker version (right).

- **Controlling motion blur:** You can determine whether moving subjects appear frozen in place or blurry. The waterfall in Figure 1-3 offers an example. The look of the water changes depending on *shutter speed,* another exposure setting covered in Chapter 5. The slower the shutter speed, the more moving objects blur. Now you know how photographers achieve the misty water effect shown in the right example. For that shot, I used a shutter speed of 1/30 second. For the left image, I used a much faster shutter speed of 1/125 second.

  Basic cameras don't offer control over shutter speed; however, some offer a "blur motion" mode designed to automatically choose a slower than usual shutter speed. Still, you rarely can set a specific shutter speed on basic models, so you can't alter the amount of blur the camera produces.

- **Controlling depth of field:** *Depth of field* refers to the distance over which objects in a photo appear to be sharply focused. You can decide whether you want objects in front of and behind your subject to appear sharp, as in the left example in Figure 1-4, or blurry, as in the right image. For the right photo, I set focus on the boat in the front of the picture. In Auto mode, the camera typically tries to keep as much of the scene in focus as possible, as shown in the left example. For the right image, I adjusted camera controls to shorten depth of field. Notice how the scene gets progressively blurrier toward the back of the frame in the right example. (The difference is most visible in the tall palm tree.)

Minimal motion blur

Extreme motion blur

FIGURE 1-3: Auto mode typically renders a waterfall similar to the left example; you need control over shutter speed to get the misty look shown in the right image.

TECHNICAL STUFF

There are various ways to manipulate depth of field: You can adjust the lens *aperture,* or *f-stop setting*; change the lens *focal length;* or get closer or farther away from your subject. If you want the greatest control over depth of field, you need all these options at your disposal. Unfortunately, control over aperture (f-stop) and focal length aren't common with smartphone and tablet cameras, although some new devices give you at least a little input over both settings.

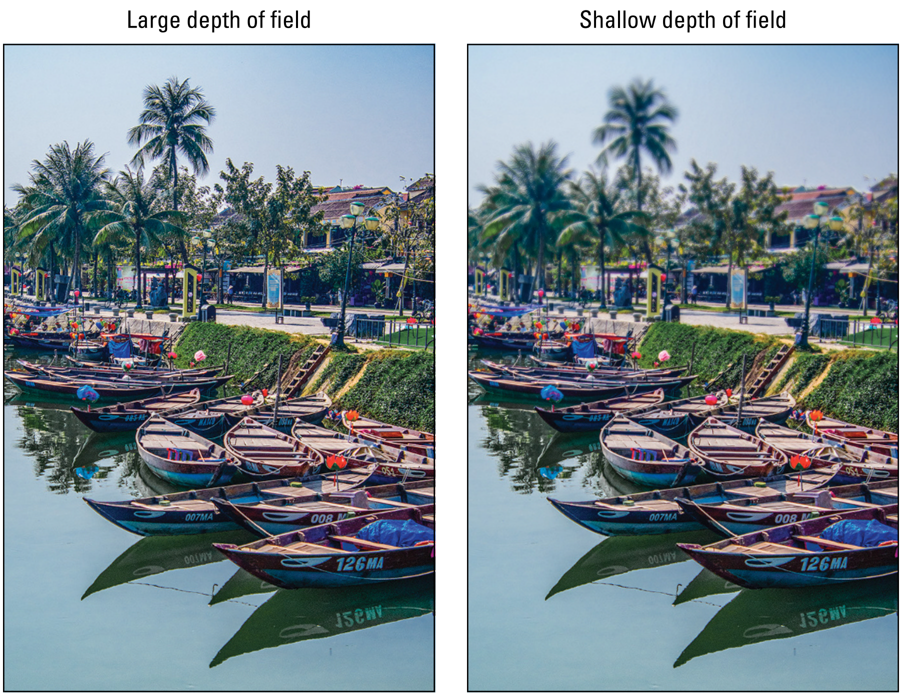


FIGURE 1-4: With the right camera controls, you can specify whether you want the entire scene to appear in sharp focus (left) or for the background to blur (right).

Neither version of the photos in Figures 1-2 through 1-4 is right or wrong, by the way; beauty, as they say, is in the eye of the beholder. The point is, if you care about these artistic decisions, you need a camera that lets you take charge of the aforementioned settings as well as others that control focusing, color, and image quality.

So how do you find such a camera? Start by checking out Table 1-1, which lists the top ten features I suggest for photographers interested in fully exploring the artistic side of photography. Please don't freak out about the photography lingo found in the table or the preceding discussion — *shutter speed, aperture, focal length, blah blah blah.* I cover them in detail in later parts of the book. For now, just use the table as a handy reference when you're looking at camera specs.

TABLE 1-1 **Top Ten Features for the Creative Photographer**

Feature	Explanation
Advanced shooting modes	Look for these modes: aperture-priority autoexposure, shutter-priority autoexposure, and manual exposure. These modes let you fine-tune exposure and manipulate depth of field (through the aperture setting) and motion blur (through shutter speed).
Continuous-capture mode	Also called *burst mode,* this shutter-release mode captures a series of photos with one press of the shutter button, which is especially critical for shooting action. Check the *frame rate* to find out how many pictures you can capture per second; higher is better.
Flash	A built-in flash or a way to attach an external flash is a must, as are options that let you control whether the flash fires, select which flash mode is used (such as red-eye reduction and slow-sync flash), and adjust flash output (often called flash exposure compensation).
Focusing options	For autofocusing, choose a model that lets you select a specific focus point, use continuous autofocusing (tracks a moving subject), and decide when to lock focus. Also note the number of focus points; the more, the better. Because autofocusing isn't always foolproof, the option to set focus manually is also essential. See Chapter 7 for focusing details.
ISO options	ISO settings control the camera's light sensitivity. Choose a camera that offers both automatic and manual control over ISO and delivers good image quality at high ISO settings. See "High ISO performance (low-light picture quality)," later in this chapter, for details.
Lens focal length and quality	*Focal length* determines how much of a scene you can capture in one shot and plays a role in depth of field. The quality of the lens glass makes a huge difference in the sharpness of your images. See the later section "Looking at Lenses" for more help.
Raw capture	For more control in the editing room and the ability to record the most brightness values, choose a model that offers Raw capture as well as the JPEG format.
Viewfinder	Without a viewfinder, you're forced to compose shots on the camera monitor, which is difficult in bright sunlight.
White Balance adjustments	White balance affects color accuracy. Look for options that enable you to fine-tune White Balance and create custom white-balance settings.
Metering mode choices	A camera's metering mode determines which part of the frame is analyzed when exposure is set. Choose a model that offers a choice of metering modes: whole frame, spot, and center-weighted, for example. (Chapter 5 explains.)

How important is picture quality?

Of course picture quality is important — no matter what your photographic interests, you want your photos to look as good as possible. But just as with most products you buy, cameras and lenses that produce the top photo quality cost more than equipment that comes in a notch or two down the scale. So the real point to ponder is, how much are you willing to spend to get the ultimate photo quality? If you want to sell or exhibit your photos, you may not be willing to compromise on quality. But if you're using your camera for some other purpose, you may be able to save some cash and still be perfectly happy with your photos.

WARNING

The following sections explain features that affect picture quality. Before you dig in, note that you can't rely on camera specifications for the final word on image quality. Photos from two cameras with the same specs may differ greatly because of a difference in various internal components. For the full story, check out reviews done by pros who have the equipment and expertise to make accurate and objective photo-quality assessments.

Resolution: How many megapixels?

TECHNICAL STUFF

Digital images are made of colored tiles known as *pixels*. Camera *resolution*, stated in *megapixels* (1 million pixels), indicates the maximum number of pixels the camera can use to create a photo. Chapter 2 discusses resolution in detail, but in terms of picture quality, you need to know just two key points:

- **For onscreen photos, you need very few pixels.** Resolution affects the display size of digital photos, but does *not* affect picture quality unless you greatly magnify your screen display. For most purposes, such as posting on Instagram or Facebook, a 1 MP (megapixel) image is adequate.
- **For prints, you need lots of pixels.** Figure 1-5 offers a look at the difference between a print with plenty of pixels (left) and one lacking in that department (right). With fewer pixels, it's easier for the eye to detect that it's looking at a bunch of squares. There simply aren't enough pixels to finely render the details of the subject, and diagonal and curved lines appear jagged, or stair-stepped, along the edges.

  A general guideline is to aim for 300 pixels per linear inch (ppi) of the print size. An 8 x 10-inch print, for example, requires 2400 x 3000 pixels, or a resolution of approximately 7 MP. (Total image resolution is calculated by multiplying the number of horizontal pixels by the number of vertical pixels; 2400 x 3000 equals 7.2 million pixels.)

WARNING

An important caveat: Not all pixels are created equal. The size of the image sensor that contains those picture building blocks must also be considered, as discussed next. The quality of the camera's lens is critical, too — all the megapixels in the world can't compensate for a poor lens.

FIGURE 1-5: A photo that has 300 pixels per inch (ppi) compared to one with a meager 50 ppi shows the impact of resolution on print quality.

Image sensor size: Full frame or smaller?

TECHNICAL STUFF

A photograph is formed when light passes through a lens and strikes a light-sensitive recording medium. In a film camera, the film negative performs the light-recording function. In a digital camera, the *image sensor* handles the task. The sensor is covered with *photosites*, which are electronic doodads (that's the technical term) that collect the light data needed to create image pixels.

When you look at camera specs, the sensor type and size should be listed. Most cameras now use a type of sensor called CMOS, which stands for *complementary metal-oxide semiconductor*. I share that nerdy detail just so you won't spend any more time worrying about what CMOS means. Instead, turn your attention to the sensor size, which is the critical part of the spec.

A smaller sensor generally produces lower image quality than a large sensor. Why? Because when you cram tons of photosites onto a small sensor, you increase the chances of electronic noise that can degrade the picture. So even if two cameras claim the same resolution, the model with the larger sensor is likely to produce higher-quality images than the one with a smaller sensor.

When sensor size is presented as a single number, such as 1″, the number reflects the diagonal measure of the sensor. The photo industry also uses the following terms to refer to certain sizes of sensors:

- **Full frame:** The sensor is the same size as a 35mm film negative (36 x 24mm). Why *full frame?* The term is related to camera lenses, which are still manufactured using the 35mm film negative as a standard. That means that a full-frame sensor is large enough to capture the entire angle of view that a lens produces on a 35mm film camera. Smaller sensors can capture only a portion of that angle of view. For more on this issue, check out the upcoming section “Lens focal length.”
- **APS-C (Advanced Photo System-type C):** This is a smaller-than-full frame sensor but with the same 3:2 proportions as a 35mm negative. Within this category, the specific dimensions of the sensor vary from camera to camera. Nikon APS-C sensors measure about 24 x 16mm, for example, whereas Canon’s typically measure approximately 22 x 15mm.

  TECHNICAL STUFF

  Some people use the term *crop* sensor to refer to this category because it’s a trimmed-down version of a full-frame sensor. Technically, the *C* in APS-C stands for *classic,* but *crop* is more helpful in remembering how these sensors vary from full-frame versions. Also, Nikon coined the term *DX* to refer to its APS-C sensors, using *FX* to indicate full-frame sensors.
- **Micro Four Thirds:** These sensors are slightly smaller than APS-C sensors, and as the name implies, they have a 4:3 aspect ratio as opposed to the 3:2 ratio of full-frame and APS-C sensors. Note that the term Four Thirds is used for any sensor that has a 4:3 aspect ratio, even for those much smaller than a Micro Four Thirds sensor.

  Which is best — 4:3 or 3:2? Well, there’s no magic to either aspect ratio. But 3:2 originals translate perfectly to a 4 x 6 print, and a 4:3 image must be cropped to fit. Mind you, you also need to crop 3:2 originals to print them at other frame sizes — 5 x 7, 8 x 10, and so on. And many cameras enable you to choose from several aspect ratios for your pictures or to crop them to a certain proportion using in-camera editing tools.

Image file format: JPEG versus Raw

TECHNICAL STUFF

File format refers to the type of file used to record picture data. The standard format is JPEG (“jay-pegg”), but cameras aimed at intermediate and advanced photographers usually offer a second format called Camera Raw, or just Raw for short.

Pro photographers generally prefer Raw for a couple of reasons. First, when it comes to image quality, Raw outperforms JPEG for reasons you can explore in Chapter 2, if you're interested. Second, Raw can record a greater *dynamic range* (spectrum of brightness values, from shadows to highlights).

Additionally, Raw provides a higher level of creative control. JPEG files are "processed" in the camera, with characteristics such as contrast, sharpness, and color saturation tweaked to provide what the manufacturer thinks its clients like. Raw files are just that: uncooked data straight from the image sensor. The photographer then does the work of turning that data into a photo using a software tool known as a Raw converter, which gives the photographer the final say over the look of a photo.

Don't take all this to mean that you should bypass cameras that offer only JPEG, however. Today's digital cameras produce excellent-quality JPEG images, unlike some of the JPEG-only models of past years. But obviously, a camera that offers both formats beats one that doesn't provide the Raw option. You may not be interested in Raw now, but as your skills grow, it may become more appealing to you.

High ISO performance (low-light picture quality)

TECHNICAL STUFF

A digital camera's sensitivity to light is measured in terms of *ISO*, named for the group that developed the standards for this attribute (International Organization for Standards). Most cameras offer a choice of ISO settings so that you can increase or decrease light sensitivity as needed. In dim lighting, for example, you may need to raise the ISO to expose the image.

Being able to increase light sensitivity is great in terms of exposure needs, but there's a tradeoff: As you increase sensitivity, you increase the chances of introducing a defect known as *noise*, which gives your photo a speckled look. Figure 1-6 offers an example, with the noise most evident in the dark background of the picture. Noise is also easier to spot when you enlarge the image, as illustrated by the magnified view shown on the right in the figure.

Today's cameras are much less noisy at high ISO settings than in years past. In fact, if you're using a camera that's more than a couple of years old, better low-light pictures is a valid reason to purchase a new model. But because noise levels at different ISO settings vary from camera to camera, check camera reviews for this important information. Bear in mind that a model that offers an ISO range that tops out at a higher number than another camera isn't automatically better; you may not be gaining anything if the noise produced by the higher ISO is significant.

FIGURE 1-6: Read reviews to find out how high an ISO setting a camera can use without producing *noise,* the speckly defect that mars this image.

See Chapter 5 to get a better understanding of ISO and how to deal with image noise.

Lens size, type, and quality

As with eyeglasses, having a carefully crafted lens — "good glass," in photo lingo — is critical to image quality. Unfortunately, it's not practical for most of us to test lenses to find the best performer. The good news is that lens reviews are readily available in photography magazines and at online photography sites.

One thing you *can* predict with some confidence is that a larger-diameter lens will produce sharper, better images than the tiny lenses found on smartphones and tablets. Then again, cameras that sport larger lenses typically lack that oh-so-handy flashlight built into most smartphones. What can I say; life's just one tradeoff after another.

See the section "Looking at Lenses," later in this chapter, for other tips on buying a lens.

Do you want to use multiple lenses?

Digital cameras fall into one of two categories: *interchangeable-lens cameras* and *fixed-lens cameras.* The next sections give you the pros and cons of each type of camera.

Interchangeable-lens cameras

Cameras in this category consist of two components: a camera *body,* which contains the guts of the picture-taking system, and a lens, which you attach to a mount on the front of the body.

What does this flexibility give you? Well, as of yet, no one has invented a single lens that's perfectly suited to capturing the entire range of subjects photographers may want to shoot. A lens designed to produce an extreme close-up, for example, has different optical qualities than one engineered to capture a faraway subject. Ergo ipso facto, we have the interchangeable-lens camera, which enables you to use whatever lens your subject demands.

Within this category, you find the following types of cameras:

- **dSLR (digital single-lens reflex):** For a look at this type of camera, refer to Figure 1-1; the far-left and far-right models are both dSLRs.

  TECHNICAL STUFF

  About the name: The *d* in *dSLR* represents *digital,* distinguishing a digital SLR from film models, which have been around for a long time. SLR stands for *single-lens reflex* and refers to the viewfinder technology used in this type of camera. The name stems from the fact that the SLR viewfinder involves a series of mirrors that reflect (reflex) the light coming through the lens to the viewfinder display.

  Although dSLRs were once large, heavy, and complicated, manufacturers now also offer models geared to novice photographers as well as advanced shooters. High-end dSLRs still remain fairly large, but entry-level and intermediate models are available in significantly reduced sizes. The smaller of the two dSLRs in Figure 1-1 isn't much wider than the compact, fixed-lens model or, for that matter, the smartphone.

- **Mirrorless cameras:** With this type of camera, the mirror-based viewfinder system is gone — thus, it's *mirrorless.* Taking out that mirror assembly enables mirrorless camera bodies to be smaller and lighter than dSLRs. Figure 1-7 shows a top view of a mirrorless model next to a small dSLR for comparison. I show both models without a lens attached so that you can get a better idea of how the mirrorless design affects the size of the camera body. However, not all mirrorless camera bodies are as small as the one in the figure. In fact, some pro mirrorless bodies are a bit larger and heavier than the smallest dSLRs. Of course, the size of the lens you put on the body determines the overall bulk and weight of both types of cameras.

FIGURE 1-7: Although it's not always the case, a mirrorless camera body (left) is usually less bulky than even a small dSLR (right).

WARNING

Some mirrorless models do away with the viewfinder entirely; you compose the image using the monitor on the camera back. Others, such as the one featured in Figure 1-7, incorporate or enable you to attach an *electronic viewfinder* (EVF), which provides the convenience of a viewfinder without taking up as much space as an *optical viewfinder*, which is the type used in a dSLR viewfinder. The section "Viewfinder: Optical or electronic," later in this chapter, has more details.

TIP

Today, the hot commodity in the pro photography arena is a full-frame mirrorless camera. You get the image-quality and lens coverage benefits of a full-frame sensor in the smaller body afforded by the mirrorless design, all of which sounds good. However, these models are expensive; expect to spend $1,000 or more just for the body. And you can't use your existing dSLR lenses without an adapter, which negates some of the size and weight benefits of a mirrorless system. If you want to ditch the adapter, you'll have to buy new lenses specially designed for the mirrorless body you pick. Personally, I don't have that kind of cash on hand, but as with all technology, prices tend to drop as time goes by, so . . . a girl can dream, can't she?

- **Rangefinders:** A less-common variety of interchangeable-lens camera, rangefinders look a lot like mirrorless models, but work quite differently. Traditional rangefinders use a different focusing system than other cameras. The viewfinder displays two views of your subject, and you determine the focusing distance, or range, by turning a ring on the lens until the two images align. Most rangefinders offer only manual focusing, although a few do also provide some autofocusing options. Leica is the best-known manufacturer of rangefinder digital cameras.

Fixed-lens cameras

Again, by *fixed lens*, I mean a lens that's permanently paired with the camera body. Cameras in this category fall into two camps:

- **"Real" cameras:** That is, a camera whose sole purpose is photography, as opposed to a computer device or phone that sports a camera.

  TIP

  Most people refer to these cameras as *point-and-shoot* models because they offer automatic settings that enable the novice photographer to, well, point and shoot. Yet I hesitate to use the term, because higher-end fixed-lens models do let you control exposure, focus, and other picture settings. And although you can't swap out lenses on these cameras, many models have zoom lenses that reach from wide-angle to telephoto views, so you still enjoy lots of picture-taking flexibility.

  Whatever you want to call them, these cameras come in a variety of sizes, shapes, and colors, ranging from models that look like a small dSLR or mirrorless camera to pocket-size wonders that make the latest smartphones look huge. You also can find models specifically designed for rugged use, offering features such as shockproof and water-resistant cases. These models are great not only for outdoor adventurers, but also for young photographers who may not always be as careful with their devices as the adults in their life would like them to be. Heck, I certainly don't qualify as a young photographer (although 60 *is* the new 59), and I can't be counted on to always retain a firm grip on my equipment, either.

- **Smartphone and tablet cameras:** Of course, no book on digital photography today would be complete without mentioning the cameras built into these multipurpose devices. Providing specifics, though, is difficult because the capabilities of smartphone and tablet cameras vary so widely. On some devices, you can do things such as tap the screen to indicate the focus point or adjust exposure slightly, but other devices give you no control at all. Some devices offer multiple built-in lenses, each with a different focal lengths, while others limit you to a single lens and focal length. Suffice it to say that if you're going to use a mobile device as your main camera, do your research.

Also note that even though you can't swap out lenses on these types of cameras, you can often attach lens modifiers that provide a different angle of view than the built-in lens. Companies such as Moment (`www.shopmoment.com`) sell telephoto and macro (close-up) add-on lenses for smartphones, for example.

Looking at Lenses

As your camera's eye, the lens plays a huge part in what types of photos you can capture. It determines not only how much of a scene you can record in one shot, but also the quality of the image and certain other characteristics of a photograph.

When considering lenses, pay attention to the specifications outlined in the next sections.

Camera compatibility

Interchangeable-lens cameras require specific lens types. If you have a Nikon camera body, for example, the lens must have a Nikon mount. That doesn't mean that you have to stick with the manufacturer's lenses; you can get great lenses from third-party makers such as Tamron and Sigma. Again, just make sure that the lens offers the correct mount for your camera (or that you can make it work with an adapter).

WARNING

Just because you can put a lens on a camera doesn't ensure that it can take advantage of all camera features, however. Autofocusing may not be possible, for example. Check your camera manual for details on what types of lenses support which camera features.

Lens focal length

TECHNICAL STUFF

Focal length, stated in millimeters, refers to the distance from the center of the lens to the image sensor.

Now that I've done my due diligence in the technical explanation department, allow me to explain focal length in practical terms:

» **Focal length determines the lens's angle of view.** The shorter the focal length, the more subject area fits in the frame. Increasing focal length narrows the angle of view and makes your subject appear closer and larger. Figure 1-8 illustrates this fact, showing the same scene captured at four focal lengths. (A lower number indicates a shorter focal length.)

  Some focal length recommendations:

  - *Landscape photography:* Look for a *wide-angle lens,* characterized by a focal length of 35mm or shorter.
  - *Nature and sports photography:* Assuming you'll be shooting at a fair distance from your subject, you need a *telephoto lens,* which has a focal length of 70mm or longer.
  - *Portrait photography:* Aim for a focal length in the range of 70–135mm. At other focal lengths, facial features can be distorted. A wide-angle lens, for example, can make your subjects appear sort of like how they look when you view them through a security peephole in a door. And a very long lens can flatten and widen a face.

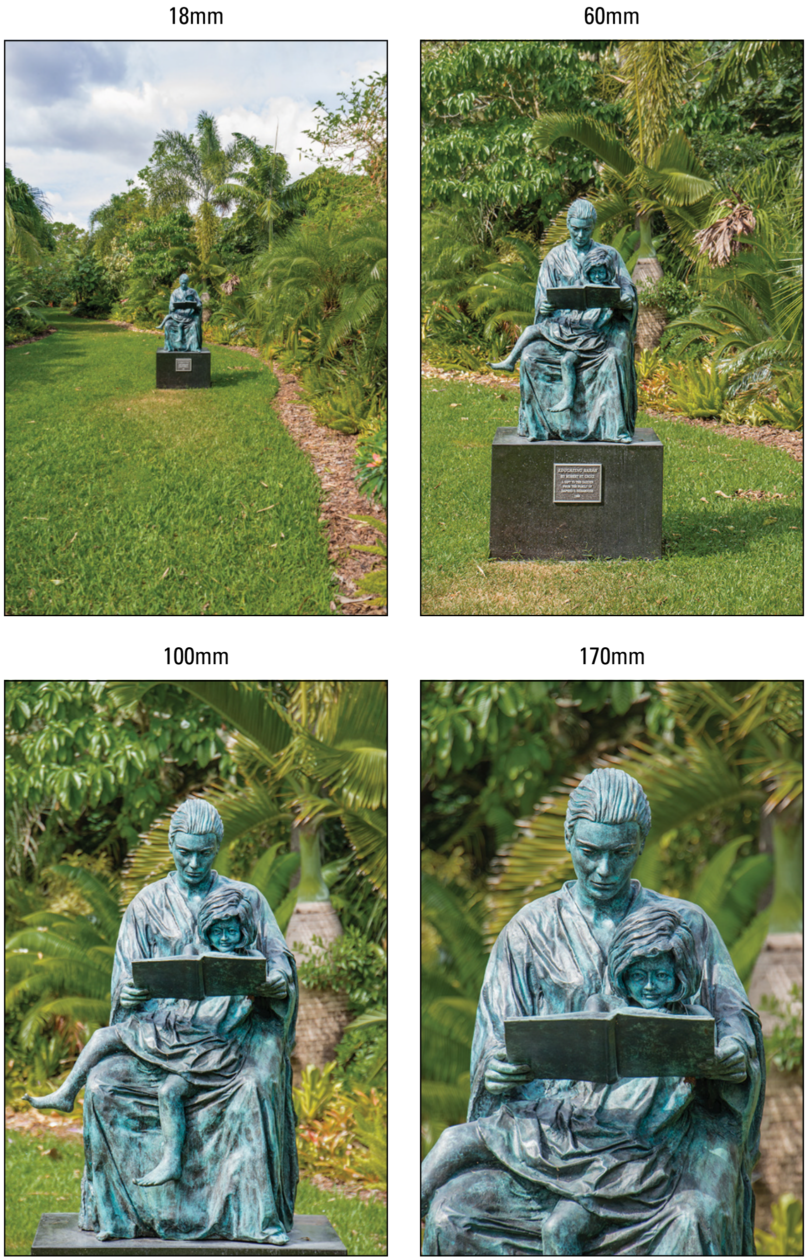


FIGURE 1-8: The shorter the focal length, the wider the angle of view.

» **Focal length affects depth of field.** As focal length goes up, depth of field — the distance over which focus appears sharp — goes down. As an example, compare the backgrounds in Figure 1-8. Notice how much blurrier the trunk of the palm tree behind the sculpture appears in the 170mm image than in the versions shot at the shorter focal lengths.

WARNING

» **The angle of view produced by any focal length depends on the camera's crop factor.** For reasons too wonky to get into, the photo industry still measures lens focal lengths using the traditional 35mm film negative as a standard. That means that you get the stated focal length — and resulting angle of view — only on a camera that has a full-frame sensor (one that's the same size as a 35mm film negative). With a camera that has a smaller sensor, the angle of view is reduced because the sensor is no longer large enough to capture the entire area that the lens can see. The resulting picture is what you would get if you took a picture with a full-frame camera and then cropped the picture. The measurement of how much frame area you lose is known as the *crop factor.*

  Because sensor sizes vary, the crop factor depends on the camera model. Most dSLR and mirrorless image sensors have a crop factor ranging from 1.5 to 2. Figure 1-9 illustrates the image area at these crop factors when compared to the full-frame view.

  To figure out what angle of view a lens will provide, multiply the lens focal length by the camera's crop factor, which should be stated in the camera specs. For example, if the camera has a crop factor of 1.5, a 50mm lens gives you the same angle of view as a 75mm lens on a full-frame digital or 35mm-film camera.

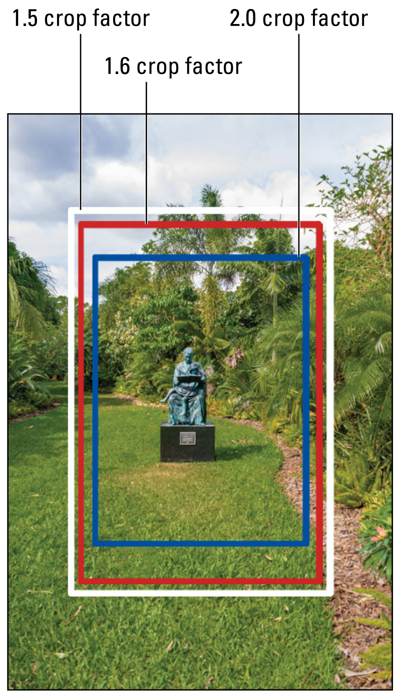


FIGURE 1-9: The white, red, and blue boxes indicate the angle of view you get with cameras that have crop factors of 1.5, 1.6, and 2.0, respectively.

In most cases, focal length is printed on the lens, but for some models, you may need to check the user manual or lens spec sheet. Often, the manufacturer gives both the actual focal length of the lens (that's the measurement mentioned in the opening to this section) as well as the 35mm equivalent.

Prime versus zoom lenses

A *prime* lens offers a single focal length; a zoom lens, a range of focal lengths. For example, a lens might zoom from 18 to 55mm.

In camera or lens advertisements, the zoom range is sometimes described in terms of an "x" factor, as in a *3x zoom.* Here, the *x* means *times,* with the value indicating the difference between the shortest and longest focal length of the lens. So an 18–55mm lens boasts a 3x zoom, for example (18 × 3 = 54).

TIP

As a general rule, prime lenses equate to better-quality photos because a lens can be engineered to optimal performance at only a single focal length. That said, one of my favorite lenses is the *super zoom;* it has a monster focal length range — 18 to 400mm. Newer lenses perform better in this regard than those manufactured in the past.

WARNING

Some fixed-lens cameras offer both *optical* and *digital* zoom. *Optical zoom* is a true zoom lens and produces the best picture quality. *Digital zoom* is a software feature that crops away the outside of the image and enlarges the remaining area, a process that lowers image quality. In other words, pay attention to the optical zoom specs and don't be too impressed by the digital zoom range.

Lens aperture range

TECHNICAL STUFF

The *aperture* is an adjustable hole through which light must pass to reach the image sensor. Aperture size is stated in *f-numbers,* more commonly referred to as *f-stops.* A higher number indicates a narrower aperture size. So f/11, for example, results in a smaller aperture opening than f/8.

Changing the aperture size is one way to manipulate exposure. But the f-stop setting also contributes to *depth of field,* or the distance over which focus appears sharp. The smaller the aperture, the greater the depth of field, as illustrated in Figure 1-10. The background is much sharper in the left image, taken with an f-stop of f/22, compared with the right image, shot at f/6.3.

If you're keeping track, you now know that the lens gives you two points of control over depth of field: the focal length and the aperture setting. In Figure 1-10, I used the same focal length for each shot, so the aperture setting is the sole reason for the shift in depth of field.

FIGURE 1-10: For the left image, I set the aperture to f/22; for the right image, f/6.3.

And why, you're probably wondering, is the exposure of both images in Figure 1-10 the same, given what I just said about the f-stop affecting image brightness? This is why: To compensate for opening the aperture to f/6.3, I reduced the exposure time by changing the shutter speed from 1/320 of a second to 1/4000 of a second, so the light was able to strike the image sensor for a shorter period. I kept the ISO setting (light sensitivity) at ISO 400 for both photos.

You can explore f-stops, exposure, and depth of field further in Part 2 of the book. For the purpose of comparing lenses, you need just a few more bits of aperture information:

- **Every lens has a specific range of aperture settings.** Obviously, the larger that range, the more control you have as a photographer.
- **The larger the maximum aperture, the "faster" the lens.** Again, the more open the aperture becomes, the less time is needed to expose the image. So if one lens can open to a maximum setting of f/4 and another lens has a maximum aperture of f/2, the f/2 version is said to be faster.

  TIP

  A fast lens is especially beneficial when photographing action, because a moving subject blurs at long exposure times. But it also helps when you shoot in dim lighting, because you can get the shot at a lower ISO setting, reducing the chances of image noise. That very low f-stop also enables you to produce images that have a very shallow depth of field when your creative vision demands it.

» **On a zoom lens, the aperture range may change as you zoom in or out.** For example, on an 18–140mm lens, you may be able to open the aperture to f/2 when the lens is at the 18mm position but only to f/5.6 at 140mm. You can buy zoom lenses that maintain the same minimum and maximum apertures throughout the zoom range, but be prepared to part with more money than for a lens that doesn't offer this feature.

» **Depth of field at any aperture varies depending on the size of the image sensor and lens.** Cameras with small sensors and lenses produce a much greater depth of field at any f-stop than cameras with larger sensors and lenses. The result is that it can be difficult to achieve much background blurring even if you open the aperture all the way. That's an important consideration if you're interested in the type of photography that benefits from a short depth of field, such as portraiture. On the other hand, if you're a landscape photographer, you may love the extended depth of field those smaller sensors and lenses produce.

Minimum focusing distance

This number is especially important if you enjoy shooting close-ups. The shorter the minimum focusing distance, the closer you can get to your subject, enabling you to fill the frame with small details.

TIP

If you're really into close-up photography, you may want a *macro* lens, which permits especially close focusing. Technically, the term *macro* means that the lens can record an object at its actual size or larger, but sometimes the label is used to refer to closer-than-normal focusing in general. Check out Chapter 10 for more tips on close-up photography.

Lens weight and size

Today's lenses are significantly lighter and smaller than those from even a few years ago. So if you're shooting with an older lens that's weighing you down — literally — check out the newer options. Some lenses retract into a more compact form when you're not using them, as shown in Figure 1-11.

TIP

For a super-zoom lens, look for a model that has a lens-lock feature. The lock holds the lens in its "unzoomed" position when you're not using the camera. Without the lock, the lens may be subject to *lens creep*, which means that the lens extends under its own weight when the camera is pointed down, such as when it's on a traditional camera strap, hanging around your neck.

FIGURE 1-11: Some lenses collapse when not in use, taking up less room in your camera bag.

Lens quality

Last but most definitely not least, two lenses with the exact same size and aperture specifications may not be equivalent in terms of the quality of the components used to manufacture them. As stated earlier, the best way to get information on this issue is to read reviews from independent photography magazines and websites. If you already own a camera body and are just shopping for a new lens, you may also be able to visit a camera store and take some test shots with different lenses.

SO HOW MUCH IS THIS GOING TO COST?

Camera prices are dynamic, so any dollar amount I mention will likely be out of date by the time you read this. But as a general guideline, basic cameras range from about $75 to $200, and intermediate-level models sell in the neighborhood of $300 to $800. Advanced models typically set you back around $800 to $2,000 or even higher, and that price may or may not include a lens. Lenses also vary widely in price, starting at around $150 and reaching into the thousands.

Note that these price guidelines don't include smart device cameras. Prices for phones and tablets are based on far more than the camera capability, although the photography-fun aspect of such devices seems to be the one most touted in ads. Again, check reviews to get the scoop on how various devices stack up in terms of camera performance.

Remember, too, to include a few necessary accessories in your budget, such as memory cards (the little cards that store your pictures), a tripod, and a good camera bag. See Chapter 6 for information about flash and lighting accessories; Chapter 8 for portrait-photography accessories; and Chapter 10 for some landscape-photography tools. Chapter 14 covers additional accessories to consider.

Lens quality isn't just about the purity of the image produced, though; things like how smoothly a telephoto lens extends and whether the lens feels solid or flimsy are also important. If you're an outdoor photographer, a weather-sealed lens may also be important to you.

Reviewing a Few Final Camera Features

I could write an entire book decoding all the other specifications that affect the type and quality of the pictures your camera can produce. But we'd both be bored to tears after the first few pages. Instead, the rest of this chapter lists only the options that I think make a real difference. Some are designed just to make things easier for beginners, some are geared to advanced photographers, and some can improve your time behind the lens no matter what your experience or interest level.

Shooting modes

How much artistic control a camera offers is closely tied to its choice of *shooting modes*, sometimes called *exposure modes.* Usually, shooting modes are represented by letters and symbols like the ones you see on the camera dial in Figure 1-12.

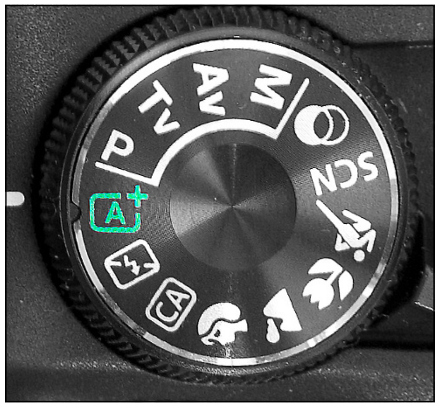


FIGURE 1-12:
The various symbols on this camera dial represent shooting modes.

If you fall into the "not that into photography" category, you'd be happy with a basic camera that offers only automatic shooting modes. Along with standard Auto mode, this level of camera typically also offers *scene modes*, which automatically dial in settings deemed most appropriate for specific types of photos, such as portraits and sports shots. (These modes are usually represented by symbols such as the ones you see in the figure — the woman's head represents portrait mode, for example.)

The problem with scene modes is that they're geared to producing a certain effect, and you can't deviate from that result. For example, in Sports scene mode, the camera can only freeze action; you don't have the option of blurring motion. And in Portrait mode, the camera blurs the background as much as it can. That's fine for most portraits, but you may have times when you want the background to be as sharp as your portrait subject.

For more photographic control, I suggest a camera that offers these three shooting modes: shutter-priority autoexposure, aperture-priority autoexposure, and manual exposure. These modes enable you to precisely control not only exposure, but also all the other characteristics I discuss at the start of this chapter and more. Many cameras also offer P mode, which stands for programmed autoexposure. This mode typically enables you to choose from different combinations of exposure settings, so it's a step above full auto. But it's not quite as convenient as the the other three modes I just mentioned when you know exactly what settings you want to use. Check out the first part of Chapter 2 for specifics on these and other common shooting modes.

Image stabilization

One cause of blurry pictures is *camera shake.* If the camera moves when the shutter is open, the entire image may be blurry even when focus is perfectly set. The longer the exposure time, the longer you have to hold the camera still to avoid this type of blur. Shooting with a telephoto lens makes things even more difficult, especially if that lens is long and heavy.

You can avoid camera shake by mounting the camera on a tripod. But a feature called *image stabilization* can enable you to get sharper shots when you handhold the camera. The feature may go by different names depending on the manufacturer: *vibration reduction, antishake, vibration compensation,* and the like. Whatever the name, the feature is implemented in one of two ways:

- **Hardware-based stabilization:** With this method, sometimes called *optical image stabilization,* the antishake benefit is produced by a mechanism built into the camera or the lens. This type of image stabilization is best.
- **Software-based stabilization:** This type of stabilization — sometimes known as *electronic image stabilization,* or EIS — is applied by the camera's operating software rather than a hardware mechanism. It works differently depending on the camera.

  In some cases, the camera applies some complex correction filters to the image when motion is detected. Other cameras address camera shake by automatically increasing the ISO setting, which makes the camera more sensitive to light. When the camera is at a higher ISO, you can use a faster shutter speed, which means that the length of time you need to hold the camera still is reduced. Unfortunately, a higher ISO often brings the unwanted side effect of image noise, as discussed in the earlier section "High ISO performance (low-light picture quality)."

Even the best possible stabilization system can't work miracles; you still need a tripod for very long exposures. But you can expect to get a steady shot at shutter speeds slower than what you can enjoy without stabilization. How much slower depends on the capabilities of the camera or lens as well as your ability to hold the camera still.

Long story short (too late, you say?): This is one camera feature that I highly recommend to photographers of any level.

Viewfinder: Optical or electronic?

TIP

Cameras that lack a viewfinder force you to frame your shots using the monitor. That causes two problems: You have to hold the camera a few inches away to see the monitor, and unless you keep your hands very steady, camera shake can cause a blurry picture. Additionally, monitors wash out in bright light, making it hard to see what you're shooting. For these reasons, I consider a viewfinder important.

But not all viewfinders work the same way, and because this component plays a critical role in your camera use, it's worth understanding the differences. Here's a look at your options:

Optical viewfinders

This term is used to describe a standard viewfinder — the kind that's been used for a long time in both film and digital cameras. Optical viewfinders come in two forms:

- *TTL (through-the-lens)*: The display is created by light coming directly through the lens.
- *Non-TTL:* For technical reasons I won't bore you with, a TTL lens requires a larger, bulkier camera design. As an alternative, some cameras have non-TTL viewfinders, which simply means that the placement of the viewfinder is such that it has a slightly different angle on the scene than the lens. This results in *parallax error*: The viewfinder doesn't show exactly what the lens will capture, making it difficult to precisely frame a photo.

  To help solve the problem, most cameras include framing marks in the viewfinder to guide you; when camera shopping, be sure the framing marks are easy to see. And note that not all viewfinders of this type are created equal — the amount of parallax error varies from camera to camera, so do your research.

Electronic viewfinders (EVFs)

With an electronic viewfinder (EVF), the camera sends the live feed that's normally displayed on the camera monitor to the viewfinder, and because the monitor shows the same area as the lens, this viewfinder option offers the same improvement in accuracy that you get with a TTL optical viewfinder. But the EVF system has two other benefits: First, you can not only use the viewfinder to compose your subject, but also see *everything* normally displayed on the camera monitor. You can review your photos through the viewfinder, for example, and see camera menus. I love these features when I'm shooting in bright sunlight. Instead of having to look for a shady spot where I can clearly see what the monitor is displaying, I simply look at the viewfinder display. However, EVF displays vary in display quality, size, and performance, so this is one component you should test in person.

Video-recording capabilities

Most digital cameras can record video as well as still pictures. In this book, I don't provide much video-recording information, for two reasons. First, if all you're after is basic recording, there's not much to it: You press the Record button to start recording and press it again to stop. On the other hand, if you want to get serious about digital cinematography, you're probably after a lot more information than I have room to offer in this book.

That said, I realize that you may want a little guidance as far as knowing which video-related specs are most important, so the following list gives you an introduction:

TECHNICAL STUFF

- **Video resolution (frame size):** Just like photos, digital videos are created out of pixels, and the resolution, or *frame size,* indicates how many pixels are used to produce each frame of video. The highest resolution found on most cameras is 1920 x 1080, known as *Full HD* (*high definition,* as in HDTV); the second highest, 1280 x 720 pixels, which is *Standard HD.*

  Many cameras now also offer 4K video, which delivers *approximately* 4000 horizontal pixels and is designed for the hot (for now) new 4K displays.

- **Progressive (p) versus interlaced (i):** This spec has to do with the way that the video frames are created. Progressive is the more current technology and is considered better for most video-recording purposes.

- **Frame rate:** This value indicates how many frames the camera records per second, which affects the look of your movies:
  - *24 fps*: The standard for motion pictures; gives videos a soft, movie-like look.
  - *25 fps:* The standard for television broadcast in countries that follow the PAL video-signal standard, such as some European countries. It gives videos a slightly more "real-life" look.
  - *30 fps*: Resulting in even crisper video, 30 fps is the broadcast standard for the United States and other countries that use the NTSC signal standard. It's the default setting for cameras bought in those countries, too.
  - *50 and 60 fps:* These super-high frame rates are designed for capturing very fast action as well as for shooting footage that you want to play in slow motion. (More original frames delivers smoother slo-mo playback.)

    How about 50 versus 60? You're back to the PAL versus NTSC question: 50 fps is a PAL standard, and 60 is an NTSC standard.
  - *120 fps or faster:* A few cameras raise the frames per second bar even higher. Again, the purpose of this high frame rate is for creating slow-motion footage.
- **Audio features:** Built-in microphones on most cameras produce so-so audio quality and also often pick up and record noise from the camera's autofocusing system. For better audio, some cameras allow you to attach an external microphone. If you're a serious videographer, look for a model that enables you to attach headphones so you can monitor audio as you're recording.
- **Continuous autofocusing:** Most new cameras can track focus during recording, a capability that was missing until a couple years ago. Of course, on interchangeable-lens cameras, you can forego autofocus and focus manually, but it takes practice to be able to adjust focus manually without creating noticeable camera movement.

Memory-card features

Instead of recording images on film, digital cameras store picture data on removable *memory cards.* Most cameras can hold only one card at a time, but some have two card slots. This feature is great because you can configure the two cards to perform different storage functions. You can put all your Raw files on one card, for example, and JPEG files on the other. Or you can send all files to both cards so that if one fails, the other provides a safety net.

Another thing to know about memory cards is that they vary in terms of capacity and in how fast they can record data. Larger cards hold more pictures and videos, and faster cards enable you to capture more pictures per second and record smoother videos. But not all cameras can take advantage of the highest-capacity, fastest cards. I won't bore you here with an explanation of card capacity and speed specs (I save that for Chapter 2); for now, just know that if you do a lot of fast-action photography or video recording, this is a camera feature that matters.

Convenience features

No matter what category of photographer you consider yourself, I rank the following features as not critical, but nice to have:

- **Articulating (adjustable) monitor:** Some cameras, such as the Canon model shown in Figure 1-13, feature fold-out screens that can be rotated to a variety of angles. The benefit is that you can position the camera at nearly any angle while still being able to see the monitor, a feature that is especially attractive to *vloggers* — people creating and starring in videos they post on YouTube or other online video platforms.

FIGURE 1-13: Some monitors can be adjusted to different viewing angles.

- **Touchscreen operation:** Of course, all smartphone and tablet cameras can be operated by touch, as can the devices' picture-playback tools. But touchscreens are being included on many other types of digital cameras as well.
- **Wireless connectivity:** Many cameras offer this feature, enabling you to enjoy the cable-free life when it's time to download pictures to your computer. Additionally, the camera manufacturer may provide a mobile app that enables you to view and transfer pictures from your camera to a smartphone or tablet via a wireless connection. The app may even make it possible to use your smart device as a wireless remote control for the camera.

- **In-camera editing tools:** Many cameras offer built-in retouching filters that can fix minor picture flaws, such as red-eye or exposure problems. For easier online sharing, you also may find in-camera options that create low-resolution copies of high-resolution originals and convert Raw files into the JPEG format. (You have to convert Raw files to JPEG in order to share them online.) These tools are especially helpful for times when you need to print or share a photo before you can get to your computer to fix the image in your photo software or create an online version.
- **Conveniently located tripod socket:** For long-exposure shooting, a tripod is a necessity. Most cameras offer a socket for attaching a tripod, but the placement is not always thoughtful. Some are positioned such that you can't access the battery or memory card slot while the camera is on the tripod — a design that will quickly become an annoyance.

So . . . Is It Time for a New Camera?

Summing up all the details in the preceding sections, the answer is "Maybe." Consider investing in a new model if any of the following statements apply:

- You're not happy with the quality of your printed photos.
- You have trouble capturing action shots because your camera is a slow performer.
- Your pictures appear noisy (speckly) when you shoot in dim lighting.
- You're a serious photographer (or want to be) and your camera doesn't offer exposure control, Raw image capture, a flash hot shoe, or other advanced features.
- Your current camera is so big and heavy that you often leave it behind — and when you do take it along, your neck and back start to hurt in no time.

Of course, some cameras address these issues better than others, so again, be sure that you read reviews on any new model you consider. Also consult with the salespeople at your local camera store, who can point you toward cameras that best solve the picture-taking problems you're experiencing.

TIP

AVOIDING SHOPPING PITFALLS

Whatever camera you decide to buy, remember these shopping tips:

Be suspicious of unusually low prices. If you see new camera equipment offered for significantly less than it's priced at major retailers, you can be pretty sure you're buying *gray market goods.* These are goods manufactured for sale in other countries, where the market may require lower prices than in your neck of the woods. Gray-market sellers snap up those bargain-priced models, import them, and then offer them to you at "bargain" prices. Usually, your purchase turns out to be anything but a good deal, however. You may find that the camera warranty is no good in your country, the user manual is written in a foreign language, or you have to pay extra for components that usually are included in the camera box, such as the battery charger.

Remember that a higher price tag doesn't necessarily translate to better pictures. Yes, you typically pay more for cameras that offer the features that deliver higher photo quality, such as larger image sensors. But just as with any other product, you can also pay a premium for vanity features, such as a limited-edition model that bears a celebrity's name or has a case made out of leather. Go for it if those things make you happy; just don't expect them to improve your photos. Nor does paying through the nose for the latest and greatest smartphone promise of superb image quality; as detailed elsewhere in this chapter, the smaller sensors and lenses used for smartphones simply can't produce the ultimate in image quality.

Check the return policy. Find out about the camera's warranty and the return policy of the store where you plan to buy. Many retailers charge a *restocking fee,* which means that unless the camera is defective, you're charged a fee for the privilege of returning or exchanging the camera. Some sellers charge restocking fees of 10 to 20 percent of the camera's price. You might also consider renting the camera you're interested in for a day or two so you can be sure it's the right choice. Some camera stores offer this service, and you also can rent from online companies such as BorrowLenses (`www.borrowlenses.com`) and Lensrentals (`www.lensrentals.com`).

IN THIS CHAPTER

» Getting your camera ready to go

» Choosing a focusing mode

» Taking your pick of exposure modes

» Looking at shutter-release options

» Selecting the right resolution (pixel count)

» Comparing file types: JPEG, Raw, and more

» Getting advice on a few more basic setup options

Chapter 2
Starting Out Right: Setup Do's and Don'ts

Digital camera manufacturers try to provide you with a good "out-of-box experience" — industry lingo that means the camera's initial settings are selected to make it as easy as possible for you to take a great picture with your first press of the shutter button. But these default settings are a one-size-fits-all compromise that don't serve every photographic situation best.

This chapter alerts you to the most important settings that you may want to modify according to your picture goals. I also cover some general camera-use topics, such as what you need to know about memory cards, camera batteries, and lenses.

Preparing the Camera

Before you can take a picture, you have to perform some basic camera-setup steps, such as inserting a memory card, charging and installing the battery, and attaching a lens (if you bought an interchangeable lens camera). Unfortunately, I can't provide details on any of those tasks because they vary so much from camera to camera. I can, however, offer general advice on these topics, which I do in the next few sections.

TIP

For more specific guidelines, root around in your camera or lens box and look for a user manual or quick-start guide. Can't find either? Head to the online support site for your camera. Most manufacturers now provide these publications in electronic form.

Buying and using memory cards

As the medium that stores your picture files, the memory card is a critical component of your camera. Tips in the next few sections offer help with buying and maintaining cards.

Choosing the right cards

Your camera manual spells out the type of card your model requires. Most cameras use SD cards, but some models use different types of cards, including MicroSD, CompactFlash, XQD, CFexpress, or CFast cards. (Don't worry about what the initials mean; that info will only clog your brain with unhelpful data.) Figure 2-1 offers a look at an SD card along with a MicroSD and CompactFlash card for size comparison.

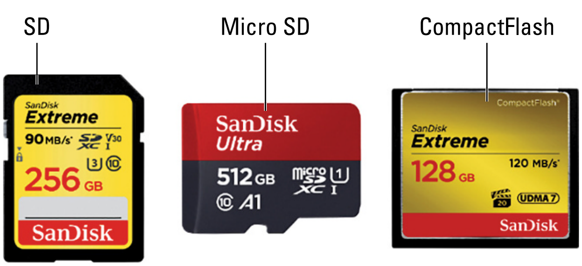


FIGURE 2-1: Memory cards come in different forms; check your camera's instruction manual to find out which type your model uses.

Aside from finding the right type of card, two other specifications are important:

- **Storage capacity:** This number, usually stated in GB (gigabytes), indicates how much data the card can store. How many picture or movie files you can fit on the card depends on the recording settings you use. Your camera's instruction manual should contain a chart that tells you how many files fit in a specific amount of card storage at different settings.

  What capacity card should you buy? That depends on your risk tolerance. Keep in mind that if you buy a 128GB card and that card fails — which has been known to happen — or you lose that card, you're out 128GB worth of images. Ouch. If your camera has multiple card slots and you can set up the second slot as a backup, recording a duplicate of every image you shoot, using high-capacity cards is a bit safer. But I prefer to stick with 32GB cards and carry several on every shoot. If I'm shooting movies, however, I put in a larger-capacity card because movie files eat up so much more card space than still images.

  TECHNICAL STUFF

  The people who developed the SD card specification make life more complicated by tagging the cards with different letters to indicate categories of capacity: SD indicates cards that can hold up to 2GB of data; SDHC, 2GB to 32GB; SDXC, 32GB to 2TB (terabytes); and SDUC, 2TB to 128TB.

- **Card speed:** Card manufacturers have developed a variety of specifications to indicate card speed, all of which are printed in tiny type on the cards. Figure 2-2 offers a look at how some of this data appears on an SD card.

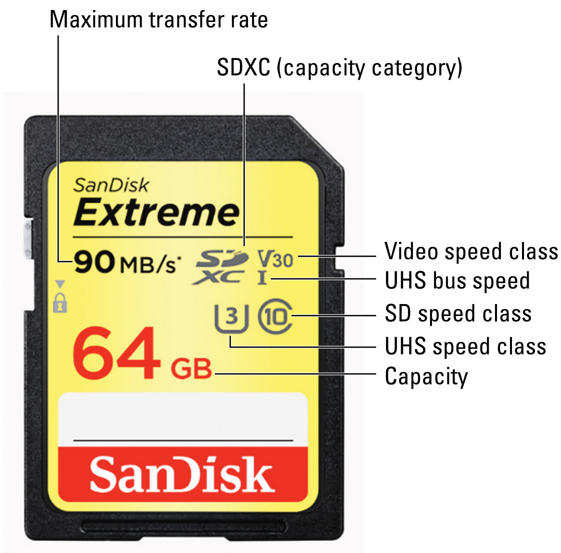


FIGURE 2-2: Storage capacity and speed are two critical specs to check when buying memory cards.

Here are some details to help you decode what you see:

- *SD capacity category:* In Figure 2-2, the card is labeled SDXC, indicating it can hold up to 2TB of data. However, more important is the exact capacity, stated in bold red lettering on the card (64GB, in the figure).
- *Video speed class:* Possible values for this spec, which calculates how long it takes the card to record video frames, range from 6 to 90. Look for the number next to a letter *V,* for video. A higher number indicates a faster data read/write speed.
- *UHS bus speed*: A *bus* is a part of the card circuitry that moves data along its route. Currently, card bus speeds are I, II, or III. Don't let the Roman numerals throw you off — higher is still faster.
- *SD speed class:* This number ranges from 2 to 10, with a higher number indicating a faster card.
- *UHS speed class mark:* This value is 1, 2, or 3 and appears inside a u-shaped container. Again, a higher number means a faster card.
- *Maximum transfer rate:* Because each speed class encompasses a range of data-transfer speeds, most cards usually state the specific data transfer rate — with the card in the figure, 90MB/s, for 90 megabytes per second.

Unless you're planning to appear on Jeopardy!, in which case you are now prepared to kill it when you ask Alex to show the "Memory Card Speeds" question — er, I mean answer — all you need to remember about speed specs is that the higher the number, the faster the card can record picture and movie data. Fast card performance is especially important for capturing action and recording video. Card speed also affects how quickly the data moves from your memory card to your computer when you transfer files from one device to the other, although for that chore, the speed of the device you're using to download the files also comes into play.

TIP

Naturally, larger capacity and higher speed ratings mean more expensive cards. So check your camera's memory-card specs before you invest in the largest and fastest cards. With some cameras, you can use the fastest cards, but you don't enjoy any speed benefit from the investment. And some older cameras limit the capacity of the card you can use.

Maintaining and using cards

Take the following precautions to keep memory cards in good working order and ensure the safety of the pictures they hold:

- **Avoid touching the contact areas of the card.** On an SD card, the little gold strips are the no-touch zone, as shown in Figure 2-3. On CF and CFast cards, make sure that the openings on the edge of the cards aren't obstructed by dirt or other debris.

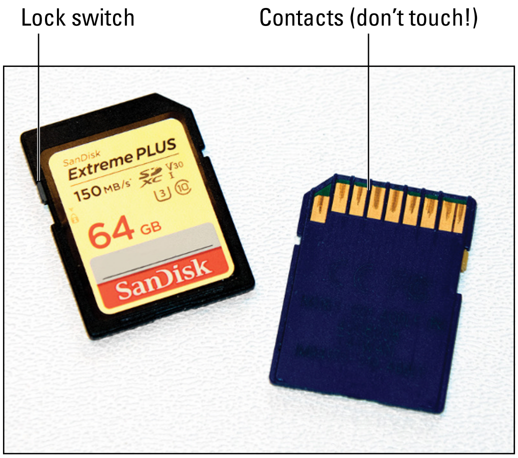


FIGURE 2-3: Avoid touching the contact areas of the memory card.

- **Turn off the camera before inserting or removing a card.** Also, if you just took a picture, don't power down the camera until it has time to write the picture data to the card. Many cameras display a tiny light while the picture is being recorded. When that light turns off, you can safely remove the memory card.
- **Use special care when inserting CompactFlash, CFast, and XQD cards.** Be sure to position the card in the card slot at the proper angle, and don't try to force the card if it doesn't slip in with a gentle push. If the card is slightly misaligned, you can easily bend the connection pins in the card slot, and getting them fixed is expensive.
- **Beware of environmental hazards.** Try not to expose memory cards to excessive heat or cold, humidity, static electricity, or strong electrical noise. You don't need to be overly paranoid, but use some common sense.

  You can, however, ignore rumors about airport security scanners destroying data on memory cards. Although scanners can damage film, they do no harm to digital media, whether the cards travel in checked or carry-on bags.

  If your card gets dirty, wipe it clean with a soft, dry cloth. Dirt and grime can affect the performance of memory cards.

- **Check the lock switch (SD cards and some CFast cards):** SD cards have a lock switch, labeled in Figure 2-3, that enables you to prevent any changes to data stored on the card. Unlock the card before installing it in your camera, or else you can't take any new photos or erase any existing ones on the card. If you insert a locked card into a memory-card reader attached to your computer or another device, you can view your pictures and movies but cannot delete or alter the files. Some CFast cards also provide a lock switch.
- **Format the card.** When you insert a card into your camera for the first time, you should *format* the card so it's prepared to accept digital images. Usually, the camera's Setup menu contains the command that initiates card formatting. It's also a good idea to format cards after you erase the pictures they hold. Some data remains on the card after you delete files; formatting takes care of the final cleanup work.

  WARNING

  Do *not* format a card that already contains pictures or any other data that you want to retain. Formatting erases all the data on a card.
- **Store extra cards properly.** Place them in their original cases or in a memory-card storage wallet, which has space for multiple cards. Some wallets also can hold spare batteries and can be attached to your camera bag or belt loop for easy access.

Preserving battery power

Your camera won't even turn on, let alone take a picture, without adequate battery power. So check the user guide to find out where to locate battery-status information; usually, it's indicated by a symbol similar to the ones shown in Figure 2-4. A full battery symbol like the ones in the figure means the battery is charged; bars inside the icon disappear as the battery drains.

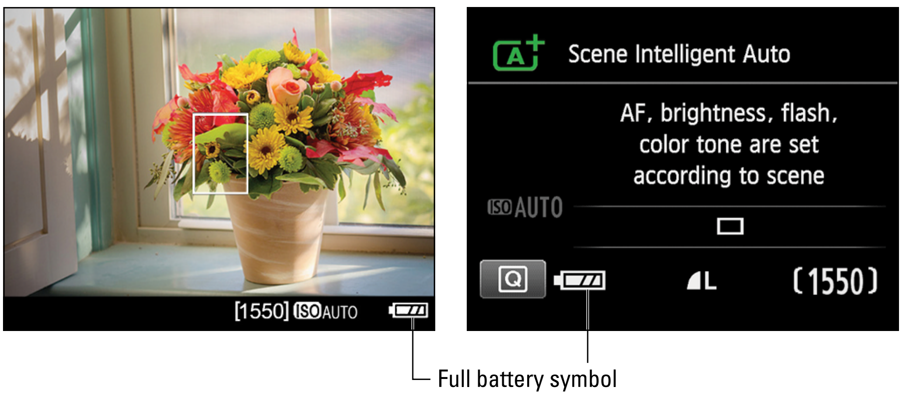


FIGURE 2-4: Check the battery-status symbol frequently to make sure you don't run out of power during a shoot.

REMEMBER

When the battery level approaches the danger zone, use these strategies to make the most of the remaining power:

- **Disable or limit the use of energy-hogging features.** Two big energy consumers are the monitor and flash, assuming the latter is of the built-in variety. (External flash heads usually run on separate batteries.) Electronic viewfinders, too, can be a major energy suck on some cameras.

  Finally, if your camera offers wireless connection to a smart device or computer through Wi-Fi or Bluetooth, shut down those features until you need to use them.
- **Turn on the autosleep function.** Most cameras offer a feature that saves power by automatically putting the camera into sleep mode after a period of inactivity. Be sure that this feature is enabled (it's usually found on the basic setup menu). You may even be able to reduce the wait time that must pass before the shutdown occurs.
- **Take off the chill.** Batteries deplete faster when cold, so when you're not shooting, do what you can to keep your camera warm.

Of course, the best plan is to always carry a spare battery — or two, or three. With larger dSLR and some mirrorless models, you may want to invest in an optional battery grip that holds extra batteries, attaches to the bottom of the camera, and enables you to keep shooting when the camera's primary battery runs out of juice.

REMEMBER

Spare, loose batteries can short-circuit if their electrical contacts connect (both touching the same piece of aluminum foil, for example). Most batteries come with little caps that cover the contacts to avoid this pitfall; you also can store the batteries in separate containers.

Working with interchangeable lenses

If you're using a dSLR or mirrorless camera that accepts multiple lenses, you need to know a few rules of the road to get maximum performance from your lens and protect it. Because I don't know which lens you're using, I can't give you full instructions on its operation. But the following basics apply to most lenses. (Explore your lens and camera instruction manuals for specifics, of course.)

- **Mounting a lens:** Before you can put a lens on the camera, you need to remove the cap that covers the camera's lens mount. You may first need to press a lens-release button like the one shown in Figure 2-5, or you may be able to simply rotate the cap to remove it. Next, remove the cover that protects the end of the lens that connects to the camera. Try not to touch the metallic bits and pieces of that end of the lens — those are the parts that enable the lens to "talk" to the camera.

The next step is to look for the lens mounting marks, which indicate how to align the lens with the camera's lens mount. Some cameras, such as the Canon model shown in Figure 2-5, have two marks, and the proper one depends on the type of lens you're attaching. (In this case, the red square is for a Canon lens type EF, and the other is for a type EF-S.) Align the mark on the camera with the one on the lens, place the lens on the mount, and then rotate the lens in the direction indicated in the camera manual. (On some cameras, you rotate the lens clockwise; on others, counter-clockwise.) You should hear and feel a solid click when the lens is properly mounted.

FIGURE 2-5:
Here's a look at some of the critical lens-mounting components of a Canon dSLR.

If you're using a third-party lens — that is, one produced by a manufacturer other than the camera manufacturer — the lens mount mark may not follow the same design as the marks on the camera. For example, the lens alignment mark may be a simple line or dot.

Also note that on some lenses, you see a second alignment mark at the other end of the lens. That mark is related to attaching a lens filter, such as a polarizing filter, or a lens hood to the lens. Again, line up the marks on the lens and the filter or lens hood to find the right position for mounting them. I talk about filters in Chapter 10; see Chapter 13 for a look at a lens hood.

» **Setting the focusing method (auto or manual):** Assuming that your lens offers autofocusing as well as manual focusing, it may have a switch that you use to choose between the two options. On the Tamron lens shown in Figure 2-6, for example, you choose MF for manual focus and AF for autofocus. Some lenses, though, have a sort of "clutch" operation: You push/pull the lens to switch between manual and autofocus. Your lens may also provide an autofocus limiter switch, which enables you to restrict the range of focusing distances for faster autofocusing.

You may need to set the focusing method on the camera itself, too. The option may come in the form of a menu option or a switch on the camera body, so again (sorry), check your camera manual for information.

FIGURE 2-6: Your lens may have a switch that sets it to autofocus or manual focus mode.

- **Focusing:** With most lenses and cameras, you use these techniques to set focus:
  - *Autofocusing:* Press and hold the shutter button halfway down. Or, if your camera offers a touchscreen monitor, you may be able to simply tap your subject on the screen to set the autofocus target.
  - *Manual focusing:* Rotate the focusing ring on the lens barrel. The position of the focusing ring varies depending on the lens; I labeled the one on the Tamron lens in Figure 2-6.
- **Zooming:** If you bought a zoom lens, it has a movable *zoom ring* that you adjust to change the focal length of the lens. Figure 2-6 shows the location of the zoom ring on the featured Tamron lens, but the location and style of the ring varies depending on the lens. Usually, you rotate the ring to zoom in or out, but some lenses instead require a push/pull zoom action.

  TIP

  The numbers printed around the edge of the zoom ring indicate the range of focal lengths offered by the lens. You can determine the current focal length of a zoom lens by looking at the number that's aligned with the white dot labeled *focal-length indicator* in Figure 2-6. (If you're new to the term focal length, Chapter 1 explains.)

ADJUST THE VIEWFINDER TO YOUR EYESIGHT

REMEMBER

If your camera has a viewfinder, you can adjust the focus of the viewfinder to match your eyesight. Making this adjustment is critical; otherwise, subjects in the viewfinder may appear blurry when they're actually in focus, and vice versa.

Follow this process: Turn on the camera and remove the lens cap, if your camera has one. Now look near the edge of the viewfinder for a tiny dial or switch like the one spotlighted in the figure here. You use this control, called a *diopter adjustment control,* to set the viewfinder focus.

With your finger on the adjustment switch or dial, look through the camera and aim the lens at a bright, plain surface, such as a white wall. Press the shutter button halfway to display data at the bottom of the viewfinder. Then move the adjustment dial or switch until the data display appears sharpest. Also notice any lines in the center of the view-finder, which relate to autofocusing or provide picture-framing guides, depending on the camera. Those lines, too, become blurrier or sharper as you adjust the viewfinder focus.

Remember: You're adjusting only viewfinder focus, not actually focusing the camera lens when you take this step. Don't be distracted by the scene in front of the lens; it won't become any more or less sharp as you move the diopter switch or dial. Pay attention only to the appearance of the viewfinder data or focusing and/or framing marks.

- **Lens-based image stabilization**: Some lenses have a feature designed to help ensure a sharper handheld shot. (Chapter 1 gives you the details). The name varies from manufacturer to manufacturer; Tamron, for example, uses the name Vibration Control, which explains the VC switch on the lens shown in Figure 2-6. Check your lens manual to find out if your lens offers this feature and, if so, how to enable it. Read the fine print regarding whether you need to turn the feature off when the camera is mounted on a tripod. With some lenses, leaving stabilization turned on can actually create blur because the lens is trying to compensate for camera shake that isn't actually occurring.

» **Removing a lens:** First, turn the camera off. Then locate the lens-release button on the camera. Check your camera manual to find the button. (Figure 2-5 shows the button on the pictured Canon dSLR.) Press the button and then rotate the lens in the opposite direction you turned it to mount the lens. When the lens detaches from the lens mount, lift it off the camera. Put the rear protective cap onto the back of the lens and, if you aren't putting another lens on the camera, cover the lens mount with its cap, too.

WARNING

Always switch lenses in a clean environment to reduce the risk of getting dust, dirt, and other contaminants inside the camera or lens. Changing lenses on a sandy beach, for example, isn't a good idea. For added safety, tilt the front of the camera body slightly down when performing this maneuver; doing so helps prevent any flotsam in the air from being drawn into the camera by gravity.

Choosing Initial Camera Settings

With your camera battery installed, memory card inserted, and lens attached, you're ready to start shooting — almost. First, I recommend that you check the status of the camera settings introduced in the rest of this chapter.

Selecting the exposure (shooting) mode

Your selection of *exposure mode*, sometimes called *shooting mode*, determines which other camera settings you can access. Depending on your camera, you may be able to choose from the following exposure modes:

» **Auto mode:** This mode gives almost all control to the camera. You usually can adjust picture resolution, however, and select the other basic setup options outlined at the end of this chapter. See Chapter 3 for tips on how to shoot in Auto mode.

» **Automatic scene modes:** These modes enable you to tell the camera what type of picture you want to take — portrait, landscape, sports, and so on. The camera then selects settings designed to produce the traditional characteristics for that type of image. For example, Sports mode is designed to freeze action. Most of the picture-taking process is the same as in Auto mode.

» **Advanced exposure modes:** The following modes enable you to take control of two important exposure settings — f-stop and shutter speed — as well as all of your camera's other options:

- *Programmed autoexposure (P):* This mode selects the f-stop and shutter speed for you. On most cameras, though, you can choose different combinations of the two settings.
- *Aperture-priority autoexposure (A or Av):* You choose the aperture setting (f-stop), and the camera selects the shutter speed required for a good exposure. (*Av* stands for *aperture value.*)
- *Shutter-priority autoexposure (S or Tv):* You choose the shutter speed (length of exposure), and the camera dials in the f-stop for you. (*Tv* stands for *time value,* as in *exposure time.*)
- *Manual (M):* You set both the f-stop and shutter speed, but the camera provides an exposure meter to help you gauge whether your settings are on target.

REMEMBER

Don't confuse the M exposure mode with the control that invokes manual focusing (usually marked with the letters M or MF). You usually can choose automatic or manual focusing no matter which exposure mode you select.

TIP

Although the first three advanced modes still rely on the camera to determine the proper exposure, you can override that decision by using such options as Exposure Compensation. See Chapter 5 for details on this feature as well as an explanation of f-stops, shutter speed, and other exposure-related settings.

Some cameras also offer specialty modes that enable you to create panoramas, add special effects, and get step-by-step guidance for taking a photograph. Advanced models usually enable you to store groups of picture settings as custom user modes as well. Because these features vary from camera to camera, I can't cover them in this book, but I encourage you to investigate them nonetheless.

FIGURE 2-7: Some cameras offer access to exposure modes via an external dial.

How you select an exposure mode also depends on your camera. You may choose the setting from a dial similar to the one in Figure 2-7. On small cameras, you may instead get a simplified dial that enables you to set the camera to still-photo mode or movie mode, as shown on the left in Figure 2-8, and then select a specific mode from a menu, as shown on the right. On advanced cameras, you may instead see a Mode button; press that button to access the available exposure modes and then use another dial or control to choose the one you want to use. (Cameras this sophisticated usually don't offer Auto or scene modes.)

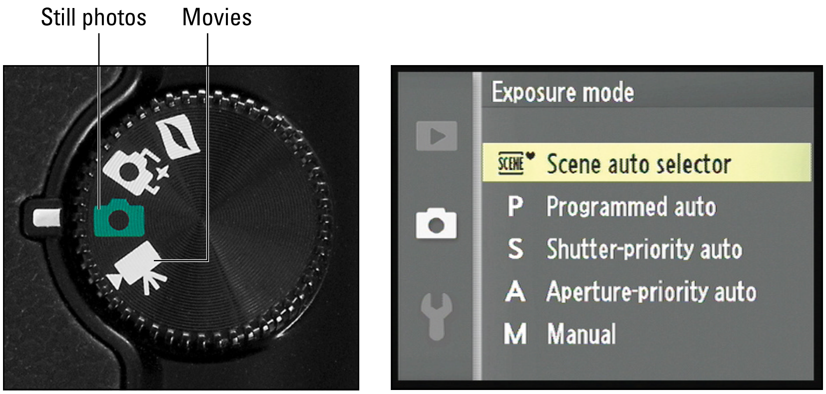


FIGURE 2-8: With some cameras, you may set the camera to still photo mode or movie mode via a dial and then select an exposure mode from a menu.

Setting the shutter-release mode

Many cameras offer a choice of shutter-release modes, which control what happens when you press the shutter button. The name of the option varies, but it's typically something like Drive mode or Release mode. You may find the settings lurking on an external dial, as shown on the left in Figure 2-9, or accessible via a button that displays a screen where you choose a release mode, as shown on the right.

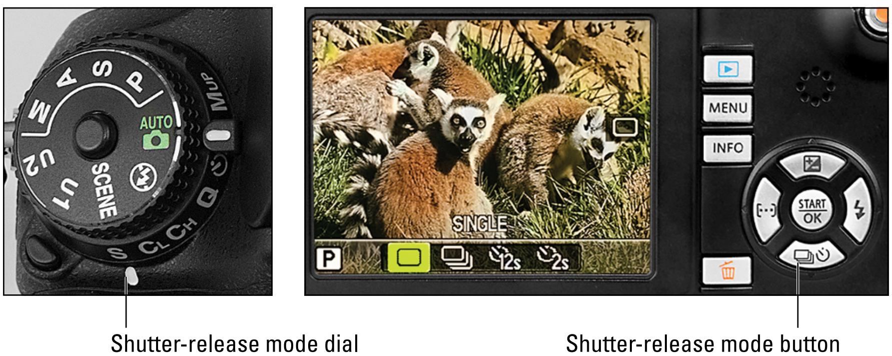


FIGURE 2-9: Although the controls used to adjust the shutter-release mode vary, most cameras offer a standard batch of settings and setting icons.

The following list describes the most common shutter-release modes. In the margins, you see the symbols typically used to represent these. Note that which shutter-release modes you can select may depend on your chosen exposure mode.

- **Single-frame mode:** The camera records one image every time you press the shutter button. In other words, this is normal photography mode. It's usually represented on camera screens as a single rectangle like the one shown here or by the letter *S,* as on the dial shown on the left in Figure 2-9.
- **Continuous or burst mode:** Designed to make capturing fast action easier, this mode records a continuous series of images — a *burst* of frames — as long as you hold down the shutter button. The standard symbol used for this mode is a stack of rectangles (representing multiple frames).

  A few tips to know about this mode:

  - *How many frames per second you can capture depends on a few factors.* These variables include your camera's capabilities and the memory card speed, a topic I cover earlier in this chapter.

    On some cameras, the maximum frame rate is also impacted by the resolution and file type settings you select. I discuss these options, both related to picture quality, later in this chapter. For now, know that selecting the highest resolution and best-quality file type can slow the frame rate slightly.
  - *You don't always need to max out the frame rate.* You may be able to choose from a couple of continuous-frame rates, typically labeled Continuous High (maximum frames per second) and Continuous Low (typically around 3 frames per second). Although it's tempting to always use the highest frames-per-second setting, I recommend that option only when shooting a subject that's moving at a really rapid pace. Otherwise, you wind up with lots of shots showing the exact same thing because not much actually changes between frames. And that's a waste of valuable memory card space.
  - *You probably can't use flash.* Most cameras disable flash when you select this shutter-release mode because there isn't enough time between frames for the flash to recycle.
- **Self-timer mode:** In this mode, the camera releases takes the picture several seconds after you press the shutter button.

  TIP

  The original purpose of this mode was to give the photographer enough time to press the shutter button and then run in front of the camera and be part of the picture. But savvy photographers also take advantage of this mode to eliminate any chance of camera shake (and resulting image blur) when shooting long exposures and using a tripod. Especially if you're using a long lens (telephoto lens), even the slight action of pushing the shutter button can move the camera enough to induce blur. So set the camera to self-timer mode, press the shutter button, and then take your hands off the camera and wait for the shutter release. Of course, if your camera offers remote-control operation, that's an easier option, but if not, self-timer mode offers a convenient work-around.

On some cameras, self-timer mode offers some bells and whistles that make it even more helpful. You may be able to vary the delay time for the shutter release — choosing between 2 seconds or 10 seconds, for example. Some cameras even allow you to set up a self-timer session that records multiple frames with each push of the shutter button. This feature is known as *continuous self-timer mode.*

- **Remote-control mode:** Some cameras enable you to trigger the shutter button with a corded or wireless remote control. You may need to choose a special shutter-release mode to take advantage of that option, so consult your camera manual about this issue. The icon shown in the margin is often used to label a special mode provided for wireless remote control, for example. As with self-timer mode, you may be able to tell the camera to release the shutter as soon as you press the button on the remote or to delay the release for a couple of seconds.

TIP

Many cameras now offer wireless shutter release via a smartphone or tablet app. For example, Figure 2-10 shows an app used to trigger the shutter on some Canon cameras. After connecting the smart device wirelessly to the camera, you tap on your device screen to set the camera's autofocus point and then tap the shutter button to take the picture. To take advantage of this option, you need to download the proper app from the manufacturer's website.

FIGURE 2-10: With cameras that offer wireless connectivity, you may be able to use an app on your smartphone or tablet to trigger the shutter release.

TIP

If you're shooting with an intermediate or advanced camera, also check out these additional shutter-release options, some of which may be buried somewhere in the camera's menus instead of grouped with the other settings:

- **Time-lapse shooting:** Sometimes called *interval* or *intervalometer* shooting mode, this feature enables you to set the camera to automatically capture one or more frames over a period of time, with a specified interval between capture sessions. You set the camera on a tripod, focus the lens on your subject, enable the feature, and then walk away and let the camera take care of the rest. You might use this option to record the gradual opening of a flower bud over a couple of days, for example.
- **Mirror lock-up:** One component of the optical system of a dSLR camera is a mirror that moves every time you press the shutter button. The small vibration caused by the action of the mirror can result in a slight blurring of the image when you use a very slow shutter speed, shoot with a long telephoto lens, or take extreme close-up shots. To cope with that issue, some cameras offer mirror lock-up shooting, which delays opening the shutter until after the mirror movement is complete.

  REMEMBER

  Situations that call for mirror lock-up also call for a tripod: Even with the mirror locked up, the slightest jostle of the camera can cause blurring. Using a remote control or self-timer mode to trigger the shutter release is also a good idea.
- **Quiet mode:** This mode is another setting sometimes found on dSLR cameras and also has to do with mirror movement, which makes some noise when you take a picture. (You may hear photographers refer to this noise as *mirror slap.*) In Quiet mode, you can delay the sound by keeping the shutter button pressed down after the shutter is released. You still hear the mirror slap when you release the button — and you can't take another picture until you do. But if you're in a situation where the slightest noise is problematic, Quiet mode may be of some help. In addition to delaying mirror noise, this mode automatically silences the beep that most cameras make to let you know that autofocusing is complete.

  TIP

  On other types of cameras, you don't have to deal with mirror slap, but you still may need to fiddle with a menu option or two to turn off other noises that occur by default during autofocusing and, sometimes, after the picture is recorded. If your camera offers both a mechanical and electronic shutter, the electronic shutter is the one that allows silent operation.

Setting photo resolution

Another critical setting to check before each shoot is the photo resolution. I introduce this topic in Chapter 1, but want to provide a more thorough explanation here so you fully understand the importance of this setting.

Digital images are composed of tiny squares of color known as *pixels. Pixel* is short for *picture element.* If you display an image in a photo-editing program and then use the program's Zoom tool to magnify the view, you can see the individual pixels, as shown in the inset in Figure 2-11. Zoom out on the image, and the pixels blend together into a seamless image, as shown on the left in the figure.

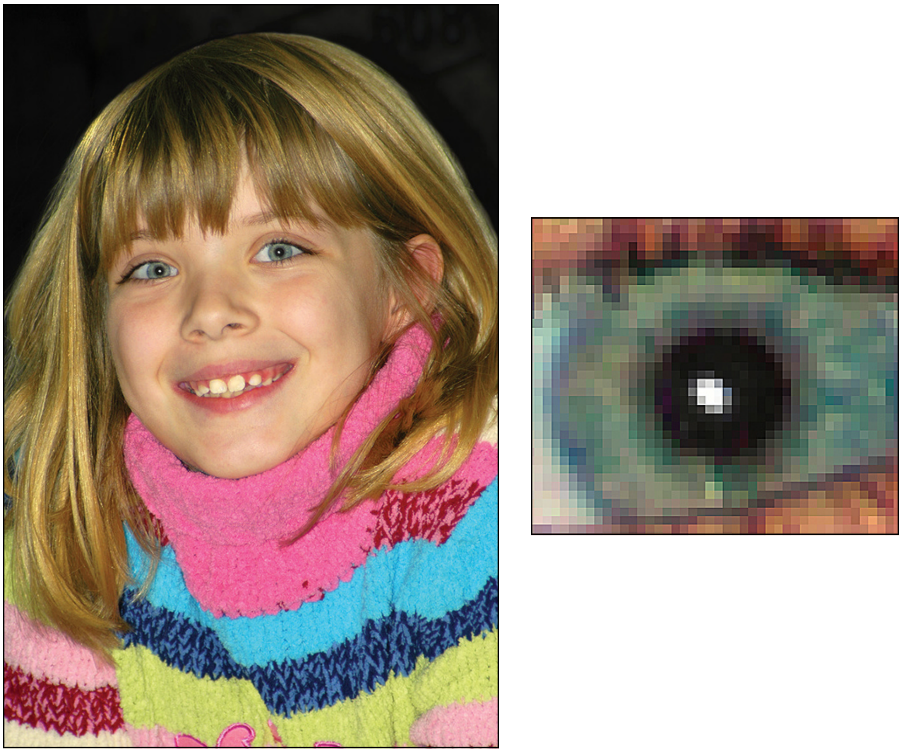


FIGURE 2-11: Zooming in on a digital photo enables you to see its individual pixels.

REMEMBER

The number of pixels in an image is referred to as *resolution.* You can define resolution either in terms of the *pixel dimensions* — the number of horizontal pixels and vertical pixels — or total resolution, which you get by multiplying those two values. This number is usually stated in *megapixels,* or MP for short, with 1 megapixel equal to 1 million pixels.

Every digital photograph is born with a set number of pixels, which you control by using the capture settings on your digital camera. Check your camera manual to find out how to access the setting; it may be called Image Size, Resolution, Quality, or something similar. Note, too, that in most cases, you set the resolution separately from the file type (JPEG or Raw, covered later in this chapter). But on other models, the two are adjusted together.

WARNING

Choosing the right resolution setting is critical because it affects three aspects of a digital photo:

- The maximum size at which you can produce good prints
- The display size of the picture when viewed on a computer monitor, a television, or another screen device
- The size of the image file, which in turn affects how much storage space is needed to hold the file

To help you determine the right pixel population for your photos, the following three sections explore each of these issues.

Pixels and print quality

REMEMBER

Generating a good print from a digital photo requires that you feed the printer a certain number of pixels per linear inch, or *ppi.* So the pixel count of a photo determines how large you can print the image without noticing a loss of picture quality.

Figures 2-12 through 2-14 illustrate this issue. The first image has a resolution of 300 ppi; the second, 150 ppi; and the third, 75 ppi. Why does the 75-ppi image look so much worse than its higher-resolution counterparts? Because at 75 ppi, the pixels are bigger, and the bigger the pixel, the more easily your eye can figure out that it's really just looking at a bunch of squares. Areas that contain diagonal and curved lines, such as the edges of the coins and the handwritten lettering, take on a stair-stepped appearance.

If you look closely at the black borders that surround Figures 2-12 through 2-14, you can get a clearer idea of how resolution affects pixel size. Each image sports a 2-pixel border. But the border in Figure 2-14 is twice as thick as the one in Figure 2-13 because a pixel at 75 ppi is twice as large as a pixel at 150 ppi. Similarly, the border around the 150-ppi image is twice as wide as the border around the 300-ppi image (Figure 2-12).

Resolution: 300 ppi

FIGURE 2-12: A photo with an output resolution of 300 ppi looks terrific.

Resolution: 150 ppi

FIGURE 2-13: At 150 ppi, the picture loses some sharpness and detail.

TIP

How many pixels are enough to guarantee great prints? Well, it depends in part on how close people will be when viewing the pictures. Consider a photo on a billboard, for example. If you could climb up for a close inspection, you would see that the picture doesn't look very good because billboard photos are typically very low-resolution images, with few pixels per inch. But when you view them from far away, as most of us do, they look okay because our eyes blend all those big pixels together. Unless you're doing billboard photography, however, people will be viewing your images at a much closer range, so a higher resolution is required.

Resolution: 75 ppi

FIGURE 2-14: Reducing the resolution to 75 ppi causes significant image degradation.

The resolution you need to produce the best prints also varies depending on the printer, but I usually shoot for 300 ppi. Your mileage may vary, however, so don't panic if an image you want to print has fewer than 300 ppi. You may be satisfied with prints made with a lower resolution — just don't go too low, for the reasons made obvious by Figures 2-13 and 2-14.

Keep these additional pixel pointers in mind:

- **Select the resolution that matches your print needs *before* you shoot.** Yes, some photo programs enable you to change the number of pixels in an existing image, a process called *resampling.* But adding pixels — *upsampling* — isn't a good idea. When you take this step, the photo-editing software simply makes its best guess as to what color and brightness to make the new pixels. And even high-end photo-editing programs usually don't do a good job of pulling pixels out of thin air. The result is often no better than or worse than the low-resolution original.

  With some images, you can get away with minimal upsampling — say, 10 to 15 percent — but with other images, you'll notice a quality loss with even slight pixel infusions. Images with large, flat areas of color tend to survive upsampling better than pictures with lots of intricate details.

- **Use the highest resolution setting for pictures you may want to crop later.** If you crop the photo before printing, you need more original pixels to generate a given print size because you're getting rid of a portion of the image. For example, the left image in Figure 2-15 shows the tightest framing I could achieve with my camera, given the distance between the bird and my lens. Because I captured the image at a resolution of 24 MP, I could crop to the better composition shown on the right and still have plenty of pixels to produce a good print. In fact, the cropped file contains about 5.3 MP, so I can output a much larger print than fits on this page.

FIGURE 2-15: I used a high-resolution setting to capture the original (left), which enabled me to crop away excess background and still have enough pixels to produce a good print (right).

Pixels and screen images

REMEMBER

Although resolution has a dramatic effect on the quality of printed photos, it's irrelevant to the quality of pictures viewed on a monitor, tablet, phone, or other screen device. The number of pixels controls only the *size* at which the picture appears.

A bit of background to help you understand this issue: Like digital cameras, digital displays create everything you see on the screen out of pixels. When you display a digital photo, the monitor simply uses one screen pixel to display one image pixel.

For example, Figure 2-16 shows a screen capture taken from a 24-inch monitor that I use for a Windows-based computer. Windows enables you to adjust the resolution of the monitor (as does the Mac operating system), with each setting resulting in a different number of screen pixels. Usually, you get the best display when using the monitor's *native* (default) resolution, which on this monitor is 1920 x 1200 pixels.

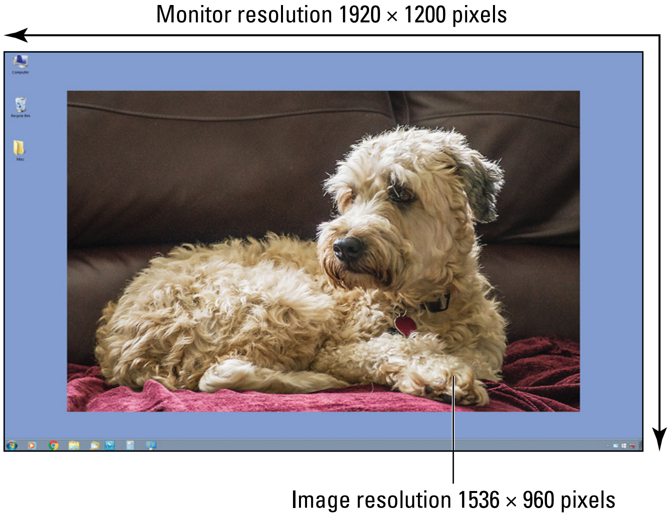


FIGURE 2-16: When the monitor's screen resolution is set to 1920 x 1200 pixels, my 1536 x 960-pixel photo consumes most of the display.

After setting my monitor to that resolution, I used the Windows display-customization options to place a 1536 x 960-pixel photo of my office assistant and life coach in the center of the display. The picture consumes just that number of screen pixels, with the remaining screen area occupied by the various Windows desktop icons and the plain blue background I chose as the desktop background.

Of course, for most onscreen uses, you don't want the picture to take up the entire display or even as much screen space as shown in my example. When you share pictures on Facebook, post them in an online gallery, or include them in a presentation, you need to leave ample screen space for text and other page elements.

The upshot is that you need far fewer pixels for images destined for screen-display purposes than you do to produce large prints. Which begs the question: What do you do if you want to be able to print your pictures *and* share them online or use them for other screen purposes? Always set the camera resolution to match the print size you have in mind. As discussed in the preceding section, you can't add pixels later successfully to achieve a good print. You can, however, dump pixels from a high-resolution original to create a copy that's appropriately sized for the screen. Your camera may offer a built-in tool that creates a low-resolution copy; if it doesn't, you can get the job done in any photo-editing program.

Chapter 12 has more details about preparing a picture for online use.

Pixels and file size

Many factors affect the size of the data file needed to store a digital picture, including the complexity of the scene (the level of detail, the number of colors, and so on). The file format in which the image is stored — usually either

JPEG or Raw — explained later in this chapter, also affects file size. But all other things being equal, an image with lots of pixels has a larger file size than a low-resolution image.

Although more pixels translates to better prints, as outlined earlier in this chapter, the large files needed to contain those pixels create several problems:

- **Large files require more storage space.** When you're shooting huge files, it doesn't take too long to fill up a camera memory card, computer hard drive, or a cloud (online) storage account.
- **Large files take longer for the camera to capture.** The more pixels you ask your camera to capture, the longer it needs to process and record the picture file to your memory card. That additional capture time can be a hindrance if you're trying to capture action shots at a fast pace.
- **Large files strain your computer.** Large files make bigger demands on your computer's memory (RAM) when you edit them. You also need lots of empty hard drive space for editing because the computer uses that space as temporary storage while it's processing your images. (This temporary storage is sometimes referred to as *virtual memory* or *scratch disk* space.)
- **Large files are inappropriate for online use.** When placed on a web page or sent via email, photos that contain bazillions of pixels are a major annoyance. First, the larger the file, the longer it takes to download. And if you send people a high-resolution image in an email, they may not be able to view the whole image without scrolling. Remember, most computer monitors can display only a limited number of pixels. (See the preceding section for details.)

TIP

All that said, large files are a fact of life if you want to capture images at your camera's highest resolution and quality settings. But do consider whether you *always* need to max out the pixel count. Are you really going to want to print the picture of your grandma's birthday cake or your new car at 8 x 10 inches or larger? If not, dialing down resolution a notch makes sense.

Setting the file type (JPEG or Raw)

Your camera may offer a choice of file types, or *file formats,* in computer lingo. Whatever you call it, this setting determines how the camera records and stores the bits of data that comprise a digital photo, which in turn affects file size, picture quality, and types of computer programs you can use to view and edit the photo.

Although several formats have been developed for digital images, most camera manufacturers have settled on just two: JPEG and Camera Raw. Each format has its pros and cons; the next sections tell you what you need to know to make a file-format decision. As for how you select a file format, the process varies from camera to camera, so check the manual. On some cameras, you set the format and resolution together; on others, the two are controlled separately.

WARNING

Don't confuse your camera's *file-format* control with the one that *formats* your camera memory card. The latter erases all data on your card and sets it so that it's optimized for your camera. Don't freak out about this possibility: When you choose the card format option, your camera displays a warning to let you know that you're about to dump data. You get no such message for the option that sets the file format to JPEG or Raw.

JPEG

TECHNICAL STUFF

Pronounced "jay-pegg," this format is standard on every camera. *JPEG* stands for Joint Photographic Experts Group, the organization that developed the format.

JPEG is the leading camera format, for two important reasons:

- **All web browsers, email programs, and mobile devices can display JPEG images.** That makes JPEG perfect for online sharing. Furthermore, every image-editing program for both Mac and Windows can open JPEG photos, as can most mobile apps.
- **JPEG files are smaller than Raw files.** Smaller files enable you to store more pictures on your memory card as well as on your computer's hard drive or whatever image-storage device you choose. Smaller files also take less time to transmit over the web.

The drawback to JPEG is that in order to trim file size, it applies *lossy compression*, a process that eliminates some original image data. (Many digital-imaging experts refer to this process as simply *JPEG compression.*) Heavy JPEG compression can significantly reduce image quality, especially when the image is printed or displayed at a large size.

Figure 2-17 offers an example of the bad things that can happen with excessive JPEG compression. The image takes on a parquet tile look and often exhibits random color defects — notice the bluish tinges around the eyelashes and near the jaw line. These defects are known collectively in the biz as *JPEG artifacts*, or simply *artifacts.*

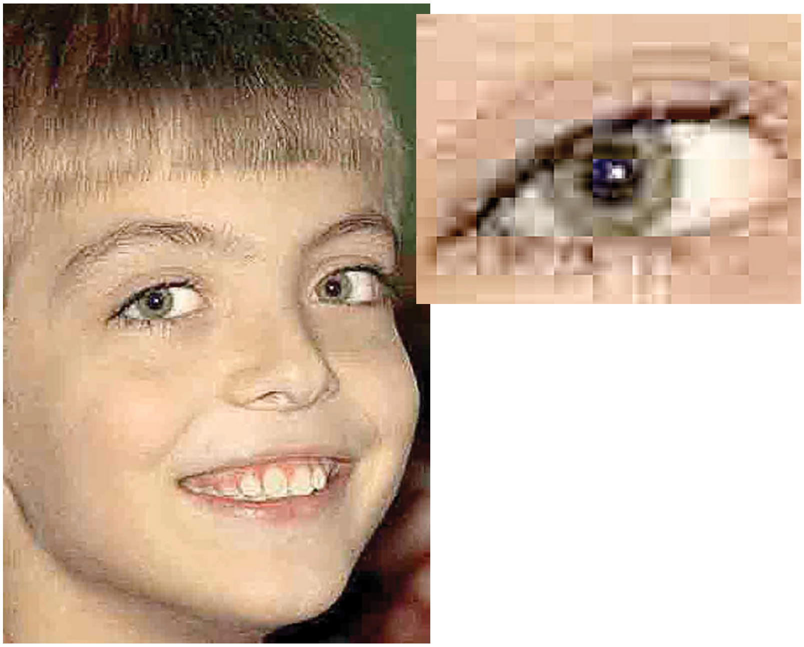


FIGURE 2-17: Too much JPEG compression destroys picture quality.

Now for the good news: Most cameras enable you to specify the level of JPEG compression that you want to apply, and at the highest-quality setting, the file undergoes only a little bit of compression. The result is a file that provides the benefits of the JPEG format with little, if any, noticeable damage to picture quality, as evidenced by the example in Figure 2-18. Sure, the file size of that image is larger — the high-quality JPEG in Figure 2-18 has a file size of 400K (kilobytes) versus the 33K size of the low-quality version in Figure 2-17 — but what good does that small file size do you if the picture is lousy? Both original pictures contain the same number of pixels, by the way, so the quality differences you see are purely a result of compression amounts.

To sum up, as long as you stick with the highest-quality JPEG file your camera can produce, this format is the right choice for all but the most demanding photographers. (If you fall in the latter camp, explore the Camera Raw format, explained in the next section.) And note that even if you choose your camera's lowest-quality JPEG setting, it's highly unlikely that you'll see the level of destruction shown in Figure 2-17. I exaggerated the defects in the picture so that you can more easily see what JPEG artifacts look like.

Figuring out which camera setting delivers the top-quality JPEG file requires a look at your camera manual because the options differ between models. Typically, compression settings are given vague monikers: Good/Better/Best or High/Normal/Basic, for example.

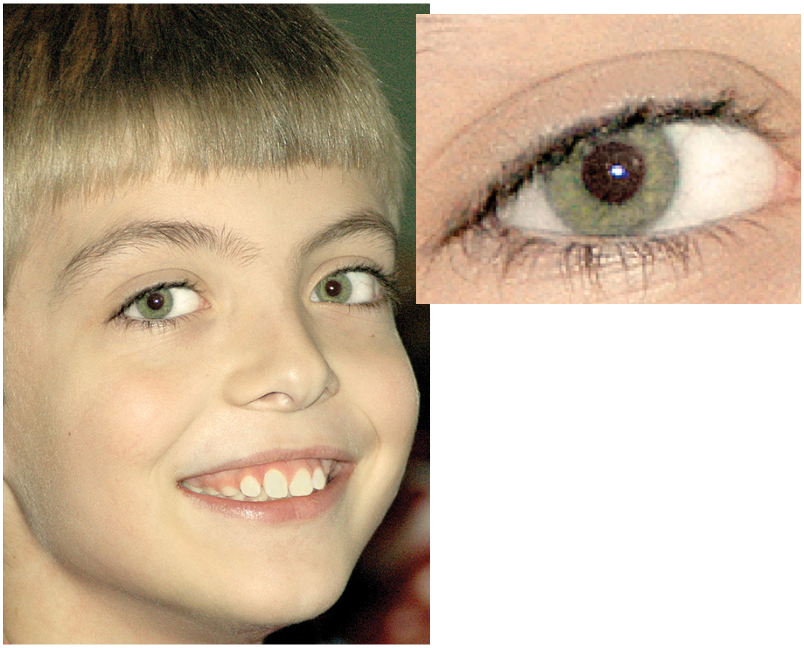


FIGURE 2-18: But a lightly compressed JPEG produces excellent images while keeping file sizes small.

REMEMBER

These names refer not to the amount of compression being applied, but to the resulting image quality. If you set your camera to the Best setting, for example, the image is compressed less than if you choose the Good setting. Also, some cameras may use similar names to refer to image-size (resolution) options rather than JPEG-quality options.

You should find a chart in your manual that indicates how many images you can fit into a certain amount of memory at different compression settings. But you need to experiment to find out exactly how each setting affects picture quality. Shoot the same image at all the different settings to get an idea of how much damage you do if you opt for a higher degree of compression.

If your camera offers several resolution settings, do the compression test for each resolution setting. Remember that resolution and compression work together to determine image quality. You can usually get away with more compression at a higher resolution. Low resolution combined with heavy compression yields results even a mother couldn't love.

WARNING

When you edit images in a photo editor, you can save the altered file in the JPEG format. If you do, though, you apply another round of lossy compression. Each pass through the JPEG compression machine does further damage, and if you edit and save to JPEG repeatedly, you *can* wind up with the level of artifacting shown in Figure 2-17. So save works in progress in a format such as TIFF, a non-destructive format that's a standard in the print-image industry and available in most photo editors as a file-saving option. Should you want to share your edited photo online (which requires a JPEG image), you can create a copy of your final TIFF image and save the copy in the JPEG format. Again, that function is possible in most photo-editing programs and apps.

Camera Raw

When you shoot in the JPEG format, your camera takes the data collected by the image sensor and applies certain enhancements — exposure correction, color adjustments, sharpening, and so on — before recording the final image. These changes are based on the picture characteristics that the manufacturer believes its customers prefer.

The *Camera Raw* format, sometimes called simply *Raw*, was developed for photo purists who don't want the camera manufacturer to make those decisions. Camera Raw records data straight from the sensor, without applying any post-capture processes. After transferring the files to a computer, you then use special software known as a *raw converter* to translate the sensor data into the actual photograph.

REMEMBER

Unlike JPEG, Camera Raw isn't a standardized format. Each manufacturer uses different data specifications and names for its Raw format. Nikon Raw files are called NEF or NRW files, for example, while Canon's versions go by the name CRW or CR2, depending on the camera model.

Whatever the specific name, Raw image capture offers the following advantages:

- **No risk of JPEG compression artifacts:** Raw files offer higher image quality because they don't undergo the kind of file compression that causes the defects associated with JPEG's lossy compression.
- **Greater creative control:** When you process your "uncooked" picture data in a raw converter, you can specify characteristics such as brightness, color saturation, sharpness, and so on, rather than dine on whatever the JPEG version might serve up. To keep up the cooking analogy, imagine that you put together a special dish and you realize after it comes out of the oven that you accidentally used cayenne pepper when your recipe didn't call for any. If your dish were like a Raw file, you'd be able to go back to the beginning of your cooking session and remove the pepper. With JPEG, that pepper would be a done deal. And that's what photographers like about Raw — files captured in this format give you much more control over the final look of your images.

- **Greater latitude for editing the picture:** Raw capture also gives you a bit of a photographic safety net. Suppose that you don't get the exposure settings quite right, for example, when you shoot a picture. With JPEG, the camera decides how brightly to render the shadows and highlights, which can limit you in how much you can retouch that aspect of your picture later. With Raw, you can specify what brightness value should be white, what should be black, and so forth, giving you greater ability to achieve just the image brightness and contrast you want — a benefit that's especially great for pictures taken in tricky light.
- **Higher bit depth:** *Bit depth* is a measure of how many distinct color values an image file can contain. With JPEG, your pictures contain 8 bits each for the red, blue, and green color components, or *channels,* that make up a digital image, for a total of 24 bits. That translates to roughly 16.7 million possible colors.

  On most cameras, choosing the Raw setting delivers a higher bit count. You may be able to set the camera to collect 12 or more bits per channel, for example. However, you may not really ever notice any difference in your photos — that 8-bit palette of 16.7 million values is more than enough for superb images. Where having the extra bits can come in handy is if you really need to adjust exposure, contrast, or color after the shot in your photo-editing program. In cases where you apply extreme adjustments, having the extra original bits sometimes helps avoid a problem known as *banding* or *posterization,* which creates abrupt color breaks where you should see smooth, seamless transitions. (A higher bit depth doesn't always prevent the problem, however, so don't expect miracles.)

Of course, like most things in life, the benefits of Raw do come at a price. First, most low-priced cameras don't offer the format. But Raw also costs you in the following ways, which may be enough for you to stick with JPEG even if your camera is dual-natured in terms of file format:

- **Raw files require some post-capture computer time.** You can't take a Raw image straight from the camera and share it online, use it in a screen presentation, retouch it in a photo editor, or, well, do much of *anything* with it until you process it in a Raw converter, which you can find in photo-editing programs such as Adobe Photoshop. Most camera manufacturers also provide a tool to do the job. As part of the conversion process, you specify critical image characteristics: color, sharpness, contrast, and so on. Then you save a copy of the processed Raw file in a standard file format, such as JPEG or TIFF.

Processing Raw files isn't difficult, but it does take time that you may prefer to spend behind the camera. And if you have a hate-hate relationship with computers, Raw is definitely not for you. Some cameras do have a built-in "mini converter" — that is, you can create a JPEG copy of a Raw image right in the camera. That feature makes the process faster and simpler, but it's not ideal because you have to make judgments about the picture based on a small camera monitor and you typically can specify only a handful of image characteristics. In other words, it's all the inconvenience of Raw without the creative-control benefits.

- **You can't view or edit Raw images on your computer or mobile device if the software or app you use doesn't support your camera's specific Raw format.** Again, though, most camera companies offer their own software for free. (Check the manufacturer's online support site for a program download link.) You should be able to view, edit, and print Raw images by using those manufacturer-created programs or apps if the photo tools you usually use can't cope with your Raw files.
- **Raw files are larger than JPEG files.** Because the Raw format doesn't compress files as much as JPEG (if at all, depending on the camera), Raw files are larger than JPEG files, even if you capture the JPEG image at the highest quality. So you can store fewer Raw files on a memory card than JPEG files. If your camera offers the Raw format, the manual should provide details on the size of its Raw files versus JPEG versions. In addition, because you probably want to hang on to your original Raw files after you convert them, just for safety's sake, you ultimately wind up with at least two copies of each image — the Raw original and the one that you converted to a standard format.

In short, because of the added complication of working with Raw files, you're better off sticking with JPEG if you're a photo-editing novice, a computer novice, or both. Frankly, the in-camera processing that occurs with JPEG is likely to produce results that are at least as good as, if not better than, what you can do in your photo editor if you're not skilled at the task. (Just remember the earlier warning about saving files that you edit in a non-destructive format such as TIFF format instead of JPEG.)

TIP

Some cameras offer a setting that creates both a Raw file and a JPEG file so that you have a version of the image that you can use immediately and another that you can use if you're inclined to spend time editing it. Of course, you consume even more camera memory with this option because you're creating two files, and later, you'll have yet one more file after you process the Raw file on your computer.

DNG: ADOBE'S ANSWER TO RAW INSECURITY

Adobe Systems offers another digital-image file format, DNG. Short for Digital Negative Format, *DNG* was created in response to growing concerns about the fact that every camera manufacturer uses its own, specially engineered flavor of Camera Raw. This Photo Tower of Babel makes it difficult for software designers to create programs that can open every type of Raw file, which in turn makes it difficult for people to share Raw files. That issue isn't a huge problem for the average consumer, but it's a pain for professionals who sometimes must work with Raw images from many photographers. In addition, the possibility exists that future software may not support earlier generations of Raw files, leaving people with images they can no longer open (think videotapes and 8-track audio recordings).

The idea of DNG is to provide a format that can be universally read by all photo programs but retains the "unbaked" quality of a Raw file, which is something that TIFF and JPEG can't do. So far, DNG hasn't caught on in a big way, but it is popular with photographers who shoot Raw and don't want to invest in software updates with every new camera. If you want to translate your Raw files to DNG, the Adobe website (`www.adobe.com`) offers a free converter that can handle files from many cameras. Of course, there's no guarantee that DNG will be around 100 years from now, either, and some photo programs can't open DNG files. But with Adobe backing the format, it's not a bad idea to give yourself the safety net of making DNG copies of your Raw files.

Looking at a Few More Setup Options

Along with the picture settings already discussed, take a few minutes to consider the following options, which affect overall camera operation. You find these options on most cameras, although you need to consult your camera manual to determine the specific option name and how to adjust the setting.

- **Date and time:** Your camera records the current date and time in the image file, along with details about what other camera settings were in force when you shot the picture. In many photo editors and image browsers, you can view this information, known as *metadata.* (*Meta,* for *extra,* data.) Having the correct date and time in the image file enables you to have a permanent record of when each picture was taken. More importantly, in many photo programs, you can search for all pictures taken on a particular date.

TIP

Some cameras also have a time-stamp menu option that slaps a text label with the picture date and time on the image itself. Because this information is always stored in the image file, there's no need to permanently mar an image with the text label. You can always add a text label in a photo editor later, if you want, but you can't get rid of it if it's created as part of the original image file.

WARNING

- **Shoot without memory card:** When this feature is enabled, you can take a photo without a memory card installed in the camera. The image is stored in a tiny bit of internal camera memory but usually isn't retained for more than a few minutes. The point of the function is to enable camera salespeople to demonstrate cameras without having to keep memory cards in all of them. To avoid any possibility that you'll shoot all day without a memory card, turn off this function. It may go by another name, such as Slot Empty Release, so check your manual for information.
- **File numbering:** Cameras assign filenames to photos, often beginning with a few letters and a symbol (for example, IMG_0023.JPG, DSCN0038.JPG, or something similar). You can often set up your camera to number files beginning with certain numbers, and some cameras let you put in a few of your own letters with the file numbers (although it's usually very limited).

WARNING

Some cameras have an option that automatically restarts the file-numbering sequence when you swap out a memory card. For example, if the current memory card contains a file named IMG_0001.JPG and you put in a new memory card, the camera assigns that same filename to the first picture you take. Obviously, this option can lead to trouble after you download pictures to your computer, because you can wind up with multiple pictures that share the same name. So check your manual to find out whether this option exists on your camera, and if so, avoid it.

- **Shooting information display:** Most cameras display some information about the current picture settings on the monitor, as shown on the left in Figure 2-19. If you find that data distracting, you may be able to hide it, as shown on the right. Usually, you alter the display type by pressing a button labeled Info or DISP (for display), but check your manual for details.

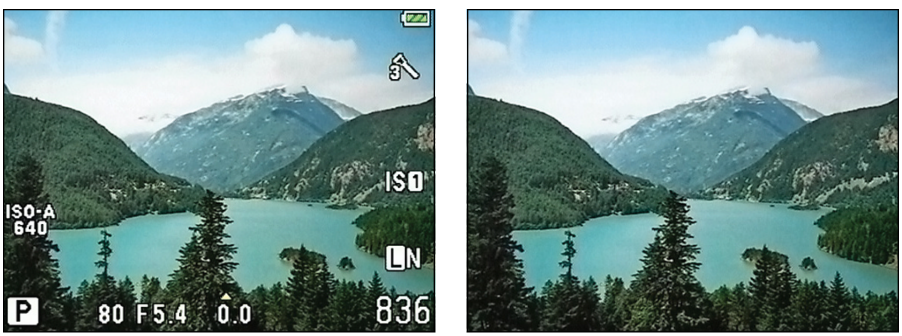


FIGURE 2-19: If the shooting data displayed on the monitor becomes distracting (left), you may be able to hide it (right).

TIP

Some cameras let you display an alignment grid over the monitor, which can be helpful in making sure your landscape shots are level. On some models, you can add other sorts of guides to the screen, such as a *histogram,* a chart that indicates the range of brightness levels in the image, from white to black. The histogram is helpful for determining exposure. You can read more about histograms in Chapter 5.

- **Monitor brightness:** Adjusting the monitor brightness can make pictures easier to view in bright light. But be careful: The monitor may give you a false impression of the image exposure. Before you put your camera away, double-check your pictures in a setting where you can use the default brightness level.
- **Auto upload to smart device:** If your camera offers wireless transfer to a smartphone or tablet via an app, it may also provide a setting that tells the camera to automatically upload each picture to the device immediately after you shoot it. I prefer to keep this option disabled and then select the specific images I want to transfer to my device. Otherwise, you wind up filling your phone or tablet storage with lots of clunker images that you later have to take the time to delete. Most devices don't have that much onboard storage, so you should keep as much free space as possible for the really good shots.

That concludes my list of basic setup options to check. Be sure to flip through your camera manual (or click through, if the manual is provided in electronic format) to find out about other options.

IN THIS CHAPTER

» Setting up your camera for automatic shooting

» Taking your first shots in Auto mode

» Solving focus and exposure problems in Auto mode

» Exploring automatic scene modes

» Trying out video recording

Chapter 3
Shooting Your First Photos (and Movies)

Learning all there is to know about digital photography — heck, learning a hundredth of what there is to know — isn't a quick process. You have so many technical terms and camera settings to consider that it's not possible to sort everything out in a few days or a single read of this book. The good news is that while you're getting up to speed, you can still take great-looking pictures by using your camera's automatic shooting modes, which select most exposure settings and other critical options for you.

Even when you're shooting in automatic modes, though, you can get better results by following a few guidelines, which I lay out in this chapter. The end of the chapter shows you how to create a basic video recording, assuming your camera offers that feature.

Looking at Automatic Shooting Modes

Although the number and type of automatic exposure modes vary from camera to camera, most models offer these options:

- **Auto mode:** This setting is designed to deliver good results no matter what your subject. Think of it as one-size-fits-all shooting. Some cameras also have an Auto Flash Off setting, which is just like Auto but with the flash disabled. (It's designed for shooting in places that don't permit flash, such as most museums.)
- **Scene modes:** These modes let you take a little more artistic control over your images but still enjoy automatic shooting. Scene modes are designed to produce characteristics traditionally found in certain types of photographs, such as portraits and action shots.
- **Special-effects modes:** As the title implies, these modes automatically apply special effects, such as giving a photo a watercolor look or a grainy, black-and-white appearance.

I cover Auto mode and the four most common scene modes later in this chapter. I don't discuss special-effects modes because, although they're fun to play around with, they also get people into trouble. Here's the problem: If you like the composition and subject of an image that you take in an effects mode but aren't keen on the effect itself, you're stuck — you can't remove the effect from the image. If you do shoot in effects mode, take a couple snaps of the subject in Auto mode or another non-effects mode as well.

One other word of advice: Automatic exposure modes typically restrict you from accessing features that may be helpful for capturing your subject. For example, you may not be able to control whether the flash fires. So when you have time, check out Chapters 5 to 7 to get familiar with advanced exposure modes and the picture-taking options you may be able to access when you move beyond fully automatic modes.

Shooting in Auto Mode

Okay, I hear you (or at least I imagine I do): "Julie, I know this is a book for newbies, but do you really think I'm so clueless that I can't take a picture in Auto mode? I mean, doesn't Auto mean *automatic,* as in no-brainer?" Well, first, I do *not* think you are clueless, or you wouldn't have been smart enough to realize that you need some help understanding digital photography and thus spent good money on this book. Second, there really *are* a couple of pitfalls you may encounter even in Auto mode, so I offer up the following step-by-step instructions to help you bypass those potential traps:

1. **Take the basic camera preparation steps outlined in Chapter 2.**

   Those steps include checking the battery status, selecting the right kind of memory card, choosing a shutter release mode, and setting the file format (JPEG or Raw).

2. **Set the shooting mode (exposure mode) to Auto.**

   Again, Chapter 2 goes into detail about selecting the exposure mode. Typically, you do so via a dial on the camera or, after setting the camera to still photography mode, via a menu option.

   Auto mode, if not represented by the word *Auto* itself (as shown on the left in Figure 3-1), is usually represented by a green camera or a green rectangle adorned with the letter *A* (as shown on the right). Note the iAuto setting on the left in the figure — the *i* stands for intelligent in this case. It's how the manufacturer of this model (Olympus) lets you know that the camera's brain is smart enough to figure out the best settings for the scene in front of the lens even in Auto mode. (See the first bullet point in the list following these steps for more information.) In the right example in the figure, the plus sign next to the *A* indicates the same "smart Auto" feature. That dial is from a camera made by Canon, which refers to its Auto mode as Scene Intelligent Auto.

WARNING

Don't confuse the A symbol found on some exposure-mode dials with Auto mode. Selecting the A setting brings up aperture-priority exposure mode rather than Auto mode. Your camera manual should point you to the right setting for automatic shooting.

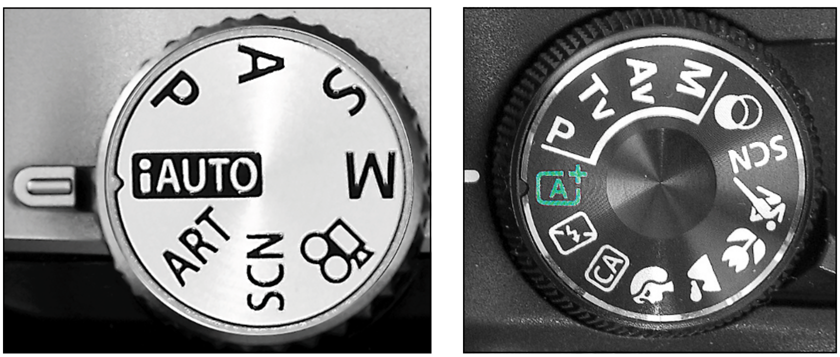


FIGURE 3-1: Auto mode is usually represented by the word Auto (left) or a green symbol that includes the letter *A* (right).

3. Set the focusing mode to automatic.

REMEMBER

Important point here: Setting the exposure mode to Auto does *not* set the focusing mode to automatic on many cameras that offer both automatic and manual focusing. You need to set the lens or the camera to the focusing mode you want to use. The control may come in the form of a switch on the lens or camera itself, or you may need to set the focusing mode through a shooting menu. See the lens section in Chapter 2 for more help with this issue.

4. Frame your subject in the viewfinder or monitor.

REMEMBER

Some cameras require you to position the subject within the specific areas of the frame when using autofocusing. Look for an illustration in the "basics" section of your camera manual for help with this framing issue. You also may see markings in the viewfinder that indicate focus points, as shown in the left screen in Figure 3-2. The tiny squares clustered in the middle of the viewfinder are the focus points in this case. In the right example in the figure, the box in the center of the frame indicates the currently selected focus area.

FIGURE 3-2: Wait until you see the "focus achieved" indicator to press the shutter button all the way down.

5. Press and hold the shutter button halfway down.

The camera's autofocus and autoexposure meters begin to do their thing. In dim light, the flash may turn on or pop up if the camera thinks additional light is needed.

For still subjects, most cameras lock focus when you depress the shutter button halfway. But if your camera senses motion, it may continually adjust focus from the time you depress the shutter button halfway until you take the picture. Your role in this scenario is to move the camera as necessary to keep the subject in the frame, keeping the shutter button pressed halfway as you do.

When focus is established, the camera will likely beep at you and display a focus-confirmation light in the viewfinder, as shown on the left in Figure 3-2, or display a green focus frame on the monitor, as shown on the right. (These signals may not be provided when the camera is tracking a moving subject.)

If your camera offers touchscreen control, you may prefer to tap your subject to initiate autofocusing. Be aware that on some cameras, tapping the screen sets focus and releases the shutter immediately after; if you don't want that to happen, turn off the so-called *touch shutter* feature. Whether you still need to press the shutter button halfway to kickstart autoexposure depends on the camera.

6. **Press the shutter button the rest of the way and then release it to record the image.**

WARNING

While the camera sends the image data to the camera memory card, another light on your camera may illuminate. Don't turn off the camera or remove the memory card while the lamp is lit, or else you may damage both the camera and card.

7. **Switch to playback mode to view the results.**

When the recording process is finished, most cameras display the picture briefly. If you want a longer look at the image, you need to put the camera into playback mode. Look for a button marked with a triangle, as shown in the margin here, which is the standard label used for the button that puts the camera into playback mode. To return to shooting, press that button again.

TIP

If things don't go right on your first try in Auto mode, here are a few tips to help you get better results on the next shot:

» **Understand how the camera decides what settings to use.** In Auto mode, most cameras analyze the scene in front of the lens and consult an internal database to determine whether you're shooting a portrait, a landscape, an action shot, or something else.

If the camera sees faces, focusing frames may automatically appear over one or more faces, which lets you know the camera has determined that you're shooting a portrait and will use settings it deems best for that type of shot, for example. In the case of a portrait, the camera usually tries to keep the background blurry to emphasize the subject. But the camera may make an incorrect guess. If your subject isn't looking directly at the lens, the face usually isn't detected, and the camera may not give you that desired blurry background. If you want to stay in an automatic shooting mode, try switching to Portrait scene mode, if your camera offers it.

- **Remember that most cameras focus on the closest object or the object in the center of the frame in Auto mode**. If that object is *not* your subject, you can use *focus lock* to establish focus where you want it to be. First, frame the scene so that your subject *is* located in the area the camera uses to establish focus. Press and hold the shutter button halfway to lock focus, and then reframe to your desired composition. Of course, on a touchscreen camera, you can simply tap your subject to set the focus point. (You may need to enable this feature in the camera's menu system.)
- **If moving subjects appear blurry, try switching to the Sports scene mode.** A blurry moving subject indicates a too-slow shutter speed. You can't change the shutter speed in Auto mode, but Sports mode automatically uses a fast shutter speed. I provide more specifics about this mode later in the chapter.
- **For help with other focus problems, check out Chapter 7.** That chapter has illustrations to help you diagnose the problem and information on how to fix it.
- **If the subject is underexposed, see whether you can add flash.** Usually, the camera automatically adds flash if it thinks the ambient light isn't sufficient. But if your subject is *backlit* — standing or sitting in front of a bright background — the camera may see all that background light and forego flash. That's exactly what happened in the left image in Figure 3-3. The camera bases exposure on the entire frame in Auto mode, and the selected settings left my subject, the lantern, underexposed. The solution? Some cameras allow you to turn on flash even in Auto mode; look for a setting called Flash On or Fill Flash. Enabling flash added enough light to properly expose the lantern and other foreground objects in my example photo.

  Chapters 5 and 6 covers additional exposure-correction and flash options, but you may need to move out of Auto mode to use them.
- **If everything seems wonky, try restoring the camera's default settings.** Your camera's default settings are designed to make it as easy as possible to get good results from the get-go. If you've played with any settings since initial setup, don't worry: Just check your camera manual to find out how to restore the defaults. Whether you get different results on your next shot depends on whether any of the settings you changed impact the scene you're shooting.

  TIP

  When the camera is set to an automatic shooting mode, sometimes simply turning the camera on and off is enough to restore the defaults. But you also should find a menu option that resets most camera options to their original states. With some cameras, you may need to choose a reset option on more than one menu. For example, you may need to reset things on both a main shooting menu and a second menu of advanced options. You may also discover a way to reset critical shooting options by pressing a couple of buttons on the camera body.

Auto mode, no flash

Auto mode, with flash

FIGURE 3-3: If a backlit subject is too dark (left), adding flash can help (right).

WHY WON'T MY CAMERA TAKE THE PICTURE?

If the camera doesn't release the shutter to take the picture when you press the shutter button, don't panic: This error is usually due to one of two problems:

- **Focus isn't set.** By default, most cameras insist on achieving focus before releasing the shutter to take a picture. You can press the shutter button all day and the camera just ignores you if it can't set focus. Try the focusing tips outlined at the end of the earlier section "Shooting in Auto Mode" as well as those detailed in Chapter 7 to resolve focusing issues.
- **You don't have a memory card in the camera (or the card is full).** In this case, the camera should alert you by flashing a card symbol in the viewfinder or displaying a message in the monitor.

Stepping Up to Scene Modes

In Auto mode, the camera tries to figure out what type of picture you want to take by assessing what it sees through the lens. If you don't want to rely on the camera to make that judgment, you may be able to select from several *scene modes,* which choose settings designed to capture specific scenes in ways that are traditionally considered best from a creative standpoint. For example, most people prefer portraits that have softly focused backgrounds. So in Portrait mode, the camera selects settings that can produce that type of background.

For the most part, shooting in scene modes involves the same process as using Auto mode. However, there are a few variations to understand, so the next four sections outline the most common (and, in my opinion, most useful) scene modes.

REMEMBER

As with other exposure modes, you select the scene mode that you want to use either from a dial on the camera or via camera menus. In many cases, you select SCN from the exposure-mode dial and then the camera displays a scrolling list of available scene types. On other cameras, the major scene modes have their own slots on the mode dial.

Regardless, Table 3-1 shows you generic versions of the symbols used to represent these modes. Check your camera manual to find out what the scene mode symbols look like on your camera and also to discover any other scene modes that may be available to you.

TABLE 3-1 Common Scene Modes

Symbol	Name	What It Does
	Portrait	Selects settings that produce a sharp subject set against a blurred background; also softens and warms skin tones.
	Landscape	Chooses settings that keep as much of the scene in sharp focus as possible, increase contrast, and emphasize blues and greens. Flash may be disabled.
	Sports	Selects a fast shutter speed to freeze motion. It also usually disables flash and uses burst-mode shooting. (The camera records a continuous series of images as long as you hold down the shutter button.)
	Close-up	Blurs background and foreground objects to emphasize your subject; on some cameras, enables closer focusing than is normally possible.

Portrait mode

Portrait mode attempts to select exposure settings that produce a blurry background, which puts the visual emphasis on your subject, as shown in Figure 3-4. In certain lighting conditions, though, the camera may not be able to choose exposure settings that produce the soft background. Additionally, the background blurring requires that your subject be at least a few feet from the background. The extent to which the background blurs also depends on the other depth-of-field factors that you can explore in Chapter 7.

FIGURE 3-4: The portrait setting produces a softly focused background.

Check your camera manual to find out what other image adjustments may be applied in Portrait mode. Most cameras tweak color and sharpness in a way designed to produce flattering skin tones and soften skin texture.

WARNING

If you're photographing a group and not all of your subjects are positioned the same distance from the camera, be careful with Portrait mode. You may wind up with a depth of field that's *too* shallow, leaving some subjects slightly blurry. Your next best bet is Auto mode.

Also, if you're not sure that your subject will remain motionless, you may get better results by using Sports mode, which is designed to capture moving subjects without blur. The *background* may not blur in that mode, however.

For help with advanced controls and techniques that will improve your portraits, see Chapter 8.

Landscape mode

FIGURE 3-5:
Landscape mode produces a large zone of sharp focus and also boosts color intensity and contrast.

Portrait mode aims for a very *shallow depth of field* (focus falls off quickly as distance from the subject increases). Landscape mode, which is designed for capturing scenic vistas, city skylines, and other large-scale subjects, goes the opposite direction, choosing settings that produce a large depth of field. As a result, objects close to the camera *and* objects at a distance appear sharply focused. Figure 3-5 offers an example.

Like Portrait mode, Landscape mode achieves the greater depth of field by manipulating exposure settings — specifically, the aperture, or f-stop setting. So the extent to which the camera can succeed in keeping everything in sharp focus depends on the available light and the range of aperture settings provided by the lens. To fully understand this issue, see Chapters 5 and 7. In the meantime, know that you also can extend depth of field by zooming out to a wider angle of view and moving farther from your subject.

On most cameras, Landscape mode also increases contrast and adjusts colors to produce more vivid blues and greens. Additionally, flash is usually disabled in Landscape mode, which presents a problem only if you need some extra light on an object in the front of the scene.

When you want to take more control over your landscape shots, whether it's to shorten depth of field or avoid the color shift that happens in Landscape mode, check out Chapter 10. There, you'll find pro techniques for capturing memorable landscape shots.

Close-up mode

On most cameras, Close-up mode — also known as *macro* mode — is represented by a little flower icon. On some point-and-shoot cameras, selecting this mode enables you to focus at a closer distance than usual. For an interchangeable-lens camera, though, the close-focusing capabilities of your camera depend entirely on the lens you're using. In either scenario, your camera or lens manual should spell out exactly how close you can get to your subject before the camera cannot focus.

Choosing Close-up mode typically results in exposure settings designed to blur background objects so they don't compete for attention with your main subject, as with the wedding cake in Figure 3-6. Again, notice that the background table is significantly blurry — which is a big help to this image because if all those objects were in sharp focus, they would compete with the cake for the eye's attention. As with Portrait mode, though, how much the background blurs depends on the capabilities of your camera, the distance between your subject and the background, and the lighting conditions. If you prefer a greater or shorter depth of field, see Chapter 7 for other ways to adjust this aspect of your pictures.

FIGURE 3-6:
Close-up mode also produces short depth of field. Notice how all the objects on the background table are blurred.

Unlike Portrait and Landscape modes, Close-up mode generally doesn't play with colors, so they appear similar to how they look in Auto mode. You may or may not be able to use flash, and the region of the frame that's used to establish focus also varies, so check your manual to find out how this mode is implemented on your model.

For more tips on close-up photography, see the last part of Chapter 10.

Sports mode

Sports mode, sometimes also called Action mode, results in a number of settings that can help you photograph moving objects such as the soccer player in Figure 3-7. First, the camera selects a fast shutter speed, which is needed to "stop motion." *Shutter speed* is an exposure control that you can explore in Chapter 5.

With some cameras, dialing in Sports mode also selects some other settings that facilitate action shooting. For example, if your camera offers *burst mode* or *continuous capture,* in which you can record multiple images with one press of the shutter button, Sports mode may automatically shift to that gear. And flash is usually disabled, which can be a problem in low-light situations; however, it also enables you to shoot successive images more quickly because the flash needs a brief period to recycle between shots.

FIGURE 3-7:
To capture moving subjects without blur, try Sports mode.

The other critical thing to understand about Sports mode is that its ability to freeze action depends on the available light. In dim lighting, the camera may need to use a slow shutter speed to properly expose the image, in which case your chances of freezing action aren't great. On the other hand, a little blurring in an action photo can sometimes be acceptable and add to the effect of motion.

For more tips on photographing moving subjects, check out Chapter 9.

Recording Movies in Auto Mode

In addition to capturing still photos, most digital cameras can also record digital movies. Once again, I'm forced to tell you that I can't provide you with specific movie-recording how-to's because the buttons, menu options, and settings involved vary widely depending on which type of camera you're using — dSLR, smartphone, point-and-shoot, and so on.

I can, however, provide you with some background information that will give you a head start on understanding the recording options that may be available on your camera.

Enabling movie mode

First things first: On most cameras, you have to switch the camera from still photography to movie mode before you can begin recording. How you accomplish this varies from camera to camera; here are a couple of common pathways:

- Look for a dial that contains a symbol that resembles an old-fashioned movie camera, like the one shown on the left in Figure 3-8. In this case, the setting lives on the exposure mode dial. Just rotate the dial to align with the movie-mode symbol.
- On cameras that have a viewfinder, you may need to engage Live View mode, which lets you compose the scene on the monitor instead of using the viewfinder. Look for a switch or button labeled LV, like the one shown on the right in the figure. After turning on Live View, the viewfinder is disabled, and the scene in front of the lens appears on the camera monitor. You also need to put the camera into movie mode; on the model shown in Figure 3-8, you do so by setting the switch next to the Live View on/off control to the movie-camera position. The regular-camera icon takes you back to still-photography mode. Note that the Live View and movie/still controls may not be placed in a configuration like the one in the figure, but you get the idea.

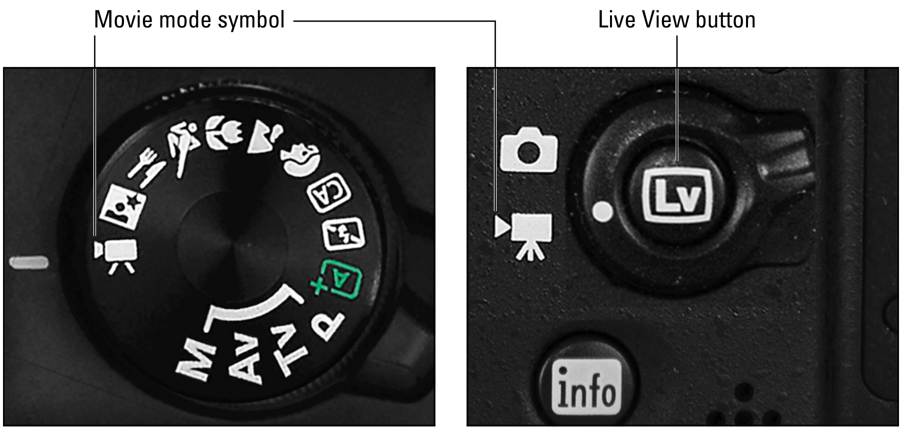


FIGURE 3-8: The control that sets the camera to movie mode usually looks like an old-fashioned movie camera.

After you switch to movie mode, the screen should update to show you the boundaries of the movie frame, which typically has a 16:9 aspect ratio by default. Figure 3-9 offers an example. Other data on the screen relates to recording settings explained in the next section. (This figure, like some others in this book, isn't captured from any one camera but is a mashup I created to provide a generic illustration of how movie-recording data may appear on your monitor.)

FIGURE 3-9: When you put the camera in movie mode, the display indicates the frame boundaries as well as various recording settings.

Reviewing recording settings

Hey, remember that fun section of Chapter 2 that explained image resolution and file formats (JPEG and Raw)? Well, if you enjoyed that bit of nerd nirvana, I've got good news: Video recording involves a batch of settings that are every bit as mind-numbing . . . I mean, *fascinating*. Here's an introduction to the basic recording settings you may encounter:

- **Video standard:** Different parts of the world use different video-broadcast standards, with the two most common being NTSC and PAL. Don't worry about what NTSC and PAL mean — they're just acronyms for the technical names of the standards. *NTSC* is used in North America; *PAL* is used in Europe and certain other countries. If you record a movie in the NTSC standard, you may not be able to play it on a TV in a country that follows the PAL standard, and vice versa.

  If your camera offers both standards, it should already be set to match the country in which it was purchased, but it never hurts to check. Note that in addition to compatibility with TVs in other countries, the standard affects choices available for frame rate, explained a few paragraphs from here.

- **Frame size:** Like digital photos, digital videos are created out of pixels. But for movies, the resolution (pixel count) is stated in terms of frame width and height. This option typically appears on camera menus as Frame Size or Movie Size. Some common options:
  - *1920 x 1080:* Produces a so-called Full HD (High Definition) movie that has a 16:9 aspect ratio.
  - *1280 x 720:* Standard HD, also 16:9.
  - *640 x 424:* This setting gives you a regular definition (that is, not high-def) movie. Frames are much smaller and have an aspect ratio of 3:2. (This smaller resolution can be useful for online videos.)

  Many cameras also offer *4K video recording.* This term refers to a device that can capture video using at least 8 million pixels. The camera frame size is usually 4096 by 2160 pixels. To enjoy the benefits of all those pixels, you of course need a television or other display with 4K resolution as well.

  You can usually spot the currently selected frame size in the camera display, as shown in Figure 3-9. Typically, only the vertical value is shown for the frame size — 1080, in the figure.

  REMEMBER

  Frame size affects the size and quality of your video during playback. But just as with still photos, the more pixels, the larger the size of the file needed to hold all the video data. And the larger the file, the fewer minutes of video you can fit into a given amount of space on your camera memory card. Most cameras also limit the number of minutes of continuous video you can record in a single clip; choosing a lower resolution usually enables you to record a longer movie.
- **Frame rate (fps):** *Frame rate* refers to how many frames of video the camera records per second; this value usually appears as *fps (frames per second).* Your choice here affects the smoothness of the playback. If your camera uses the NTSC video standard, common frame rate options include:
  - *24 fps:* The standard for motion pictures, giving your videos a softer, more movie-like look.
  - *30 fps:* The standard for most network TV, producing a crisper picture.
  - *60 fps:* Often used for creating slow-motion footage. With more frames per second, the video is smoother when you slow down the movie playback.

  In the PAL world, frame rates instead are 25, 30, and 50 fps, but the resulting look of each setting is similar to those described for the NTSC frame rates.

  Some cameras offer frame rates of 120 fps or higher; again, this setting is useful for creating slow-motion movies.

TECHNICAL STUFF

- **Interlaced versus progressive video:** When video specs are listed, the frame rate is often followed by the letter *p* or *i,* as in "60p." (Refer to Figure 3-9.)

  These initials refer to how the individual video frames are recorded. The *p* stands for *progressive;* the *i,* for *interlaced*. With progressive video, frames are created by scanning one line of pixels at a time, from the top to the bottom of the frame. An older recording technology, *interlaced video,* scans and records the even and odd lines of video separately and then combines them to create a full frame.

  Progressive is the newer and, theoretically, higher-quality option. However, some folks prefer interlaced video for certain types of recordings (and some older video-editing programs support only interlaced video). I leave that whole debate up to the video wonks in the crowd, but if you own a newer camera, the point may be moot — most now only offer progressive.

- **Audio options:** If your camera can record video, it no doubt has a built-in microphone. Somewhere on the top or front of the camera, you should see tiny holes that lead to the microphone. Consult your camera guide on this point, though; one set of holes leads to the microphone, and a second set, to the speakers through which you hear the audio during playback. Make sure that you don't inadvertently cover the microphone holes with your finger while recording, and remember that anything you say during the recording will be picked up by the microphone (including any huffing and puffing you do while chasing a moving subject).

  A couple of other audio-recording issues to note:

  - *You should be able to disable audio recording if you want to create a silent movie.* Look for this setting in the camera's menus.
  - *For better audio quality, some cameras let attach an external microphone.* This option, obviously, is for the serious videographer.
  - *Internal microphones may pick up sounds made by the camera's autofocusing system.* If this is a problem, you can disable continuous autofocusing (which is usually the default movie-focusing system) or record audio with an external microphone that's placed far enough from the camera that it doesn't pick up the focusing-motor sounds.
  - *You may be able to manually adjust audio-recording volume.* Again, this option, if available, is found in the camera's menu system with the other movie settings. To help guide you, some cameras display a volume meter like the one shown in Figure 3-9.

    TECHNICAL STUFF

    Audio levels are measured in decibels (dB), and levels on most volume meters range from –40 (very, very soft) to 0 (as loud as can be measured digitally). Ideally, sound should peak consistently in the –12 range. The indicators on the meter turn yellow in this range. If the sound level is too high, the volume meters will peak at 0 and appear red — a warning that audio may be distorted.

» **Autofocusing:** By default, most cameras use continuous autofocusing in movie mode. That is, you set focus at the beginning of the recording, and the camera automatically adjusts focus as needed if your subject moves through the frame. While continuous movie focusing sounds great, it has a couple of drawbacks on many cameras. First, as just mentioned, the autofocusing sounds may be picked up by the camera's internal microphone. Second, there may be visible breaks in the video as the camera refocuses, with your subjected periodically going into and out of focus.

  If you're recording a stationary subject — a pianist at a recital, for example — it's a better to switch to manual focusing, if available, or turn off continuous autofocusing. You can then set the focusing distance before beginning the recording. Because your subject won't be moving, focus should remain on target throughout the recording.

Recording a movie in Auto mode

TIP

Some cameras let you shoot movies in exposure modes other than Auto. For example, after setting the camera to movie mode, you may be able to choose a setting that gives you full control over exposure, which is the equivalent of shooting still photos in M (Manual) exposure mode. Although I generally diss Auto mode for shooting stills, I take the opposite stance for recording videos because managing exposure for digital video can be tricky and involves different considerations than still photography. So unless you're really into digital videography, stick with automatic exposure control for movie recording.

My guess is that you'll be happy with the results you get from using the camera's default settings for all the movie options, which usually result in a high-definition video with audio recorded. The exception to this recommendation regards continuous autofocusing. As just discussed, if the subject will be mostly at the same distance from the camera during the recording, I'd switch to manual focusing or turn off continuous autofocusing and then set the focusing distance before hitting the record button.

After you set the camera to movie mode and select the settings you want to use, there's not a lot to know about recording. On most cameras, you'll find a red button that you press to start and stop recording, as shown in Figure 3-10. After you begin recording, the data on the monitor may change, with most of the readouts disappearing so that you can better see your subject. As the seconds tick by, the available recording time updates to let you know how much more video you can capture in the current clip. You also usually see a red "recording" light to let you know that frames are being captured, as shown in Figure 3-11.

FIGURE 3-10:
The red button is universally used to start and stop recording.

When the time expires or your memory card runs out of storage space, recording stops automatically. To stop recording before that point, press the red record button again. To begin a new clip, press the record button again.

FIGURE 3-11:
While recording is in progress, the time-remaining value updates, and the red recording light appears.

To play your movie, press the Playback button — again, usually indicated by the triangle symbol shown in the margin here. You then may need to press an OK or Set button or tap a playback symbol on screen to begin playing the movie. In most cases, you see symbols that look and work just like the ones that let you play, pause, fast-forward, and rewind on any video playback device, such as a VCR. Wait, I'm dating myself — how about the controls on a DVD player? No? Okay, then, you young whippersnapper, perhaps you're familiar with the playback controls that appear when you binge-watch Netflix on your tablet or smartphone? Whatever your age group, the symbols have (thankfully) remained the same since time immemorial, and I have no doubt you can figure them out. The one possibly confusing control is the volume control. On some cameras, you rotate a dial to adjust volume; on others, you use the zoom in and zoom out buttons.

If you have a touchscreen device, tap the playback symbols on the screen to fast-forward, pause, or whatever. If not, you use the camera's usual navigation buttons (left, right, up, down) to highlight playback-control symbols on the screen and then press the OK or Set button. To exit playback, press the Playback button again.

2

Taking Your Photography to the Next Level

IN THIS PART . . .

Explore the art of composition so that you can capture more compelling photographs with any camera.

Understand key exposure settings — aperture (f-stop), shutter speed, and ISO — and how they affect your pictures in ways other than image brightness. Also get acquainted with tools that can help you solve exposure problems.

Discover how to take better flash pictures and get advice on other lighting solutions.

Find out which autofocusing settings work best for different subjects, and discover how to use depth of field to emphasize your subject and diminish distracting background objects.

Use your camera's white-balance setting and other color-related features to accurately capture the hues in a scene.

IN THIS CHAPTER

» Exploring the basics of composition

» Drawing the eye to your subject

» Understanding depth of field

» Deciding whether to blur motion

» Looking for the light

» Seeking out new and unusual subjects

Chapter 4

Starting to See Like a Photographer

When I started mingling with professional photographers, I noticed that they often used the term "making a photograph" instead of "taking a photograph." At first, I assumed this was just a bit of artistic posturing — after all, isn't producing a photograph simply a matter of pressing a shutter button?

But as I learned more about photography, I realized that pressing the shutter button is actually the last in a series of steps a good photographer takes to create an image. Before that moment, you need to consider several creative issues, such as composition, *depth of field* (how much of the surrounding area should be as sharply focused as your subject), whether you want to blur or freeze action, and lighting. For the most part, you can control these aspects of your photograph even when shooting with basic cameras, although advanced models give you a few additional tools for varying depth of field, motion blur, and lighting.

This chapter helps you understand these creative choices so that you can start creating stronger images. Also check out chapters in Part 3 for additional tips specific to shooting portraits, action, and landscapes.

Exploring Composition Basics

Not everyone agrees on the best ways to compose an image — art being in the eye of the beholder and all that. But the tips laid out in this section are generally accepted as tried-and-true ways to give your photos more visual appeal. For every "rule," however, you can find great-looking images that prove the exception, so don't be afraid to experiment.

Dead center is deadly boring

One of the biggest "don'ts" when it comes to composition is to place the center of interest smack-dab in the middle of the frame. In the first image in Figure 4-1, for example, I positioned the horizon line halfway down the frame. Most people would be happy with that shot, especially given the stunning shades of the sunset. But compare that photo with the one on the right, and you can see that reframing to shift the horizon line down creates a more dynamic composition.

FIGURE 4-1: Positioning the horizon line halfway down the frame makes for a dull image (left); reframing to move that line off-center leads to a more dynamic shot (right).

So where is the best place to position your subject? People who study such things have come up with a variety of formulas to answer that question; the next three sections illustrate three of these concepts.

You can find other proven compositional guides if you do an online search for the term *image composition.* Don't worry about whether you land on a page devoted to paintings or drawings instead of photography — the principles are the same no matter what your creative medium.

The rule of thirds

Perhaps the best-known composition strategy is to divide the frame into horizontal and vertical thirds and position your subject at a spot where two lines intersect. Notice the placement of the bee in Figure 4-2, for example.

FIGURE 4-2: One rule of composition is to divide the frame into thirds and position the main point of interest at the spot where two lines intersect.

What about times when you need to fill the entire frame with your subject — such as in a high-school senior portrait? The same concept applies: Assuming that you're shooting the person's face (or full body, with face visible), the eyes are the most important component of the image, so place them at one of the intersecting lines suggested by the framing guidelines, whether you're following the rule of thirds or one of the following two compositional formulas.

TIP

Some cameras can display rule-of-thirds framing lines in the monitor or viewfinder. A few models even enable you to choose from other compositional framing-guideline overlays.

The golden ratio

This concept follows the same idea as the rule of thirds, but the framing lines are spaced a little differently, as shown in Figure 4-3.

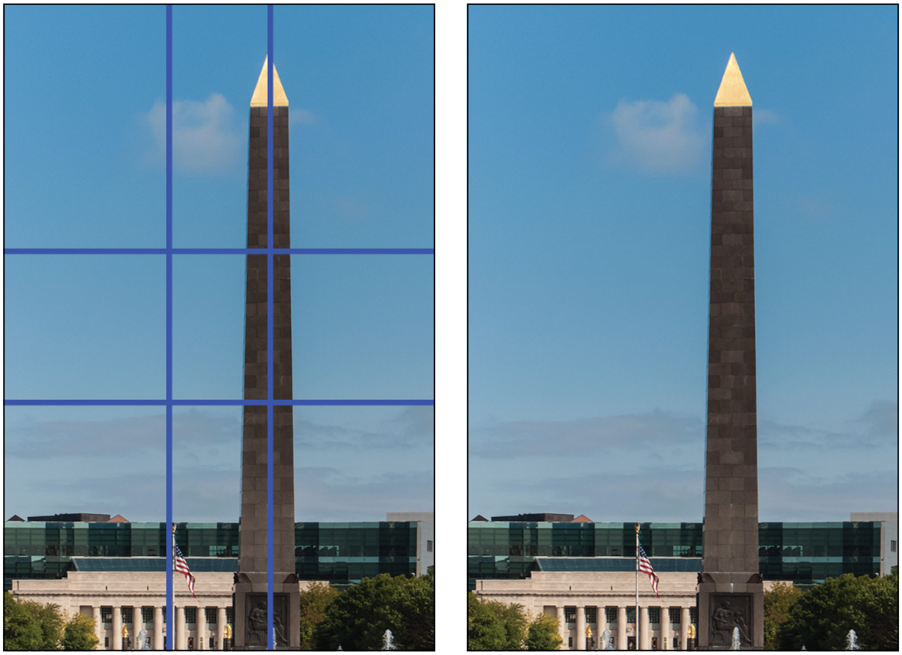


FIGURE 4-3: A variation of the rule of thirds, the golden ratio divides the frame using slightly different spacing of the intersecting lines.

REMEMBER

When you're shooting buildings and monuments such as the ones featured in Figure 4-3, it's beneficial to frame your original shot loosely. Most lenses distort the lines of scenes such as this one, making vertical structures appear to lean slightly inward or outward or tilt forward or backward. This distortion is pretty easy to fix in a photo editor (some cameras even have a built-in tool for doing the job). But the process crops away some of the original frame area. So if you don't frame loosely, you may lose an important element of the scene when you apply the correction. Check out Chapter 10 to find out more about this photographic phenomenon.

The golden triangle

Yet another variation on the theme, this arrangement divides the frame into triangles, as shown on the left in Figure 4-4. The sweet spots for your subject are, again, at the points where those lines intersect.

FIGURE 4-4: A third compositional concept divides the frame into triangles.

Create movement through the frame

To add life to your images, compose the scene so that the viewer's eye is led naturally from one edge of the frame to the other or even entirely around the frame. You can create these *leading lines* with shapes, patterns of color, or variations of light and shadow.

Figure 4-5, which I captured after climbing at least a million steps to the top of a lighthouse, shows an obvious example of this concept. The strong curve of the railing on the left leads the eye into the frame, and the spiral formed by the stairs carries the movement to the bottom of the lighthouse. Light plays a role, too: Notice that the areas of sunlight and shadow create additional paths for the eye to follow.

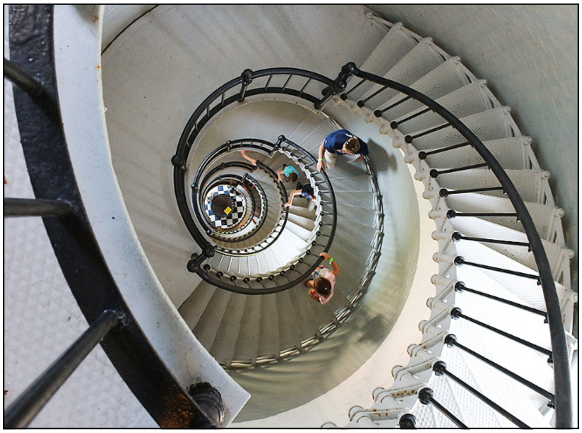


FIGURE 4-5: The spiraling stairs, along with the patterns of light and dark, lead the eye from the top of the stairs to the bottom.

In Figure 4-6, the diagonal lines created by the oars and the blue and white areas of the boats lead the eye from left to right. In the left image in Figure 4-7, the winding canal takes the eye from the boat in the foreground to the back of the frame. In the right image, color and form create the movement. The eye is drawn from the bright pink tail feathers of the right flamingo, around the curves of the second bird, down to the reflections in the water, and then up again to those first tail feathers.

FIGURE 4-6: You also can use strong diagonal lines to create movement.

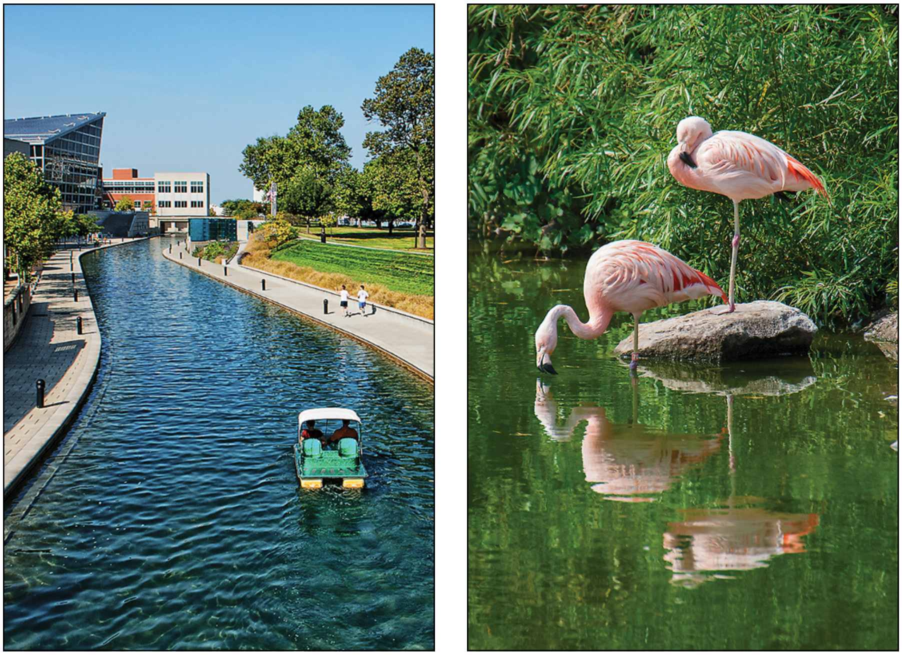


FIGURE 4-7: In these images, movement is created by the colors and curves of the canal water (left) and flamingoes and their reflections (right).

Eliminate clutter

Do you know that claustrophobic feeling you get when you walk around in a store that's jam-packed to the rafters with goods — so cluttered that you can't even move down the aisles? That's the same reaction most people have when looking at a photo like the one in Figure 4-8: There's simply too much going on. The eye doesn't know where to look, except away.

FIGURE 4-8: This shot looks chaotic because there's too much going on for the eye to land on any single subject.

As a photographer, you must decide what you want your main subject to be and then try to frame the shot so that distracting elements aren't visible. In Figure 4-9, reframing the shot to include just a portion of the ride creates a much better image. All the energy of the fair is captured in the whirling chairs, and the composition is such that the eye moves around the curve of the frame to take it all in.

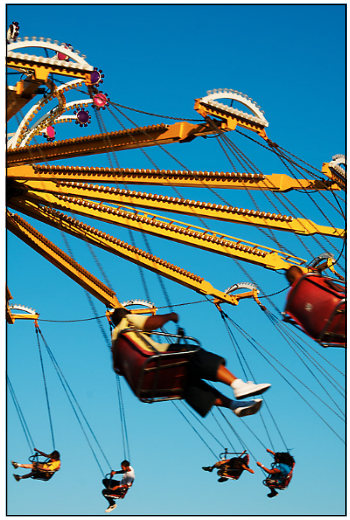


FIGURE 4-9: Concentrating on just a small portion of the ride captures its energy without all the distracting background.

WARNING

Being aware of the subject's surroundings is especially critical in portraits. If you're not paying attention, you can wind up with plant-on-the-head syndrome, as illustrated in Figure 4-10. The window blinds and computer monitor further distract from the subject's beautiful face in this picture.

FIGURE 4-10: Scan the background for distracting objects to avoid plant-on-the-head syndrome in portraits.

Leave some "head room"

Don't frame your images so tightly that your subject looks cramped. Instead, allow what photographers refer to as *head room,* which means leaving a small margin of empty background at the top of the frame. When shooting a subject in profile, also leave extra padding in the direction that the subject's eyes are focused, as shown in Figure 4-11. This helps the eye follow the focus of the subject across the frame and then causes the viewer to imagine what is just out of sight.

For action shots, you may need to increase the amount of background margin on the side of the frame where the subject is headed. As an example, see Figure 4-12. I left plenty of empty space on the right, according to the direction the cyclist is riding. Otherwise, it can appear that there's nowhere for the subject to go.

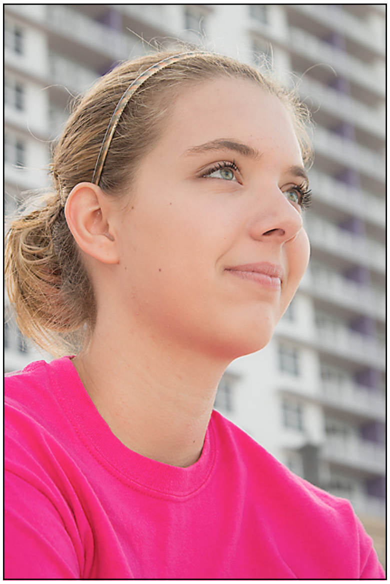


FIGURE 4-11:
Leaving extra space on the right causes the viewer to follow the subject's glance across the frame.

FIGURE 4-12:
Give moving subjects somewhere to go in the frame.

Using Depth of Field to Artistic Advantage

When you set focus on your subject, you establish the distance at which the image appears sharpest. *Depth of field* refers to how far that sharp focus zone extends in front of and behind that point.

Figure 4-13 shows examples of both treatments. In the left image, the sharp focus region extends only a few inches in front of and behind my subject, the butterfly. Notice that the leaf in front of the butterfly appears just slightly blurry, and the background objects become progressively blurrier as the distance from the butterfly increases. The right image features a landscape that has a very large depth of field. I set focus on the hut on the left side of the walkway, but everything in front of and behind that structure remains sharp for quite a distance.

FIGURE 4-13: A short depth of field causes foreground and background objects to blur (left); a long depth of field extends the range of focus over a greater distance (right).

Skilled photographers vary depth of field for the following reasons:

- **Assign visual weight to the various elements of a scene.** Viewers typically look first at the parts of a photo that are in sharpest focus. So a short depth of field draws the eye to a specific portion of the frame, and a long depth of field prompts the eye to consider all objects in the scene together.

  Consider the photos in Figure 4-14, for example. In both cases, I set focus on the gecko. In the left image, the depth of field is large enough that the pink flower behind the gecko subject is sharp, giving it and the gecko equal visual weight. In the right image, a shallow depth of field blurs the flower, which in turn emphasizes the gecko. Neither treatment is right or wrong; this use of depth of field is completely up to your artistic discretion.

- **Diminish the impact of distracting background and foreground objects by using a short depth of field.** In my butterfly image, blurring the foreground and background greenery prevents them from grabbing attention from the butterfly.
- **Visually separate your subject from a similarly colored background.** I used this tactic for the photo shown in Figure 4-15, which features a caterpillar munching away on my milkweed plant. The only angle I could get for this shot was against a background that was very similar in color to the white and yellows of the caterpillar. So that those areas didn't make it difficult to

distinguish the caterpillar, I shortened depth of field as much as possible. The difference in focus between background and subject creates a distinct boundary between the two.

FIGURE 4-14: With a long depth of field, the flower and gecko have equal visual weight (left); shortening the depth of field makes the gecko the star of the shot (right).

Enough theory; I think you get the idea. The question now is, how do you control this important aspect of your photos? Chapter 7 details ways to manipulate depth of field, but here's a quick introduction. Depending on your camera, you can use some or all of the following techniques:

- **Change the distance between your subject and the objects in the background or foreground.** The greater the distance between your subject and the background, the more the background blurs. Ditto for foreground objects.
- **Move the camera closer to or farther from your subject.** For less depth of field, move closer; for greater depth of field, back up.

FIGURE 4-15: A short depth of field helps a subject stand out from a similarly colored background.

- **Vary the lens focal length.** If your camera has a zoom lens or you have several lenses with different focal lengths, you can increase depth of field by zooming out to the shortest focal length. For example, if you're shooting with an 18–55mm lens, you get more depth of field at 18mm than at 55mm.

  REMEMBER

  Increase focal length to reduce depth of field. Remember though, that changing the focal length also alters how much of a scene fits in the frame. The shorter the focal length, the wider the angle of view. (The Chapter 2 section related to lenses talks more about focal length.)

- **Adjust the aperture (f-stop) or use an automatic scene mode designed to produce the depth of field you want.** If your camera enables you to specify the aperture setting, dial in a low f-stop number for shallow depth of field; raise the f-stop number to increase depth of field. Before you go this route, explore Chapter 5, which explains how adjusting aperture also affects image exposure.

  If you don't have the option to set the f-stop, you may be able to manipulate depth of field by using certain scene modes if your camera offers them. Portrait mode is designed to deliver a shallow depth of field, while Landscape mode goes the opposite direction. Some cameras also offer a Background Blur setting that you can use in other automatic shooting modes to specify how much depth of field you prefer.

  See Chapter 3 for more information about scene modes.

Capturing Motion: To Blur or Not to Blur?

Any time you're photographing a moving subject, whether it's an athlete on the field, a toddler taking those first steps, or a flower blowing in the wind, you have two choices:

- **Freeze time.** In other words, capture a split second in time, such as the moment a water droplet falls from a melting icicle, as shown in Figure 4-16. This image, by the way, is not a black-and-white photo; on the day I took this shot, the melting ice was simply devoid of color. You should also know that it took many tries to get the timing of the shutter release just right to catch the droplet in mid-air. On a personal note, it was this ice storm, which kept me housebound for four days, that convinced me to relocate from Indiana to south Florida. I do miss my friends in the Midwest, but at my age, photographing raindrops falling from palm fronds is more appealing than standing in the bitter cold and snapping images of icicles.

- **Allow the moving object to appear blurry.** A little blur can emphasize movement, as shown in Figure 4-17. Notice that the iguana's raised arm is just a tad out of focus, and that blur helps tell the viewer that the iguana was moving toward the camera. You also can blur the object so much that you create an abstract field of color, as I did in Figure 4-18. The subject for this picture was a whirling carnival ride.

FIGURE 4-16: I used a fast shutter speed (1/500 second) to "stop motion," freezing the droplet of melting ice in midair.

The key to controlling how much a moving object blurs is *shutter speed*, an exposure setting I explain in Chapter 5. In short, a fast shutter speed freezes motion, and a slow shutter speed blurs it. The shutter speed you need to blur or freeze action depends on the speed of your subject. For my icicle image, I set the shutter speed to 1/500 second; for the iguana, 1/250 second; and for the carnival ride, 1/5 second. But don't mistake the speeds I used in my examples as one-speed-fits-all recipes; you need to experiment to find out which shutter speed works best for the amount of blur (or lack thereof) you have in mind for your subject.

You can find more tips and techniques related to shooting moving subjects in Chapter 9.

FIGURE 4-17: A shutter speed of 1/250 second caused the iguana's moving arm to blur slightly, emphasizing that the creature is in midstride.

FIGURE 4-18: Allowing a colorful moving object to blur completely produces a fun abstract image; shutter speed for this image was 1/5 second.

Becoming a Student of Light

Creating a photograph requires light — the word *photograph*, in fact, stems from the Greek words *photo* (light) and *graph* (writing). Chapter 5 explains how to adjust your camera settings to get a proper exposure in any light — although, frankly, today's autoexposure systems handle that job fairly well with little input from you. Just as important, though, is becoming aware of the following characteristics of light and how they affect your images:

- **Quality of light:** Is the light soft and diffuse, touching everything evenly and creating very little shadow, as you might see on an overcast day? Or is the light harsh and narrowly focused, creating what photographers call *contrasty* light — leaving some parts of the scene very bright and others very dark?
- **Color of light:** Every light source infuses a scene with its own color cast. For example, just before sunset and just after sunrise, the sun paints the scenery with a beautiful gold tint, which is why photographers refer to these times of day as the *golden hours.* And the period just after sunset and just before sunrise is called the *blue hours* because the light takes on a cool, bluish tint at that time.

  TIP

  Don't fret if you can't wait for golden-hour light; if you like the golden color cast, you can create it artificially via your digital camera's White Balance control, which I discuss in Chapter 7. Ditto for blue-hour light. On the flip side, if you prefer to neutralize the color of the light source, you can use the White Balance control to make that shift.
- **Direction of light:** The angle at which the light hits a subject is also important. Most people gravitate toward front lighting because it provides the greatest degree of subject illumination. But you often can get more interesting

results with side lighting, which brings out the texture in a subject, or back lighting, which you can use to either photograph your subject in silhouette or bring out details that emerge when light shines through translucent objects.

Figures 4-19 and 4-20 offer two examples to get you to start thinking more about how these attributes of light affect your images. In the first image, the sun is striking the buildings from directly overhead, telling the viewer what time of day the shot was taken. Bright daylight is nearly white, lending no additional color to the scene, and making the skies appear a brilliant blue in contrast.

FIGURE 4-19: The midday sun strikes a New York street with bright, neutral light.

In Figure 4-20, the soft, warm light bathes everything in that lovely golden-hour light, telling you that the shot was taken just before sunset. Yet the direction of the light is such that the bridge reflects in the water — an important element in this scene.

TIP

A side note regarding Figure 4-19: The buildings seem to lean toward each other because of the lens phenomenon I mention earlier in the section "The golden ratio." You can buy a special *tilt-shift* lens to avoid this issue or correct the leaning structures in a photo editor. But in this case, I like the result because it suggests the somewhat caged-in feeling I get when I actually walk among skyscrapers.

Again, Chapter 5 explores the topic of light, including how to achieve a brighter or darker exposure than the camera's autoexposure system thinks is ideal. You can find tips for using flash and other artificial light sources in Chapter 6.

FIGURE 4-20: The fading sunlight in this scene lends a soft, golden tone to the image; the direction of the light creates interesting reflections in the water beneath the bridge.

Exploring New Subjects and Angles

One more piece of advice I can give to help you make the shift from picture-taker to photographer is to look for the subject or subject angle that sets your photo apart from the ones that everyone else snaps. The following sections offer a few ideas to help you achieve this goal.

Find a new angle

Figure 4-21 shows two views of an architectural ruin located in a park in Indianapolis (Holliday Park, to be specific). My guess is that about 90 percent of park visitors who photograph the ruin capture the wide-angle front view shown on the left. Technically, it's fine — in focus, nice colors, and so on — but there's nothing compelling about the image. Compare that photo with the one on the right side of the figure, which gives you an entirely different take on the scene. In this close-up view, you can see the details that make this structure so intriguing when you view it in person: the expression on the man's face, the rough texture of his body, and even the veins in his foot.

Notice reflections, patterns, and textures

Figures 4-22 and 4-23 offer two examples of how training your eye to look for these elements can pay off. I was attracted to the first scene by the way the hard, straight edges of the lines in the side of the building emphasize the distortions of the lines

FIGURE 4-21: The left image is a technically fine rendition of the scene, but the right image provides a more interesting angle and reveals details not visible in the wide-angle view.

in the reflected buildings. In the second photo, the rough texture and pattern of the brick walkway provides an interesting contrast to the soft petals and curving leaves of the flower.

Look beyond the usual suspects

Most people focus their cameras on the obvious photographic subjects: When in Rome, for example, everyone takes a picture of the Trevi Fountain, and if you go to the beach, photographing the sunset or sunrise is pretty much a requirement. I'm not saying that you should ignore those subjects, but if you want your photographs to stand out, search for scenes that most people wouldn't think of as photographic opportunities. If you keep your eyes open, subjects often present themselves when and

FIGURE 4-22: When shooting in the city, look for interesting reflections in windows.

where least expected. That was the case with the photo featured in Figure 4-24.

FIGURE 4-23:
Here, the softness of the flower provides interesting contrast to the rough texture of the brick.

The story: I went to a butterfly garden with the intention of filling up my camera's memory card with images of those winged beauties. But it was summer in south Florida, and the heat and humidity got to me faster than I anticipated. I knew that I had enough butterfly pictures to have made the trip worthwhile, so I headed toward the parking lot. Luckily for me, the path to the exit leads past a large, decorative pool. As I stood for a moment debating how much trouble I would get into if I jumped into the water to cool off, I noticed the feather and the flower petals floating on the surface. Whatever part of my creative brain that wasn't shut down by the heat kicked into gear, excited by the mixture of colors and textures in the pool.

The result was the image that I considered the most successful shot of the day. Why? Because it was *different.* I'm fairly certain that almost everyone who took a picture at those gardens came home with at least one or two good butterfly images, but I suspect that I may be the only person who captured this colorful collage.

FIGURE 4-24:
A feather, a few flower petals, and a watery background create a colorful image, enhanced by the leaf shapes visible at the bottom of the pool.

IN THIS CHAPTER

» Understanding the basics of exposure: Aperture, shutter speed, and ISO

» Deciphering exposure meters and histograms

» Picking a metering mode

» Shooting in aperture-priority and shutter-priority autoexposure modes

» Solving exposure problems

Chapter 5
Taking Control of Exposure

Getting a grip on the digital characteristics of your camera — resolution, file type, and so on — is critical. But don't get so involved in this side of digital photography that you overlook traditional photography fundamentals such as proper exposure and lighting. All the megapixels in the world can't save a picture that's too dark or too light.

To that end, this chapter tackles the subject of exposure, explaining such basics as how shutter speed, aperture, and ISO affect your pictures. With that knowledge, you can then take advantage of advanced exposure features that enable you to manipulate exposure to meet your creative goals and solve the most common exposure problems.

One exposure-related topic not covered in this chapter is the use of flash and other artificial lighting sources. For help with those tools, check out Chapter 6. And for even more exposure tips specifically related to shooting portraits, action, and landscapes, check out Chapters 8 through 10.

Understanding Exposure

Entire books have been written on the subject of exposure, which may lead you to believe that exposure is an incredibly complex issue. And you *can* get into lots of arcane details about the science behind how cameras turn light into photographs, if you're interested. But if you're not the science-y type, I have good news: You can take a huge leap forward in your photographic skills by familiarizing yourself with just three exposure controls: aperture, shutter speed, and ISO. The next several sections get you up to speed on these three critical settings.

Introducing the exposure trio: Aperture, shutter speed, and ISO

Any photograph, whether taken with a film or digital camera, is created by focusing light through a lens onto a light-sensitive recording medium. In a film camera, the film negative serves as that medium; in a digital camera, it's the image sensor, which is an array of light-responsive computer chips.

Between the lens and the sensor are two barriers, known as the *aperture* and *shutter,* which together control how much light makes its way to the sensor. The actual design and arrangement of the aperture, shutter, and sensor vary depending on the camera, but Figure 5-1 offers an illustration of the basic concept.

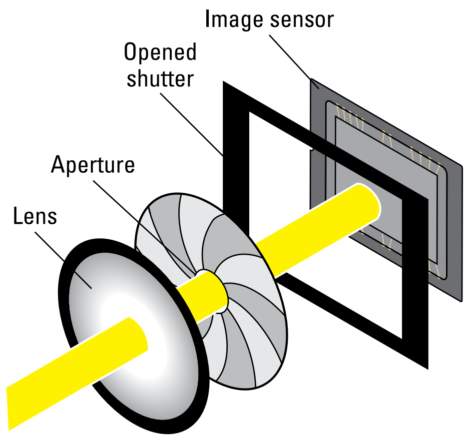


FIGURE 5-1:
The aperture size and shutter speed determine how much light strikes the image sensor.

The aperture and shutter, along with a third feature known as *ISO,* determine *exposure* — what most would describe as the picture's overall brightness. This three-part exposure formula works as follows:

» **Aperture (controls the *amount* of light):** The *aperture* is an adjustable hole in a diaphragm set just inside the lens. By changing the size of the aperture, you control the size of the light beam that can enter the camera. Aperture settings are stated as *f-stop numbers,* or simply *f-stops,* and are expressed with the letter *f* followed by a number: f/2, f/5.6, f/16, and so on. The lower the f-stop number, the larger the aperture, and the more light is permitted into the camera, as illustrated by Figure 5-2. To put it another way, raising the f-number reduces the amount of light that enters the camera.

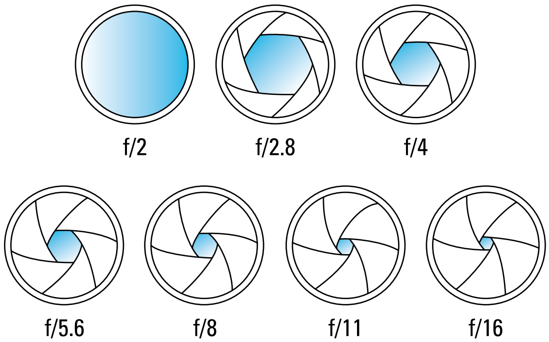


FIGURE 5-2: As the f-stop number increases, the aperture size shrinks, allowing less light to enter the camera.

TECHNICAL STUFF

The range of possible f-stops depends on the lens and, on many zoom lenses, the zoom position (focal length) of the lens. Your camera or lens manual should spell out the f-stops you can use.

- **Shutter speed (controls the *duration* of light):** The shutter works something like, er, the shutters on a window. When you aren't taking pictures, the camera's shutter stays closed, preventing light from striking the image sensor, just as closed window shutters prevent sunlight from entering a room. When you press the shutter button, the shutter opens briefly to allow light that passes through the aperture to hit the image sensor. The exception to this scenario is when you compose images using the camera's monitor instead of a viewfinder — the shutter remains open so that your image can form on the sensor and be displayed on the camera's LCD. Then, when you press the shutter release, the shutter first closes and then reopens for the actual exposure.

  This description, however, applies to a traditional, mechanical shutter similar to the one represented in Figure 5-1. Many digital cameras now use an *electronic shutter* instead (or offer an electronic shutter in addition to a mechanical one). With an electronic shutter, the image sensor simply passes the current image data to the memory card for the duration of the exposure. A few other critical shutter speed facts to know:

  - Exposure time is measured in seconds: 1/60 second, 1/250 second, and so on. The range of shutter speeds varies from camera to camera and, on cameras that offer both electronic and manual shutters, which technology is currently in use. Again, check your manual for specifics.

  - On most cameras, an inches mark (") is used to indicate shutter speeds of 1 second or more: 1", for example, means a shutter speed of 1 second.
  - You set the exposure time via the *shutter speed control.* You usually don't have any input on this setting unless you use an advanced exposure mode, such as shutter-priority autoexposure (covered later in this chapter).
  - Your camera may offer a *bulb setting,* which keeps the shutter open as long as you press the shutter button. You may also have a *time* setting; with this setup, you press the shutter button once to open the shutter and press again to close it. Both settings are useful when you want to experiment with different shutter speeds without having to dial in a specific speed between shots. On some cameras, you also need to select these settings to use shutter speeds longer than 30 seconds.

- **ISO (controls light *sensitivity*):** ISO, which is a digital function rather than a mechanical structure, enables you to adjust how responsive the image sensor is to light. The term *ISO* is a holdover from film days, when an international standards organization rated film stock according to light sensitivity: ISO 200, ISO 400, and so on. The range of ISO settings varies from camera to camera. On a digital camera, the sensor doesn't actually get more or less sensitive when you change the ISO — rather, the light "signal" that hits the sensor is either amplified or dampened through electronic wizardry, sort of like how raising the volume on a radio boosts the audio signal. But the upshot is the same as changing to a more light-reactive film stock: A higher ISO means that less light is needed to produce the image, enabling you to use a smaller aperture, faster shutter speed, or both.

REMEMBER

Distilled to its essence, the image-exposure formula is just this simple:

- Aperture and shutter speed together determine the quantity of light permitted to strike the image sensor.
- ISO determines how much the image sensor reacts to that light and, therefore, how much light you need to expose the picture.

WARNING

The tricky part of the equation is that aperture, shutter speed, and ISO settings affect your pictures in ways that go *beyond* exposure. You need to be aware of these side effects, explained in the next section, to determine which combination of the three exposure settings will work best for your picture.

Aperture also affects depth of field

Along with altering exposure, the aperture setting also affects *depth of field*, or the distance over which objects in the picture appear sharply focused. Figure 5-3 illustrates this issue. For both shots, I set focus on the yellow center of the water lily. Notice that the background in the left image, captured at f/6.3, is much blurrier than in the second image, taken at f/25. The right image has a greater depth of field due to the higher f-stop.

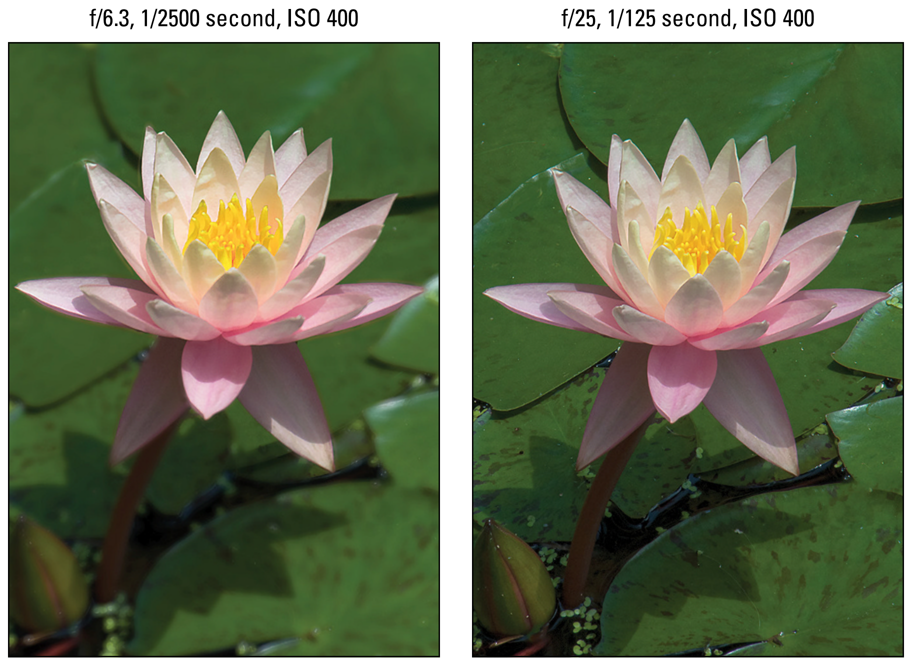


FIGURE 5-3: A higher f-stop increases *depth of field,* or the distance over which objects appear sharply focused.

Which treatment you prefer is entirely up to you. Just remember that the f-stop setting affects the apparent sharpness of objects in front of your subject as well as those behind it. In the example image, notice that the green lily pads in the foreground of the f/6.3 image appear softer than those in the f/25 version.

REMEMBER

Also, adjusting the aperture setting is just one way to manipulate depth of field. The subject-to-camera distance, subject-to-background (or foreground) distance, and lens focal length all affect depth of field as well. Chapter 7 offers examples of each of these depth-of-field factors.

Shutter speed also affects motion blur

Like the aperture setting, shutter speed affects the apparent focus of your image, but in a different way: Shutter speed determines whether moving objects appear blurry or sharp. I introduce this topic in Chapter 4, but it's an important concept, so here's a recap:

- **To freeze motion, use a fast shutter speed.** The speed you need to stop action depends on how fast your subject is moving. Consider the butterfly featured in Figure 5-4, for example. It wasn't moving its wings much — just enough that a shutter speed of 1/60 created motion blur, as shown in the left image in the figure. Raising the shutter speed to 1/125 second solved the problem, as shown on the right.

  Of course, when you alter the exposure time, you let more or less light into the camera, so you have to compensate by also adjusting the aperture (f-stop) or ISO (light sensitivity). For this example, I raised the ISO setting to enable the faster shutter speed.

  It's important, too, to understand the difference between motion blur, caused by a too-slow shutter speed, and depth-of-field blur, which affects both stationary and moving objects. In the butterfly image, the background blurs by the same amount in both shots because I used a low f-stop setting (f/5.6) for both captures.

f/5.6, 1/60 second, ISO 100 | f/5.6, 1/125 second, ISO 200

FIGURE 5-4: In addition to affecting exposure, shutter speed determines whether moving objects appear blurry.

- **To blur motion, use a slow shutter speed.** On occasion, you may want to use a slow shutter to intentionally blur your subject. For example, I used a shutter speed of 1 second to make the fountain water in the foreground appear misty in the Las Vegas scene shown in Figure 5-5. In action shots, a shutter speed that allows just a slight blur can emphasize the feeling of motion. And in nighttime street scenes, a long exposure turns moving car taillights into trails of streaming light. You can see an example of that effect in Chapter 10.

f/7.1, 1/5 second, ISO 100

FIGURE 5-5: A slow shutter speed blurs motion; in this case, it makes the fountain water appear misty.

WARNING

A slow shutter speed can also cause problems when you handhold the camera because any movement of the camera during the exposure can blur the entire image. There's an easy ounce of prevention for this potential malady: Put the camera on a tripod when you use a slow shutter speed. What constitutes "too slow" to handhold depends on a variety of factors, which you can explore in Chapter 7. I try to avoid handholding at speeds slower than 1/60 second, but your mileage may vary.

ISO also affects image noise

As ISO increases, making the image sensor more reactive to light, you increase the risk of noise. *Noise* is a defect that looks similar in appearance to film *grain,* a defect that often mars pictures taken with high ISO film. Both problems make your photo look like it was sprinkled with tiny grains of sand. Figure 5-6 offers an example.

Ideally, then, you should always use the lowest ISO setting on your camera to ensure top image quality. But sometimes the lighting conditions don't permit you to do so. Take the rose photos in Figure 5-7 as an example. When I shot these pictures, I didn't have a tripod, so I needed a shutter speed fast enough to allow a sharp handheld image. I opened the aperture to f/5.6, which was the widest setting on the lens I was using, to allow as much light as possible into the camera. At ISO 100, the camera needed a shutter speed of 1/40 second to expose the picture, but that shutter speed wasn't fast enough for a successful handheld shot. You see the blurred result on the left in Figure 5-7. Raising the ISO to 200 allowed a shutter speed of 1/80 second, which was fast enough to capture the flower cleanly, as shown on the right in the figure.

FIGURE 5-6: Caused by a very high ISO or long exposure time, noise becomes more visible as you enlarge the image.

FIGURE 5-7: Raising the ISO from 100 to 200 allowed a faster shutter speed, enabling a sharper handheld shot without introducing objectionable noise.

With most cameras, serious noise doesn't become evident until you ratchet up to a very high ISO, which is why the one-step bump from ISO 100 to ISO 200 produced no noticeable change in the amount of noise in my rose photo. In fact, some people probably wouldn't even notice the noise in the left image in Figure 5-6 unless they were looking for it. But as with other image defects, noise becomes more apparent as you enlarge the photo, as shown on the right in that same figure. Noise is also easier to spot in shadowed areas of the picture and in large areas of solid color.

How much noise is acceptable — and, therefore, how high of an ISO is safe — is your choice. Even a little noise isn't acceptable for pictures that require the highest quality, such as images for a product catalog or a travel shot that you want to blow up to poster size.

A few other critical points about ISO and noise:

- **Noise levels vary from camera to camera.** Some cameras, especially newer models, produce much better high-ISO images than others. Bottom line: Experiment with ISO settings, assuming that your camera gives you control over this feature. Then evaluate your test shots to see how much quality you can expect to give up when you raise ISO. And if you're in the market for a new camera, read reviews to find out how models you're considering perform at different ISO settings.
- **Auto ISO adjustment may not be your friend.** When you shoot in automatic exposure modes, the camera typically adjusts ISO for you. Some cameras, however, give you a choice between automatic ISO adjustment and manual ISO control. If you have the option, sticking with manual is the best idea. In automatic mode, the camera may ramp up the ISO to a point that produces more noise than is acceptable to you. Some cameras allow you to limit the top ISO that can be selected in auto mode or to specify the shutter speed at which ISO increase occurs, which makes Auto ISO more palatable. But if you're a stickler for image quality, it's better to control this aspect of your picture-taking yourself.
- **Long exposure times also can cause noise.** A high ISO isn't the only cause of noise; a long exposure time (slow shutter speed) can also produce the defect. So, how high you can raise the ISO before the image gets ugly varies depending on shutter speed.
- **Some cameras offer built-in noise-reduction filters, but they have some disadvantages.** Some of these filters affect image sharpness because they apply a slight blur to try to make noise less visible. Other noise-reduction filters increase the time the camera needs to process the shot, which can make rapid-fire shooting difficult. If your camera offers these tools, experiment to

see how they affect your images and frame-to-frame capture time. Keep in mind that many photo-editing programs also have tools for softening noise, and if you go that route, you can usually work on just the noisiest parts of the image. In-camera filters, on the other hand, typically affect the entire picture.

Doing the exposure balancing act

REMEMBER

Aperture, shutter speed, and ISO combine to determine image brightness. So changing any one setting means that one or both of the others must also shift to maintain the same image brightness.

Suppose that you're shooting a soccer game and you notice that although the overall exposure looks great, the players appear slightly blurry at the current shutter speed. If you raise the shutter speed, you have to compensate with either a larger aperture (to allow in more light during the shorter exposure time) or a higher ISO setting (to make the camera more sensitive to the light). Which way should you go? This is the point where you have to stop and consider the side effects of each exposure setting. In the soccer scenario, you have to decide whether you prefer the shallower depth of field that comes with a larger aperture or the increased risk of noise that accompanies a higher ISO. Of course, you can also adjust both settings to get the exposure results you need, perhaps upping ISO slightly and opening the aperture just a bit as well.

All photographers have their own approaches to finding the right combination of aperture, shutter speed, and ISO, and you'll no doubt develop your own system when you become more practiced at using the advanced exposure modes. In the meantime, here are some recommendations:

- Use the lowest possible ISO setting unless the lighting conditions are so poor that you can't use the aperture and shutter speed you want without raising the ISO. Note, though, that some cameras offer specialty low-ISO modes (usually labeled Lo 1, Lo 2, and so on) that can actually produce more noise than, say, ISO 100, which is typically the lowest "normal" ISO setting. Check your manual for information if your camera offers these ISO options.
- If your subject is moving, give shutter speed the next-highest priority in your exposure decision. Choose a fast shutter speed to ensure a blur-free photo or, on the flip side, select a slow shutter speed to intentionally blur that moving object.
- For nonmoving subjects, make aperture a priority over shutter speed, setting the aperture according to the depth of field you have in mind.

You can find tips in Part 3 for choosing exposure settings for portraits, action shots, and landscapes; keep moving through this chapter for details on how to monitor and adjust aperture, shutter speed, and ISO settings.

Adjusting f-stop, Shutter Speed, and ISO

How much control you have over ISO, aperture, and shutter speed depends on your camera. Some basic models give you no or limited input, while others offer manual exposure mode, which enables you to control all three exposure settings. You also may be able to select semiautomatic modes that let you weigh in on the settings you prefer while still getting an assist from the autoexposure system. Check out the section related to “priority” exposure modes, later in this chapter, for information on two semiauto modes: aperture-priority autoexposure and shutter-priority autoexposure.

Your camera manual should spell out which exposure modes offer what level of exposure control and explain how to adjust the various settings. Also check that manual to find out how the camera indicates the current exposure settings. On cameras that have a viewfinder, you may see the current shutter speed, f-stop, and ISO in the viewfinder display, as shown on the left side of Figure 5-8. Some cameras also display the settings in the camera monitor, as shown on the right. And with some cameras, you can check exposure settings either way. (The viewfinder and monitor may also display several other pieces of information related to other camera settings, as they do here.) Advanced cameras typically also have a smaller settings display on top of the camera or underneath the monitor.

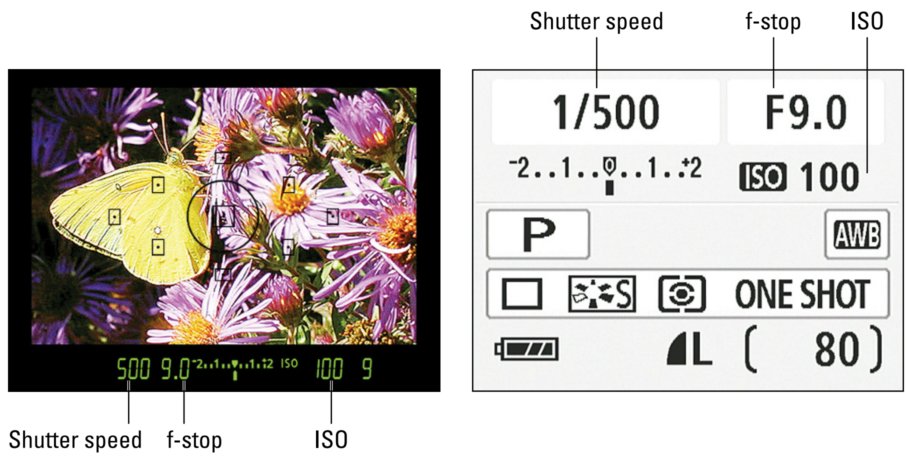


FIGURE 5-8: You may be able to view exposure settings in the viewfinder or on the monitor display.

If you use a point-and-shoot camera, however, you may be able to view the current settings on the monitor only, even if the camera has a viewfinder. And if you have a very basic, fully automatic camera that handles exposure for you, you may not even be able to view the aperture and shutter speed settings until *after* you take the picture and download it to your computer. Then you can open the photo in a program that can read the camera *metadata,* which records the settings you used to take the picture. See Chapter 11 for more about viewing metadata. Doing so, by the way, is a great way to learn more about how aperture, shutter speed, and ISO affect the look of your pictures.

The next several sections provide information on additional features related to choosing the right f-stop, shutter speed, and ISO settings.

Taking advantage of exposure guides

When it comes to checking exposure, the image shown on the camera monitor can be misleading. The actual image may be brighter or darker than what you see onscreen because the display is affected by the ambient light in which you view the image and on the brightness of the monitor itself. For more reliable exposure feedback, find out whether your camera offers the exposure guides discussed in the next sections.

Reading the meter

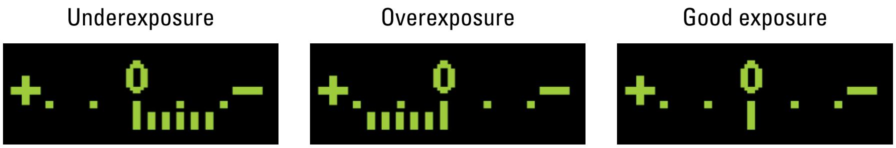
An *exposure meter* offers before-the-shot assistance. This simple bar graph indicates whether the camera thinks your current settings will produce a good exposure, as shown in Figure 5-9. When you see a single bar at the 0 mark, as in the third illustration, you're good to go. Bars appearing on the side of the meter that sports a minus sign indicate underexposure; bars on the plus-sign side predict overexposure. The more bars that appear, the greater the potential exposure problem. Note that some cameras place the positive end of the meter on the left while other models put it on the right, so inspect the meter closely to see which is which on your camera. In some displays, the meter may be oriented vertically and placed along the right or left edge of the monitor or viewfinder.

TECHNICAL STUFF

WHAT'S A "STOP"?

Ready for another bit of photography lingo? The word *stop* is used to indicate a specific amount of exposure change. Increasing exposure by one stop means to select an f-stop or shutter speed that doubles either the amount of light (f-stop) or the duration of the light (shutter speed). Decreasing exposure by one stop means to cut the light in half. On a digital camera, you can also increase exposure by a stop by doubling the ISO value or decrease it by a stop by halving the ISO value.

FIGURE 5-9: The exposure meter indicates whether the current camera settings will produce a good exposure.



REMEMBER

A few pointers about the way exposure meters operate:

- **You may need to press the shutter button halfway to display the meter.** Your half-press wakes the exposure system and tells the meter to do its thing.
- **Where and when the meter appears depends on your camera and shooting mode.** The meter may appear in the viewfinder, monitor, or top LCD readout, depending on your camera. But on many cameras, the meter appears all the time only when the camera is set to shoot in manual exposure mode. In other modes, the meter typically appears only if the camera anticipates an exposure problem or if you enable Exposure Compensation, an autoexposure adjustment feature I discuss later in this chapter, in the section "Applying exposure compensation."
- **The meter readout depends on the *metering mode.*** This setting determines which part of the frame the camera analyzes when calculating exposure. Normally, the entire frame is measured. You can read more about metering modes later in this chapter, in the section "Changing the Metering mode."
- **Keep the lens trained on your subject while checking the meter.** If your camera displays the meter only in the monitor (or if you prefer to view the meter there), don't move the camera after pressing the shutter button to display the meter. All too often, people frame the shot, press the shutter button halfway to activate the meter, and then point the lens at the ground so that they can get a better look at the display. The problem is that most cameras continue adjusting exposure settings until you take the picture, so as soon as you move the camera, it takes a new reading. So when the lens is pointing down, you're viewing the proper settings for photographing the ground and not your subject. For this reason, I encourage you to rely on the viewfinder meter if your camera offers one.

WARNING

TIP

If your camera doesn't display a traditional exposure meter, it may still offer alerts to let you know that you're headed for an exposure problem. For example, the shutter speed or f-stop value may blink or change colors in the display.

Interpreting a histogram

A *histogram* is a chart that plots out the brightness values of all pixels in the photo, using a scale of 0 (black) to 255 (white). For example, the histogram shown in Figure 5-10 represents the accompanying butterfly photo. The horizontal axis of the chart displays brightness values, with shadows on the left and highlights on the right. The vertical axis shows you how many pixels fall at each brightness value. A spike at any point indicates that you have lots of pixels at that particular brightness value.

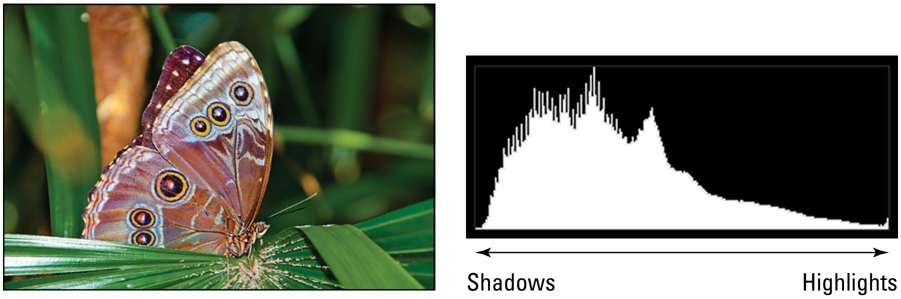


FIGURE 5-10: A histogram tells you how many pixels fall at each point on the brightness scale, from 0 (black) to 255 (white).

Some cameras can display a histogram on the monitor in shooting mode, helping you suss out exposure settings before you snap the shot. Most models, however, offer this tool only during playback; you may need to change your camera's default playback settings to display it.

TIP

Normally, a histogram that resembles a bell-shaped curve, or something close to it, is a good sign because well-exposed photos typically contain more *midtones* (areas of medium brightness) accented by highlights and shadows. This fact has led some photographers to believe that their exposure decisions should be based on generating this so-called perfect histogram. But unless you plan to frame and exhibit your histogram instead of your photograph, this idea is hogwash. There — I said it. Bring it on, histogram perfectionists!

Here's the thing: You have to interpret a histogram with respect to the brightness values of your subject. You're just not going to see a ton of pixels at the dark end of the scale when you're photographing a polar bear against a snowy backdrop, for example. However, if you look at your camera's histogram and it has a big spike to the left, it may be that your photo is too dark, in which case you need to adjust the exposure settings or add a flash. If it's spiked to the right, your photo may be too bright. It's normal to have a few odd spikes here and there, though.

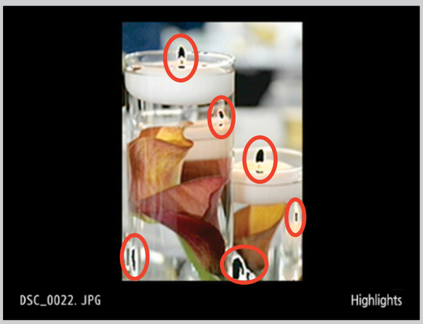
TIP

DISPLAYING HIGHLIGHT ALERTS

The problem with both the meter and the histogram is that although they can indicate an overexposure issue, they don't tell you *which* parts of the image are overexposed. To provide this information, some cameras offer image-preview or playback-mode alerts to indicate exactly which parts of the image contain the blown highlights — that is, pixels that are pure white, with a brightness value of 0.

Highlight alerts typically come in two forms, commonly referred to as "the blinkies" and "zebra stripes." When you enable the blinkies, blown highlights blink in the display. The left example here shows an example of the blinkies when displayed in picture-playback mode. I recorded the playback screen at the moment the pixels blinked "off"; covering the blown highlights with black blobs. (These areas are circled in red in the figure to make them easier to spot.) The right example shows a live preview screen that illustrates the zebra-style highlight alert. In this case, the stripes indicate the presence of blown highlights in a portion of the white serving bowl. Again, the red circle appears in the figure just to help you see what's what — you don't see the circles on your camera monitor.

To find out whether your camera offers these tools, check the user instruction manual or scroll through menu options looking for a setting called Highlight Alerts or something similar. As when inspecting a histogram, consider these alerts with respect to your subject. If your subject is well exposed, ignore the alerts. In both images here, reducing exposure to eliminate the small areas of blown highlights would have left more important elements of the scene too dark, for example. But if the highlight indicators cover more than a tiny area of your subject, take the hint and adjust exposure settings or find different light in which to shoot your subject.



Changing the Metering mode

TECHNICAL STUFF

Most cameras offer a choice of exposure *metering modes.* This setting determines the area of the frame that the camera analyzes in order to choose exposure settings for you when you take advantage of autoexposure. When you shoot in manual exposure mode, the data reported by the exposure meter is also based on the frame area measured in the current metering mode.

The three standard metering modes, usually represented by the symbols shown in the following list, work as follows:

- **Whole-frame metering:** This setting analyzes the light throughout the entire frame. Depending on your camera, it may be called *matrix metering, multizone metering, evaluative metering, pattern metering,* or another, similar name.
- **Center-weighted metering:** In this mode, the camera measures the light in the entire frame but assigns a greater importance — weight — to the center of the frame.
- **Spot metering:** This mode gives you pinpoint exposure control, telling the camera to set exposure based on just a small area of the frame. Most cameras start out using the center of the frame to calculate exposure, but you may be able to choose a different metering spot.

  REMEMBER

  How large an area the camera uses in spot metering varies depending on the camera. Also, you may get two spot-metering settings, with one measuring a slightly larger area than the other. The larger-spot metering option is often called *partial metering.*

Whole-frame metering is typically the default setting and usually produces good results. The exception is when the background is much brighter or darker than the subject, which can result in an over- or underexposed subject. Figure 5-11 offers an example. I took the left image using whole-frame metering. Because the camera saw so much darkness in the frame, it used an exposure that left the white rose overexposed, leaving almost no detail in the petals. Changing to spot metering corrected the white rose, but left the red rose too dark, as shown in the middle image. For this scene, center-weighted metering produced the best exposure balance. However, if that red rose were out of the picture, the spot-metering image would be preferable because the white rose retains more detail.

In theory, you should select the best metering mode for your subject every time you shoot. But in practice, I usually stick with whole-frame metering unless I'm shooting portraits, in which case I opt for center-weighted metering so that I can base exposure on the subject's face. I also use that setting or spot metering when I visit the local bird sanctuary, setting the metering spot on the bird I'm photographing. That way, snowy-white birds aren't overexposed when they're posing amid dark green foliage, and the darker-hued birds aren't underexposed when photographed against a bright blue sky.

FIGURE 5-11: Try center-weighted or spot metering when your subject is much darker or brighter than the background.

TIP

Speaking of photographing bright white subjects, also check your camera's metering mode settings to find out whether it offers a specialized mode called *highlight-tone priority* metering. This option meters exposure based on the highlights, helping to avoid a loss of detail in those areas.

Of course, when exposure is set for the highlights, the darkest parts of your image become even darker, so you may lose details in the shadows. But wait — there may be a fix for that issue, too: Some cameras offer an option that brightens the shadows without also making the highlights too bright — see the later section "Expanding Tonal Range" for details.

Using "priority" exposure modes

In addition to regular autoexposure modes (where the camera sets both aperture and shutter speed), your camera may offer *aperture-priority* autoexposure or *shutter-priority* autoexposure.

On some cameras, aperture-priority autoexposure is abbreviated as A; on others, Av. The *a* stands for aperture; the *v* stands for value. Shutter-priority autoexposure is abbreviated by either the letter *S* or *Tv*, for time value. (Shutter speed determines the exposure time.) Oh, and if you see the letters *AE*, as you will if you read many photography magazines, it's an abbreviation for autoexposure.

Whatever they're labeled, these options offer more control while still giving you the benefit of the camera's exposure brain. Here's how they work:

- **Aperture-priority autoexposure:** This setting gives you control over the aperture (f-stop). After you set the aperture, the camera selects the shutter speed necessary to correctly expose the image at that f-stop, taking into account the current ISO setting when making its decision.

  REMEMBER

  By altering the aperture, you also change depth of field — the distance over which focus appears acceptably sharp. The earlier section "Aperture also affects depth of field" explores this issue.
- **Shutter-priority autoexposure:** In shutter-priority mode, you choose the shutter speed, and the camera selects the correct f-stop. This mode is good for times when your scene contains moving objects because shutter speed determines whether those objects appear blurry or are "frozen" in place. See the earlier section "Shutter speed also affects motion blur" for more details.

WARNING

Assuming that the ISO value doesn't change, you theoretically should wind up with the same exposure no matter which aperture or shutter speed you choose, because as you adjust one value, the camera makes a corresponding change to the other value, right? Well, yes, sort of. Remember that you're working with a limited range of shutter speeds and apertures (your camera manual provides information on available settings). So, depending on the lighting conditions, the camera may not be able to properly compensate for the shutter speed or aperture that you choose.

Say that you're trying to catch a tennis player in the act of serving the ball during a gray, overcast day. You know that you need a high shutter speed to capture action, so you switch to shutter-priority mode and set the shutter speed to 1/500 second. But given the dim lighting, the camera can't capture enough light even with the aperture open to its maximum setting, so your picture will turn out too dark unless you increase the ISO setting, making the camera more sensitive to light. Understand that this issue isn't due to any inherent problem with aperture- or shutter-priority modes. Switch to manual exposure mode, and you still have to either adjust the ISO or compromise on the f-stop or shutter speed to get a good exposure.

I rely on aperture- or shutter-priority modes for most shots because letting the camera do half of the exposure heavy lifting frees me up to concentrate on other issues, including composition. The only time I switch to manual exposure is when I want to dial in specific combinations of aperture and shutter speed or when I'm after an unusual exposure — that is, a result that the autoexposure system wouldn't normally deliver. If you're not comfortable using manual exposure mode, however, you may be able to use the tools described in the next section to modify the results that the autoexposure system produces.

Adjusting Autoexposure Results

Autoexposure is a useful tool, and for most subjects and lighting conditions, produces good results. But it's not foolproof, and it can't read your mind on occasions when you want to purposely under- or overexpose an image to evoke a certain photographic look or mood. Not to worry: Even using autoexposure mode, you may be able to adjust the brightness of your next shot by using the features outlined next: exposure compensation and autoexposure lock (AE Lock).

TIP

Another possible autoexposure fix lies in the exposure metering mode, which I cover earlier in this chapter. Again, that setting tells the camera which part of the frame to analyze when setting exposure. If the metering mode is set to measure the entire frame, you may get different exposure results if you shift to spot metering mode, which enables you to base exposure primarily on your subject. Even then, though, the picture may still come out too bright or too dark for your tastes, so you may need to combine metering mode adjustment with these other autoexposure fixes.

Applying exposure compensation

This feature, often referred to as *EV (exposure value)* compensation, bumps the exposure up or down a few notches from what the camera's autoexposure computer thinks is appropriate.

The setting is often marked with a little plus/minus symbol like the one shown in the margin, and you typically choose from settings such as +0.7, +0.3, 0.0, −0.3, −0.7, and so on, with 0.0 representing the default autoexposure setting. (If you're an old-school photographer, it may help you to know that these settings represent exposure stops. For example, EV −0.3 reduces the exposure by one-third of a stop.)

How you adjust the amount of compensation varies from camera to camera, but the settings themselves are simple to understand:

- **For a brighter exposure, raise the EV value.** The scene in Figure 5-12 is a classic example of the problem that occurs when you have a dark subject against a bright background: The camera, choosing exposure settings that average out the brightness values of the entire frame, left the palm tree too dark for my taste. So I applied EV compensation of +1.0 to produce the brighter result on the right.

FIGURE 5-12: The original autoexposure setting left the palm tree too dark; raising the EV setting to +1.0 produced the brighter result.

- **For a darker exposure, lower the value.** In Figure 5-13, the original exposure didn't have the drama I was after with this composition, and highlights in the sunlit brick and the candle flame are so overexposed that all that remains is a blob of white pixels. To get the more artistic result on the right, I dialed in EV –1.0.

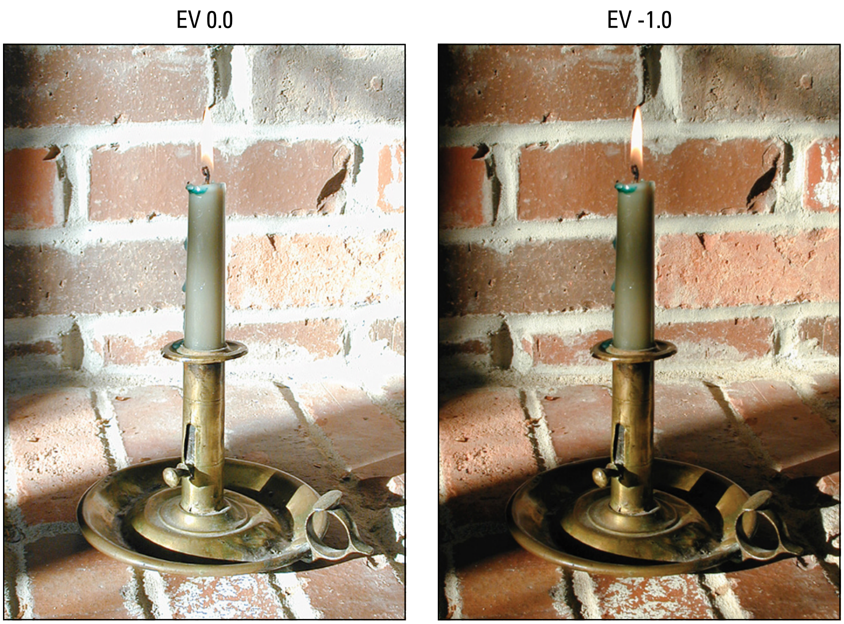


FIGURE 5-13: Here, the autoexposure system blew out the highlights; lowering the EV value solved the problem.

TIP

On some cameras, the exposure meter — which isn't usually displayed when you use autoexposure shooting modes — appears to indicate how much exposure compensation is set. For example, if you dial in an adjustment of EV +1.0, you see a bar under the 1.0 mark on the positive side of the meter. If you're experienced with using the meter to evaluate exposure while shooting in manual exposure mode, this method of indicating exposure compensation can be confusing because in manual mode, a mark at the +1.0 mark would indicate that you're about to overexpose the picture. But remember: The meter is based on what *the camera* considers the ideal exposure, which is what you get when the EV value is 0.0 (no compensation). When you set the EV compensation level to +1.0, you are, in essence, asking the camera to overexpose the shot by one stop over what it thinks is ideal.

WARNING

Make it a practice to reset the Exposure Compensation value to EV 0.0 after you finish shooting the subject that required the adjustment. You can easily forget that you enabled the option and then not be able to figure out why everything is too bright or too dark when you move on to your next subject. If you do get weird exposure results on a shot, check this setting first to make sure that you didn't leave compensation turned on by accident.

AE Lock (autoexposure lock)

When you use autoexposure, most cameras continually measure and adjust exposure settings from the time you press the shutter button halfway until the time you take the picture. Usually, that system works well because it accounts for any lighting changes that may occur at the last second. But on occasion, you may want to interrupt the continuous exposure adjustment and lock in the current settings. Some cameras offer an AE Lock feature that does just that.

Your camera may have a button specifically set aside for this function, or you may be able to assign it to a Function (Fn) button or another button. Many cameras offer a button labeled AE-L/AF-L, which locks both autoexposure and autofocus, respectively, when pressed. (You often can customize the button so it locks exposure only if you prefer.)

Expanding Tonal Range

A scene like the one in Figure 5-14 presents the classic photographer's challenge: Choosing exposure settings that capture the darkest parts of the subject appropriately causes the brightest areas to be overexposed. And if you instead *expose for the highlights* — that is, set the exposure settings to capture the brightest regions properly — the darker areas are underexposed.

FIGURE 5-14: Some cameras have features that brighten shadows without also blowing out highlights.

In the past, you had to choose between favoring the highlights or the shadows. But now photographers have a couple ways to work around the problem:

- **In-camera image manipulation:** Some cameras have tools that brighten the shadows without altering the highlights, enabling you to stretch a photo's *tonal range* — the range of shadows to highlights, also called *dynamic range.* Some Nikon cameras, for example, offer a feature called Active D-Lighting, which tackles the problem in two stages. First, the original exposure is slightly underexposed, to ensure that highlights are properly rendered. Then, before the image is written to the memory card, it undergoes a software process that brightens only the shadows. I used this tool to create the improved seal image in Figure 5-14. Some Canon cameras offer a similar tool called Highlight Tone Priority, and some Sony models offer DRO (dynamic range optimizer). Check your camera manual to find out whether you have this sort of option at your disposal.
- **HDR (high dynamic range) imaging:** This term refers to a technique in which you photograph the same subject multiple times, exposing some images for the darkest areas, some for the midtones, and some for the highlights. You then use special HDR software to combine the exposures, specifying which parts of the frame to pull from which exposure.

For a great example of HDR work, take a look at the images in Figures 5-15 and 5-16, both from photographer Dan Burkholder (`www.danburkholder.com`). In the first image, you see the scene captured at a single exposure. The waterfall is beautiful, but you can't see much detail in the shadows. The second image offers the HDR version, created by combining the shot from Figure 5-15 with seven additional exposures. With the expanded tonal range possible through HDR, you now can see the moss-covered rocks that the water is spilling over.

FIGURE 5-15: Here you see one of the exposures that photographer Dan Burkholder used to create the HDR image in Figure 5-16.

Courtesy of Dan Burkholder

TIP

Some cameras offer automated HDR, capturing and blending multiple exposures with one press of the shutter button. The automated features usually don't capture more than a couple of frames, and you don't have much control over the exposure shift between frames or how frames are blended into the HDR composite. Still, they often produce better results than you can achieve in a single exposure.

Figure 5-17 shows the type of results you can expect. This scene illustrates a problem often faced by real estate agents taking photos of their clients' homes: how to capture both the interior of the house and the exterior landscaping that's visible through the windows. The first two shots show you what I was able to capture in a single exposure. When I set the exposure based on the exterior, the interior was underexposed. When I instead exposed for the interior, the view out the doors became too bright. To produce the final image, I enabled automated HDR mode. Is it perfect? Well, I'd like the interior to be slightly brighter and the exterior to be a tad darker. But it's a definite improvement over the other two exposures.

FIGURE 5-16: The final HDR image includes a greater tonal range than can be captured in a single exposure.

Courtesy of Dan Burkholder

FIGURE 5-17: Some cameras offer automated HDR shooting, which I used to produce the third image in this series.

WARNING

However you approach HDR, use a tripod to make sure the framing doesn't change between shots; otherwise, the HDR software, whether in-camera or on your computer, can't successfully blend the frames. Also, maintain the same f-stop throughout all frames so that the depth of field doesn't shift from one frame to the next. Avoid scenes that contain moving objects, including people. In the blended HDR frame, moving objects will appear at partial opacity along the path they took while the shutter was open.

Bracketing Exposures

Creating HDR images requires you to *bracket* exposures, which means to capture the scene at different exposure settings. But bracketing isn't just for HDR: For tricky exposures, it's a good idea to capture the subject at a few different exposure settings, to increase your chances of coming home with at least one frame that you like.

How you accomplish bracketing depends on what exposure modes are available to you:

- In **manual** exposure mode, change the shutter speed, aperture, or ISO between each shot. When deciding which setting to change between shots, remember to consider the side effects produced by each one: shutter speed affects motion blur; aperture, depth of field; and ISO, image noise. See the first part of this chapter for more about these issues.
- In the **automatic** exposure modes (including shutter- and aperture-priority autoexposure modes), shoot the subject using three different exposure compensation settings. Simply changing the shutter speed or aperture won't do the trick — as soon as you change one of those settings, the camera adjusts the other to compensate so that the final exposure is the same, no matter what.

TIP

Some cameras also offer *automatic exposure bracketing.* With this feature, often abbreviated as AEB, you take a series of successive shots, and the camera automatically adjusts exposure between each capture. Usually, you can select the number of frames and the amount of exposure shift between each frame. Check your camera manual to find out what your camera offers and how it works.

IN THIS CHAPTER

» Getting familiar with the basics of flash photography

» Adjusting flash power

» Experimenting with flash modes

» Using flash to improve outdoor photos

» Considering continuous lighting as a flash alternative

» Putting together a multiple-light setup for home or office

» Discovering free or inexpensive product-lighting solutions

Chapter 6
Adding Flash and Other Lights

Most cameras enable you to use flash to illuminate your subject when the ambient lighting is insufficient. This chapter digs into the topic of flash photography, which involves a lot more art and skill than most people realize. In addition to covering the most common flash settings, I introduce you to some advanced lighting options, such as using multiple flashes, continuous lighting, and specialty lighting tools. Additional tips and techniques related to portrait photography lighting await in Chapter 8.

Enabling and Disabling Built-In Flash

On most cameras, the exposure mode you use determines whether you can enable or disable flash. In Auto mode, for example, the camera may decide whether flash is needed, preventing you from having any say in the matter. But in advanced modes such as aperture-priority autoexposure (introduced in Chapter 5), the camera may bow out of the decision, leaving it up to you to enable flash if you see fit.

The following list describes the most common buttons and settings that you use to enable and disable a built-in flash — assuming, of course, that your camera gives you that flexibility:

- **Flash button:** On cameras that offer a pop-up flash, look for a button like the one shown in Figure 6-1. To bring the flash out of hiding, just press that button. Again, you may need to shoot in advanced exposure mode to have this option. To stop using flash, just gently press down on the flash unit to put it away.
- **Auto Flash Off exposure mode:** If you want the convenience of shooting in Auto mode but don't want the flash to fire — something that the camera typically controls in Auto mode — look for a mode called Auto Flash Off, which usually sports a label like the one highlighted in Figure 6-2. This exposure mode works just like Auto mode, detailed in Chapter 3, but disables flash.
- **Flash mode setting:** Some cameras offer a variety of *flash modes,* each of which affects flash firing in slightly different ways. You usually adjust this option via the camera's main settings screen, as shown in Figure 6-3, or via a menu option. Sometimes, you press a Flash button while rotating a dial to adjust the flash mode. (In other words, check your camera guide for how-to's.)

FIGURE 6-1: A lightning-bolt symbol is typically used to mark the button that you press to raise a built-in flash.

I explain the more complex flash modes later in this chapter, in the section cleverly titled "Exploring Special Flash Modes," but for the purposes of simply getting the flash to fire or not, look for these two modes:

- *Flash On:* This setting causes the flash to fire no matter what the ambient light, which is why it's sometimes called *force flash*. You may also see this setting represented by the term *fill flash* or *fill-in flash*. The idea is that even though there's enough light to expose most of the scene, you need a little light from the flash to fill in the shadows. Typically, the symbol representing this mode looks like a lightning bolt, as shown in Figure 6-3. See the section "Improving Outdoor Photos with Flash," later in this chapter, for tips on using flash in bright light.
- *Flash Off:* In this mode, represented by lightning bolt with a slash through it, like the symbol highlighted in Figure 6-2, the flash won't fire — no way, no how. It's designed primarily for venues such as churches and museums that don't permit flash photography. But you may also want to turn off the flash simply because the quality of the existing light is part of what makes the scene compelling. Or, you may want to go flashless when shooting highly reflective objects, such as glass or metal, because the flash can cause *blown highlights* (areas that are completely white, with no tonal detail).

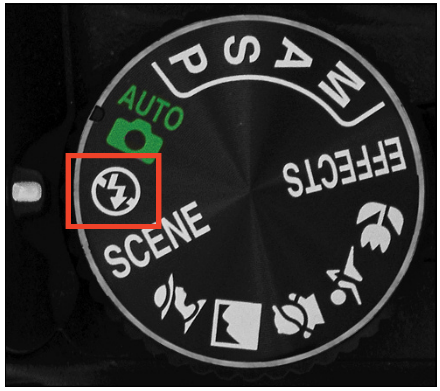


FIGURE 6-2:
Auto Flash Off exposure mode works just like Auto mode but prevents the flash from firing.

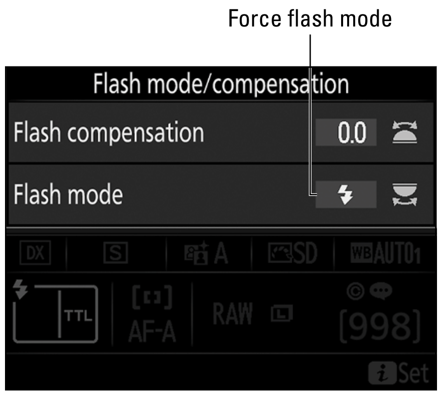


FIGURE 6-3:
You may also be able to force the flash to fire via a Flash mode setting.

TIP

If flash isn't enabled and the camera thinks you need more light, you may see a blinking lightning bolt in the monitor or viewfinder display. That's the camera's gentle nudge to consider adding flash. Find this feature annoying? On some cameras, you can disable it; browse the camera menus and look for an option named *Flash Warning* or something similar.

Comparing Built-In and External Flashes

Even if your camera offers a built-in flash, it may enable you to add an external flash head like the one shown in Figure 6-4. In most cases, you attach the flash via a connection known as a *hot shoe*, shown in Figure 6-5. But some cameras also let you connect the flash via a cable known as *a flash-sync cable.*

FIGURE 6-4:
This external flash features a rotating head, enabling you to aim the light in any direction.

An external flash will set your budget back by at least $100 and possibly hundreds more, depending on the unit you buy. To help you decide whether this is an investment you should make, the next two sections discuss the pros and cons of both types of flashes.

Pros and cons of built-in flashes

The number one benefit of a built-in flash is convenience. It's there whenever you need it and doesn't add (much) weight or bulk to your camera bag. Because it's powered by the camera's battery, you don't need to worry about carrying extra batteries or another power source as you do when using an external external flash.

FIGURE 6-5:
On most cameras, you connect an external flash via this connection, known as a hot shoe.

And now for the downsides of a built-in flash:

- **The range of a built-in flash is limited.** Depending on the size of the flash, the light typically reaches about 20 feet at best. In other words, don't bother using the built-in flash when photographing a stage performance from your seat in the theater balcony. The only things that will be illuminated are the backs of your fellow audience members (who will turn around and glare if you keep it up).

On the other hand, if you shoot lots of close-ups, be aware that the minimum flash distance can become an issue, too. Ironically, when you get very close to your subject, it may not be fully illuminated by the built-in flash because the flash emits a very narrow, focused light. And if your lens if very long, it may block part of the flash light, creating weird shadows on your image. The same problem can occur when you use a lens hood, an accessory that I discuss in Chapter 13.

TECHNICAL STUFF

The effective range of any flash depends on the current ISO and f-stop settings, two exposure options I explain in Chapter 5. At some combinations of ISO and shutter speed, you must be much closer to your subject than the usual long end of the flash range when using a built-in flash. Your camera manual may list the flash range at various aperture and ISO combinations; if not, experiment to find out how these settings affect flash outcomes.

- **Flash portraits often suffer from red-eye.** This phenomenon, which turns people's eyes into glowing red orbs, is common when you shoot indoor portraits, especially in dimly lit rooms. See the later section "Flash with red-eye reduction" for tips on using a special flash option that can reduce the odds of red-eye. And see Chapter 8 for ways to go flash-free when you shoot portraits, eliminating the issue of red-eye altogether.
- **Don't expect to use the built-in flash for action photography.** Three issues get in the way:
  - *Burst-mode shooting usually doesn't work with flash.* This shutter-release mode, usually called Continuous mode, records a burst of images as long as you hold down the shutter button. (Chapter 2 introduces shutter-release modes.) On many cameras, enabling a built-in flash immediately disables burst-mode shooting, and the camera then takes one photograph for each press of the shutter button instead of recording a burst of frames. Or, if the camera does permit burst shooting, the flash may fire only on the first shot or for the first few frames.
  - *With a built-in flash, you may not be able to use a fast enough shutter speed to freeze action.* On most cameras, the highest shutter speed you can select when the built-in flash is enabled is somewhere between 1/200 and 1/320 second. For slowly moving subjects, that shutter speed may work, but anything moving at a fast pace won't be recorded without blur. (For help understanding how shutter speed affects motion blur, see Chapter 5.)
  - *The flash needs time to recycle between shots.* And Murphy's Law being, well, a law, it's pretty much certain that your flash will be recharging when the highlight-reel moment of the day occurs.

- **Many cameras disable flash when you shoot in certain automatic exposure modes.** For example, if your camera offers a Landscape scene mode, it probably disables flash when you use that mode. That makes sense given the short reach of a built-in flash, but what if you're shooting a landscape that has a fountain or statue in the foreground? You may want to use flash to illuminate that subject, but the camera says "nuh uh." A built-in flash is also usually disabled for Sports mode (for the reasons outlined in the preceding section) and some other automatic scene modes.

All that said, I do use my camera's built-in flash a lot, mostly for outdoor photography when the small pop of light it emits is just what's needed to better illuminate a subject that's backlit or lit from a bright sun above. The section "Improving Outdoor Photos with Flash" offers some illustrations.

Pros and cons of external flash heads

Because of the built-in flash limitations outlined in the preceding section, you may want to purchase a larger, external flash like the one shown in Figure 6-4 if your camera offers that option. Here are some of the benefits of using a larger flash:

- **The light covers a larger distance than you get with a built-in flash.** The maximum flash range varies depending on the flash unit, so this is a specification you should investigate when shopping for an external flash.
- **The light has a wider spread than the built-in flash.** And the wider the area over which the light is spread, the softer the illumination. In this regard, an external flash has it all over the built-in flash.
- **Depending on your camera, you may be able to shoot at a much faster shutter speed than you can with the built-in flash.** If your camera offers a feature known as *high-speed flash,* you usually can access the camera's entire range of shutter speeds even when flash is enabled. That means you can use your flash to light an action shot. You may not be able to capture a continuous burst of shots using flash because the flash needs time to recycle between frames, but you can set the shutter speed high enough to freeze action for a single shot of a moving subject. And sometimes, the flash does have enough juice to light a couple of shots before recycling.

  TIP

  The fast-shutter speed capability of an external external flash isn't beneficial just for capturing action, however. It's also useful for outdoor portrait photography because you can use a large *aperture* (low f-stop number). As detailed in Chapter 5, a large aperture produces a soft, blurry background that's perfect for portraits. But with a large aperture, more light enters the camera, which means that you need a very fast shutter speed (short exposure time) to expose the image properly. The top shutter speed available with the built-in flash usually isn't enough to avoid overexposure when you use a large aperture in bright sunlight.

- **If you buy a flash that has a rotating head, you can take advantage of *bounce flash*.** That's the term for aiming the flash head upward so that the flash light bounces off the ceiling and falls softly down onto the subject. Not only does this technique produce more flattering lighting, but it also reduces or eliminates distracting background shadows and all but eliminates the chances of red-eye.

  As an example, Figure 6-6 shows a portrait taken with the flash aimed directly at the subject (left image) and with bounce flash aimed at the ceiling (right image). You can also experiment with bouncing the light off a white wall or white card positioned to one side of the subject, which creates a more dramatic look because one side of the face is more brightly lit than the other.

  WARNING

  Make sure the ceiling or other surface you use to bounce the light is white or another neutral color; otherwise, the flash light will pick up the color of the surface and influence the color of your subject.

- **With an external flash, you may be able to use flash in automatic scene modes that disable the built-in flash.** For example, if you like using your camera's Landscape scene mode because it delivers a long depth of field and vivid colors, you're not locked out of using flash to add a little light to a foreground object.

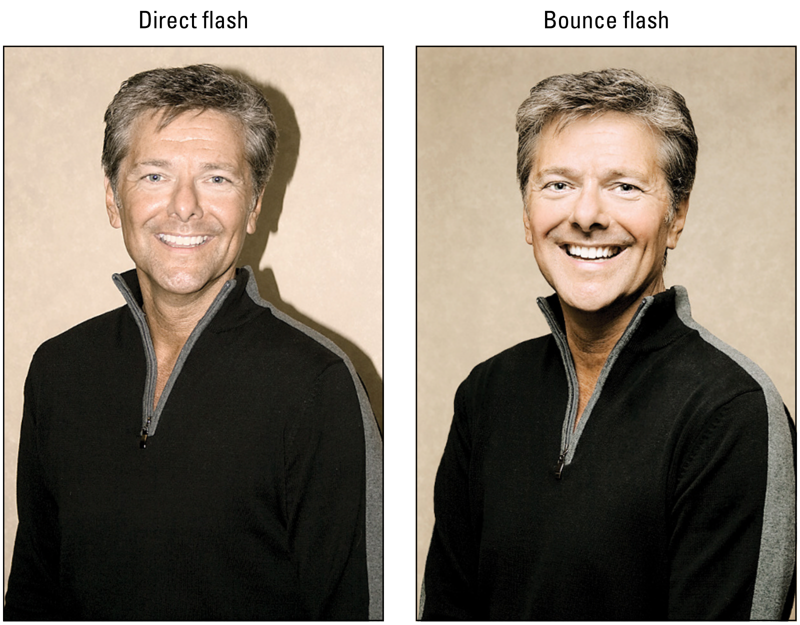


FIGURE 6-6: Blasting the subject from the front creates harsh lighting and strong shadows (left); bouncing the light off the ceiling produces softer results (right).

- **You can adjust flash settings either via controls on the flash unit or with options found on the camera itself.** However, to ensure full compatibility with the camera's options, you need to buy an external flash that's set up to work with your specific camera.
- **Depending on the flash you buy, you may be able to remove the flash from the camera and trigger it remotely.** This feature gives you lots of flexibility in positioning your light source, which in turn enables you to get more creative with lighting.

The downside to an external flash? Well, the most obvious disadvantages are the cost and added bulk of the equipment you have to lug around. In addition, external flash heads require their own power source, whereas the built-in flash works off the camera's battery. The flash I use, for example, takes four AA batteries. A flash eats up battery power quickly, so you should always carry at least one set of spare batteries.

Despite those drawbacks, I consider an external flash a necessity if you want to seriously pursue portrait photography. Yes, you can take great portraits using natural light, but doing so presumes that you're shooting during daylight and the weather forecast isn't calling for freezing temperatures or pouring rain. At the very least, the external flash gives you a lighting safety net even if you plan to shoot in natural light. On the other hand, if you're primarily interested in wildlife or landscape photography, I recommend waiting to buy an external flash until you feel limited by the abilities of the built-in flash.

WARNING

One final note on this subject: The advantages I list for an external flash assume that you're using a traditional (large) flash like the one featured in Figure 6-4 and not one of the tiny flashes sometimes available for compact cameras. Figure 6-7 has an example of such a flash unit mounted on a mirrorless camera. Although this flash, like the one in Figure 6-4, has a rotating head, notice that the area that emits the light isn't much bigger than that found on the built-in flash in Figure 6-1. In other words, it's not the fact that the flash is an add-on that matters — it's the amount and spread of the light that the flash emits that makes the difference.

FIGURE 6-7: Some compact cameras enable you to attach an external unit like this one, but the small size of the flash head doesn't provide all the benefits of a larger flash.

Adjusting Flash Power

When you use a built-in flash, the camera is set by default to automatically use the flash power that it thinks is necessary. You may see this automatic flash feature referred to as *TTL flash.* The TTL stands for *through the lens.* Simply put, TTL flash means that the camera measures the light coming through the lens and sets the flash power accordingly.

Many cameras enable you to adjust the strength of the flash, however. Check your instruction manual to find out whether you have access to the following features:

- **Flash exposure compensation (flash EV):** This feature works just like exposure compensation, which adjusts overall exposure (refer to Chapter 5), but instead varies the strength of the flash. Usually, the option is represented by a symbol like the one shown in the margin here: a plus/minus symbol alongside a lightning bolt — the universal symbol for flash.

  As with exposure compensation, settings are stated in numerical terms, such as +1.0, –1.0, and so on. If you want more flash power, you use a positive flash EV value: +0.3, +0.7, and so on. For less flash power, select a negative value.

  Figure 6-8 offers an example of how this feature works. I shot this picture at an outdoor farmers' market, in a stall that was shaded by a large awning. I wanted to add flash to bring a little more light to the scene, but at the default flash power, the light was just too hot, blowing out the highlights in the fruit. I reduced the flash power by setting the flash compensation value to –1.3, which added just a small pop of light without overpowering the subject.

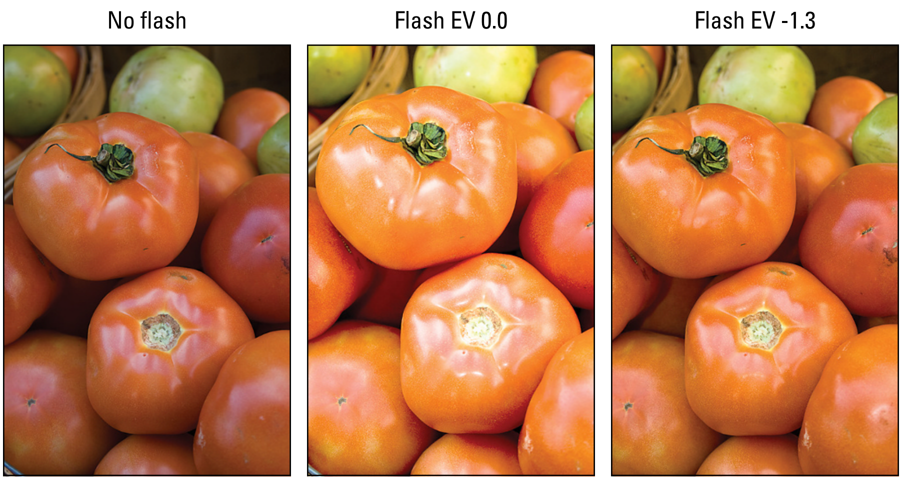


FIGURE 6-8: Flash exposure compensation enables you to adjust the strength of the flash.

» **Manual flash power adjustment:** For advanced photographers, some cameras also offer manual control over the power of the built-in flash. If you go this route, the camera doesn't take any role in setting flash power; you dial in exactly how much flash power you want to use. Settings in this case are presented in terms of fractions of the normal, full power. For example, you can ask the flash to deliver ¼ of its full power.

Most external flash units offer both of these adjustments. In some cases, you dial in the flash power via controls on the flash head, but depending on the flash you buy, you may be able to use the controls on the camera itself. In addition to using these flash adjustments, you can diminish flash power by using a mechanical solution: Place a diffuser over the flash head. For example, Figure 6-9 shows a diffuser designed to work with the pop-up flashes on dSLR cameras, but there are many other designs of diffusers for both built-in and external flashes. Regardless of the style or size, the idea is to spread and soften the flash light, helping to eliminate harsh shadows and create more flattering light. If you do much flash photography, especially portrait photography, adding a diffuser to your camera bag is one of the best investments you can make. The product shown in the figure is from LumiQuest (`www.lumiquest.com`).

FIGURE 6-9: From LumiQuest, this diffuser is designed for use with built-in flashes.

Photo courtesy LumiQuest

WARNING

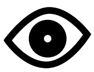
A diffuser reduces the amount of light hitting your subject, so you may need to increase flash power slightly via flash exposure compensation or manual flash control to compensate. The camera has no way to know that you've added a diffuser to your flash, so it won't increase flash power automatically.

Exploring Special Flash Modes

In addition to the two basic flash modes, Flash On and Flash Off, your camera may offer the three flash-mode settings outlined next. How you adjust the flash mode varies from camera to camera. Some models make it as easy as pressing a button to access the setting, but others require you to dig into camera menus. If you're using an external flash, you can set the flash mode on the flash itself or, assuming the flash is fully compatible with the camera, via the camera's controls.

In the following sections, the margin icons show you the symbols that are usually used to represent each flash mode.

Flash with red-eye reduction



It's the rare photographer who has never experienced the problem of *red-eye*, where the flash causes a demonic red glint in the eye. The portrait on the left in Figure 6-10 shows an example. The phenomenon occurs when light from the flash reflects blood vessels in the eye and is most common when you shoot in a very dark room and use a small built-in flash. But even with a large external flash, red-eye can happen in certain circumstances, especially if you aim the light directly at the subject's face.

FIGURE 6-10: Got red-eye? Try using red-eye reduction flash mode for a better result.

Red-eye reduction flash mode, typically represented by an eyeball icon, aims to thwart this phenomenon by emitting a blinking light from the flash or from a special lamp on the front of the camera for a few seconds before firing the actual flash and releasing the shutter. The idea is that the prelight causes the pupil of the eye to shut down a little, thereby lessening the chance of a reflection when the flash goes off.

Unfortunately, red-eye reduction flash doesn't always work perfectly. Often, you still wind up with fire in the eyes — hey, the manufacturer promised only to *reduce* red-eye, not eliminate it, right? Worse, your subjects sometimes think the prelight is the actual flash and start walking away or blink just when the picture is being captured. So if you shoot with red-eye mode turned on, be sure to explain to your subjects what's going to happen.

TIP

The good news is that, because you're shooting digitally, you can repair red-eye easily. Some cameras have an in-camera red-eye remover that you can apply after you take a picture. If not, the fix is easy to make in a photo-editing program. Many online printing sites and in-store photo kiosks even have tools that let you do the job before you order your prints.

Slow-sync flash

Slow-sync flash enables you to use an exposure time beyond what the camera normally allows for flash pictures. The name comes from the way the timing of the flash firing is synchronized with the shutter action.

With regular, fill-flash mode, the camera generally prevents you from using a shutter speed slower than 1/60 second. In dim lighting, the result typically looks like what you see on the left in Figure 6-11. The foreground objects are illuminated by the flash, but background elements beyond the reach of the flash are dark. Slow-sync flash enables you to keep the shutter open for a longer time, allowing more ambient light to enter the camera. The result is a brighter background, as shown in the second example in the figure. Exposure time for this shot was 1 second.

Whether a brighter background is desirable depends upon the subject and your artistic mood. However, remember that the slower shutter speed required for slow-sync flash can easily result in a blurred image; both camera and subject must remain absolutely still during the entire exposure to avoid that problem.

Normal flash Slow-sync flash

FIGURE 6-11: Slow-sync flash produces a brighter background and softer flash light than normal flash mode.

How you switch to slow-sync flash varies depending on your exposure mode. If you're shooting in manual mode or shutter-priority autoexposure (both of which give you control over the shutter speed), you usually just dial in the shutter speed you want to use, and the camera fires the flash without making any fuss. But in aperture-priority mode, in which you set the aperture and the camera controls the shutter speed, you usually have to specifically select slow-sync flash as your flash mode. Auto and scene exposure modes usually don't give you a slow-sync option, but if your camera offers a Nighttime Portrait option, it likely uses slow-sync flash automatically.

Chapter 8 offers examples of how slow-sync flash can also be used to good effect in portrait photos. Again, this is a technique to consider only with subjects that can remain still during the longer exposure time required by slow-sync flash.

Rear-curtain sync

REAR

By default, the flash fires at the beginning of the exposure, an arrangement known as *front-curtain sync.* But some cameras give you the option of rear-curtain sync, which sets the flash to fire at the end of the exposure. The classic use of rear-curtain sync is to create an image that shows motion trails following a moving object. In addition to changing to rear-curtain sync, you also need to use a long exposure time (slow shutter speed) so that blur is produced by the moving object. For example, to create the illustration shown in Figure 6-12, I set the shutter speed to 3 seconds.

Shutter speed, 3 seconds; Flash set to rear-curtain sync mode

FIGURE 6-12: If you want motion trails to follow a moving object, set the flash mode to rear-curtain sync.

Here's why rear-curtain flash sync is critical to this effect: When the shutter is open for a long time — as it is when you use a slow shutter speed — the moving object is recorded as a faint, blurred version of itself, appearing several times throughout the frame. When the flash fires, the object is recorded as solid, with its action frozen at that moment.

If the flash fires at the beginning of the exposure, the motion trails created by the object blur appear in *front* of the moving object, as shown in Figure 6-13. I suppose you could use such an image to illustrate a disruption of the time-space continuum, which science-fiction lovers know is a dangerous move. But if you want the image to make visual sense in the real world, you want the motion trails to follow the moving object, as in Figure 6-12, and that requires rear-curtain sync.

Shutter speed, 3 seconds; Flash, normal mode (front-curtain sync)

FIGURE 6-13: With front-curtain sync and a long exposure, the motion trails appear in front of the moving object, as shown here.

USING ONE FLASH TO CONTROL OTHERS

TIP

Some cameras offer a feature that enables you to use the built-in flash as a wireless controller for off-camera flash units. This option enables you to light your subject from any angle — you're not restricted to keeping the light source atop the camera. It's also helpful for photographers who want an easy, compact way to light a large area. If you're trying to photograph an event in a room that's dimly lit, for example, you can put several remote flashes throughout the area. I also use multiple flashes for formal portraits and for product photography; the section "Setting Up a Small Lighting Studio," near the end of this chapter, shows you the setups I use for both.

In some circles, the trigger flash is called the *master,* and the remote units are *slaves.* But most manufacturers have shifted away from those terms — for obvious reasons — and use the terms *transceiver* and *receiver* or *commander* and *remote.* Whatever terminology you choose, the idea is the same: When you press the shutter button on the camera, the off-camera flashes fire when they "see" the light from the built-in flash. Usually, you can opt to have the built-in flash put out just enough light to trigger the other units if you don't want any strong light hitting your subject from the front of the camera.

If your camera doesn't have a built-in flash or doesn't offer the commander/transceiver function, you can buy stand-alone units to do the job. Transceivers typically attach to the camera via a standard flash hot shoe or cable and operate via infrared or some other wireless technology rather than emitting a light to trigger the off-camera remote flashes.

Improving Outdoor Photos with Flash

Most people think about flash as a tool that you only need for indoor pictures and for nighttime shots outdoors. But flash can also come in handy outdoors on a bright day. And why, you ask, would you *want* flash if there's lots of ambient light? Because depending on the setting, your subject may either be *backlit* — that is, the light is coming from behind — or be lit from above, as when the sun is at high noon. Either way, the front of your subject may not be adequately lit and appear underexposed in the photo.

Figure 6-14 offers an example of the difference flash makes with a backlit subject. Mind you, this is one of those "art is in the eye of the beholder" photos. You may prefer the no-flash image because of the dramatic silhouette formed by the leaves of the plant. I vote for the flash version, though, because you can see details at the center of the plant that aren't visible in the flash-free version. When in doubt, experiment: Take each shot with and without flash.

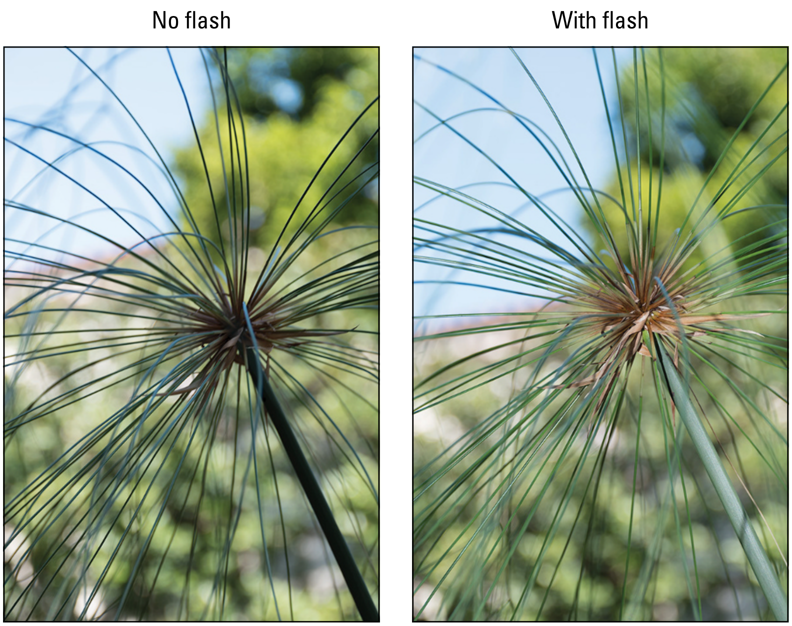


FIGURE 6-14: When subjects are backlit, adding flash can expose more details.

When you're shooting portraits, however, flash is almost certain to improve your results even if your subject isn't backlit. Remember, with the light source (the sun) positioned above the subject, the face may not receive enough light for a good exposure. In addition, the ridge of the brow can create shadows that obscure the eyes. The problem is exacerbated if your subject is wearing a hat or hoodie, as in the example shown in Figure 6-15.

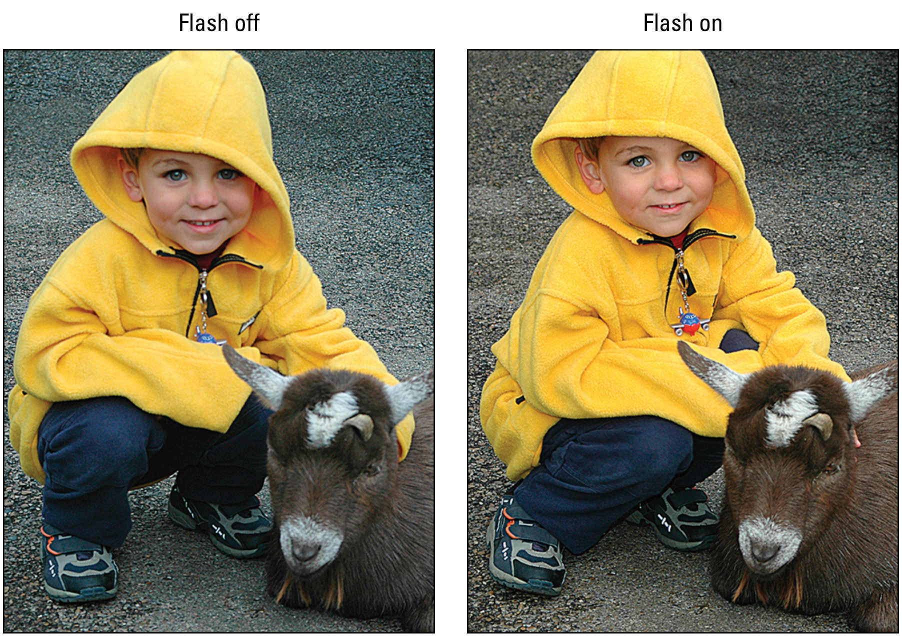


FIGURE 6-15: I used my camera's built-in flash to add just enough light to bring the boy's face out of the shadows.

Of course, you could always dial in exposure settings that brighten the entire image instead of using flash. But doing so has a couple of drawbacks. In the scene like the one in Figure 6-14, increasing exposure might have overexposed the sky, turning it from blue to white. By using flash, you have a better chance to properly expose your subject without losing background details. And in the portrait in Figure 6-15, the eyes would still be in shadow relative to the rest of the face without flash. Because the pupils are already dilated from the bright outdoor light, you don't have to worry about the flash causing red-eye, as you do in dimly lit settings.

Using flash in bright light does involve a few complications, however:

- **When using a built-in flash, you must set the flash mode to the setting that causes the flash to fire regardless of the ambient light.** In Auto flash mode, the camera is unlikely to see the need for flash because of the bright ambient light. You may need to shoot in an advanced exposure mode, such as aperture-priority exposure mode, to gain control over whether the built-in flash fires. Again, this mode is often called *fill flash* or *force flash* and is represented by a lightning bolt that appears *without* the word Auto.
- **Colors may need tweaking.** When you combine multiple light sources, such as flash and daylight, colors may appear warmer (more amber) or cooler

(more blue) than neutral. Notice that in the flash example in Figure 6-15, the boy's face, as well as the background and the animal's fur, appear noticeably warmer than in the no-flash version. For portraits, this warming effect is usually flattering. But if you prefer a neutral color rendition, see the Chapter 7 section related to White Balance controls to find out how to address this issue.

- **When using flash in very bright light, you may need to increase shutter speed to avoid overexposing the image.** Because you're adding more light to the scene, the camera needs less time to soak up ambient light to expose the image.

  Unfortunately, most built-in flashes limit the top of the range of shutter speeds you can use with flash as they do with the bottom of the range. Typically, the fastest available shutter speed is about 1/200 to 1/320, which may not be fast enough to deliver a good exposure in very bright light.

  Here are a few potential solutions for this problem:

  - *Lower the ISO value, which makes the camera less responsive to light.* The result is a darker image at the same shutter speed.
  - *Set the aperture to a higher f-stop number.* The higher the f-stop setting, the smaller the aperture opening and the less light enters the camera. Keep in mind, though, that changing the f-stop also alters the depth of field. When you increase the f-stop, objects at a distance from your subject will appear sharper than they do when you use a low f-stop setting.
  - *Place a neutral density filter over the lens.* Like sunglasses for your lens, a neutral density filter cuts the amount of light that can enter the lens, allowing you to use a slower shutter speed and still expose the image correctly. See Chapter 10 for a look at this type of filter.

  TIP

  With an external flash and camera that offer high-speed flash, problem solved: You can access the camera's entire range of shutter speeds. All you need to do is dial in a shutter speed fast enough to avoid overexposure.

Considering Continuous Lighting

Although flash is the most common form of artificial lighting, you do have another option: You can opt for *continuous lights*, which is a fancy term for photography lights that stay on all the time rather than emit light only when you press the shutter button. Constant lighting gives you the advantage of being able to see in advance where and how the light is going to hit your subject, making it easier to get the light just right before you shoot. (Some flashes do offer a *modeling flash* feature, which outputs a blinking burst of light so that you can preview the flash, but it happens so quickly that it's difficult to make a judgment on whether you've got things set up right or not.)

The downside to continuous lights is that they require either AC power or suck up battery juice like crazy — which makes sense, given the lights are drawing power, uh, continuously. Additionally, continuous lights that offer enough output to do the job well aren't any less costly than a good external flash.

Years ago when I started experimenting with multiple-light setups for my still-life photography, I used constant lighting in the form of tungsten bulbs. These bulbs are sometimes referred to as *hot lights* because if they have enough wattage to put out decent light, they get hot. And I don't mean just a little warm; touching one can result in a nasty burn. And if you're positioned close to hot lights, it doesn't take long before you start to feel like you're shooting in 98-degree noonday sun. Let's just say that when I had the option to swap out those lights for multiple remote-controlled flash units, those tungsten lights went into the back of my equipment closet and haven't been used since.

Today, you can get the benefits of constant lighting without the extreme heat by buying products that use LED or fluorescent bulbs. Some of these lighting products are aimed primarily at videographers — movie recording requires constant lighting — but they can do dual duty for still photography. Some can even connect to your camera via a hot shoe, just like an external flash. Figure 6-16 shows one such product, an LED light panel from Smith-Victor, which costs about $110 (`www.smithvictor.com`).

Courtesy Smith-Victor

FIGURE 6-16: This Smith-Victor LED light panel can attach to your camera via a hot shoe, offering continuous lighting on the go.

Setting Up a Small Lighting Studio

If your job or your passion requires shooting lots of formal portraits (such as corporate head shots) or product photography, I highly recommend putting together a small, multiple-light studio. You don't need to spend a lot of money or devote a large area for such a studio, and you'll get far better lighting results in less time with the proper tools at hand.

Figure 6-17 offers an illustration. I used a regular, built-in flash to take the picture on the left, resulting in harsh shadows and uneven lighting. To get the result shown on the right, I used the multiple-flash setup shown in Figure 6-18. To achieve the bright, shadow-free illumination all the way around the camera, I set up *cross lighting*, which means that I place one remote flash to the left of the camera and another to the right, as shown in Figure 6-18. With cross lighting, the light from the left flash takes out the shadows cast by the right flash, and vice versa.

Single flash, lit from front   Two flashes, lit from both sides

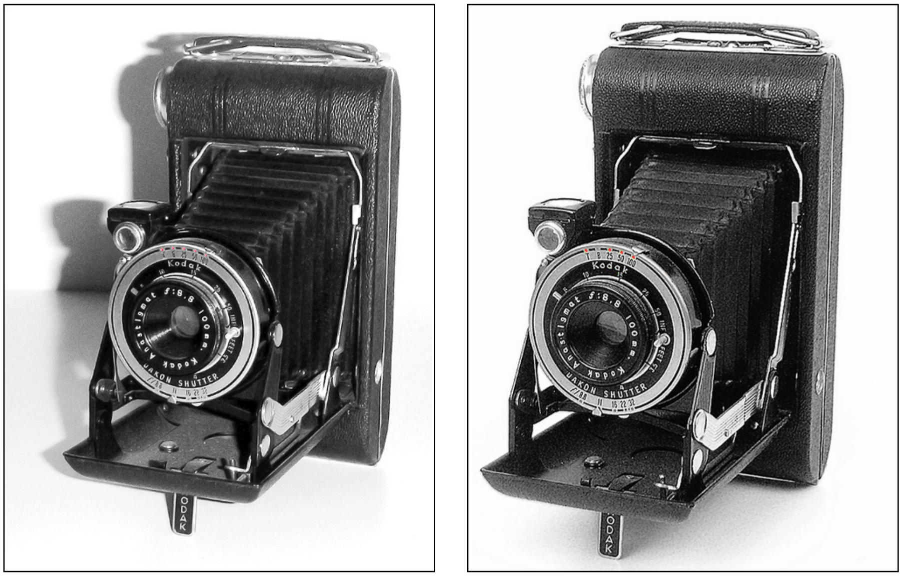


FIGURE 6-17: Using the built-in flash produced harsh shadows and uneven lighting; I lit the second shot using the two-light setup shown in Figure 6-18.

FIGURE 6-18: Here's a basic cross-lighting setup, which can produce shadow-free product shots.

Here's a list of the tools involved in my multiple-light tabletop setup:

- **Camera:** I shot the photo with a Nikon dSLR mounted on a tripod. This camera has features associated with Nikon's commander/remote flash system, known as the Nikon Creative Lighting System (CLS). For this shot, I used my camera's built-in flash to trigger the off-camera flashes. I set the built-in flash to emit only enough light to trigger the remote flashes because I didn't want any light hitting the front of the subject, which sports lots of shiny bits that might reflect a stronger pop of light.

  Although this setup happens to feature Nikon products, many other camera and lighting manufacturers offer these same capabilities.

- **Remote flash units:** This setup features two external flash units that are also compatible with Nikon CLS. The flash head to the left of the table is my regular external flash, and the one on the right is a smaller unit that works only as a remote flash.

  TIP

  When you use multiple flash units like this, it's nice to be able to adjust the flash power of each unit separately. That way, you can set one light to be the primary light — *key light,* in photo terms — and use the second to add just a little illumination from another direction. Also, if your flash units are different sizes, as are the ones in my setup, you may need to dial down the power of the larger unit and increase the power of the smaller one to keep the lighting even across the scene. With the Nikon CLS system, I can make these changes via a camera menu, but depending on what system you use, you may instead adjust power on the transceiver unit or on the remote flashes.

- **Light stands:** Although most flash units come with a small stand that enables you to set them upright on any flat surface, I mount mine on light stands so that I can set the flashes at any height. These particular stands also enable you to rotate the angle of the flash up or down.
- **Umbrella diffusers:** Each light stand has an adapter that holds a translucent umbrella, which diffuses the light.
- **Product backdrop:** The white, curved backdrop on the table is designed especially for product photography and is from CloudDome. Unfortunately, this particular backdrop isn't available any longer, but you can find similar solutions if you do an online search for product-photography backdrops. Or you can rig up a DIY version by using a flexible piece of white matte board.
- **Shooting table:** You can buy portable shooting tables on wheels to use for your product photography, but I just use my dining room table with the leaves folded down. It's just the right height, and it's not like I'm using it for its intended purpose most nights anyway.

Behind my tabletop setup, I placed a large pop-up backdrop to block out light coming from two large French doors in the background. (It's called a *pop-up* backdrop because it collapses and folds up into a small bag when not in use. When you remove it from the carrying case, it pops open to the size you see in the figure.) Obviously, this background isn't a required element for tabletop photography. You can put your setup somewhere not impacted by window light — just not in my house, where this is the only easily available spot to set up my gear.

I do recommend a pop-up background if you want to raise your portrait photography game, however. The left image in Figure 6-19 shows the setup I use for the portrait-shooting variation of my multiple-flash studio. All I have to do to change the setup is drag the table out of the way, move a small stool in front of the backdrop, and reposition the lights. In the figure, the lights are set up in a traditional portrait-lighting orientation, with one light set at about a 45-degree angle and above the subject and the other set directly to the side, at about the height of the subject's face. (Ignore the chandelier in the upper-left corner; it's not part of the lighting setup, just a fixture that I have to work around and remind myself not to conk my head on.)

FIGURE 6-19: Here's the portrait-shooting variation of the studio.

There's one other product added to the mix: I place a tool called a reflector in front of the subject, resting it against a painter's easel (which I have used for nothing else since concluding that I would never be able to draw or paint). The reflector catches some of the light from the remote flashes and bounces it upward towards the subject, helping to banish any shadows that might otherwise appear under the eyes and to soften shadowing under the chin and nose. The right image in Figure 6-19 shows an example of the result of this lighting setup. Notice that the background, although white in real life, appears as a nice, soft gray in the photo. That's because the background is far enough from the lights that it doesn't become fully illuminated in the shot.

The best things about these setups — other than the benefits to my images — is that teardown and storage is simple. The light stands and umbrellas collapse and go into a carrying bag. The pop-up background and reflector also fold up into their own carrying cases, and both flashes fit in my camera bag. Although I mostly use the setup at home, everything is lightweight and compact enough for me to take to remote sites. I even used the portrait setup in the back corner of a restaurant for an office party not long ago.

As for cost, I think I paid less than $500 for the whole shebang, minus the two flash units. But as I said, I needed the large external flash anyway (about $600 at the time I bought it). The smaller, remote-only flash cost another couple hundred dollars.

You can use a similar setup with continuous lights, by the way. Just make sure that the light stands and diffusers you buy are compatible with the type of light you choose.

TIP

SHOPPING FOR LIGHTING GEAR

If you're ready to start shopping for lighting equipment, I recommend that you visit a camera store if there's one nearby. You're not likely to find a good selection of lighting products at electronics stores, which usually reserve most of their display space for cameras and camera bags. No camera store nearby? The next best bet is to buy through the online site of a reputable store. Here are three nationally known stores I recommend:

- B&H Photo Video, headquartered in New York City (`www.bhphotovideo.com`)
- Roberts Camera (`www.robertscamera.com`), based in my former hometown of Indianapolis (Go Colts!)
- Glazer's Camera in Seattle (`www.glazerscamera.com`)

Looking at Simpler (and Cheaper) Lighting Setups

Before closing out this chapter, I want to emphasize that the multiple-light setups shown in the preceding section are absolutely not necessary if you have neither the space nor the budget for such solutions. You can shoot very nice shots of products you want to sell online, for example, with just your camera's on-board flash — or no flash at all. All you need is a suitable backdrop and a way to drape it behind the object.

Figure 6-20 shows an example. My backdrop is a black velvet skirt that I haven't worn since moving to the sub-tropical clime of South Florida. I draped it over a picture frame and set my subject, a jade horse, in front of it. Again, I blocked off the window that's behind the table using the same pop-up portrait backdrop featured earlier in this chapter, but only because I was too lazy to move the dining-room table, er, I mean, shooting table, to another location. The jade horse is fairly reflective, so I didn't want the window light causing reflections on its surface. For the same reason, I opted not to use flash and instead put my camera on a tripod. That way I could use a shutter speed slow enough to expose the image using only ambient lighting coming through windows that were far enough away that they didn't have the potential to result in reflections. The resulting product shot appears on the right in Figure 6-20.

f/9.0, 1/2 second, ISO 500, no flash

FIGURE 6-20: Here's proof that you don't have to invest in expensive lighting setups to take good product shots.

Don't have a velvet skirt lying around? Really, any piece of plain or subtly patterned fabric will do. I've picked up a number of differently colored backdrops for a few bucks apiece by shopping the remnants table of my local fabric store. Other inexpensive and easily available background options are poster board and matte board, which you can pick up at any arts and crafts store.

Lighting, too, can be done on the cheap, even with a hardware-store clamp light — the kind that has a silver, reflective dish and a socket for installing a light bulb. Just be sure to buy a bulb that is as color neutral as possible so your photo colors aren't affected by the light's hue. (Chapter 7 offers information on how to neutralize colors using your camera's white-balance setting if necessary.) I've also used clip-on LED office lights for simple desktop setups; the left image in Figure 6-21 gives you a peek at a makeshift stage I created atop a file cabinet to shoot a still-life creation. Again, the backdrop is from the fabric-store remnant pile. The final photo appears on the right side of the figure.

FIGURE 6-21: I used two standard, clip-on LED lamps to light this still-life shot.

TIP

My final advice on this issue is that if you shoot a lot of small or medium-sized products and grow weary of having to hunt for backdrops and set up lights all the time, you may find it worthwhile to invest in a *light box,* which is a small, portable product-shooting solution. Many are simply soft, flexible cubes made out of translucent panels; you set your product inside and set up your lights outside the box. Then panels diffuse the light, helping to eliminate harsh shadows and reflection.

For even more convenience, some manufacturers offer an alternative solution that has an LED light panel set into the top of the box. The sides of the light box are made of black fabric or acrylic to help isolate your subject from ambient room light and thus are illuminated evenly by the cube's own light. One example of this type of product is the Fotodiox Pro LED Studio-in-a-Box, shown in Figure 6-22. I like this particular design because of its flexibility: You can open the front of the box to shoot your subject from the front (as shown on the left in the figure), or if you want to prevent any ambient light from hitting your subject, you can close the front panel and shoot through an opening on the top of the box (as shown on the right in the figure). The 28 x 28-inch version shown in the figure sells for about $135 (Fotodiox Pro, `fotodioxpro.com`). It comes with four colored inserts that you can install if you don't want a white background, and it folds flat into a compact package for storage. The other nice thing about this solution is that you don't have to invest in or tote around separate lights as you do with a translucent tent. The only caveat is that the built-in light requires AC power.

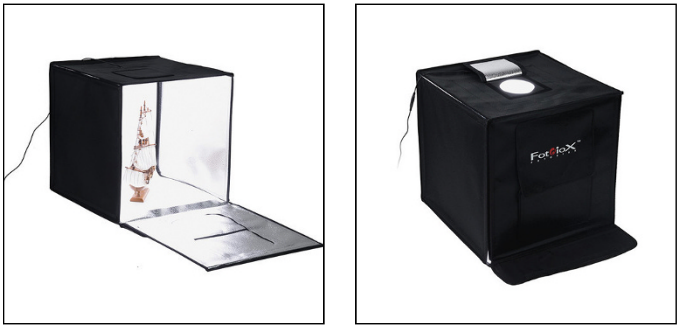


FIGURE 6-22: This product-lighting kit from Fotodiox has built-in LED lighting and enables you to shoot from the front of the box or through a small hole in the top.

Courtesy Fotodiox Pro, Inc.

Now that you probably know more than you ever cared to learn about product lighting, turn to Chapter 8 for additional tips and products related to portrait lighting. You also can find information on how to use window light to your advantage in that chapter.

IN THIS CHAPTER

» Solving focus problems

» Exploring autofocus features

» Focusing manually

» Playing with depth of field

» Understanding digital color

» Using white balance and other tools to adjust color

Chapter 7 Manipulating Focus and Color

Today's digital cameras offer an abundance of focus and color features. But if you don't understand how they work, you may get unexpected and unacceptable results. To help you avoid such miscues, this chapter explains common focusing and color-related options.

Understanding Autofocus Options

Because autofocusing features vary widely depending on the type of camera you use, I can't provide specific details on how to bend the focusing system to your will. But the following sections provide some generic information to get you started. As you read this information, cross-check things with your camera's instruction manual to find out whether your model offers a feature being discussed and, if so, how to implement it. I also recommend visiting the manufacturer's website; many offer good tutorials on using their cameras' autofocusing systems.

REMEMBER

Not up for wading through all this autofocusing info right now? Flip to the Chapter 3 section that steps you through the process of taking a picture in Auto exposure mode. The steps include an introduction to the basics of autofocusing. Just keep in mind that the concepts presented there are just the start of the autofocus story; come back to this page and read the next several sections to find out how to take advantage of your camera's full range of focusing capabilities. I promise that if you take the time to do so, you'll wind up with fewer blurry photos and be able to lock focus on your subject more quickly and easily.

Note, however, that the focusing information I cover relates primarily to still photography. Your camera may offer additional focusing setups specifically for recording video.

Enabling autofocus

If your camera offers both autofocusing and manual focusing, you need to specify which option you want to use. On an interchangeable-lens camera, you may find a control on the lens or camera body (or both) that switches the system from manual focusing to autofocusing. Figure 7-1 shows the switch as it appears on a Canon dSLR and lens combo. Other cameras require you to switch the focusing method to auto via a menu option.

Auto/Manual focus switch

FIGURE 7-1:
Some lenses have a switch that sets the camera to autofocus mode.

TIP

Certain lenses offer *autofocus with manual override* — meaning that you can use the autofocusing system to set the initial focusing distance and then fine-tune focusing manually. Look at your lens or camera manual to find out how to take advantage of this option, if your equipment offers it. *Don't* try to turn the manual focusing ring on a lens while autofocus is engaged unless your system does offer this feature and it's enabled. If you do, you can harm the lens.

Locating your camera's focus points

At the heart of your camera's automatic focusing system are focus points positioned at various spots throughout the frame. When you compose your shot, you need to make sure that your subject is under one of those focus points in order for the camera to set the correct focusing distance.

Most cameras display marks in the viewfinder or on the monitor to indicate the autofocus points. For example, the left screen in Figure 7-2 shows the autofocus points as they appear in the viewfinder on a model that offers nine focus points. On some cameras, you instead see a simple border that indicates the frame area that contains the focus points, as shown on the right in the figure. On cameras that offer touchscreen focus, you may see just a single box indicating the current focusing area, as you do on a smartphone. When you tap the screen, the focus box jumps to cover the spot you touched. However, even cameras that don't offer touchscreen focusing may use a focusing frame like the one in Figure 7-3 when you use Live View, the feature that enables you to compose the shot on the monitor instead of using the viewfinder.

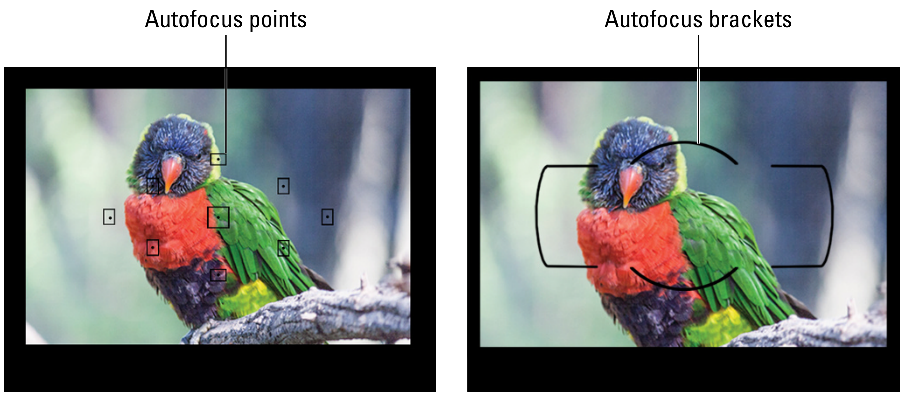


FIGURE 7-2: Autofocus points may be indicated by little squares in the viewfinder (left) or by an outline that indicates the focusing-area boundary (right).

Note that some cameras display additional marks that aren't related to focusing. For example, the markings on the left side of the screen in Figure 7-3 indicate current picture-taking settings, such as the exposure mode (Auto, in this case).

WARNING

How many focus points are available and where they appear may change depending on certain autofocus settings. Again, I can't cover the myriad variations in this book, but the next sections discuss two critical settings offered by most cameras: one that determines how the camera chooses which focus point to use when setting the focusing distance and another that determines when the final focusing distance is established.

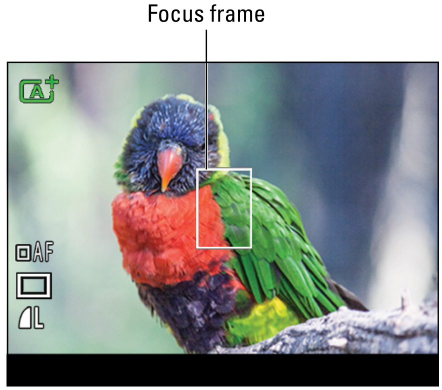


FIGURE 7-3: The focusing area may instead by indicated by a single box, as here.

Selecting a focus point or zone

Depending on your camera, you may be able to control which focus point or area of the frame the camera uses when establishing the focusing distance. Look for a setting that has a name such as *AF Point Selection*, *AF-area mode*, and the like. (*AF* stands for *autofocus.*)

Generally speaking, things break down into two categories:

- **Only one point is active at a time.** This autofocusing scheme is generally known as single-point autofocusing, for obvious reasons.

  By default, the active point is usually in the center of the frame. But you may be able to select a different focus point by using a control on the camera or, on touchscreen-enabled devices, tapping the screen. For example, the left screen in Figure 7-4 shows the standard default location of the active point — smack dab in the center of the frame. In the second example, I moved the focus point over the clock tower to tell the camera to concentrate on that part of the frame.

- **Multiple focus points are available for service.** Although only one point is ultimately used to set focus when you use this setup, the camera can choose from all of its focus points or those located in a specific area of the frame. You may have any or all of the following multiple-point focusing options:

  - *All points on deck.* Usually named something like Auto Area mode or MultiZone AF, this setup makes all points available to the autofocusing system. How much control you have over which point is selected as the one the camera uses to establish focus typically depends on your exposure mode. If you shoot in Auto exposure mode, for example, most cameras make the selection for you, usually choosing the point that falls over the object nearest the lens; the object occupying the largest portion of the frame (such as a building); or the object at the center of the frame.

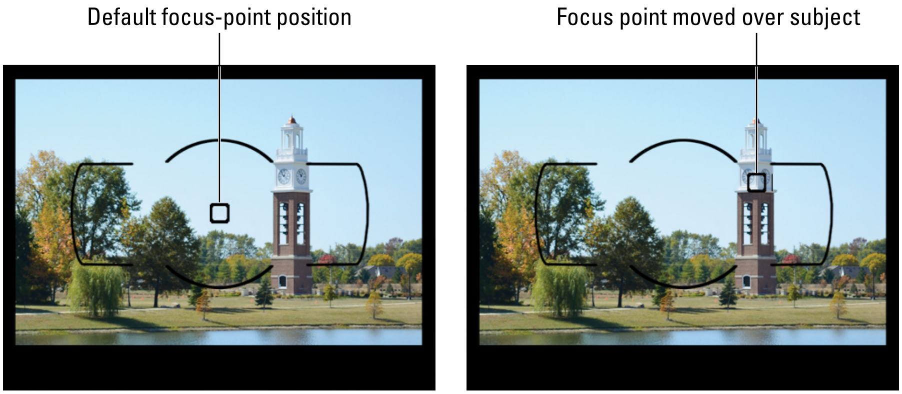
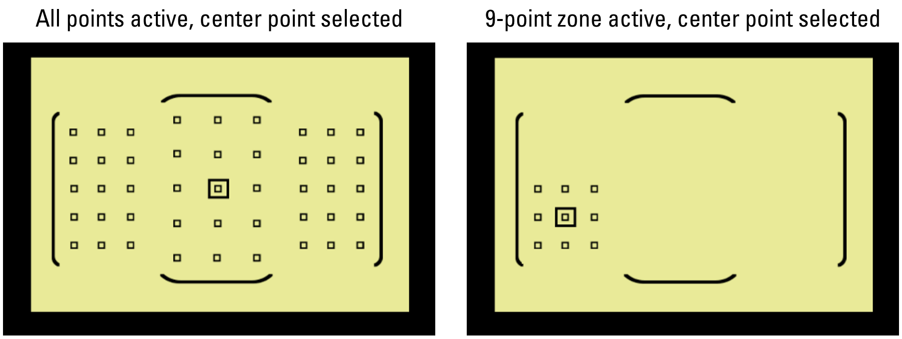


FIGURE 7-4: By default, the center focus point is usually selected (left); to set focus on the clock tower, I selected a different point (right).

In advanced exposure modes, such as aperture-priority autoexposure, you can specify which point you want to use. Which leads to the question, why opt for having all points active if you're going to use just one? Why not go with single-point autofocusing? The most common reason is if you want to use continuous autofocusing, an action-photography option that tracks your subject as it moves through the frame. I cover this option in the next section; for now, just understand that with most continuous-autofocusing systems, you start by selecting the point that's currently over your subject. The camera sets focus initially based on that point, but if the subject moves, the system automatically switches to another point as needed to keep the subject in focus. Enabling all available focus points gives the camera the widest latitude when tracking your subject.

- *Zone autofocus:* If your camera offers a massive number of focus points, it may enable you to activate just a small cluster — or *zone* — of points. For example, the illustration on the left in Figure 7-5 shows the focus-point placement on a camera that offers 45 points. The large square indicates the currently selected point — the center point, which is the usual default position. On the right side of Figure 7-5, the camera is set to 9-point zone autofocusing, which tells the camera to take focusing information from a single point and the eight surrounding points. Again, the point in the center of the zone is initially selected by default.

FIGURE 7-5: Cameras that offer bazillions of autofocus points (left) often offer zone autofocusing, which limits the focusing area to a small cluster of points (right).



As with all-points autofocusing, the zone system is designed to facilitate continuous autofocusing. The benefits of restricting the camera to a small cluster of points are twofold. First, autofocusing is faster when the camera doesn't have to consider a huge number of focus points. Second, choosing a zone also helps ensure that the autofocus system doesn't mistakenly wander too far from your initially selected point and wind up targeting the wrong subject.

For example, if you're shooting your child's dance recital, and you know from attending countless practices that your dancer starts the performance at the far left side of the stage but only moves a few feet to the right or left of that position during the dance, you might select the zone shown on the right in Figure 7-5. If all points were enabled, there's a chance the focusing system might instead shift its attention to the prima donna whose parents bribed the teacher to get their child a position at center stage.

WARNING

The downside to using a smaller array of focus points with continuous autofocusing is that you have to pay close attention to framing during the action. You may need to reframe now and then to keep your subject within the selected zone.

- *Face and eye-detection autofocus:* Cameras that offer *face-detection autofocus* search the frame for faces and automatically lock onto the one nearest the camera. Some cameras even offer *Eye AF,* a feature that automatically looks for a portrait subject's eyes and locks focus on them. In both cases, all autofocus points are initially active to give the camera the most flexibility in its search. Be aware that both options typically fail if your subject isn't looking directly into the camera.

REMEMBER

Some cameras don't display any autofocus points or related markings when the camera is in sleep mode — that is, it's powered on but has shut off most functions to save battery power. To wake the camera up, press the shutter button halfway or, on a touchscreen device, tap the screen. Some cameras require you to take this step to view the active focus point even when they're not in sleep mode.

Finally, if your camera has a viewfinder and also offers Live View, which enables you to compose your shot on the camera monitor, it may offer a different assortment of focus-point options in Live View than it does when you use the viewfinder.

Choosing focus lock or continuous AF

In addition to directing the camera *where* to set focus, you may be able to specify *when* you want the final focusing distance to be established. Most cameras offer two choices: *single-servo autofocus* and *continuous-servo autofocus.*

Don't get freaked out by the techie-sounding names — these two options are actually easy to understand:

- **Single-servo autofocus:** In this mode, the camera sets focus once and retains the same focusing distance until you take the picture. One and done, if you like. An easy way to remember what single servo means is to translate it to "one-time service." It's kind of like when a parent says "I'm only serving dinner once, so don't come waltzing home at 8 p.m. and expect to enjoy the meal that the rest of us ate at 6."

  To focus using a shutter button, press and hold the button halfway down. After focus is established, it remains locked as long as you keep the button pressed halfway. If you have a touchscreen-enabled camera, tap the area on the screen where you want focus to be set, and focus is locked as soon as you lift your finger from the monitor.

  TIP

  Single-servo autofocus enables you to use the "focus and reframe technique" when you want your subject to appear somewhere other than under the selected focus point. This technique is helpful if you don't have touchscreen focus and your camera doesn't offer a lot of focus-point choices or control. Here's how it works: Compose the picture initially so that the subject *is* under the selected focus point, and press the shutter button halfway to set focus. Keep the button pressed down halfway, reframe as desired, and then press the shutter button the rest of the way to take the picture. Figure 7-6 illustrates this technique.

  WARNING

  When you reframe, be careful not to change the distance between the camera and your subject, or else focus will be off.

- **Continuous-servo autofocus:** In this mode, designed for photographing moving subjects, the camera sets the initial focusing distance just as it does in single-servo mode but then adjusts focus continuously as needed up to the time you take the shot. So if you set focus on a subject that's 20 feet in front of you but don't take the picture until the subject is 10 feet closer, it should still be in focus.

On intermediate and advanced cameras, you're likely to find several different continuous-autofocusing options. For example, your camera may have a setting that's designed to track focus based on a prominent color found on the subject. You might use such a setting when trying to photograph a single child in a group. If he or she is wearing a bright red shirt, the camera will be less likely to shift focus to surrounding kids — assuming they aren't all wearing the same color. And some cameras have a continuous-focusing option designed for subjects moving in a predictable manner, such as a trumpet player marching in a parade band, and a second option for subjects whose movements aren't predictable, such as a soccer player zig-zagging across the field.

TIP

Using continuous autofocusing can be confusing when you first try it, but after you get the hang of it, I think you'll be much happier when photographing action. So use the Google machine to look for videos on how to use this function with your camera and then spend some time practicing so you'll feel more confident on your next action shoot.

FIGURE 7-6: With single-servo autofocus, you can lock focus on your subject (top) and then reframe to your desired composition (bottom).

Of course, not all cameras offer this degree of autofocusing flexibility. Some models don't offer continuous autofocusing, and others decide for you whether to use single- or continuous-servo autofocusing. If the camera senses motion in front of the lens, it uses continuous-servo autofocusing; if not, it sticks with single-servo. Even on cameras that do enable you to make the call, the default mode is usually the automatic (camera's choice) setting. To access the other options, you may need to switch to an advanced exposure mode, such as aperture-priority autoexposure or manual exposure.

These when-to-focus settings go by different names depending on the camera manufacturer. For example, most Canon cameras use the terms *One Shot* for single-servo autofocus; *AI Servo* for continuous autofocus (AI stands for *artificial intelligence*); and *AI Focus* for the automatic mode that lets the camera decide whether to lock focus or use continuous autofocus. Nikon, on the other hand, uses the terms AF-S for single-servo; AF-C or AF-F for continuous-servo (C for continuous and F for full-time autofocusing); and AF-A to represent the Auto setting.

Using the right autofocus technique

No matter what autofocusing options you select and what exposure mode you choose, keep the following pointers in mind to get the best autofocus results:

REMEMBER

- **If you set focus using a shutter button, remember to use the two-stage button-pressing technique.** To set focus, press the button halfway down and hold it there. Don't simply press the button all the way down to take the picture in one motion; if you do, the camera doesn't have adequate time to set focus and exposure.

  When you're ready to take the shot, gently (but firmly) press the shutter button the rest of the way, being careful not to move the camera in the process. Remember, any camera movement while the shutter is open can blur the image.

- **Wait for the focus-achieved signal to take the picture.** When focus is set, the camera may emit a beep or display a focusing symbol in the displays. If your camera has a viewfinder, you usually see a little green light in the data display area, as shown on the left in Figure 7-7. In some cases, the selected focus point turns red briefly, as shown in the same image. With cameras that use a single focus frame, the frame turns green, as shown on the right in Figure 7-7, to indicate that focus was successfully set.

  With continuous autofocusing, most cameras send the focus-achieved signal only when the initial focusing distance is set. Some don't provide any signal in continuous-autofocus mode.

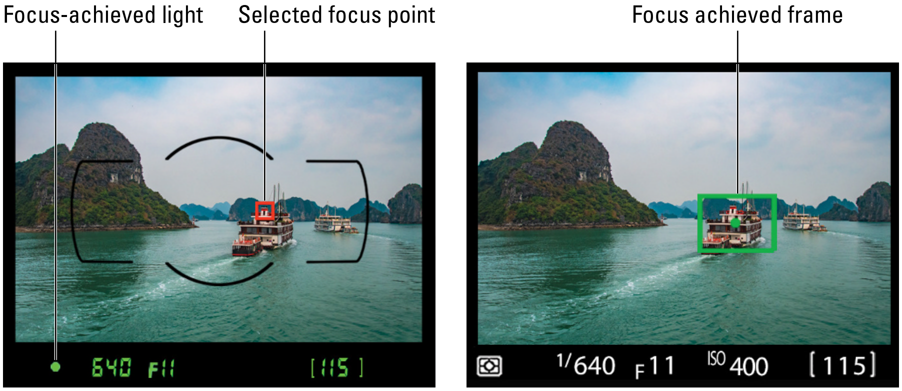


FIGURE 7-7: A green light in the viewfinder or a green focus frame means you're good to go, focus-wise.

TIP

ALTERNATIVE AUTOFOCUSING BUTTONS

Advanced and intermediate-level cameras often sport one or both of the following buttons to give you an alternative to using the shutter button (or touchscreen, if your camera has one) to initiate and lock autofocus:

- **AE-L/AF-L button:** The initials stand for *autoexposure lock/autofocus lock.* When you use continuous autofocusing, you can press and hold this button to interrupt focus adjustment and lock focus at the current distance. When you release the button, continuous autofocusing begins again. By default, pressing the button also locks in the current autoexposure settings, which are otherwise adjusted up to the time you take the shot in most exposure modes. If you consult your camera menus, you may find an option that enables you to modify the function of this button so that it locks focus only or exposure only, depending on which setup you find more helpful.
- **AF-ON button:** This button is related only to autofocusing. It allows you to initiate autofocusing, lock the focusing distance, and start and stop continuous autofocusing without pressing the shutter button halfway. Because the button is usually on the back of the camera, photographers refer to this option as *back-button autofocus.*

  Note that some cameras have a button labeled simply AF. This button usually is provided for a purpose other than starting and stopping autofocusing. Instead, it brings up a screen where you can modify autofocusing settings.

  If your camera doesn't have a button dedicated for back-button focus, you may be able to set another button to serve that purpose. For example, many cameras have a Fn (function) button you can customize to perform a variety of operations.

Focusing Manually

On most cameras, you specify that you want to exit autofocus mode and focus manually by setting a switch on the lens or camera body to manual-focus mode, selecting manual focusing from a camera menu, or both. Then you just rotate the focusing ring on the lens to bring your subject into focus. The steps you use and the placement of the focusing ring vary, so check out those camera and lens manuals for details. If your lens doesn't have a focusing ring, you still may be able to set focus manually by using a switch or lever on the camera or by entering a specific focusing distance via a menu option.

If you use a viewfinder to frame your shots, focusing manually makes it especially critical to adjust the viewfinder to your eyesight, as described in Chapter 1, because you're basing your focusing judgment on what you see in the viewfinder. If you don't take this step, things may look blurry in the viewfinder when they're actually in focus or vice versa.

TIP

Some cameras offer other tools to help you know when you've found the right focusing distance when you focus manually. Here are some of these features:

- **Standard "focus achieved" signals:** Your camera may send the same signals as it does when you use autofocusing. For example, the focus indicator lamp may light, the camera may beep at you, or both. (Refer to Figure 7-7.)
- **Focus peaking:** Some cameras can display highlights around the edges of the objects that appear to be in sharpest focus — they're at the peak of the focus scale, if you will. The highlights may appear on the monitor or in the viewfinder, and you may be able to set the color of those highlights to make them easier to see.

MACRO AND INFINITY FOCUS MODES

Some point-and-shoot cameras that don't offer interchangeable lenses may offer special modes that automatically set focus at the nearest or farthest possible focusing distance:

- *Macro* focusing mode allows you to focus at a closer distance than you normally could. It's designed for shooting close-ups, in other words.
- *Infinity mode* does the opposite. It sets focus at the farthest point possible and is designed for shooting subjects at a long distance.

For each of these focus settings, check your camera's manual to find out the proper camera-to-subject distance.

» **Display magnification:** You may be able to magnify the screen display so that you can verify focus is set precisely on your subject.

» **Rangefinder:** You also may be able to display a focusing aid called a *rangefinder.* Figure 7-8 gives you a look at the rangefinder design used on some Nikon cameras. The bars under the rangefinder meter indicate whether focus is set behind, in front of, or on your subject. Just keep in mind that because the rangefinder is based on the same focusing system that the autofocus system employs, subjects that confuse the autofocus system also render the rangefinder unable to find a focusing target.

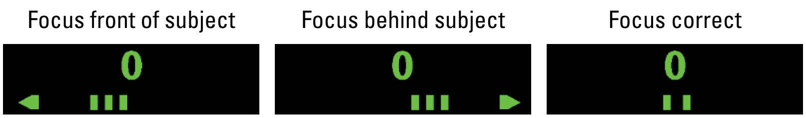


FIGURE 7-8: A rangefinder is a focusing aid that provides feedback when you focus manually.

Diagnosing Focus Problems

Even after you familiarize yourself with your camera's focusing options, you're bound to wind up with a blurry mess now and then. Because several factors affect focus — some not related to the focusing system at all — the first step in solving the problem is identifying the cause. Luckily, a careful inspection of the picture can provide the clues you need to make that diagnosis. The next several sections describe out-of-focus symptoms and provide possible ways to cure the blurries.

My entire picture is blurry

If blur exists throughout your entire photo, there are three possible causes, outlined in the next three sections.

The camera moved during the exposure (camera shake)

If your photo looks like the one on the left in Figure 7-9, you can usually chalk the lack of focus to *camera shake* — camera movement during the exposure. Camera shake is a possibility any time you handhold the camera, and the slower the shutter speed, the greater the risk. To remedy the situation, put the camera on a tripod or find another surface on which to place the camera so that you can get a no-shake shot. (Chapter 14 offers some advice on buying tripods.)

Shutter speed, 1/8 second, no tripod   Shutter speed, 1/8 second, using tripod

FIGURE 7-9: When you handhold a camera at slow shutter speeds, camera shake can cause allover blur (left); use a tripod to ensure sharp shots (right).

A few other tips to avoid the blur caused by camera shake:

- **Even if your camera is on a tripod, you may want to trigger the shutter release via remote control when you use a very slow shutter speed.** For long exposure shots, simply pressing the shutter button can jiggle the camera enough to cause some blur. If your camera doesn't offer remote control, try this work-around: Set the camera to self-timer shutter-release mode, which delays the opening of the shutter for a few seconds after you press the shutter button. After you depress the shutter button, take your hands off the camera until the picture is captured. Chapter 2 talks more about shutter-release options.
- **Check the setting of the image stabilization system, if your camera or lens has one.** That feature, when enabled, can compensate for small amounts of camera shake, although often not enough to deal with an exposure as long as the one in my example photo, shot at a shutter speed of 1/8 second.

  WARNING

  Check your instruction manual to find out whether you need to disable image stabilization when the camera is mounted on a tripod. With some systems, leaving stabilization turned on can *cause* blur as it attempts to compensate for movement that isn't occurring.

» **When handholding the camera, use the viewfinder, if available, to compose your shots.** Why rely on the viewfinder and not the live display on the monitor? Because when you use the monitor, your arms are extended from the body, which increases the odds of camera shake. With the viewfinder, you can brace the camera against your face. Tucking your elbows into your sides further steadies the camera.

  Unfortunately, not all cameras have a viewfinder, which means you have no framing alternative other than the monitor. Again, tuck your elbows against your side to keep the camera as still as possible. You can also try leaning against a wall for extra stability or, if the shooting angle permits it, setting the camera base on a table or other surface.

Focus wasn't achieved before the shutter was released

If you use autofocusing, most cameras refuse to take the picture until the focusing system locks onto a target. But advanced and intermediate cameras sometimes give you the option to override this safeguard, enabling you to take the picture at the precise moment you fully depress the shutter button, whether or not the autofocus system has finished its business. Why would you choose such an option? Because if you're shooting action or a scene where something happens only once — the bride and groom's first kiss, for example — you may miss the moment if the autofocusing system takes even an instant too long to do its job. Better a slightly blurry shot, which you may be able to render acceptable with sharpening tools in a photo-editing program, than no shot at all.

If you focus manually, the autofocus shutter-release lockout system doesn't kick in regardless of whether you enable or disable the feature. Many cameras do, however, provide some sort of focus-achieved indicator as an assist; see the earlier section "Focusing Manually" for a rundown of these tools.

Your lens is fogged

If your photo looks like you're shooting in dense fog, like the shot on the left in Figure 7-10, you may assume that you're having a focusing problem. But if there is, in fact, no fog in the area, this photo flub is actually unrelated to focusing. Instead, it's caused by condensation forming on the lens, which can happen when you move from an air-conditioned car or building into a warm environment. Wipe away the condensation with a lens cloth, and the fog should disappear, leading to a crisp shot like the second photo in Figure 7-10. You may have to also wipe off the viewfinder and/or monitor to get a clear view of things.

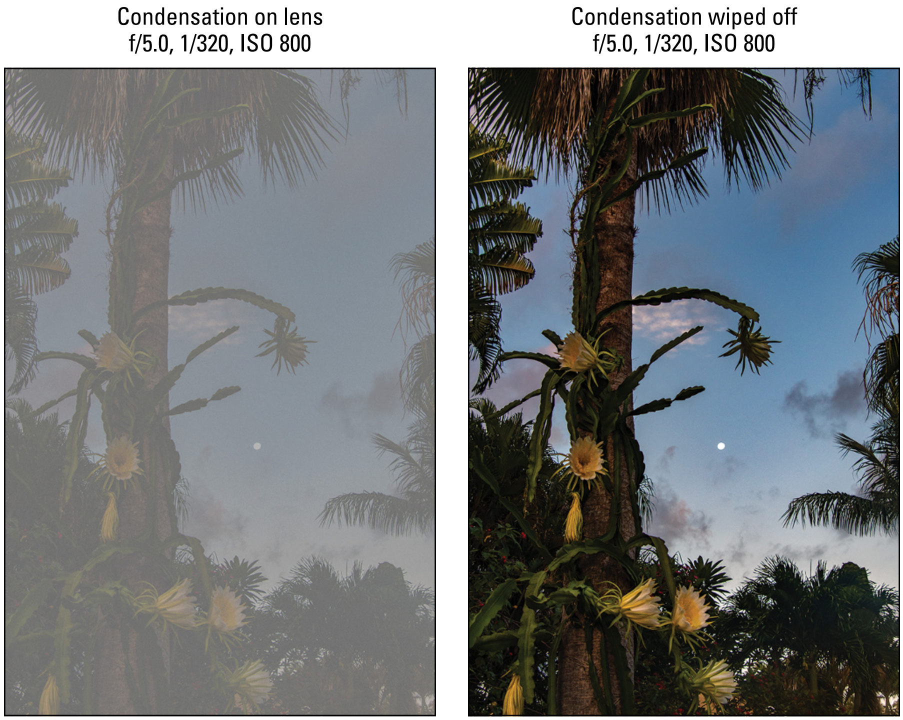


FIGURE 7-10: The less-than-sharp result on the left isn't due to focusing problems, but to a lens fogged with condensation.

WARNING

I'd be remiss not to warn you that sudden temperature changes aren't that great for your camera, never mind the impact on your photos. So if you have time, it's a good idea to slowly transition the camera from a cold to hot environment. Put the camera in a bag and put a blanket over it to warm it up a little before you head out into the hot weather.

The wrong thing is in focus

The top-left image in Figure 7-11 offers an example. The main subject of interest, the white orchid bloom, is blurry, while the as-yet-unopened blooms and the stem in the background appear sharp. This condition is easy to diagnose: The camera used the wrong focus point to set the focusing distance.

I shot this photo using a camera that offers three autofocusing points placed in the positions indicated by the rectangles in the right images in Figure 7-11. By default, this camera uses the center focus point, highlighted in green in the top-right illustration in the figure. And if you inspect the resulting photo on the top left, you can see that the areas under that frame are indeed sharply focused.

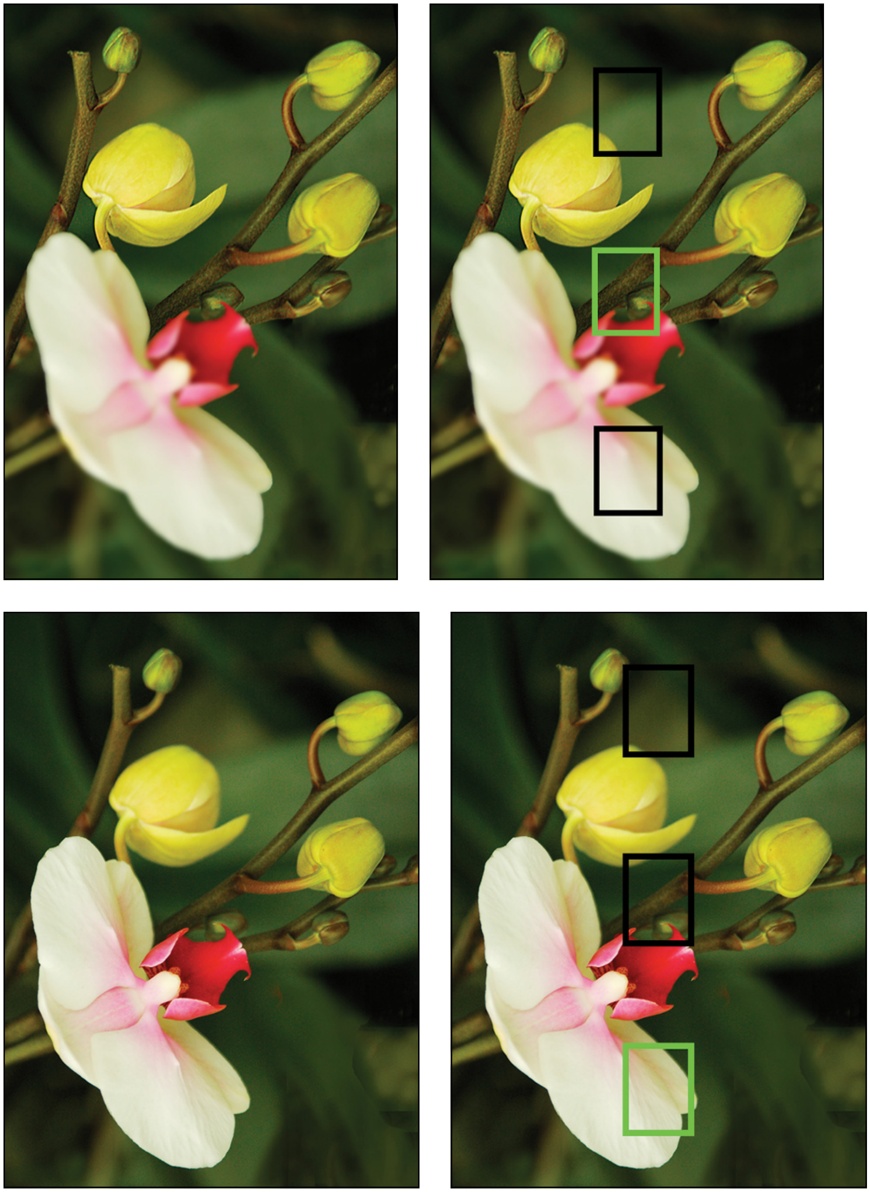


FIGURE 7-11: The green focus rectangle indicates the focus point used for each photo.

Fortunately, most cameras let you deviate from the default focus-point location. To get the shot shown in the lower left in Figure 7-11, I took advantage of this option and selected the bottom focus frame, as shown on the right in the figure.

Obviously, it's critical to know the spot your camera targets when setting focus so you can be sure that your subject is within that focusing area. See the sections "Locating your camera's focus points" and "Selecting a focus point or zone," earlier in this chapter, for help with this aspect of focusing. For times when you simply can't get the autofocusing system to lock onto your subject, see the section "Focusing Manually" to take over the focus reins yourself — often an easier option than fiddling with autofocus settings.

TIP

If you're wondering whether there's a way to have the entire flower in focus in a shot like the one in Figure 7-11, the answer is yes. You just need to use the tactics outlined in the section "Playing with Depth of Field" to stretch the zone of sharp focus so that it extends farther in front of and behind the selected focus point.

Moving subjects are blurry

Assuming that focus was targeted accurately on your subject, a slow shutter speed is to blame when a moving object appears blurry. As detailed in Chapter 5, you need a fast shutter speed to capture moving subjects without blur.

How fast depends on your subject's speed. In the first photo in Figure 7-12, for example, the duck on the left was moving his head too fast to be captured cleanly at a shutter speed of 1/60 second. Bumping the shutter speed up to 1/250 second froze the action successfully, as shown in the photo on the right.

f/6, 1/60 second, ISO 100

f/6, 1/250 second, ISO 400

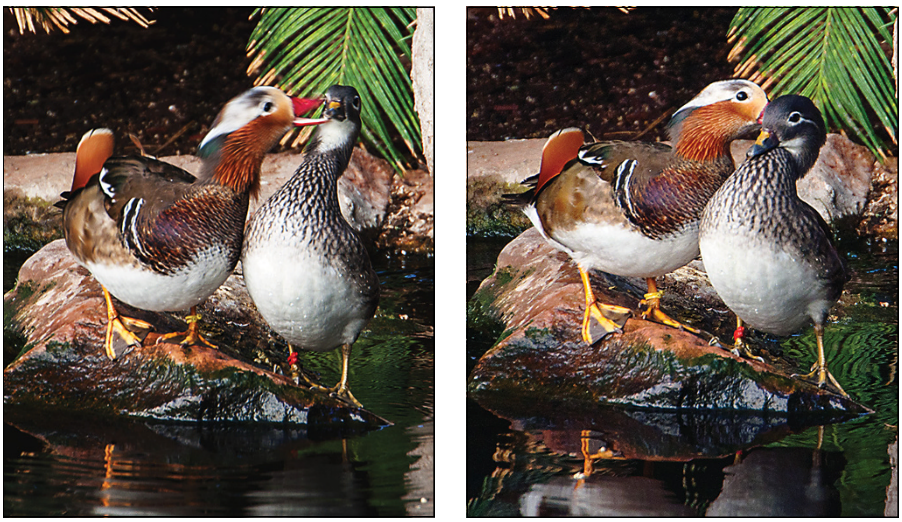


FIGURE 7-12: If moving objects are blurry, try using a faster shutter speed.

WARNING

Using a faster shutter speed means the camera has less time to absorb light because the shutter opens and closes more quickly. So to maintain the same picture brightness, you have to compensate for the shorter exposure by either choosing a lower f-stop setting (opening the aperture to allow more light into the camera) or raising the ISO setting (to make the camera more sensitive to light). In Figure 7-12, I adjusted ISO. Chapter 5 talks more about exposure; for more tips on shooting a moving target, check out Chapter 9.

You may also want to take advantage of continuous autofocusing, introduced in the section "Choosing focus lock or continuous AF." In this case, the subjects are moving parts of their bodies but not moving significantly closer to or farther away from the camera. Because continuous autofocusing is designed to adjust focus only when the subject-to-camera distance changes, it wouldn't have changed the outcome here.

The camera won't focus at all

Can't seem to achieve focus no matter what you try? The following issues may be to blame:

- **You're too close to the subject.** Every lens has a close-focusing limit, which you should be able to determine with a look at your camera or lens manual.
- **The autofocus system is confused.** Even the best autofocusing systems have trouble with certain subjects, such as reflective surfaces and objects underwater or behind a fence. Very dim lighting is also problematic for autofocusing systems, as are scenes in which little contrast exists between your desired focus point and the surrounding area. The easiest fix is to focus manually, if your camera permits it. Another option is to look for an easy-to-focus object that's the same distance from the camera as your subject, lock focus on that object, and then reframe to your desired composition and take the picture. Check out the earlier section "Choosing focus lock or continuous AF" for specifics on that technique.
- **Autofocusing is disabled.** If you want to use autofocusing, you may need to enable it on the lens, on the camera, or both. I've often been baffled as to why my autofocus system was refusing to work and then remembered (duh!) that I was previously using manual focusing and had the lens and camera set to that focusing option.

  If your camera offers specialty scene or special effects modes, know that some modes also disable autofocusing. Check your camera instruction manual for the scoop on which modes require you to use manual focusing.

TIP

Dirt or dust on your lens can also cause focusing miscues, so keep your lens-cleaning supplies handy.

Playing with Depth of Field

One way to become a more artful photographer is to learn how to control *depth of field*, which refers to the distance over which sharp focus is maintained. Chapter 4 introduces you to this concept and offers several examples of how to put depth of field to creative use, but here's a quick recap:

- **Shallow depth of field:** The subject is sharp, but objects at a distance are blurred, as in the left image in Figure 7-13. This treatment is perfect for portraits because it prevents the background from drawing attention from the subject. You can also use shallow depth of field to help a subject stand apart from a similarly colored background (see Figure 7-15, later in this section).

  REMEMBER

  For the background to appear blurry, some distance must exist between it and the subject. The farther the background is from the subject, the blurrier it appears. Ditto for objects in front of the subject.

- **Large depth of field:** A large depth of field extends the sharp-focus zone over a greater distance in front of and behind your focus point. Landscapes and architectural shots like the one on the right in Figure 7-13 typically benefit from a large depth of field. Focus in this image was set on the foreground figure, but the figures in the distance look nearly as sharp.

Shallow depth of field

Large depth of field

FIGURE 7-13: Shallow depth of field is ideal for portraits (left); landscapes benefit from a longer zone of sharp focus (right).

TIP

A long depth of field is also helpful when you're photographing a subject that's moving quickly toward or away from you. The larger the depth of field, the greater your chances of capturing a moment when the subject is within the sharp-focus zone.

With the "whys" of manipulating depth of field out of the way, here are the three ways you can modify this aspect of your picture:

- **Adjust the aperture (f-stop).** Chapter 5 introduces the aperture setting, or *f-stop,* which is an exposure control that also affects depth of field. The higher the f-stop number, the greater the depth of field. The water lily images in Figure 7-14 show an example: At f/6.3, the leaf and the watery background are much blurrier than in the f/20 example.

f/6.3, 1/1250 second, ISO 400

f/20, 1/125 second, ISO 400

FIGURE 7-14: Changing the aperture is one way to adjust depth of field.

A few reminders about using aperture to manipulate depth of field:

- *As you change the f-stop, either the shutter speed or ISO must also change to maintain the same exposure.* As you raise the f-stop, which reduces the size of the aperture, you must use a slower shutter speed or higher ISO to compensate for the reduced light that results from the smaller aperture opening.

- *Try using aperture-priority autoexposure mode when you want to control depth of field.* In this mode (normally identified by *Av* or *A* on your camera's mode dial), you set the f-stop, and the camera selects a shutter speed that will deliver a good exposure at the current ISO setting.
- *Some scene modes also are designed to deliver a short or long depth of field.* For example, Portrait mode typically selects a wide aperture setting to produce a shallow depth of field, and Landscape mode typically selects a narrow aperture to produce a greater depth of field. The extent to which these automatic modes can adjust aperture depends on the light and the aperture settings available on your lens, though, so they won't always produce the desired depth of field.
- *A traditional (optical) viewfinder doesn't show the depth of field that your f-stop setting will produce.* That preview isn't possible because the aperture doesn't actually adjust to the selected f-stop setting until you press the shutter button. However, some cameras often provide a *depth-of-field preview button.* When you press the button, the camera adjusts the aperture to the chosen f-stop, and you can then preview aperture-related depth of field in the viewfinder. If you're using a small aperture, the scene may appear very dark because not much light is coming through the lens.

» **Change the lens focal length.** *Focal length,* measured in millimeters, determines the camera's angle of view, how large objects appear in the frame, and — the important point for this discussion — depth of field. A long focal length, such as the one you get from a telephoto lens, produces a shallow depth of field. A wide-angle lens, on the other hand, has a short focal length and produces a large depth of field.

  Figure 7-15 offers an example. Both photos were taken at an aperture of f/5.6; however, the top image was taken at a shorter focal length (wider angle), so more of the scene remains in the sharp-focus zone. Also understand that the original 174mm-version contained a great deal more background area (because of the wider angle of view). I cropped the image so that the subject filled about the same amount of the frame as the 270mm version.

  If your camera has an optical zoom, you can change focal length by simply zooming in and out. Of course, if you own an interchangeable-lens camera, you can buy lenses of various focal lengths or even a couple of zoom lenses that each offer a different focal-length range. If your camera doesn't have an optical zoom, though, you're stuck with a single focal length. Digital zoom, a feature found on some cameras, does *not* produce a shift in depth of field; digital zoom simply results in cropping and enlarging the existing image.

» **Change the distance between camera and subject.** As you move closer to your subject, you decrease depth of field; as you move away, you extend depth of field.

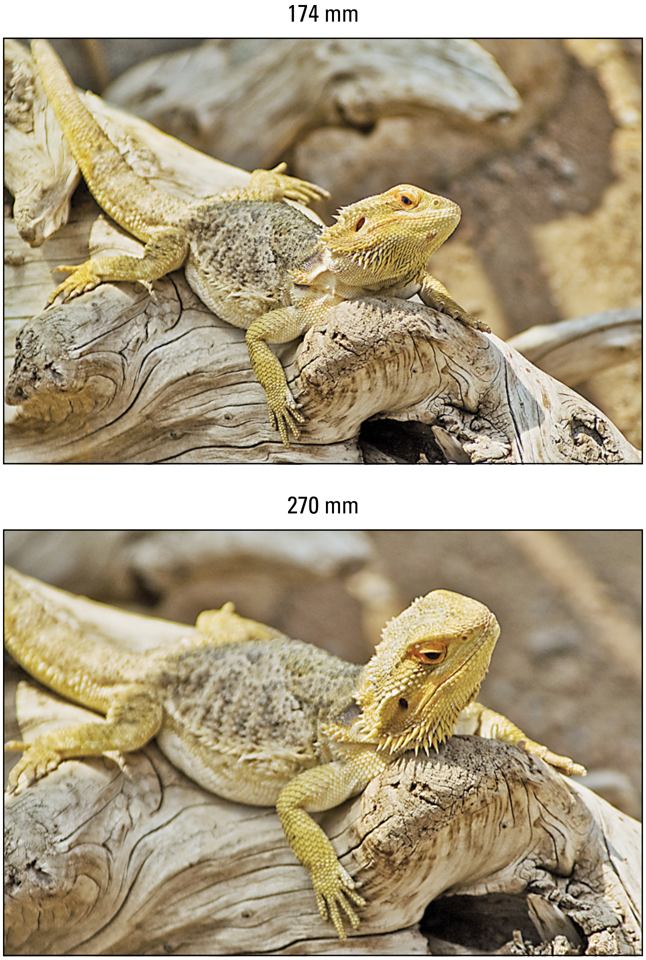


FIGURE 7-15: Zooming to a longer focal length also decreases depth of field.

REMEMBER

To put it all together, then, decide how much depth of field best suits your subject, and then combine aperture, focal length, and camera-to-subject distance to create the look you want. Remember the following formulas:

- **For minimum depth of field:** Use a wide aperture (low f-stop number) and a long focal length (telephoto lens), and move as close as possible to your subject.
- **For maximum depth of field:** Use a small aperture (high f-stop number) and a short focal length (wide-angle lens), and move back from your subject as much as possible.

I want to emphasize one often misunderstood aspect of this characteristic of your photos: Depth of field extends in front of and behind your focus point. So if you use a shallow depth of field, objects in front of the subject may appear blurry, too — it doesn't affect just the background. Figure 7-16 reinforces this point. For both photos, I set focus on the die; my lens was set to a focal length of 210mm; and the camera was mounted on a tripod about 3 feet from the subject. When you combine a long focal length and close camera-to-subject distance, you're already starting out with a shallow depth of field. So using a low f-stop value of 5.6 created the uber-shallow depth of field shown in the left image in the figure. The zone of sharp focus extends only a short distance in front of and behind the die.

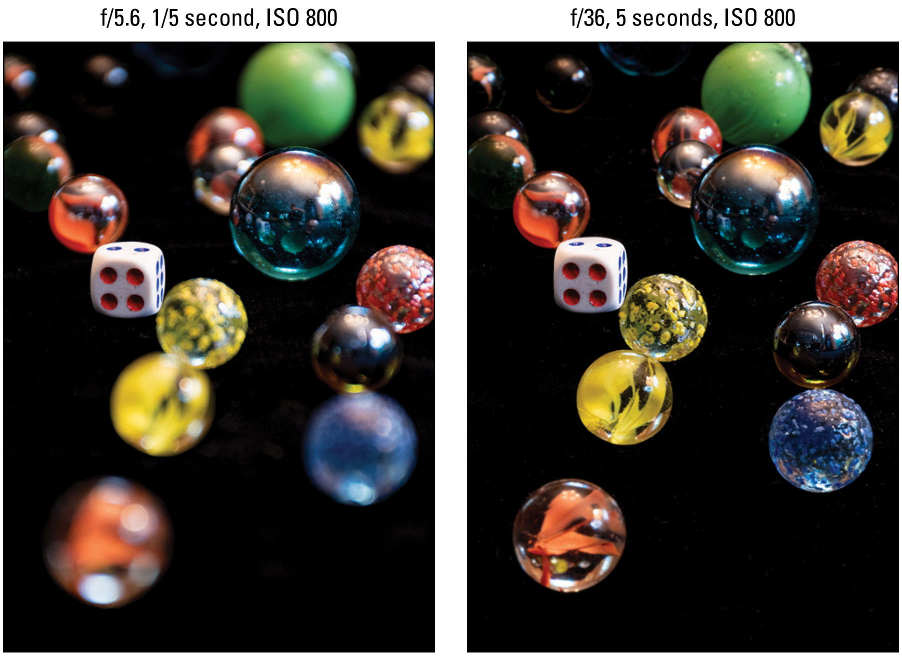


FIGURE 7-16: I set focus in both shots on the die, changing just the aperture setting to alter the sharpness of the foreground and background marbles.

To get the entire scene in acceptable focus, as shown on the right in the figure, I had to stop down the aperture all the way to f/36. And to maintain the same exposure given the very tiny aperture opening you get at f/36, I had to increase the exposure time from 1/5 second (left image) to a whopping 5 seconds (right example). Because the camera was on a tripod, the long exposure was no problem, but were I handholding the camera, I could have instead increased the ISO to make the camera more sensitive to light. That choice, as detailed in Chapter 5, increases the possibility of a noisy (speckled) picture.

REMEMBER: *F* AS IN DEPTH OF *FIELD*

TIP

Here's an easy way to remember which way to adjust the f-stop to extend or shorten depth of field: Just think of the *f* as referring to the *f* in depth of *field* or, even more simply, *focus zone.* For a larger focus zone, use a higher f-stop number. For a smaller depth of field, lower the f-stop number.

Don't share this tip with your photo-guru friends, who will feel compelled to tell you that the *f* in *f-stop* actually refers to the mathematical formula that calculates the f-stop number, which is *focal* length divided by the diameter of the aperture opening. I personally don't possess the kind of brain that finds that information helpful when thinking about depth of field, but then again, my motto has always been "Friends don't let friends do math."

Controlling Color

Compared with digesting focusing and exposure options, understanding ways to control picture colors is relatively simple. In fact, you may be able to handle any color issues that arise by using just a single color feature, *white balance.*

The next two sections provide background information that will help you understand how digital color works, which in turn will make it easier to get a grasp on your camera's color tools, as well as color-correction features found in many photo-editing programs. Following that, I show you how to use the aforementioned white balance option to solve — or better yet, avoid — color miscues.

RGB: A new way of thinking about color

In grade school, you probably learned to mix three primary colors — red, blue, and yellow — to create other colors. Blue and yellow paint, for example, combine to make green. Well, put all that aside when thinking about digital photography, because digital imaging is based on an entirely different color-creation system.

Digital images are created by mixing red, green, and blue light, which is why they're called *RGB images.* Monitors, scanners, and digital projectors also use this light-based color technology. In fact, so does the human eye.

To understand the light-based color system, you need to know that light can be broken into three primary color ranges: reds, greens, and blues. Inside your eye, three receptors correspond to those color ranges. Each receptor measures the brightness of the light for its particular range. Your brain then combines the information from the three receptors into one multicolored image in your head. Just like your eyes, a digital camera analyzes the intensity — sometimes referred to as the *brightness value* — of the red, green, and blue light in a scene. Then the camera's computer brain mixes the brightness values to create the full-color image.

Figure 7-17 offers a simple illustration that may help you understand this light-based system. Again, red, green, and blue are the primary colors. Cyan, magenta, and yellow are the secondary colors, which you create by mixing equal amounts of two primary colors. For example, full-intensity green and blue create cyan. If you mix full-strength red, green, and blue, you get white, as shown in the center of the illustration. Zero-intensity red, green, and blue give you black — because no light equals, um, darkness.

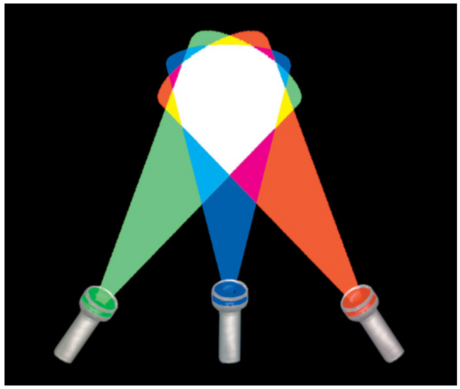


FIGURE 7-17:
In the RGB color world, red, green, and blue are the primary colors; yellow, cyan, and magenta are the secondary colors.

Choosing between sRGB and Adobe RGB

The term *color space* refers to the spectrum of colors that a device can render. By default, most cameras capture images using the *sRGB color space*, which refers to an industry-standard color spectrum. (The *s* is for *standard*, and the *RGB* is for *red, green*, and *blue*, which, again, are the primary colors in the light-based color mixing model used by digital devices.) This color space was created to help ensure color consistency as an image moves from camera (or scanner) to monitor and printer. The idea was to create a spectrum of colors that all devices can reproduce.

Because sRGB excludes some colors that *can* be reproduced in print and onscreen, at least by certain devices, some cameras enable you to shoot in the Adobe RGB color space, which was developed by Adobe and contains a larger spectrum of colors. Figure 7-18 compares the two color spaces and how they fit into the larger *gamut* (spectrum) of colors that the human eye can perceive.

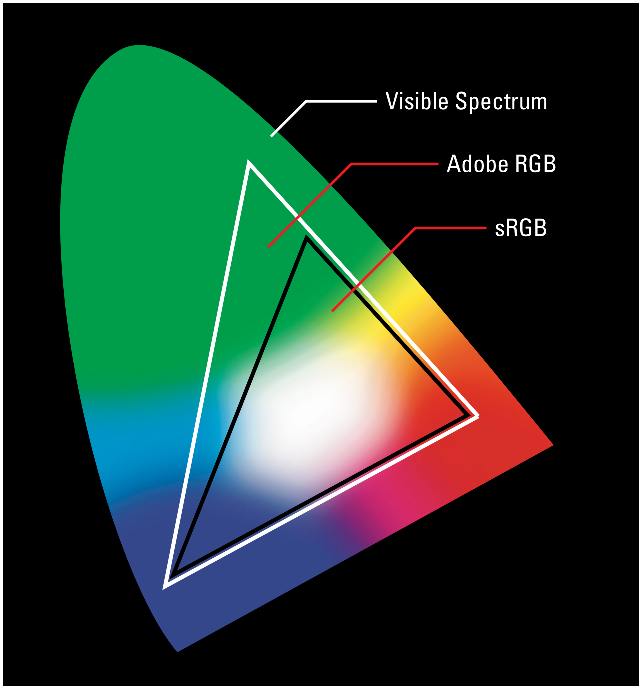


FIGURE 7-18: Although Adobe RGB can capture more colors than sRGB, using the larger color space isn't a good idea for most people.

Although capturing a larger color spectrum sounds like a no-brainer, choosing Adobe RGB isn't necessarily the right choice. Consider these factors when making your decision:

- Some colors in the Adobe RGB spectrum can't be reproduced in print; the printer substitutes the closest printable color, if necessary.
- Home photo printers and retail photo labs are geared toward sRGB files. If you send an Adobe RGB file to the printer, its printed colors may be off because the printer may not correctly translate the Adobe RGB colors to the sRGB color space.
- Computer monitors, tablet displays, and even digital projectors are also set up around the sRGB spectrum. Again, feeding the display an Adobe RGB image can lead to color confusion unless the monitor is specifically tuned to render colors in the Adobe RGB space.
- If you want to retain the original Adobe RGB colors when you edit images in a photo-editing program, the program must support that color space. For that kind of support, you usually need to invest in a professional editing solution such as Adobe Photoshop. You also must be willing to study the topic of digital color because you need to use specific software and printing settings to avoid mucking up the color works.

Long story short: Stick with sRGB unless you're schooled enough in this topic to set up a color-managed viewing, editing, and printing system (*workflow*, in photography lingo).

Using white balance to adjust color

If the colors in your picture are out of whack — skin tones are green or pink, for example — you probably have an issue related to the camera's *white-balance* setting. This feature is designed to compensate for the fact that different light sources have varying *color temperatures,* which is a fancy way of saying that they contain different amounts of red, green, and blue light and thus cast their own color bias on a scene.

TECHNICAL STUFF

Color temperature is measured on the Kelvin scale, illustrated in Figure 7-19. The midday sun has a color temperature of about 5500 Kelvin, which is sometimes abbreviated as 5500K — not to be confused with 5500 kilobytes, also abbreviated as 5500K. When two worlds as full of technical lingo as photography and computers collide, havoc ensues. If you're ever unsure which *K* is being discussed, just nod your head thoughtfully and say, "Yes, I see your point."

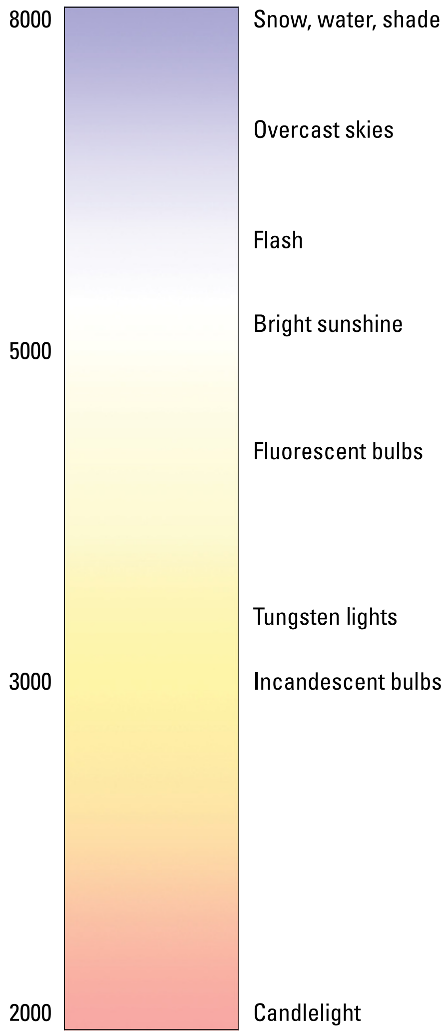


FIGURE 7-19:
Each light source emits its own color cast.

At any rate, the human eye manages the perception of color temperature naturally, and no matter if you're in an office with fluorescent light, under a bright sun, or in a living room with house lamps, when you see red, it looks red (assuming no difficulties with color blindness, of course). However, cameras aren't as sophisticated as your brain at accommodating various lighting conditions and the colors being illuminated by them.

Film photographers use special films or lens filters designed to compensate for different light sources. But digital cameras, like video cameras, get around the color-temperature problem by using a process known as white balancing. *White balancing* simply tells the camera what combination of red, green, and blue light it should perceive as pure white, given the current lighting conditions. With that information as a baseline, the camera can then accurately reproduce the other colors in the scene.

On some digital cameras, white balancing is handled automatically, but most models give you the option to set the white balance manually to match the light source. That feature comes in handy when your subject is lit by two light sources that have different color temperatures. Figure 7-20 shows one such example. For this shot, my subject was lit primarily by tungsten studio lights, which have a yellow color cast (refer to Figure 7-19). But an adjacent window allowed some daylight into the room, and because it was a cloudy day, the light had a slight blue tint. The mixture of the two light sources confused the automatic white-balance system, resulting in the yellowish cast shown in the first shot. After I set the White Balance option to Tungsten, my whites were once again white.

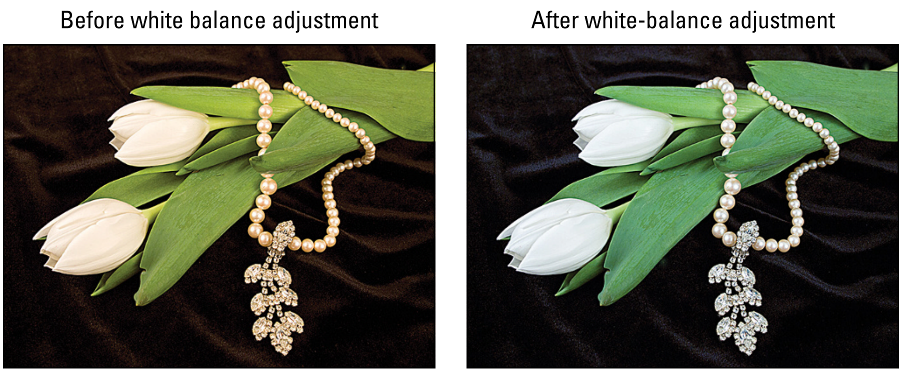


FIGURE 7-20: Using two different light sources confused the automatic white balance system (left); modifying the White Balance setting corrected the problem (right).

When you take the white balance reins, choose the option that most closely matches your most prominent light source. Table 7-1 shows some common manual settings. These settings are usually represented by graphical icons; the ones in the table are generic, but most cameras use similar symbols to represent the white-balance settings.

That's the short story on white balance: Turn to this control any time your colors look out of whack. But also investigate the tactics explored in the next few sections, which present additional white-balance features.

TABLE 7-1 Manual White-Balance Settings

Icon	Setting	Use
	Daylight or Sunny	Shooting outdoors in bright light
	Cloudy	Shooting outdoors in overcast skies
	Fluorescent	Taking pictures in areas with fluorescent lights
	Incandescent	Shooting under incandescent lights (standard household lights)
	Flash	Shooting with the flash
K	Kelvin	Select a specific Kelvin temperature

WARNING

Get in the habit of resetting the White Balance option back to AWB (automatic white balance) after you're done using a manual setting. Otherwise, if you shoot another photo in different light, the color is likely to appear wrong in that photo.

White-balance shift

Some cameras offer a way to refine white balance beyond what you can do with the six or seven usual manual settings. Suppose that you're using incandescent lamps but the Incandescent setting on your camera doesn't quite produce neutral colors. You may be able to nudge the white-balance adjustment in small increments to eliminate the problem. For example, on some Canon cameras, you can tweak the white-balance adjustment by moving a little marker inside a color grid, shifting hues along both a blue/amber axis and a green/magenta axis, as shown in Figure 7-21. The setting in the figure shifts the white balance three steps toward amber and one toward magenta.

This feature sometimes goes by the name *white-balance shift;* on other models, it may go by the name *white-balance fine-tune* or a similar term.

TECHNICAL STUFF

Typically, the shift increments are geared around a measure called a *mired* ("my-red"), which indicates the degree of color correction applied by a traditional colored-lens filter. Each white-balance adjustment increment equals so many mireds (usually, five). If you're hip to the whole mired issue, check the fine print in your camera manual for details on how your model handles the situation.

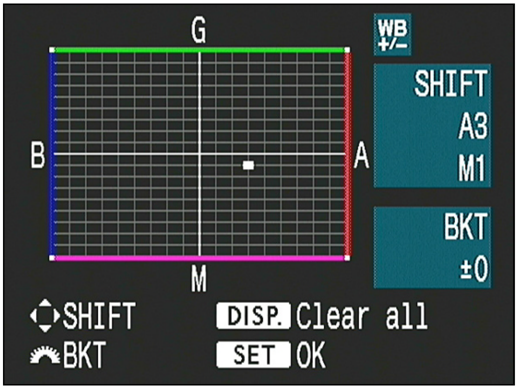


FIGURE 7-21: On some cameras, you use this type of control to adjust white balance in small increments.

Custom white balancing based on a gray card

TIP

Some cameras allow you to shoot a reference photo that the camera analyzes to determine the right amount of white balancing needed to completely remove any color casts. This feature is usually the most reliable and efficient way to ensure accurate color.

Here's how it works: You take a picture of a neutral gray card, illuminating the card with the same lighting that you plan to use for your shot. (You can buy cards made just for this purpose for under $20.) The camera then determines what white-balance adjustment is needed to get that image to a neutral color state. The adjustment information is stored as a custom setting, and any time you shoot in that same light, you select that custom setting as the white-balance option, and the camera applies the same correction to ensure color accuracy.

REMEMBER

WHEN WHITE BALANCE ISN'T TO BLAME

I recently took some photos at a cookout at which people were seated under colored patio umbrellas. After looking at several of the shots, I noticed that the subjects seated under a red umbrella had skin that looked decidedly sunburned. In fact, they hadn't been in the sun at all — it was the reflection from that umbrella that made their faces appear red. Because this was a family event and no one was all that interested in little old me trying to take some good portraits, I didn't force people to leave behind their barbecue so that I could shoot them in a better setting. Luckily, I was able to fix the skin tones later in my photo editor. But if you want to avoid that post-production hassle, take a moment before you shoot to look for any surfaces that may cause unwanted color reflections on your subject.

Looking at Picture Presets

In addition to the options already explored in this chapter, be aware of one other common setting that affects the apparent focus of your photos as well as how colors are rendered.

When you shoot in the JPEG file format, which is the default format on most cameras and the only format on some cameras, the camera applies certain color adjustments as it creates the image. At the same time, it may tweak contrast and apply some *sharpening,* which is a process that boosts contrast in a way that creates the illusion of slightly sharper focus. (Note *slightly sharper* — sharpening isn't a fix for images that are extremely soft.) All these adjustments are designed to deliver a picture that has the look that the manufacturers' focus-group studies say their customers prefer.

Usually, you can choose from a handful of different post-processing "looks." The setting in question goes by various names, such as *Picture Style, Picture Control,* and *Optimize Image*. The available settings vary depending on your camera, but you typically get a choice of the settings described in the following list (again, the names vary; I used some of the common monikers here):

- **Standard or Auto:** This option captures the image using characteristics that the manufacturer considers suitable for the majority of subjects.
- **Neutral or Flat:** At this setting, the camera doesn't enhance color, contrast, and sharpening as much as in the other modes. The setting is designed for people who want to precisely manipulate these picture characteristics in a photo editor. By not overworking colors, sharpening, and so on when producing your original file, the camera delivers an original that gives you more latitude in the digital darkroom.
- **Vivid or Intense:** In this mode, the camera amps up color saturation, contrast, and sharpening.
- **Portrait:** This mode tweaks colors and reduces sharpness in a way that is designed to produce soft skin texture and pleasing skin tones.
- **Landscape:** This mode emphasizes blues and greens and increases contrast and sharpening.
- **Monochrome:** This setting produces black-and-white photos.

With the exception of Monochrome, the extent to which the selected preset affects an image depends on the subject and the camera — though Figure 7-22 offers a look at the same scene as produced by four typical JPEG presets. As you can see, there's not a lot of difference, although the blues in the Landscape version are decidedly more intense than in the other versions, and the Neutral version is clearly undersaturated and lacks contrast. This scene also points up another hiccup related to JPEG presets: What option do you choose if your scene contains both people — suitable for the Portrait option — and a landscape, as here?

FIGURE 7-22: You may be able to choose from several JPEG presets, each of which tweaks color, contrast, and sharpness slightly differently.

In my experience, the default setting works best for most shots, and on some cameras, you don't even notice as much difference between the various preset styles as shown in the figure. I stick with the default. Your mileage may vary, though, so take test shots at each of your camera's settings.

Keep in mind these additional points:

- **You may not be able to choose which preset is applied when you shoot in Auto exposure mode, scene modes, or other automatic exposure modes.** Most cameras don't give you control over this feature unless you shoot in an advanced mode (programmed autoexposure, manual, aperture-priority autoexposure, or shutter-priority autoexposure).

- **Don't confuse these Portrait and Landscape settings with the Portrait and Landscape scene modes.** I know — like this stuff isn't confusing enough, you have to deal with two settings bearing the same option names? But the deal is this: Assuming that you shoot in an exposure mode that gives you control over these presets, you can select any one you like — you can snap a photo of a mountain landscape using the Portrait setting, if that's the look you want. If, on the other hand, you shoot in Landscape scene mode, the camera automatically selects the Landscape setting. And in the Portrait scene mode, the file is processed according to the Portrait preset color/sharpness/contrast recipe.
- **Using black-and-white mode isn't the best route to a black-and-white photo.** When you take a photo in black-and-white mode, the camera captures a full-color image and then just *desaturates* (removes all color from) the photo. Depending on the original colors in the scene, this can lead to a fairly "blah" black-and-white image. A better choice is to capture the image in full color and then do the conversion to black-and-white in a photo-editing program. Assuming that you own a capable program, you'll have much more control over how the colors in the image are translated to grayscale.
- **You may be able to modify presets or create your own presets.** For example, some cameras enable you to adjust the amount of sharpening, contrast, color saturation, and other parameters that are made by a particular preset. Even better, you can sometimes create and store your own custom preset in addition to the prefab ones.

Shooting Raw for More Color Control

In the Raw file-capture format, the camera doesn't apply white balancing or any of the other color, sharpness, or contrast adjustments that are made by the JPEG presets discussed in the preceding section. Instead, you specify these image attributes (and more) when you convert the Raw file to a standard format (such as TIFF or JPEG) on your computer.

Although Raw capture involves more time behind the computer and has a few other complications you can explore in Chapter 2, shooting in this format gives you a much finer degree of control over these picture characteristics than you get in JPEG, even if you play with all available capture settings.

Take a look at the screen shown in Figure 7-23, which shows one of multiple panels of options found in the Adobe Camera Raw converter tool, which is provided with several Adobe photo programs, including Photoshop and Lightroom Classic. This particular panel is one of my favorites because it enables you to adjust the hue (basic color), saturation (intensity of color), and luminance (brightness) of individual color ranges. For this image, I was able to tweak sky and sea colors separately from skin tones and from the clothing colors.

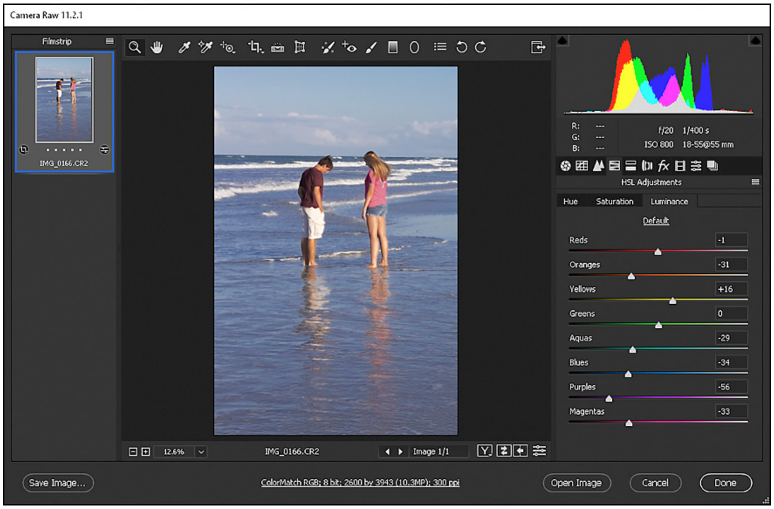


FIGURE 7-23: Here's a look at some of the color-related options available in the Adobe Camera Raw file-conversion tool.

I find Raw especially helpful when I'm shooting in mixed lighting sources and can't find just the right white-balance setting or another adjustment to produce neutral colors. If you shoot JPEG and your photos have a color cast, it's sometimes difficult to make things right even using a powerful photo-editing program. But with Raw, the color isn't locked in when the file is created, so you always get a second chance. Additionally, because the Raw format can retain a slightly greater range of brightness values than the JPEG format, it gives you a bit more latitude if you need to adjust exposure after the shot.

That's not to say that you should completely ignore white balance and the other settings explained in this chapter when you shoot in the Raw format. For one thing, the picture you see during playback on the camera monitor is a JPEG preview of the image as it will appear if you stick with the current white-balance setting. So, if the color is way off, judging the overall result of the picture is a little difficult. It's hard to tell whether a red flower is properly exposed, for example, if the entire image has a blue color cast. And when you open the picture file in a Raw converter, the software initially translates the picture data according to the recorded white-balance setting. Getting as close as possible from the get-go can thus save you some time tweaking colors during the conversion stage.

3

Pro Tips for Capturing Specific Subjects

IN THIS PART . . .

Improve portraits through better composition, backgrounds, and lighting.

Get a look at easy-to-use (and affordable) studio setups for photographing products and people.

Discover the secrets to super action shots, from selecting the right shooting modes to choosing the best exposure and autofocus settings. Find out how to freeze motion or add visual interest by intentionally blurring moving subjects.

Create more powerful landscape photos, whether your subject is a serene lakeside vista or a towering skyscraper set in a bustling city square.

Find out how to photograph fireworks, create special effects in nighttime city scenes, and capture dynamic close-ups.

IN THIS CHAPTER

» Choosing the right camera settings for a classic portrait

» Figuring out your lighting options

» Dealing with red-eye and other flash-related issues

» Lighting an outdoor portrait

» Improving the shot with a better background

» Going beyond traditional poses to capture memorable moments

Chapter 8
Shooting Frame-Worthy Portraits

A complete course in portrait photography would consume way more pages than I have to offer in this book. I don't have room to get into details such as posing, high-end studio equipment, wedding portraiture, and so on. What I can do is provide the basics of shooting a good portrait, from choosing the right camera settings to avoiding common portrait problems.

Note that the camera settings and techniques I outline in this chapter assume that you're shooting a non-moving subject. If your portrait involves a person (or pet) who isn't willing to remain still while you take the picture, you may need to incorporate the tips that I cover in Chapter 9, which is dedicated to photographing action.

Starting with a Classic Portrait Recipe

Figure 8-1 illustrates the classic portraiture approach, which features a sharply focused subject set against a blurred background. This artistic choice emphasizes the subject and helps diminish the impact of any distracting background objects.

FIGURE 8-1:
A blurry background draws more attention to your portrait subject.

Upcoming sections in this chapter offer additional advice about backgrounds, lighting, and other portrait-shooting issues, but if you're in a hurry, the following steps provide a simple recipe for producing this traditional portrait look.

REMEMBER

These steps assume you're using a camera that offers advanced exposure modes — in this case, aperture-priority autoexposure. If your camera doesn't provide that mode, I've included work-arounds in the steps related to it. Also, don't worry about the length of the steps. After you get through them once, you'll see that the process isn't nearly as long or convoluted as the text may make it appear; I just had lots of explaining to do along the way. Nor do you necessarily have to follow the recipe in this exact order. Just choose the recommended settings and work out framing before you take the shot.

For quick reference to camera settings and the chapters that explain them fully, see Table 8-1.

1. **For maximum quality, set the file format to Raw and choose the highest resolution setting your camera offers.**

   Chapter 2 introduces you to file format and resolution and explains why "shooting Raw" and using the highest resolution are the way to go for important pictures. But don't worry if your camera doesn't offer the Raw file type; the other option, JPEG, will be fine as long as you select the JPEG setting that produces the best quality. Check your camera instruction manual for the name of this setting; most cameras use a name like "Fine" or "Best."

TABLE 8-1 **Recommended Settings for Shooting Portraits**

Option	Recommended Setting	See This Chapter
Autofocus settings	Single point with focus lock	7
Exposure mode	Aperture-priority autoexposure, manual exposure, or Portrait mode	2, 5
File type	Raw or JPEG Fine	2
F-stop (aperture)	f/5.6 or lower, unless shooting a group; raise number as needed to extend zone of sharp focus to cover all subjects	5
Flash	Off for indoor portraits, if possible; on for outdoor portraits	6
Image resolution	Highest available	2
ISO	Auto (with high ISO limit enabled, if available)	5
JPEG picture preset	Standard (may be called Auto) or Portrait	7
Metering mode	Center-weighted, if available; otherwise, whole-frame	5
Shutter-release mode	Single-frame if using flash; can opt for continuous (burst mode) when not using flash	2
Shutter speed	Varies depending on light and ISO setting; avoid slow speeds when handholding camera or shooting subject that may move during exposure	5
White balance	Auto	7

2. **Set the White Balance option to Auto (AWB).**

   This setting affects how colors are rendered. Auto White Balance is the default and works well in most cases. If you do have a color problem, Chapter 7 explains more about this option and other possible solutions.

3. **Set the exposure mode to aperture-priority autoexposure, if available, and dial in a low f-stop value.**

   Some whys and wherefores about this step:

   - *Dialing in a low f-stop value is the first step in softening your portrait background.* As covered in Chapters 5 and 7, the f-stop, or aperture setting, affects exposure and *depth of field,* or how sharply focused objects in front of and behind your subject appear. The lower the f-stop number, the shallower the depth of field.
   - *To control f-stop, you need to choose an exposure mode that offers that option.* Auto mode won't do the trick; you need to use an advanced exposure mode. I prefer aperture-priority autoexposure because in that mode, I set the f-stop, and the camera automatically chooses the shutter speed

needed to properly expose the subject at the current ISO (light sensitivity) setting. Of course, if you're comfortable with manual exposure mode, in which you set both aperture and shutter speed, that's an option as well.

WARNING

Even though the camera selects the shutter speed for you in aperture-priority autoexposure, don't ignore shutter speed. You need to make sure the selected speed isn't so slow that even a small movement of the subject or camera will blur the image. If you're worried about a too-slow shutter speed, increase the ISO setting to allow the camera to choose a faster shutter speed.

- *For a group portrait, you may need a higher f-stop than for a single subject.* This warning applies only when the people in the group aren't all at the same distance from the camera. Think of a bride standing in front of the groom, for example, or a group of 20 employees posed in four rows. At a very low f-stop, depth of field may not be large enough to keep everyone properly in focus. Take test shots and inspect the results at different f-stops to find the right setting. A setting between f/8 and f/14 is usually sufficient, but it all depends on how close the front row of people is to the back row.
- *If your camera doesn't offer advanced exposure modes, try Portrait scene mode.* Almost every camera — even many smartphone cameras — offers this setting, which automatically chooses the lowest possible f-stop setting for you. Usually, this setting also tweaks color and contrast to produce softer, warmer skin tones that flatter most subjects. Want the same effect in an advanced exposure mode? When using JPEG as the file format, select the Portrait preset; when shooting in the Raw format, you can tweak these portrait characteristics when you process the file.

4. **Set the exposure metering mode to center-weighted, if available.**

The metering mode determines which part of the frame the camera uses to base exposure settings. On entry-level cameras, you may not have a choice — the entire frame comes into play. This can cause exposure problems when the portrait background is considerably darker or lighter than your subject. Your subject may be over- or underexposed because the camera is factoring the background into the exposure, not knowing that your subject is the critical element in the shot.

Center-weighted metering considers the entire frame but gives additional emphasis to the center of the frame, which is presumably where your subject will be. So using center-weighted metering gives you a better chance of a properly exposed subject. Some cameras also offer spot metering, which bases exposure on a small area of the frame that you select. Usually, that area is tied to the focus point that's used. If you set focus on the eye, as recommended later in these steps, the skin may not be properly exposed. There can be other complicating factors to using spot metering, depending on your camera, so if you opt for this setting, check the instruction manual to fully understand how it works.

Don't have a choice of metering modes? Don't panic — the next section of this chapter explains how to modify lighting if the initial exposure isn't to your liking. Chapter 5 shows you additional ways to adjust lighting when you're using autoexposure.

5. **Check the lens focal length.**

   A focal length of 70–135mm is ideal for a classic head-and-shoulders portrait. Avoid using a short focal length (wide-angle lens) for portraits. It can cause features to appear distorted, sort of like how people look when you view them through a security peephole in a door. On the flip side, a very long focal length can flatten and widen a face.

   Remember these additional focal-length pointers:

   - *Increasing focal length shortens depth of field.* So now you have two ways to create that blurry portrait background: opening the aperture (low f-stop setting) and using a long (but not too long) focal length.

   REMEMBER

   - *The focal length printed on your lens may not be accurate for your camera.* As explained in Chapter 1, focal lengths are stated in terms of 35mm equivalency. That means that unless you're shooting with a *full-frame* camera (where the image sensor is the same size as a 35mm film negative), you need to multiply the stated focal length of the lens by the crop factor of your camera's sensor in order to know the actual angle of view and focal length you're using.

     For example, if your camera came with an 18–55mm lens and your camera has a crop factor of 1.5, the actual focal length when the lens is used on your camera is 27–82mm. At 82mm, you're within the range recommended for portraits to get by without investing in a special portrait lens. That said, so-called "kit lenses" usually don't offer the highest image quality, so if you're serious about portrait photography, I encourage you to consider investing in a better lens. A lens designed for portrait photography often provides wider aperture settings (lower f-stop numbers) than a kit lens, too.

6. **To further soften the background, get closer to your subject and put more distance between the subject and background.**

   At minimum, put your subject at an arm's-length from the background, if possible. Of course, how close you can get to your subject depends on your lens focal length and the subject.

7. **Choose the shutter-release mode based on the shooting scenario.**

   Chapter 2 explains this setting, which determines how soon the shutter is released after you fully depress the shutter button (or tap the touchscreen, if you're using a camera with a touch shutter). Here are my recommendations on this setting:

- *Single-frame mode*: This setting is the default, giving you one frame at a time. Select this setting if you're using flash to light your subject.
- *Continuous (burst mode) release:* At this setting, the camera captures a continuous series of frames (burst) as long as you hold down the shutter button. It may seem odd to consider this setting for portraits, but if you're photographing "blinkers" — subjects who routinely blink at the moment you capture the picture — burst mode can be a useful tool. If you're shooting several frames per second, you should be able to capture at least one eyes-open frame. The only hitch is that many cameras don't let you use flash when burst mode is enabled.
- *Self-timer mode:* Want to be part of the portrait? Put your camera on a tripod and use this setting, which delays the shutter release for a few seconds after you fully depress the shutter button. Depending on the camera, you may be able to specify the delay time and even tell the camera to capture several frames at a time.
- *Remote control mode:* Here's another option for times when you want to be part of the picture. If your camera offers wireless remote control through a smartphone app, you don't even have to worry about falling down as you run into the frame. Get yourself situated, press the shutter button on the phone, and you're done.

  TIP

  This option can also come in handy when you're photographing kids and pets and don't want them to look directly into the lens, either for artistic effect or because you want to reduce the chances of red-eye when using flash. Position your camera on a tripod, frame the scene, and then move to the spot where you want the subject to look. After attracting the subject's attention, use the remote control to release the shutter.

8. **Set focus on your subject's eye, as shown in Figure 8-2.**

   Specifically, lock focus on the eye that's closest to the camera.

   If you use manual focusing, this step shouldn't be a problem. If you use autofocusing, you may need to do a little work to lock focus on the eye. Which of these solutions will work best depends on the autofocus features your camera offers.

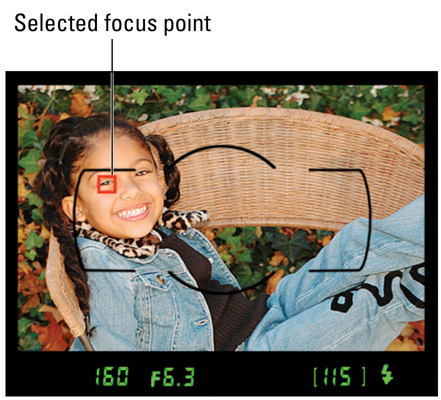


FIGURE 8-2:
Set focus on the eye that's closest to the lens.

- *If eye-detection autofocus is available, select that setting.* The camera then scans the frame looking for a portrait subject's eyes and automatically focuses on them. However, make sure that the camera picks out the eye you're targeting — this system isn't foolproof. Ditto for face-detection autofocus, a feature that promises to automatically detect and focus on your subject's face. Both features may fall short if your subject isn't looking into the lens or you're shooting the subject in profile (from a side view). Move on to the next solution if necessary.
- *To choose the focus point yourself, set the autofocus system to its single-point, focus-lock settings.* If you haven't yet checked out Chapter 7, that sentence likely made no sense at all, so here's a short recap. Many cameras have two settings: one that lets you specify whether you want it to base focus on one, all, or a group of focus points; and another that determines whether the camera locks focus when you press the shutter button halfway (or tap the screen on a touchscreen-enabled camera) or adjusts autofocus continuously until you take the picture. For portraits — for any stationary subject, really — using a single point and locking focus is the way to go. I used this option in the example shown in Figure 8-2.

  TIP

  If you compose your shot and none of the camera's focus points fall over the eye, use the autofocus-lock and recompose technique: Frame the scene initially so that the selected point falls over the eye, lock focus at that distance, and then reframe to your desired composition before releasing the shutter.

9. **Enable or disable flash, depending the lighting conditions.**

   Although most people assume they should use flash when shooting indoors and turn flash off when shooting outdoors during daylight, I encourage you to explore the next section, "Creating Good Portrait Lighting," for proof that the opposite is often true.

   REMEMBER

   In aperture-priority autoexposure mode, keeping the built-in flash unit closed usually disables the flash, and you have to press a flash button or choose a menu option to enable flash. In Portrait scene mode, your camera may or may not give you control over flash; if it does offer you the choice, you usually state your preference via a setting called *flash mode.*

10. **Check composition.**

    A couple of tips on this step:

    - *Scan the background for distracting background objects.* If necessary, reposition the subject against a more-flattering backdrop. The upcoming section "Building a Better Backdrop" offers some options.

- *Frame the subject loosely to allow for later cropping to a variety of frame sizes.* Most cameras produce images that have an aspect ratio of 3:2. That means your portrait perfectly fits a 4-x-6 print size but will require cropping to print at any other proportion, such as 5 x 7 or 8 x 10. Figure 8-3 shows an example. Both images show the 3:2 area captured in my original shot; the red outlines show how much of the subject fits within a 5 x 7 and 8 x 10-inch frame, respectively.

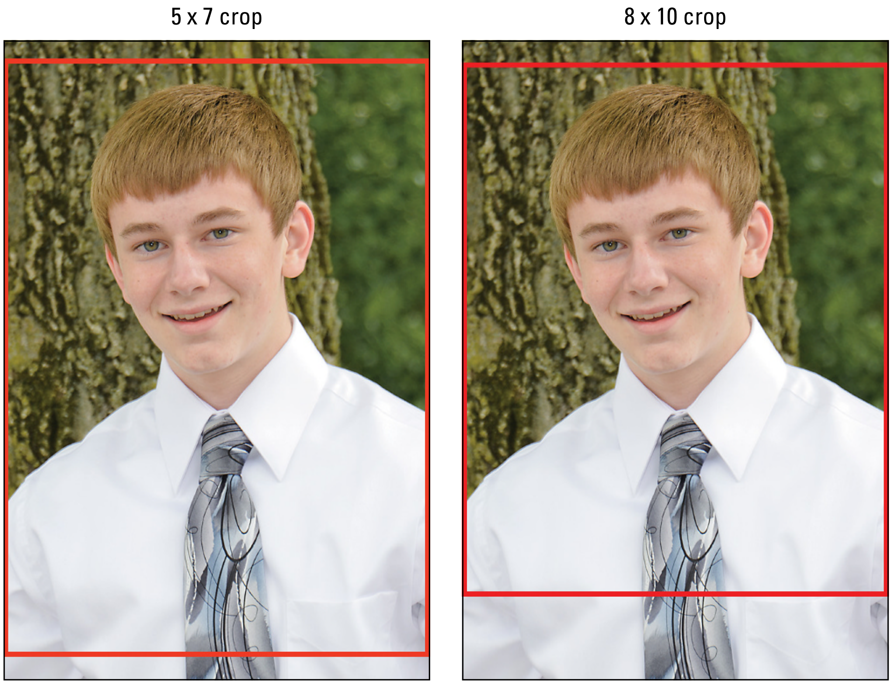


FIGURE 8-3: The red rectangles indicate how much of a 3:2 original portrait can fit inside a 5 x 7-inch frame (left) and an 8 x 10-inch frame (right).

There you have it — ten easy, albeit somewhat wordy, steps — to prepare to shoot a classic portrait. Keep reading to discover more information about lighting, backgrounds, and shooting portraits that don't fall into the static, headshot type featured in this section.

Creating Good Portrait Lighting

Near the end of Chapter 6, I discuss setting up a multiple-light portrait studio that can be used in your home, office, or even at remote locations. But because most people aren't interested in taking things to that level, the next sections discuss simpler portrait-lighting options.

Shoot indoor portraits by window light

For indoor portraits taken during the daytime, try disabling flash and instead expose the portrait courtesy of light coming through a window. Even on a cloudy day, the light coming through the glass is often strong enough to enable you to go flash-free, eliminating any chances of red-eye and providing softer, more even illumination. Figure 8-4 shows an example of how beautifully this "available light" option can work.

Courtesy of Mandy Holmes

FIGURE 8-4: For soft, even lighting, forego flash and instead expose your subject using daylight coming through a nearby window.

Catch light with a reflector

One of the least-expensive but most helpful tools for portrait shooting is a *reflector,* which, as the name implies, enables you to reflect light onto your subject. This technique is especially helpful when you want to shoot by window light, as just described, but the angle or amount of light isn't sufficient to illuminate your subject. You can multiply the light by using a reflector, as shown in Figure 8-5. The window light bounces off the reflector and onto the side of the face that's turned away from the window. Figure 8-6 shows the final portrait (left) compared with one taken using a built-in flash (right). Notice that using the reflected-light setup cured two common flash flaws: harsh shadows behind the head and red-eye.

FIGURE 8-5: Use a reflector to bounce window light onto the subject.

FIGURE 8-6: I shot the left portrait using window light and a reflector, eliminating the harsh shadows and red-eye caused by shooting with my built-in flash (right image).

Some tips about reflectors:

- Reflectors come in many shapes and sizes; the one in Figure 8-5 is a 32-inch, round version that has two sides. One side is gold, which adds a nice warm touch to the reflected light; the other side is white for times when you want the bounced light to be neutral. Like most reflectors, this one folds up into a small carrying case, making it easy to transport and store.

- In addition to reflectors of the two-sided variety shown in Figure 8-5, you can buy kits that consist of a white reflector and an assortment of covers that change the color and strength (strong or subtle) of the reflected light. Reflectors with a silver panel produce a cool (bluish) light, for example. And a reflector that has a black panel is handy for blocking unwanted light. In a pinch, you can even use a large black reflector as a portrait backdrop.

  Among the companies known for making good reflectors are Photoflex, Westcott, and Lastolite. Prices range from about $15 to $70, depending on the size of the reflector and how many different reflective surfaces it offers.
- I also use a reflector when shooting portraits in the multiple-light studio setup shown at the end of Chapter 6. This setup uses two remote flashes, each set to one side of the subject. I position the reflector in front of the subject, angled to reflect some of the flash light upwards. The extra light helps to fill in shadows that may appear under the eyes and soften shadows under the chin.
- Outdoors, you can pose your subject in the shade and use a reflector to bounce light onto the face instead of (or in addition to) using flash. You can also use a reflector to create instant shade — just have someone hold the reflector in a position that blocks the sun from hitting your subject.

TIP

- Reflectors aren't just for portrait shooting. I also carry a much smaller reflector than the one shown in the figure when I photograph flowers, for example. By placing the reflector at the base of the flower, I can throw a bit of light onto the underside of the petals.
- As an alternative to buying a professional reflector, you can make your own out of a piece of white foam core (that stiff presentation board you find in craft and art-supply stores). The silver windshield covers that people use inside their cars to block out the sun can also serve as reflectors.

Lessen the chances of red-eye in flash portraits

Red-eye — the phenomenon that makes a person's eyes appear to emit a red glow — is a common problem with flash photos. If you can't go flash-free, there are a few things you can do to reduce the chances of red-eye. First, it helps to understand why it happens. When a flash is aimed directly at the eyes, the retina of the eye can reflect the light back towards the camera lens. That reflection picks up the color of the blood vessels of the eye, resulting in the red glint. In animal eyes, there is a colored coating behind the retina, so the reflected light usually gives the eye a yellow, white, or green glow instead of red. Figure 8-7 shows an example that suffers from both of these problems.

FIGURE 8-7: Aiming flash directly at your subjects often results in red-eye in humans and green, white, or yellow eyes in pets.

With that little science lesson out of the way, the following strategies for reducing red-eye should make more sense:

- **Brighten the room as much as possible by turning on room lights and, during daylight hours, opening curtains and blinds.** As you increase ambient light, the subject's pupils narrow in response, so less light from the flash makes it to that reflective retina. (Now you know why red-eye rarely occurs when you use flash in daytime portraits shot outdoors.)
- **Set the flash to red-eye reduction mode, if available on your camera.** In this mode, usually indicated by an eyeball (refer to the icon in the margin here), the flash or another lamp on the front of the camera blinks rapidly before the shutter is released and the actual flash fires. The idea is the same as turning up the ambient room light: to cause the pupils to shrink so that less flash light can bounce into and out of the eye.

  WARNING

  Be sure to tell your subjects to expect the prelight. Otherwise, they may presume that the light is from the flash and look away from the lens after seeing the first pop of light.
- **When using a flash that has a rotating head, use bounce flash instead of aiming the light directly at the subject.** You can aim the flash at the ceiling, as illustrated in Figure 8-8, or a wall next to your subject, angling the flash head so that the light bounces from the initial surface and lands softly on the subject. Chapter 6 has an example and more tips on using bounce flash.

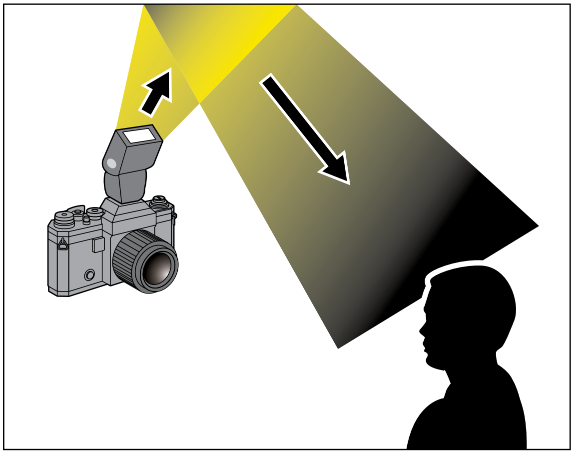


FIGURE 8-8: With a rotating flash head, you can bounce the flash light off the ceiling so that it doesn't hit the eyes with full force.

I made use of all three strategies to get the result shown in Figure 8-9. Don't worry if you take these steps and red-eye persists, though; there are still a few red-eye reduction maneuvers available:

FIGURE 8-9: Bouncing the flash and using a few other tricks enabled me to eliminate the reflections in the boy's and dog's eyes.

- **Compose the photo so that the subject doesn't look directly at the flash.** Figure 8-10 shows one pooch pose that takes advantage of this option. Okay, so the dog wasn't really posing, per se; I just took advantage of the fact that she was refusing to look at me. I'm not sure whether she was angry about having just spent the day at the groomer or didn't appreciate the color of her post-groom bandana. Probably both, but luckily she's quick to forgive. Well, after a treat or two, anyway.
- **Add a diffuser in front of or over the flash head to soften and spread the light.** I show a couple of examples of diffusers in Chapter 6. The more diffuse the light, the less chance of red-eye. You also get a softer, more flattering light on the entire portrait subject as a side benefit.

» **Switch the flash mode from red-eye reduction to slow-sync mode, as explained next.** This technique requires a slow shutter speed, so it probably won't work well with pets, toddlers, and annoyed teenagers who refuse to sit still, but it can work out well with some subjects.

TIP

The final bit of good news about red-eye is that even if you can't eliminate it while shooting, most photo-editing programs have red-eye repair tools that work pretty well. Your camera may even offer a built-in red-eye removal tool that you can apply to your photo after you take the shot. Animal eyes are a bit trickier; most repair tools know only how to replace red pixels in the eye with dark pixels. But if you use the Google machine, you can find programs and apps especially designed to work on the white, yellow, and green pet versions of red-eye. If you're skillful with Photoshop or another program that offers a painting tool, you can also just set the paint brush to the animal's actual eye color and paint over the incorrectly colored pixels.

FIGURE 8-10:
Another option is to compose your shot so that your subject isn't looking directly at the flash.

Try slow-sync flash for softer flash lighting

Detailed in the flash mode section of Chapter 6, *slow-sync flash* is an option that enables you to use a shutter speed that's slower than the camera normally uses when flash is enabled. (Most cameras default to a shutter speed of 1/60 second for flash pictures.) The longer the shutter is open, the more time the camera has to soak up ambient light, and the less flash light is needed to illuminate the subject. The results are twofold: brighter backgrounds and softer, less harsh lighting on your subject.

Figure 8-11 offers a comparison of regular flash versus slow-sync flash in a night-time portrait taken outdoors. The slow-sync version, in addition to exhibiting a huge change in lighting, makes clear the potential downside of using a slow shutter speed in this type of shot: blur caused by camera shake, movement of the subject, or, as in this case, both. I didn't have a tripod handy when taking this photo of a friend at Rome's Trevi Fountain, and a shutter speed of 1/2 second is beyond my ability to keep the camera absolutely still during the exposure. And although my friend is much better at holding steady, you can see some motion in the hand that's about to toss a coin in the fountain. I don't mind the arm movement so much — it emphasizes that she's about to do what one does when in Rome, which is to pitch a coin into Trevi Fountain. But I'd like the rest of the shot to be sharper, which would have required a tripod. I include this "almost" great example to emphasize that when you use slow-sync flash, you have to be aware of the risk of blurring due to camera shake or subject movement.

f/3.8, 1/160 second, ISO 200, regular flash   f/3.8, 1/2 second, ISO 200, slow-sync flash

FIGURE 8-11: Slow-sync flash results in brighter backgrounds and softer flash lighting, but the slow shutter speed brings a risk of blur due to camera shake or subject movement.

Figure 8-12 shows a more successful use of slow-sync flash, this time used to take an indoor portrait with my camera mounted on a tripod and featuring a seated, non-moving subject. When I used regular flash, the shutter speed was 1/60 second. At that speed, the camera has little time to soak up any ambient light. As a result, the scene is lit primarily by the flash. That caused two problems, which you can see in the first image in the figure: The strong flash created glare on the subject's skin, and the window frame is more prominent because of the contrast between it and the darker bushes outside the window. Although it was daylight when I took the picture, the skies were overcast, so at 1/60 second, the exterior appears dark.

In the slow-sync example, shot at 1/4 second, the exposure time was long enough to permit the ambient light to brighten the exteriors to the point that the window frame almost blends into the background. And because much less flash power was needed to expose the subject, the lighting is much more flattering. In this case, the bright background also helps to set the subject apart because of her dark hair and shirt. If the subject had been a pale blonde, this setup wouldn't have worked as well.

FIGURE 8-12: Although usually considered a tool for nighttime shooting, slow-sync flash worked well for this indoor portrait.

REMEMBER

Both Figure 8-10 and Figure 8-11 exhibit the color shift that can occur when you use Auto White Balance and shoot in a combination of flash and ambient light. Depending on the hue of the ambient light, colors may appear cooler (more blue) or, as in my example figures, warmer (more golden). That hint of gold is usually flattering in portraits, but Chapter 7 explains how to modify colors using your camera's white-balance setting if needed.

Shoot a subject in silhouette

Although the preceding sections emphasize ways to add light to your subject, you also may want to go the opposite direction, removing light to purposely shoot your subject in silhouette, as shown in Figures 8-13 and 8-14. You can get this result any time your subject is positioned in front of a bright background and you disable your camera's flash. (If the flash fires, your subject will appear bright instead of silhouetted.)

To me, the silhouette treatment works well for both of these examples because after your eye spots the subject, it goes directly to the brightest part of the frame. You then become a participant in the scene, enjoying the same view as the subject. In Figure 8-13, the beauty of the aquarium is highlighted. And just enough light reflects back onto the subject to enable you to see the intensity on the boy's face as he studies the creates in front of him.

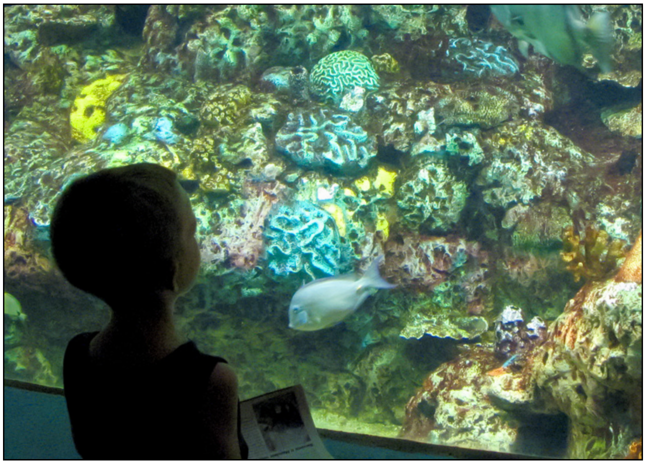


FIGURE 8-13: To keep your subject in silhouette, disable flash.

Figure 8-14 offers an example of a subject in complete silhouette. This image may mean more to me than it does to you because I had a relationship with this particular furball, who could spend hours in front of that screen door, glued to Yard TV (best station ever, if you're a Wheaten Terrier). But assuming that you're shooting for your own enjoyment (as opposed to taking pictures for someone else), creating an image that will evoke a happy memory years later is the whole point of making a portrait, yes?

FIGURE 8-14: This photo captured my first furkid at his favorite post, keeping watch in case something in the yard needed a good barking at.

Use flash to fill in shadows outdoors

I mention this technique in Chapter 6, but because it's so essential to outdoor portrait photography, I think it bears repeating: Even in daylight, a flash can add a beneficial pop of light to subjects' faces, as illustrated in Figures 8-15 and 8-16. The flash helps eliminate shadows that would otherwise occur when your subjects are backlit, as in Figure 8-15, or when wearing a hat, as in Figure 8-16. Why not just increase exposure to fix the problem? Because increasing exposure enough to brighten the faces often overexposes the rest of the image. This is why you absolutely need flash when your subject is posed in front of a sunset or sunrise sky, by the way. Without flash, you'd have to increase the exposure so much that the sky would become too light and no longer show all those beautiful sunset colors. Using flash also makes the eyes sparkle a little, adding what photographers call a *catchlight* — a tiny white reflection of the flash in the eye.

WARNING

Using flash outdoors during daylight involves a few considerations related to shutter speed, exposure mode, and image colors. Look for these details in Chapter 6.

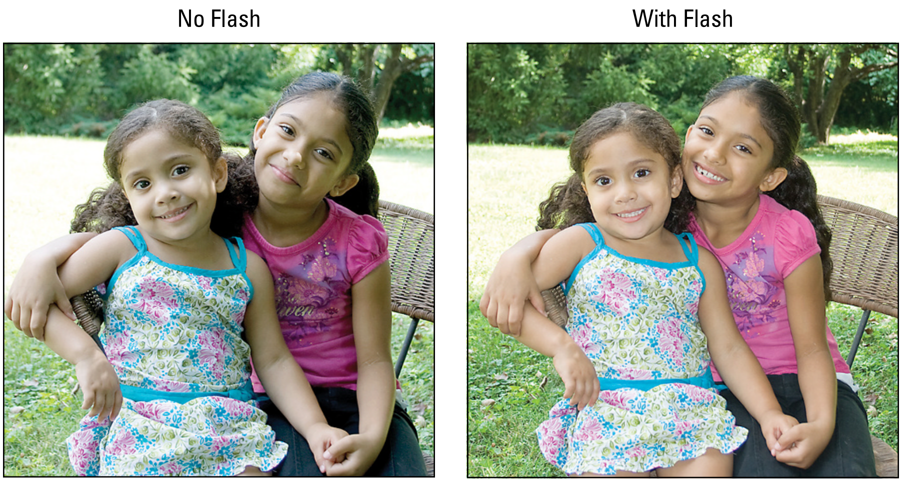


FIGURE 8-15: Even on sunny days, backlit subjects benefit from a flash.

FIGURE 8-16: Shadows cast by the brim of a hat can also be eliminated by using flash.

DEALING WITH BLINKERS AND EYEGLASSES

Aside from red-eye caused by flash lighting, you may need to deal with two other eye-related portrait difficulties: subjects who simply can't keep their eyes open during an exposure (I'm talking about you, dear brother-in-law) and reflections bouncing off eyeglasses, whether the reflection is caused by flash or ambient lighting.

The best trick I know for dealing with "blinkers" is to disable flash and use the continuous (burst mode) shutter-release option. As long as the person can maintain a pose for a few seconds, you should end up with one or two frames out of a burst where the eyes are open. You also can try asking your subjects to close their eyes and open them on the count of three, but I've found that when people concentrate on trying not to blink, the result is usually unnatural; they only wind up looking wide-eyed and surprised.

Going without flash also eliminates the resulting reflections that can appear in eyeglasses. But look at the subject closely before you shoot because light from nearby windows or other light sources may also create reflections. If the glasses aren't a main identifying feature for your subjects, you can ask that they simply remove them for the shot. Or you can create a pose in which the subject is holding the glasses — think of someone using his glasses to emphasize a point in a business meeting, for example.

One more glasses-related tip: If the glasses feature self-darkening lenses, ask the subject to remove the glasses and put them under a blanket or in another situation where the lenses won't receive any light for a bit. You'll have to shoot quickly once the lenses are clear, because they typically darken pretty soon after being exposed to light.

Building a Better Backdrop

Paying attention to the background of your portraits is just as important as choosing the right camera settings and lighting options. If you don't, the viewer's eye may be distracted from the subjects. Consider the left portrait Figure 8-17, for example. Where does your eye go first? Maybe to the children's faces, but my guess is that it then wanders to the bit of bright white building in the upper-left corner. Not good. To get the distraction-free result in the second shot, all I had to do was ask the kids to move a few feet from their initial position, so that only the pine branches are visible. I also moved them a bit farther away from the branches to soften the background a bit more; notice in the original shot, the branches at the top of the frame are sharply focused enough to be intrusive themselves.

FIGURE 8-17: To eliminate the distractions in the background (left), I moved my subjects to a slightly different area in front of the pine branches (right).

TIP

Finding an uncluttered backdrop outside is usually much easier than when you're shooting indoors, especially in a typical family home. In Chapter 6, I show a collapsible, pop-up portrait background that you may want to consider if you want to start your own portrait business. But here are a couple of other, cheaper or free solutions:

» When photographing babies, you can place them on a plain-colored blanket and shoot from above, as shown earlier in Figure 8-4. You can also clear a swath of carpet and to serve the same purpose; Figure 8-18 shows an example.

FIGURE 8-18: Indoors, one solution is to have kids lie on a plain-colored carpet and photograph them from above.

- If there happens to be a plain-colored couch with removable cushions, toss a few on the floor and have the kids lay on them. I use this trick a lot with younger kids who aren't in the mood to have their pictures taken. They decide this tearing-apart-the-couch thing is fun and often start laughing, leading to some smiles that otherwise probably wouldn't have happened.
- For the more formal portrait shown in Figure 8-19, I simply hung a piece of blue fabric behind the subject. No fancy equipment needed — I opened a hallway-closet door, used hardware store clamps to attach the fabric to the door, and had the subject sit on a chair a few feet in front of the door. The fabric itself came from the remnant table of a local fabric store and cost just a few dollars.

FIGURE 8-19:
A piece of blue fabric hung from a closet door provided a nice backdrop for this formal head shot.

Capturing More Memorable Portraits

This chapter has included a lot of technical how-tos for portrait shooting. But after you get that bit of business down, start looking for opportunities to make portraits that go beyond the typical "look at me and say cheese!" type of portrait. Figure 8-20 shows what I mean. The formal pose on the left is okay, but the second one is more compelling because it reflects a moment of spontaneous fun between brother and sister.

Figures 8-21 and 8-22 show two more favorites from my personal, family portrait portfolio.

FIGURE 8-20: Instead of adopting a formal pose (left), invite your subjects to get playful for a more memorable shot (right).

FIGURE 8-21: One of my favorite portraits of all time, this one required only hanging around long enough for this candid moment of "gossip" to occur.

Although getting the camera properly set up is a necessary ingredient, the biggest key to shooting this type of portrait is just having your camera in hand, ready to snap an interaction that moves you. It also helps to have a lens that enables you to put a little distance between the camera and your subjects. You'll get the most natural, unselfconscious images when your subjects start focusing on a task at hand or, in a group shot, on each other.

FIGURE 8-22: Three siblings enjoying a quiet, late-day walk on the beach made for a great vacation portrait.

CHECKING OUT SOME COOL LIGHTING SOFTWARE

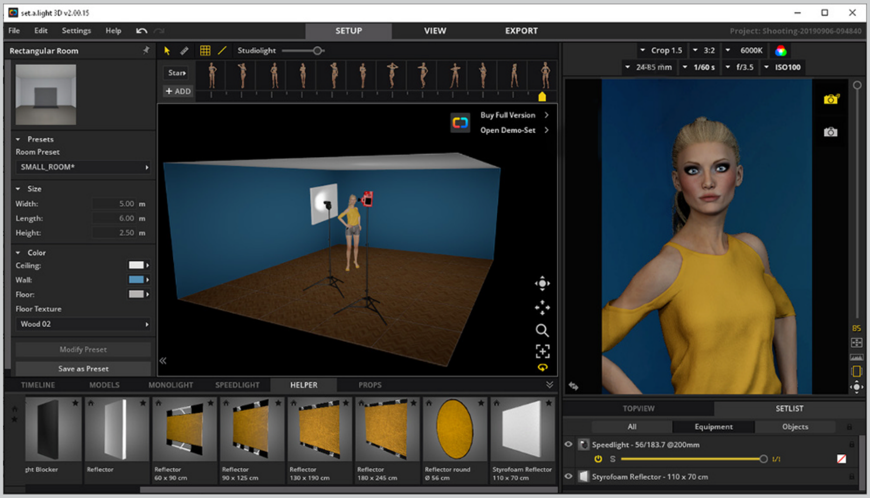
When I refer to lighting software, I'm not talking about programs that fix lighting problems after you've taken the shot. Instead, I'm referring to a program that enables you to create a 3D model that helps you plan where to position lights, reflectors, and other portrait tools. Called set.a.light 3D, it comes from Elixxier Software (`www.elixxier.com`) and comes in a basic version that sells for $94 and pro version that costs $229. You can download a free trial to see which version best serves your needs.

I think this program is especially helpful if you're interested in exploring portrait lighting that's more sophisticated than what I used for the photos you see in this chapter. It lets you try out different types of lights (from a single flash to high-end studio lights), move the lights around to see how their placement affects the results, and even print out a map to use as a reference when your subjects arrive for their portrait shoot. You can specify the size of the room, the color of the walls, add virtual models and props, and even see how different camera settings and lens focal lengths will affect the shot. For example, the screenshot here shows the result of bouncing a single flash off a white

(continued)

(continued)

reflector board with a subject posed in front of a blue wall. Thanks to my technical editor, Theano Nikitas, for bringing this cool tool to my attention (as well as for pointing out other ways to make my words and pictures better throughout the book).



IN THIS CHAPTER

» Looking at camera settings designed for action photography

» Choosing the right shutter speed to freeze or blur motion

» Recording a burst of continuous images

» Taking advantage of continuous autofocus

» Giving yourself a focus safety net through depth of field

» Panning to create interesting backgrounds

Chapter 9
Photographing Action

To most people, the term "action photography" implies the sort of pictures you see in sports magazines — a tack-sharp image of a basketball star dunking the ball or a marathon winner frozen mid-stride, crossing the finish line.

If that describes your action photography goals, the tips in this chapter will help you get there. But I also invite you to broaden your definition of what constitutes an action shot. In short, if your subject is moving, even a little bit, the techniques covered in this chapter apply. Try them when you're shooting in a garden and the flowers are swaying in the breeze, for example, or when you're snapping pics of a pet playing with a new toy.

TIP

Although I try to provide information in a way that will be useful even if this chapter is where you start your exploration of this book, you may gain a better understanding of some concepts after reading the exposure and focusing fundamentals provided in Chapters 5 and 7. You may also find it helpful to scan the explanations of exposure modes and shutter-release modes in Chapter 2.

Choosing an Action Plan

When you photograph moving subjects, you have two creative options:

- **Freeze action:** You can *freeze action,* using camera settings that produce sharply focused moving subjects, as shown on the left in Figure 9-1.
- **Blur motion:** On occasion, you may want to go the other direction, blurring the moving object. With a shot like the one on the right in Figure 9-1, the blurring of the whisk adds interest by creating a heightened sense of motion. Blurring motion is also key to waterfall shots in which the water has a misty appearance and to nighttime city scenes in which car lights create long, neon trails of color.

f/14, 1/640 second, ISO 640 | f/5.6, 1/80 second, ISO 400

FIGURE 9-1: To choose the right camera settings, you first need to decide whether you want to freeze action (left) or allow the moving object to blur (right).

The next few sections cover freezing motion; later sections discuss the whys and wherefores of blurring motion.

REMEMBER

In Figure 9-1 and throughout this chapter, I provide the exposure settings I used for each shot, in some cases also including the lens focal length. But don't consider these settings as the best choices for all subjects of the sort featured in a particular figure. The right settings depend on the speed of your subject, the ambient light, and the capabilities of your camera.

Freezing Action

When your goal is to freeze motion, the number-one setting to check is shutter speed: You need a fast shutter speed to stop action. But shutter speed isn't the whole story. Your autofocus settings and the shutter-release mode, for example, are also important.

The next section details the best settings for freezing action and the steps involved in taking pictures with those settings in force. Following that, I offer additional tips that will improve your chances of success.

Following the classic action recipe

Table 9-1 offers a summary of the starting camera settings that I recommend for freezing action. The following steps provide more information about these settings and guide you through the process of framing, focusing, and shooting your subject. You can explore additional details about each setting in the chapters listed in the table.

TABLE 9-1 Recommended Settings for Freezing Action

Option	Recommended Setting	See This Chapter
Autofocus (AF)	Multi-spot, continuous AF	7
Exposure mode	Shutter-priority autoexposure	5
File type	Raw or JPEG Fine	2
F-stop (aperture)	Varies depending on shutter speed, available light, and depth-of-field goals	5
Flash	Off	6
Image resolution	Maximum megapixels	2
ISO	Auto (with high ISO limit enabled, if available)	5
JPEG picture preset	Standard or Auto (whichever is the default on your camera)	7
Metering mode	Whole frame	5
Shutter-release mode	Continuous (burst mode)	2
Shutter speed	1/125 or faster, depending on speed of subject. See Table 9-2 for general guidelines.	5
White balance	Auto White Balance (AWB)	7

TIP

Don't be dismayed by the length of the steps; I include lots of background details for people like me, who find it easier to remember *what* to do when they understand *why* they need to do it. After you've read the explanations once or twice, you can get by fine if you ignore everything but the information in the tables.

Also, my recommendation to disable flash (see Table 9-1) presumes that your equipment doesn't offer high-speed flash — the feature that lets you use very fast shutter speeds with flash. See the Chapter 6 section related to external flash heads for details that will help you understand the feature and decide when to incorporate it into your action photography. The steps here assume flash is disabled.

1. **Choose the largest image size (resolution) setting.**

TIP

Detailed in Chapter 2, the resolution setting controls how many megapixels your image contains, which in turn determines how large you can print a photo at high quality and how large the image can be displayed on screen. When shooting action, maxing out the pixel count is especially helpful because you can shoot the original using a wide-angle view, helping ensure that your subject doesn't move out of the frame just as you press the shutter button. You can then crop to a tighter framing without worrying that you won't have enough pixels in the cropped image to meet your print or display needs. I took this approach when photographing the cyclist in Figure 9-2.

f/8, 1/640 second, ISO 500

FIGURE 9-2: Choose your camera's maximum resolution setting so that you can frame your subject loosely (left) and then crop to a tighter framing if desired (right).

2. **Set the file format to Raw or high-quality JPEG.**

The file format, like resolution, affects picture quality. Raw is my preference for reasons I detail in Chapter 2, but the other option, JPEG, works fine as long as you select the JPEG setting that delivers the highest picture quality. (Consult your camera manual to find the specific setting name.) When you use a low-quality JPEG setting, you may notice a defect known as artifacting if you use the "shoot wide then crop" strategy just discussed; artifacting becomes more visible the more you enlarge an image.

3. **Set the exposure mode to shutter-priority autoexposure, if available.**

REMEMBER

Again, shutter speed determines whether moving objects appear frozen in time or blurred. So you need to use an exposure mode that lets you dictate that setting. I prefer shutter-priority autoexposure mode, usually abbreviated S or Tv (for exposure *time value*). In this mode, detailed in Chapter 5, you specify the shutter speed, and the camera automatically chooses the f-stop needed to expose the image properly at the current ISO.

Of course, you can always switch to manual exposure, if your camera offers that option, and set both shutter speed and aperture yourself. But when the action is happening quickly, I don't like manual mode because it may require me to change two settings between shots. If I change the shutter speed, for example, I then have to adjust the f-stop to maintain the same exposure. During the time it takes to make that second adjustment, I may miss the opportunity to get the shot. I prefer to let the camera make that f-stop adjustment for me.

TIP

If your camera doesn't offer shutter-priority or manual exposure mode, it may offer Sports scene mode, which automatically chooses settings that freeze action. Unfortunately, there's no guarantee that the camera will choose the right shutter speed for your subject. Most cameras prioritize exposure over freezing action. So in dim lighting, the shutter speed the camera chooses to get a good exposure may be too slow to freeze a fast-moving subject.

4. **Set the ISO to Auto mode.**

In Auto mode, the camera selects the ISO setting, which determines how sensitive the camera is to light and, therefore, what shutter speed and f-stop will produce a good exposure. Using Auto ISO lets you concentrate on other aspects of exposure and saves you the time required to adjust the setting between shots when the light changes.

One caveat: If the camera selects a very high ISO, the picture may exhibit noise, the defect that gives your photo a grainy look. A couple of tips for dealing with this possibility:

- You may be able to limit the top ISO speed the camera can select. So if you know that your camera starts producing an objectionable level of noise at, say, ISO 800, you can tell the camera not to go higher than one notch below that setting.
- In shutter-priority autoexposure mode, the camera may adjust ISO as well as f-stop when Auto ISO is enabled. Check your camera's instruction manual to find out if this is how things work on your model. If so, it's not a bad thing, especially if you are able to set a top ISO limit — it's just something to note.

- You may not be able to set a maximum Auto ISO limit if you use Sports scene mode. If that's the case, see whether the camera lets you set a specific ISO value. Choose the value that gives you the best results, allowing you to use a shutter speed fast enough to freeze action with as little noise as possible.

Unfortunately, sometimes the lighting is just not sufficient to allow the shutter speed and f-stop you want to use without accepting the noise that comes with a higher ISO.

WARNING

Many cameras offer a feature that attempts to remove high ISO noise as the image is recorded to the memory card. Using this tool can slow the rate at which you can capture images, though, so I disable it for fast-action shooting. If your images do exhibit noise, many photo-editing programs offer tools that you can use to reduce it. These tools usually do a better job than in-camera filters.

5. **Set the White Balance option to Auto (AWB).**

   This color setting should work fine at the standard default setting (AWB, or automatic white balance). However, you may encounter color issues when shooting in mixed light sources. Photographing in a school gym is often problematic, for example, if the room is lit by both daylight streaming in through high windows and by fluorescent ceiling lights. Try switching from AWB to the setting that matches the strongest light source (in a gym, it's usually the overhead lighting). Chapter 7 has more ideas on how to solve color problems.

6. **If using the JPEG file format, set the JPEG Preset option to the default (usually called Auto but sometimes named Standard).**

   This camera setting goes by different names depending on the camera; Picture Style, Picture Control, and Optimize Image are just three possibilities. You can read about how the setting affects your image at the end of Chapter 7, but for now, this is one setting you can comfortably leave at the default setting.

7. **Set the exposure metering mode to whole-frame.**

   On most cameras, this setting is the default; it may be called matrix metering, evaluative metering, or something else depending on the camera manufacturer. Whatever the name, this setting tells the camera to consider the entire frame when calculating exposure, which usually works out fine for action photography. If your subject appears over- or underexposed in your test shots, try using Exposure Compensation, if available, to adjust the results. Chapter 5 details this and other exposure solutions.

REMEMBER

When you use Exposure Compensation in shutter-priority autoexposure mode, the camera will not alter your selected shutter speed. Instead, it adjusts f-stop and/or ISO.

8. **Choose your shutter speed.**

   The range of shutter speeds available depends on your camera; many models max out at at 1/2000 second, but some offer speeds as high as 1/8000 second. How fast a shutter speed you need to freeze action depends on the speed of your subject. Table 9-2 offers a general guide to get you started, but expect to do some experimenting, especially if you've never photographed your subject before. For example, when I attended one of my nephew's hockey games for the first time, I thought that a shutter speed of 1/500 second would be plenty fast to stop motion, based on the speed at which the guys were skating during warmups. But when the game started, the pace picked up considerably. After firing off a few shots, I checked my results and saw that he was a little blurry, as shown in Figure 9-3. So I bumped the shutter speed up to 1/1000 second to get the sharper photo shown in Figure 9-4.

TABLE 9-2 Shutter Speeds for Freezing Action

Subject	Minimum Shutter Speed
Person walking at a normal pace	1/125 second
Children or pets interacting with others	1/250 second
Person or pet running at medium pace	1/500 second
Birds in flight, animals running at full speed	1/1000 second
Athletes moving at fast pace	1/1000 second
Cars, motorcycles, and boats moving at moderate speed	1/2000 second
Racing vehicles moving at top speed	1/4000 second

TECHNICAL STUFF

Of course, using a faster shutter meant I had to adjust either the f-stop or ISO setting to maintain the same exposure. In this case, I chose a lower f/stop setting, opening the aperture to allow more light into the camera.

Don't forget that in addition to determining exposure, the f-stop affects depth of field, and the ISO determines the amount of image noise. So you have to weigh these side effects when deciding which of the two settings to change to allow your desired shutter speed. If you're unclear on the whole shutter speed, f/stop, and ISO story, Chapter 5 explains it in detail. And see "Improving your odds of freezing action" for information about why using a higher f-stop can help you get a sharply focused moving subject.

f/14, 1/500 second, ISO 400

FIGURE 9-3: A shutter speed of 1/500 second wasn't fast enough to freeze the action.

f/10, 1/1000 second, ISO 400

FIGURE 9-4: Raising the shutter speed to 1/1000 second got the job done.

9. **Set the shutter-release mode to continuous (burst mode).**

   Detailed in Chapter 2, this feature, sometimes called *burst mode,* tells the camera to capture a continuous series of images as long as you hold down the shutter button. Capturing a rapid-fire string of shots increases the chances of getting one or more good images when you're photographing action.

How many frames per second you can shoot varies from camera to camera as well as some other factors, such as file type. (Read the frame-rate fine print in your camera manual to find out how to maximize the frames per second rate on your model.)

Some cameras give you a choice of frame rates, such as 3 frames per second and 7 frames per second. For really fast-moving subjects or those moving in an unpredictable manner, I use my camera's maximum frame rate. The upside is that I have a better chance of catching the exact instant when something special happens.

Figure 9-5, for example, shows three images from a series of about 20 frames I captured of a bird collecting branches to build a nest. When I shot these frames, I was positioned near the nest-in-progress, using a frame rate of 5 fps — the maximum rate on the camera I was using. The bird was flying toward me as I shot, which is why it gets progressively larger in each frame. Most of the frames look fine at the size at which the appear in Figure 9-5. But when I reviewed them at a larger size, I found that the branch covered the bird's eye in all frames except the one shown in the far right position in Figure 9-5. Figure 9-6 shows a magnified view of the frame captured just before I caught that final frame, for example. Again, the bird was flying quickly toward me, so its wing and head position are different from frame to frame, as is the amount of background in the images, but you get the point: At a slower frame rate, I might not have captured the moment when the bird was positioned at an angle that revealed its eye.

TECHNICAL STUFF

Note the change in ISO between frames in Figure 9-5. I was shooting in manual exposure mode, setting the shutter speed and f-stop myself, but using Auto ISO so that the camera would adjust ISO for me as I shot. As the bird got closer to me, the amount of white in the frame grew bigger, changing the exposure calculation. The camera took that added brightness into account when reducing the ISO from 1200 in the first frame in the figure to ISO 450 in the final frame.

FIGURE 9-5: I used my camera's burst mode setting to capture these images of a bird flying toward me.

FIGURE 9-6: Even though I captured these frames instants apart, the change in the bird's position during that time created a significant difference in the result.

The downside to using the maximum burst rate is that all those frames eat up a lot of space on the camera memory card, and with some subjects, not that much changes over the course of one second — meaning you're storing a bunch of frames that look the same. A faster burst rate also eats up battery power more than a slower rate. Bottom line: With many subjects, you can get by with "only" 3 frames per second.

10. **Set the autofocus mode to continuous.**

At the default autofocus setting, most cameras lock focus when you press the shutter button halfway. That's fine for stationary subjects, but when your subject is on the move, the correct focusing distance can change in an instant — even from the time you frame the shot, set focus, and then press the shutter button the rest of the way to capture the frame.

Consider the bird images in Figure 9-5, for example. The bird's distance from the camera was constantly changing as I clicked off shots, meaning the correct focusing distance was also changing. In situations such as this, there's no time to lift your finger off the shutter button, reset focus, and take another frame. That's where the magic of continuous autofocus comes into play. When you enable this feature, found on most cameras today, the camera adjusts focus as necessary from the time you set the initial focusing distance until you lift your finger off the shutter button to stop capturing frames.

WARNING

Continuous autofocus may not be available on some cameras when set to the maximum continuous shooting speed. In this case, the camera locks focus and exposure on the first shot and uses those parameters throughout the burst. Check your camera manual to find out if this limitation applies; if so, you may have to go to a slower burst speed to enable continuous autofocusing.

11. **Frame your subject under the active focus point and press and hold the shutter button down halfway.**

    When continuous autofocusing is enabled, you may be able to choose which focus point is used to set the initial focusing distance. On some cameras, however, the center focus point is always the active starting point.

    WARNING

    It's important to know how this part of the focusing system works and remember to frame the subject under the correct focus point before initiating autofocusing. You also may be able to specify how many autofocus points you want the camera to consider as it tracks focus. Chapter 7 has more information on what factors to consider when you make this decision; if you're not up for that discussion right now, just choose the "all points active" option.

    If you're using Sports scene mode, the camera likely uses the center focus point to establish the initial focusing distance. Most cameras automatically engage continuous autofocusing in Sports mode.

12. **While keeping the shutter button pressed halfway, verify that the shutter speed you selected won't cause an exposure problem.**

    When you press the shutter button halfway to initiate autofocusing, the exposure system also kicks into gear. Most cameras display some sort of warning in the viewfinder or on the monitor if your picture will be over- or underexposed at the current combination of shutter speed, f-stop, and ISO. But in shutter-priority autoexposure and manual exposure mode, most cameras won't prevent you from releasing the shutter and taking a poorly exposed image. So check for that exposure warning, and if you see it, decide whether you want to modify your exposure settings or take your chances. (If the subject winds up only slightly under- or overexposed, you can usually get it to an acceptable exposure in a photo-editing program; see Chapter 12 for a look at some software options.)

13. **Press the shutter button down all the way and hold it down to capture a continuous series of frames.**

    Release the shutter button to stop shooting.

If you're using a touchscreen camera, continuous autofocusing may work differently than described in the steps. On most cameras that enable you to set focus by using the touchscreen, you tap the screen to set the initial focus point and then lift your finger off the monitor to start continuous focus adjustment. Be aware that some cameras also offer touch-shutter operation, which means that as soon as the camera sets focus, it releases the shutter and takes the picture. When the touch shutter is enabled, you usually can't use burst mode shooting — you get one frame each time you tap the screen. Open your camera's instruction manual to get specifics on your touchscreen focusing and shutter-release options.

INTERRUPTING CONTINUOUS AUTOFOCUSING

TIP

If your camera offers continuous autofocusing, it may also provide a way for you to temporarily pause focus adjustment. When you pause continuous autofocusing, the camera maintains the current focusing distance until you tell it to restart continuous focus adjustment.

The main reason I take advantage of this option is that it gives me an easy, quick way to switch between continuous autofocus and non-continuous autofocusing — that is, the normal focusing setup, when the camera locks in the focusing distance when you press the shutter button halfway. When I'm shooting at the local bird sanctuary, for example, I want to use continuous autofocusing and a horizontal camera orientation to track birds that are on the move. (The horizontal composition gives the birds more room to move before they exit the frame.) But when I'm shooting a bird that's at rest, such as a duck sitting on her eggs in a nest, I want to be able to set focus on the duck's eye and then reframe as needed to get a nice portrait composition.

With continuous autofocusing, reorienting the camera can sometimes throw continuous autofocusing off its game, shifting focus to something other than the bird's eye, so I want to use focus lock. Instead of digging through my camera's autofocus settings each time I want to make the change to normal autofocus, I leave the camera in continuous autofocus mode. Then, to photograph that sitting duck (Ha! See what I did there?), I frame the subject so that its eye is under the active focus point but then immediately pause continuous autofocusing before reframing to my desired composition. After I'm done shooting my portrait, I can repeat the process for another non-moving bird or resume continuous autofocusing to catch more birds on the wing.

Pausing continuous autofocusing also comes in handy when there's a chance that something or someone may pass in front of or behind your subject as you're shooting. Locking focus on your subject ensures that the continuous autofocusing system doesn't shift its attention to the photobombers but instead keeps the focus distance correct for your subject.

How you pause continuous autofocusing depends on your camera. If your camera offers back-button autofocus — in other words, it has a button on the back of the camera that you can use to initiate autofocusing instead of pressing the shutter button halfway or tapping the touchscreen — you likely use that button to interrupt and resume continuous autofocusing. On cameras that don't have this button, you may be able to assign the duty to another button, such as the AE-L/AF-L (autoexposure lock/autofocus lock) button, which normally locks both exposure and focus. Cameras that offer touchscreen focusing sometimes enable you to toggle between continuous and locking autofocus by tapping the screen. See your camera's instruction manual for specifics on all these possibilities.

Shooting subjects "moving in place"

When I use the phrase "moving in place," I'm referring to subjects like the ones featured in Figure 9-7. The subjects are staying in one spot, but they're in motion nonetheless, playing that time-honored game of pattycake pattycake.

f/5.6, 1/500 second, ISO 200

FIGURE 9-7: It's a portrait! It's an action shot! It's two, two photo challenges in one!

You still need a fast shutter speed to get a non-blurry shot of such subjects, and most of the other settings and techniques mentioned in the preceding section still apply. But you may want to consider making the following modifications to that basic recipe when photographing subjects moving in place:

- **Try using regular autofocus instead of continuous autofocusing.** In other words, use the settings that enable you to select a single focus point and lock focus when you press the shutter button halfway (or tap the monitor on a touchscreen-enabled camera). The benefit is that you can reframe to a different composition if needed after locking focus. I used this technique when shooting the photo in Figure 9-7. With my camera's center autofocus point selected, I set focus on the toddler's eye. Then I reframed to the composition you see in the photo.

  Of course, if your camera has lots of focus points from which to choose, there's a chance that one of them may fall over your subject with the framing you have in mind. If so, you select that point for focusing and skip the "focus then recompose" process. I just find it easier and quicker to always use the center point and then reframe after locking focus. On most cameras, the center point and those immediately adjacent to it provide the fastest and most accurate performance, which is another reason I use that part of the frame to lock focus.

For another possibility, see the sidebar "Interrupting continuous autofocusing" to find out how you can lock focus without switching out of continuous autofocus mode.

- **If the background is much darker or brighter than your subject, change the metering mode to spot or center-weighted.** When you use these settings, the camera bases exposure on the area under the selected focus point (spot metering) or gives extra weight to the center of the frame (center-weighted metering). Both should result in a better initial exposure of your subject. As an example, see Figure 9-8. Had I used whole-frame metering, the camera would have paid attention to the dark background, resulting in an exposure that likely would have overexposed the bird, eliminating some of the detail in the feathers. Instead, I used spot metering based on the center focus point.

FIGURE 9-8: To ensure that the bird was properly exposed, I used spot metering, telling the camera to base exposure on the white feathers.

  For white subjects like the chick in Figure 9-8, some cameras offer a metering mode called *highlight-priority spot metering.* This setting puts even greater emphasis on making sure that your whites aren't overexposed. It works great unless parts of your subject aren't white; in that scenario, those areas may be a little underexposed.

  If you don't have these metering-mode options, don't stress; you probably still can apply exposure compensation or some other tool to get the subject's exposure where it needs to be. See Chapter 5 for more information.

- **You may want to enable flash.** Even when you're shooting outdoors during daylight, as I did for the image in Figure 9-7, flash can be an essential exposure tool. Chapter 6 explains why and tells you how to enable flash and set the flash power. In dim lighting, flash brings with it the chances of red-eye, but you may not have another option. Raising the ISO is one alternative, but if you use too high an ISO, the image quality may be spoiled by the noise that accompanies that choice.

WARNING

Some caveats about using flash when photographing moving subjects, even those who are moving in place:

- *On most cameras, you can't use a built-in flash with a shutter speed faster than about 1/200 to 1/320 second.* That may not be fast enough to freeze the motion of even a subject that's moving in place, so do a test shot to verify that your shutter speed is adequate. If it isn't, you may be able to use a faster shutter speed by attaching an external flash, but only if the camera offers high-speed flash. I had to go this route for Figure 9-7 because I needed a shutter speed of 1/500 second to freeze the motion of the girls' hands. (Again, see Chapter 6 for explanations of high-speed flash.)
- *Most cameras don't enable you to use continuous shutter release (burst mode) when flash is enabled.* Check your camera instruction manual to find out whether this is the case on your model. If you need the rapid frame capture that burst mode provides, you'll probably have to go flash-free, though.

Keep in mind, too, that a built-in flash has a pretty limited range, so you need to be pretty close to your subject to get any exposure benefit from the flash. Even an external flash, which has a longer reach, typically won't reach far enough to help expose wildlife such as the bird in Figure 9-8. Yes, you can buy tools that extend the reach of a flash, but in my book, it's not cool to fire a flash at an unsuspecting bird or other wildlife — not to mention that it's highly irritating to other people trying to take in the scenery.

Improving your odds of freezing action

Even though I've been a photographer for longer than I care to admit, I still consider myself lucky if 1 shot out of 50 is a winner when I'm photographing action, especially fast-moving subjects like birds in flight. And other experienced photographers will tell you the same when they're being honest — it just isn't that easy to get those highlight-reel moments.

That said, the following list describes some things you can do to increase your chances of success:

» **For subjects moving toward or away from you, a large depth of field makes life easier.** Detailed in Chapter 7, *depth of field* refers to the distance over which focus remains sharp. With a shallow depth of field, the zone of sharp focus reaches only a short distance in front of and behind your subject.

Objects outside that sharp-focus zone become progressively blurrier as the distance from the subject increases.

Although a shallow depth of field helps obscure distracting foreground and background objects, it makes getting a sharply focused shot of a subject that's moving toward or away from you more challenging because you have to snap the photo at the exact moment the subject is within the zone of sharp focus. With a larger depth of field, the subject remains within the sharp-focus zone for a longer time, giving you a bit of a safety net.

Remember that depth of field is affected by three factors:

- *F-stop (aperture setting):* The higher the f-stop number, the greater the depth of field.
- *Lens focal length:* As focal length increases, depth of field becomes shallower. So a 50mm lens gives you a larger depth of field than, say, a 200mm lens.
- *Camera-to-subject distance:* The closer you are to your subject, the shallower the depth of field.

» **For subjects moving in place, a shallow depth of field can help hide distracting background objects.** A photo of a subject moving in place is, in essence, both an action shot and a portrait. Your fast shutter takes care of freezing the action; blurring the background offers the same benefit as in a portrait, drawing the eye to the subject and making distracting background objects less intrusive.

WARNING

Remember, though, not to go too shallow with depth of field, which can happen easily when you're photographing wildlife with a telephoto lens. For example, I used a 300mm lens to capture the image shown in Figure 9-9, and because I was shooting in a zoo, was able to get fairly close to my subject. The long focal length combined with a short camera-to-subject distance and an f/stop of f/7.1 produced a really shallow depth of field. The end result is that the depth of field isn't large enough to keep the whole iguana in the sharp focus zone. My shutter speed was 1/640 — plenty fast to catch the minimal movements made by the iguana and avoid camera shake on my part — so the blurring is purely a depth-of-field issue. I like the effect for this image, because it draws attention to the iguana's eye, but it may not work for every subject.

» **Get to know the habits of your subjects.** For example, if you enjoy photographing your daughter's softball team, pay attention to how the various players react after a winning play. After a strikeout, does the pitcher always punch her fist in the air? If you know that detail, you can compose a photo of her well in advance of the pitch, leaving extra room at the top of the frame to accommodate her arm. Photographers who aren't familiar with her routine, on the other hand, wind up with images that don't include that pumped fist, which is important to the moment.

f/7.1, 1/640 second, ISO 400; lens, 300mm

FIGURE 9-9: Because I was close to my subject, these camera settings produced a depth of field so shallow that part of the subject is beyond the sharp focus zone.

- **For some shots, you may want to lock focus in advance of the action.** Suppose you're photographing a marathon, waiting to get a shot of the winner breaking through the finish-line tape. You could wait until the runners approach to set focus, but if you do, you have to not only frame and focus quickly, but also make sure that you pick the right runner. If you're focused on the runner in first place and then the second-place runner surges ahead, you're not likely to have time to reframe and refocus on that runner. Instead, lock focus ahead of time on the finish line tape and then wait for the action to come to you, starting your burst of frames as the first runners arrive. Assuming that you don't move after setting focus, the focusing distance should be correct for whichever runner finishes first. And as a bonus, you'll also get some well-focused frames of the second- and third-place finishers as they cross the finish line.

  The easiest way to take advantage of this technique is to use normal one-point, locking autofocus — you select a focus point and then the camera locks focus on the area under that point when you press the shutter button halfway down. Focus remains locked as long as you keep holding the button. Press the button the rest of the way to start taking pictures. If your camera offers back-button autofocus, you can use that that button to lock focus instead.

- **Spend time learning to use your camera's continuous autofocusing system.** You might have to open the instruction manual (ugh), but there's also a good chance that you can find online videos explaining how things work. Either way, if you want to get good at action photography, mastering your autofocus system is time well spent.

- **Understand that the right camera gear can make a big difference when you're shooting action.** I hate to say it, but the truth is that you're not likely to get superior action shots with a smartphone or a basic, fixed-lens camera. If sports photography is your passion, you'll be much happier if you invest in a camera that offers fast, flexible autofocusing, a high frames-per-second burst rate, noise-free images at high ISO settings (necessary for action photography in dim lighting), and lots and lots of megapixels. And of course, you need a high-quality lens to put on that high-performance camera body.

  That's not to say you have to buy top of the line, uber-spendy equipment that the pros use. You can get excellent results from less-expensive equipment if you do your homework and pick equipment that's aimed at sports shooters. If it helps, I do my bird photography with a camera that's one notch down from a pro model and pair it with a really good zoom lens that cost about as much as the camera. Altogether, this camera and lens combo cost about $2,000.

- **Make friends with people who can get you close to the action.** Using high-end equipment isn't the only advantage that pro sports photographers enjoy; they also get to shoot from prime positions on the sidelines, giving them unobstructed views of the action. You, on the other hand, may be stuck in the bleachers, sitting behind a guy who's wearing a huge blue wig or some other nutty headgear that's impossible to shoot around.

  Now I happen to know *some* people who donate enough to their alma mater to get a sideline pass to all the big games, but you may have to work a little harder. Find out if your local photography club arranges any special outings that will get you a better vantage point for a particular event, for example. It never hurts to call the media office for the event you want to shoot to find out if and how you can get out of the bleachers and onto the field. Of course, there is some risk of being forever remembered for your appearance in a sports blooper highlight reel as the photographer who got flattened by a big tight end running out of bounds. Hey, man, you've got to be willing to suffer for your art, you know?

- **Keep your battery charged and your camera close at hand.** You never know when a great action shot is going to present itself, and if your camera isn't ready to go and easy to grab, you're going to miss the moment.

  Figure 9-10 offers a case in point. Here's the backstory: When I lived in the Midwest, I had a dog who loved racing up and down the fence line of my yard. One day, the neighbors who lived on the other side of the fence brought home a new pup and let it out into their yard. Well, now *here's* something interesting enough to investigate, says my dog. (He spoke to me like that, I swear.) Wanting to capture the fun, I rushed into my office/guest room, grabbed my camera, and dialed in action-photography settings. Then I just waited for the two dogs to stop yapping at each other and start making friends. When they relaxed and started sniffing each other through the fence, I began shooting. The figure shows just three of the many frames I shot of that interaction. Only the third image is a "keeper," but it turned out to be the favorite of all the images I ever took of the two dogs. And I wouldn't have that image had my camera not been ready to go.

f/8, 1/250 second, ISO 400; lens, 42mm

FIGURE 9-10: The last frame in this string of action shots produced a great portrait of my dog swapping gossip with the neighbor's pup.

TIP

Some intermediate and advanced cameras enable you to create custom shooting modes that store a collection of initial settings — the autofocus mode, selected focus point, shutter-release mode, and so on. If your camera offers this feature, you can create a custom mode based on your action-photography settings so that you can pretty much just select that shooting mode and start firing off frames. I use one of my camera's custom modes for just that purpose, using the other custom mode to store my favorite portrait-shooting settings.

- **Practice, practice, practice.** Find a subject willing to run or walk back and forth as you practice shooting with action-photography settings. The more you shoot, the better you'll get at predicting what shutter speed will work, understanding which autofocusing options will be your best bet, and so on.

Blurring Motion

Although most action photos that you see freeze motion, choosing a shutter speed slow enough to cause the subject to blur can add interest because it emphasizes motion. I went with this choice for the whisk image originally shown in Figure 9-1 and repeated on the left in Figure 9-11 to save you the effort of flipping back through pages to view it. The image on the right shows another example of a slight blur; you may have seen this image if you already checked out Chapter 4. In this photo, the blurring of the people on the carnival ride and the chains that hold the swings makes it clear that they're whirling through the sky — a more dynamic result than if they were all frozen in mid-air.

f/5.6, 1/80 second, ISO 400

f/8, 1/250 second, ISO 200

FIGURE 9-11: A slight blur adds drama by creating a heightened sense of motion.

Figure 9-12 shows examples of more-extreme motion blur. For the first image, I used a shutter speed of 1/30 second. At that shutter speed, there's a lot of blurring of the moving parts of the ride, but not so much that you can't make out that you're looking at one of those centrifugal-force carnival rides. For the second image, I used a longer exposure time of 1/5 second and also zoomed to a longer focal length — 97mm versus the 42mm used for the first image. In the second image, the blurring is so extreme that you probably wouldn't know what I had photographed unless I told you. It's a cool abstract image, but little detail of the subject remains visible.

f/22, 1/30 second, ISO 100; lens, 42mm

f/32, 1/5 second, ISO 100; lens, 97mm

FIGURE 9-12: I used a slow shutter to create these motion-blur images of a carnival ride.

Using a long exposure time (slow shutter speed) is also a common choice for landscape photographers shooting waterfalls. Check out the first image in Figure 9-13, for example. For this image, I set the shutter speed to 1/40 second. Compare the water in that example with the image on the right, which I shot using a shutter speed of 1/5 second. A long exposure time is also how travel photographers create those cityscape images in which car headlights and taillights are transformed into bright, glowing neon trails. A slow shutter speed works well for fireworks shots as well. (Chapter 10 has examples of both.)

TECHNICAL STUFF

Why does a slow shutter speed blur motion? Because shutter speed determines the length of the exposure, or the total time that the camera is recording your subject. With a fast shutter speed, the camera captures just a split second of the action, so a moving subject appears frozen in time. With a slow shutter speed, the camera records the subject for a longer period of time, and anything that moves is captured multiple times at low opacity as it travels around or through the frame, resulting in motion blur.

As with freezing action, exactly what shutter speed will produce the look you want depends on the speed of your subject and how much blurring you want. So experiment, shooting the subject at many different shutter speeds, to figure out which one works best.

f/8, 1/40 second, ISO 800 f/8, 1/5 second, ISO 100

FIGURE 9-13: The slower the shutter speed, the silkier the water appears.

With the exception of using a slow shutter speed instead of a fast one, the steps and settings that work best for blurring motion are pretty much the same as for freezing action. But there are a couple of differences:

- **Use single-point, locking autofocus instead of continuous autofocusing.** Decide which part of the frame you want to be in sharpest focus and then lock focus on that spot. That way, the camera won't try to track the action of the moving part of the frame. For my waterfall shot, for example, I locked focus on the orchid. Which brings me to my next important warning . . .
- **Remember that anything that moves during the shot will blur, not just your subject.** Consider my waterfall example. I actually took this shot at an indoor botanical garden. There was no wind to blow the orchids around, so they were stationary during the shot. But if you're shooting an outdoor waterfall, any leaves or flowers in the scene may appear as blurry as the water.
- **Use a tripod to avoid camera shake that can blur the stationary parts of the image.** This rule applies any time you use a slow shutter, not just when you're shooting action. If you don't have a tripod with you, turning on image stabilization, if it's available on your camera or lens, can help compensate for some camera shake. But it's unlikely to do the job successfully at really slow shutter speeds.

- **In bright light, you may need to stop down the aperture or use a neutral density filter to avoid overexposing the image, even at your camera's lowest ISO setting.** Back to my waterfall example: The light in the botanical garden was pretty limited, so I didn't have this worry even when using a 1/5 second exposure. In fact, when I increased the shutter speed to 1/40 second, I had to bump the ISO all the way up to ISO 800 to use my preferred f/stop. (I wanted to keep the aperture at f/8 to get the same depth of field for each shot.)

  When I'm shooting long-exposure scenes during daylight, I attach a neutral density filter, which works something like a pair of sunglasses for your lens, reducing the light coming through the lens. The filter enables you to use a wider aperture and slower shutter speed than you can with a "bare" lens.
- **If your camera doesn't allow you to set the shutter speed, see if it offers a special scene or effects mode that uses a slow shutter speed.** For example, some cameras offer a Waterfall scene mode that is designed to use the slow-shutter setting that produces misty waterfalls. But you can use this mode any time you want to blur motion.
- **If you use flash, remember that the flash sync mode may affect the look of your photo.** The sync mode determines whether the flash fires at the beginning of the exposure (front-curtain sync) or at the end (rear-curtain sync). With subjects that produce motion trails, switching to rear-curtain sync ensures that the trails appear behind the subject instead of in advance of it. To see an example that will clarify this subject, see the section related to rear-curtain sync in Chapter 6.

Panning for Cool Background Effects

Panning is an action-photography technique that creates a look like the one in Figure 9-14, where the subjects are sharp but the background appears as blurry horizontal lines. To get this result, you use a slow shutter speed, press the shutter when your subject comes into the frame, and then start *panning* — that is, moving the camera to follow the action until the exposure is complete. For this image, photographer David Marcu used a shutter speed of 1/15 second, an aperture setting of f/5.3, and ISO 320.

Notice that this blurred-background appearance is different from the soft, nondirectional blur produced by a shallow depth of field. In the example, the photographer panned from right to left to follow the cyclists as they progressed down the street, so the blurred lines are horizontal. If you instead pan in a vertical direction, as you might do to follow a volleyball player leaping to spike the ball across the net, the blurred lines go up and down.

FIGURE 9-14: Using a slow shutter speed and panning the camera during the exposure creates this look.

Photo courtesy David Marcu via Unsplash

Whichever direction you go, panning is really hard to do because it requires precise coordination between the shutter speed you use, the speed at which you pan the camera, and the speed of your subject. A good way to practice is to plant yourself in a safe location along a street where runners or bicyclists regularly pass by. For better results, you may want to put your camera on a tripod that has a rotating head. That way, the camera remains level as you pan, and you eliminate the chances that camera shake will blur your subject. Start with a shutter speed of 1/30 second, check your results, and then try using progressively slower shutter speeds until you get a look you like.

IN THIS CHAPTER

- » Understanding the basics of great landscape photography
- » Taking advantage of lens filters
- » Creating panoramas
- » Shooting architecture and other city sights
- » Photographing nighttime scenes
- » Zooming in on small details

Chapter 10
Taking in the Scenery

As you explore the world with your camera, whether it's the universe contained within a few blocks of your home or a foreign city halfway around the world, you'll no doubt encounter plenty of portrait- and action-photography opportunities. Chapters 8 and 9 give you the information you need to capture those types of shots.

This chapter covers a third popular photography specialty, landscapes. I use the word *landscape* in a broad sense, covering both the traditional meaning of the word — large vistas of mountains and lakes, for example, or a long stretch of ocean beach — and the so-called *urban landscape,* full of towering buildings, historic plazas, monuments, and so on. After a review of the basics of landscape composition and camera settings that will serve you best, I offer tips to help you capture specific landscape shots, such as panoramas, fireworks, and sunset and sunrise images. At the end of the chapter, I devote some page space to taking close-ups of small details that catch your eye.

Note: I've included the exposure settings and the lens focal length used for most of the shots in this chapter. But please keep two points in mind: The correct exposure settings vary depending on the ambient light and other issues you can explore in Chapter 5, so consider the settings I used as just a starting point. Second, I've cropped many of the images to achieve the composition you see in the figures.

I usually frame my images loosely so that I can later crop them to fit different frame aspect ratios (5 x 7, 8 x 10, and so on). When shooting architecture, loose framing also enables you to correct lens perspective issues in a photo editor, a topic I cover in the section "Photographing Tall Structures," later in this chapter.

Reviewing a Few Basics

Whether you want to capture the beauty of a lavender field, the mystery of an ancient ruin, or the serenity of a courtyard garden in the city, a few fundamentals will help you get the best results. Some of these concepts are presented in more detail in other chapters; the following list provides a recap of the most important points as they relate to the types of photos you see in this chapter.

Composition is critical

IMNHO (in my not humble opinion), a good landscape shot is even more dependent on composition than when you're photographing any other subject. A nicely exposed, perfectly focused image just isn't enough to make the viewer say, "Wow!" even if the view you're seeing with your eyes at the moment made *you* say, "Wow!" Why? Because *everyone* with a camera is going to see and shoot that same scene. I'm not saying you shouldn't take the picture, mind you, just that if you want yours to stand apart, you have to "work the shot" a little to come up with something that goes beyond a technically accurate rendition of the scene.

Chapter 4 provides you with a starter course in composition, so you may want to take in that information now if you haven't already. Many of the figures presented there feature landscape shots, but the points illustrated with other subjects apply as well.

After thumbing through — or swiping through, if you're reading this book in electronic form — Chapter 4, add the following landscape-specific tips to your composition notebook.

- **Include a person or object to create a sense of scale.** For example, in the image featured in Figure 10-1, the bench serves this purpose. Because viewers are familiar with the approximate size of a typical wooden bench, they can get a better idea of the size of the mountain landscape beyond.

  In Figure 10-2, the hikers serve the same purpose and also create a leading line through the frame.

FIGURE 10-1: The bench in the foreground helps provide a sense of scale to reinforce the vastness of the landscape beyond.

Courtesy of Kristen E. Reyes

FIGURE 10-2: Here, the hikers not only provide a reference as to the size of the canyon but also create a leading line to draw the eye through the frame.

Courtesy of Timothy B. Holmes

- **Wait for it. . . .** Sometimes — heck, *many* times — you just have to wait for an interesting object, animal, or person to come into the frame. *And* you have to have your camera ready to go, with the right settings dialed in, to catch the moment when your subjects arrive at just the right spot. Figure 10-3 offers an example. I took this shot on the third day of a beach vacation. By that time, I knew to expect a brief, late-afternoon rainstorm that, when over, would leave behind intense blue skies and, usually, a rainbow. I also had seen the yellow boat anchored at the same spot for the duration of my visit. All of which is to say that I knew that this image was there for the taking if I came prepared with my camera and the patience to allow the rainbow to appear.

FIGURE 10-3:
I shot this image just after an afternoon shower passed, leaving behind a rainbow that seems to lead directly to the boat.

- **Especially when photographing famous sites, look for the unconventional shot.** For example, when in Rome, *everyone* takes pictures of the buildings at Vatican City. I have tons of those pictures, too. But two of the ones I like best — well, like enough to show the world here — appear in Figure 10-4. They speak more to me than conventional shots of the area because they include people who help tell the story of the place. In the first image, the men in the clergy robes emphasize the religious aspect of the setting. In the second image, the pale sunset behind the dome of the cathedral is nice, as are the street lights leading the eye toward that building. But it's the two gentlemen taking a late-afternoon stroll, both with hands clasped behind their backs, that make the shot. I like to think that they're longtime friends exchanging news of the day as they take their evening exercise. Of course, it's also entirely possible that they were talking about the tourist with the big camera standing behind them: "Let's pretend we don't know she's there and do that thing where we walk with our hands behind our backs." Either way, I thank them for moving into the frame at just the right moment.

f/9, 1/250 second, ISO 200; lens, 42mm

f/5, 1/60 second, ISO 640; lens, 69mm

FIGURE 10-4: The famous structures shown in these images are lovely, but it's the people in the frame that make the scenes more interesting.

Lens focal length matters (a lot)

Your choice of lens is a big factor when you're shooting landscapes because the lens focal length determines the angle of view you can fit in the frame. I introduce this topic in Chapter 1, but to provide a quick visual recap, Figure 10-5 shows the same building shot at increasingly long focal lengths. Notice that as the focal length gets longer, the subject appears larger and closer to the viewer, and less of the scene makes it into the frame.

Even the shortest focal length in the figure, 82mm, is pretty long — probably *too* long — for capturing wide vistas, assuming that you're not standing miles away from said vista. Just for the sake of comparison, Figure 10-6 shows the building in Figure 10-5 when photographed from the same position but at a focal length of 27mm. For this shot, I used a horizontal camera orientation to include the largest possible area in the frame. Again, your distance from the subject comes into play, but you get the idea: For the widest possible angle of view, use the shortest focal length lens available to you.

FIGURE 10-5: Lens focal length determines angle of view and also contributes to depth of field.

You say you want a choice of focal lengths without carrying a bag full of different lenses? Yeah, me too, which is why I invested in a *super zoom* lens. This particular lens has a whopping 18–400mm focal-length range.

FIGURE 10-6: Use a short focal length and a horizontal framing to capture the widest view of the scene.

Chapter 1 provides lots more information about choosing lenses, but here are the highlights:

REMEMBER

- **The actual focal length you get from a lens depends on your camera's crop factor.** If you're using a camera that has a full-frame sensor — an image sensor that's the same size as a 35mm film frame — you can ignore this paragraph. The focal length printed on your lens is the focal length you get. But otherwise, you get a narrower angle of view than the stated focal length of the lens due to the smaller size of the camera's image sensor. This issue requires some math: Multiply the stated lens focal length by the *crop factor* of your camera, which should be included in the camera's instruction manual. I took the pictures shown in Figures 10-1 and 10-2 with my 18–400mm lens, for example, but I was using that lens on a dSLR that has a crop factor of 1.5. So the actual range available to me was 27– 600mm.
- **Remember that focal length also affects depth of field.** Another result of increasing focal length is that depth of field gets shorter, which makes objects in front of and behind your focus point appear less sharply focused. Check out the next section for more on this topic.

Remember the impact of depth of field

Detailed in Chapter 7, *depth of field* refers to the distance over which focus appears acceptably sharp. Deciding whether you want your sharp focus zone to extend as far as the eye can see (or as close to it as possible) or remain in a narrow part of the frame will guide you to the right camera settings, shooting distance, and lens focal length — the three factors that affect this characteristic of a photograph.

This decision is entirely personal, by the way. One person's idea of a super cityscape might be to keep all buildings in the scene sharply focused; however, another photographer might prefer to shoot the same scene so that a foreground building is sharply focused while the others are less so, thus drawing the eye to that first building. Or you may want a large depth of field for a shot that encompasses a large area but prefer a shallow depth of field when shooting a close-up of some element of that scene, as I did when photographing the images shown in Figure 10-7.

f/8, 1/80 second, ISO 320; lens, 27mm

f/8, 1/80 second, ISO 320; lens, 105mm

FIGURE 10-7: I opted for a large depth of field for my wide-angle shot (left), but a shallow depth of field for the close-up of the gate lock (right).

Here's a quick reminder of how to achieve the depth of field you want:

- **To minimize depth of field:** Set the aperture (f-stop) to a low number; set your lens to its longest focal length (200mm instead of 55mm, for example); and get as close as possible to your subject.
- **To maximize depth of field:** Go the opposite direction, using a high f-stop value, a short focal length, and increase the distance between you and your subject.

For the images in Figure 10-7, the change in depth of field was due entirely to focal length. I stood at the same position and used the same f-stop for both shots, but zoomed to a much longer focal length for the close-up than I used for the first shot.

Pick the right exposure mode

You can take great landscape shots in Auto mode. But if your camera offers other shooting modes, you can gain more control over the look of your pictures because you can specify the f-stop and shutter speed you want to use. Both settings, along with ISO (light sensitivity), determine exposure but also affect other aspects of a photo. F-stop plays a role in depth of field, as just discussed, while shutter speed determines whether moving objects appear blurry. See Chapter 5 if you're fuzzy on the whole concept of exposure and these specific exposure settings.

Assuming that your camera does provide alternatives to Auto exposure mode, I offer the following exposure-mode recommendations for landscape shooting:

- **When depth of field is the most important factor, use aperture-priority autoexposure.** Shooting in aperture-priority autoexposure mode makes it easy to control one component of depth of field — the f-stop setting. Figure 10-8 offers a reminder of how changing the f-stop impacts depth of field. For both shots, I used the same focal length (70mm) and stood at the same distance from the fountain, so changing the f-stop was the sole reason why the left image, shot at f/13, has a sharper background than the right image, taken at f/5.6.

  In aperture-priority autoexposure mode, typically represented on the camera dial or menus by the letter A or Av (*aperture value),* you select the aperture, and the camera handles the rest of the exposure equation for you by dialing in the right shutter speed to properly expose the image at the current ISO (light sensitivity setting).

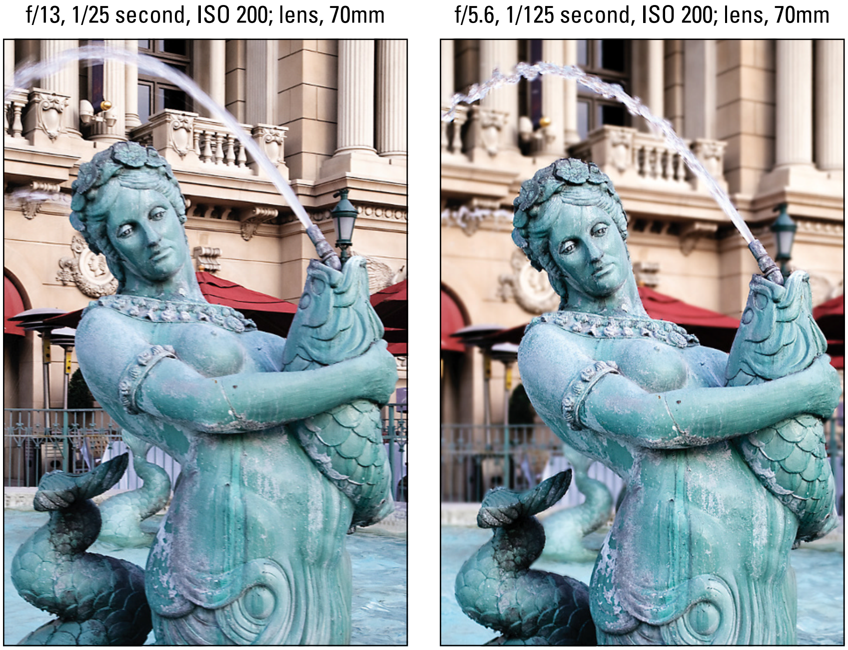


FIGURE 10-8: Adjusting the f-stop changed the depth of field; varying the shutter speed affected the look of the fountain water.

- **If shutter speed (exposure time) is more critical than depth of field, use shutter-priority autoexposure.** One common scenario where shutter speed is important is when you're photographing a scene that includes a waterfall or fountain. Using a slow shutter speed blurs the water; the slower the shutter speed, the greater the blur. To achieve the effect shown on the left image in Figure 10-8, I set the shutter speed to 1/25 second. Compare that result with the right image, taken at a much faster shutter speed of 1/125 second.

  In shutter-priority autoexposure mode, usually represented by the letter S or Tv (for exposure *time value*), you dial in the shutter speed, and the camera automatically chooses the f-stop needed to give you a good exposure at the current ISO setting.

- **To control both shutter speed and aperture, use manual exposure mode.** One scenario that comes to mind is shooting a series of shots that you plan to stitch into a panorama. Using the same shutter speed and aperture for all the frames ensures that any moving objects are equally blurred (or frozen) and that the depth of field remains constant.

  TIP

  The other benefit of manual exposure mode is that on many cameras, it gives you access to a special shutter-speed setting called *bulb mode.* In this mode, the camera exposes the image for as long as you hold down the shutter button, making it easy to experiment with different shutter speeds. You don't have to take the time to reset the shutter speed between frames; you can just hold the button down for different lengths of time for each shot. I often use this option when shooting fireworks, which I cover later in this chapter. The other benefit of bulb mode is that most cameras enable you to use an exposure time of longer than 30 seconds *only* in that mode or in a similar setting, called *time mode.* In time mode, you press the shutter button once to start the exposure and press it again to end the exposure. Time mode is nice when you're doing really long exposures because you don't have to keep the shutter button pressed the whole time. It's best to use time mode with a wired or wireless remote, though, because pressing the shutter button twice with your finger doubles the chances of camera shake that can blur the image.

» **If your camera doesn't offer these modes or you're not yet comfortable using them, check out your scene mode options.** For example, most cameras that provide scene modes offer a Landscape mode, which automatically selects a high f-stop number to produce a large depth of field. Prefer a shallow depth of field? Try Portrait mode, which chooses a low f-stop setting to reduce depth of field. (The camera doesn't know that you're not really shooting a portrait, so it works for any type of shot.) Be aware, though, that these modes typically tweak color and contrast beyond what you get in your camera's Auto exposure mode. Landscape mode increases contrast and sharpness and produces more vivid blues and greens; Portrait mode typically reduces contrast and sharpness and warms colors (makes them more amber).

  Some cameras go a step further, offering special modes for shooting sunsets, snowy landscapes, beach scenes, and so on. Check your camera instruction manual to find out how to access and use these modes.

Pack a lens filter (or two or three)

You're probably aware of phone and tablet apps that enable you to enhance colors or fiddle with exposure of an existing image. (Chapter 14 introduces you to a few of my favorites.) But there are two issues that you can't solve with software: glare caused by light hitting reflective surfaces and light that's too bright to enable you to use the exposure settings you have in mind. The only way to deal with these problems is to use an analog solution, which is to say, add a physical filter in front of your lens. For glare removal, you need a polarizing filter; to reduce excess light, a neutral density filter. You can buy filters that screw onto the end of your camera lens or are placed in a filter holder that you mount onto the lens.

The next two sections provide information to help you understand both types of filters. Before I dig into those details, though, I want to impart one piece of advice that applies to these filters and any others you put on your lens: You can find low-priced filters that seem like a good deal until you notice that when you use them, image quality suffers. Bargain-basement prices usually indicate filters that don't use the best glass or other materials, which can result in softer images and vignetting (darkening at the corners of a photo). In general, expect to pay in the neighborhood of $100 or more for a quality filter, but as always, read reviews before buying to get the most for your money.

Polarizing filters

Acting sort of like polarized sunglasses for your camera, a polarizing filter reduces or eliminates glare that may appear on the surface of water, glass, and other non-metal reflective objects. I believe that a polarizing filter is based on pure magic, but if you're interested, you can go online and find a ton of technical data that suggests there's actual science behind how polarizing filters do their thing.

Whether you opt to join the people in the science lab or stick with me in the land of unicorns and fairy dust is up to you. (Magic is more fun, though.) Either way, take a look at Figures 10-9 and 10-10 for a look at results you can achieve by using a polarizing filter. In Figure 10-9, the filter cut through some of the haze in the sky and removed glare from the water, making colors more saturated and allowing the sand beneath the water to become visible. In Figure 10-10, the filter reduced reflections in the building's windows and gave a serious bump in intensity to already blue skies.

No polarization
f/14, 1/160 second, ISO 320

Max polarization
f/14, 1/100 second, ISO 320

FIGURE 10-9: In this scene, taken on an overcast day, the polarizing filter reduced haze and removed glare from the water.

f/9, 1/640 second, ISO 400, no polarization   f/9, 1/500 second, ISO 400, max polarization

FIGURE 10-10: For this shot, the polarizing filter eliminated glare on the glass and made already blue skies even more dramatic.

REMEMBER

The impact a polarizing filter makes depends on the lighting conditions and the angle of your lens with respect to both the sun and your subject. For maximum effect, position yourself with the sun at one of your shoulders and your lens at a 90-degree angle to your subject.

This aspect of using a polarizing filter explains why the filter didn't have the same extreme effect on the sky in Figure 10-9 as it did in Figure 10-10. For Figure 10-10, I was able to get the lens angle just right and still get the composition I wanted. For Figure 10-9, I wasn't able to do both, and I opted to make composition my priority. Additionally, I shot Figure 10-10 under nearly cloudless blue skies, while I took the photo in Figure 10-9 on a hazy, overcast day. Heavy clouds eliminate some of the light rays that the filter is designed to tackle, so it makes sense that the skies didn't get as strong of a color bump in Figure 10-9 as in Figure 10-10.

In addition to the quality/price tradeoff I mention in the preceding section, here are some other tips about buying and using polarizing filters:

» **Look for a circular polarizing filter.** With this type of filter — the most commonly used type for photography — you turn a ring on the filter to vary the amount of the polarizing effect. If you don't see any change when you rotate the filter ring, there's no reflected light to eliminate or you need to change your position with respect to the light source or subject. (Remember the 90-degree rule.)

REMEMBER

- **Check the filter's light-reduction specs.** Regardless of the position of the adjustment ring on a circular polarizer, the filter cuts the amount of light coming through the lens, so you have to use a slower shutter speed, larger aperture, or higher ISO to compensate. I took all the shots in Figures 10-9 and 10-10 with the filter on the lens, adjusting the filter ring to minimum or no effect for the left images and to maximum effect for the right images. Even at the "no polarization effect" position, the light is reduced, so when you look at the exposure settings shown for my example photos, understand that the shift I made for the right images is in *addition* to what I did for the left images.

  The specs for any lens filter that reduces light indicate the amount of exposure adjustment you need to make. The values may be stated in terms of an *optical density number,* a *filter factor*, or *stops,* or all three. Either way, a higher number indicates a darker filter. The circular polarizing filter I used to take the example photos has a filter factor of 3–4, which means that depending on the position of the adjustment ring, the filter results in a 1/3 to 1/4 reduction in light. And *that* translates to the need to adjust exposure settings by 1.5 to 2 stops.

  Don't worry too much about all the math — again, just remember that a higher value means more light reduction. And assuming that your camera offers a live preview, you'll be able to see how dark things get as soon as you put the filter on your lens. See Chapter 5 for help understanding stops and other exposure issues.

- **Don't use a polarizing filter if you like the look of specular highlights dancing on water.** The polarizer will eliminate them.

- **If your subject is a rainbow-filled sky, be careful when using a polarizing filter.** With the right lens angle and polarizing position, you can filter a rainbow right out of the sky.

- **A polarizing filter can also come in handy for photographing smaller reflective objects.** It's not just for photos of sea and sky; try it out if you're bothered by reflections on any non-metal surface, such as a glass gazing ball in a garden.

Neutral density (ND) filters

For landscape photography in bright sunlight, a neutral density (ND) filter is another helpful tool. This type of filter simply cuts light coming through the lens without affecting picture colors — essentially, it's a gray (neutral) piece of glass. Its purpose is to cut the light enough that you can use a slow shutter speed (to blur a moving object, such as a waterfall) or wide-open aperture (for a blurry background), or both, without overexposing the picture.

Like polarizing filters, ND filters come in different densities. Again, check the filter specs to find out how much light reduction it offers. As a point of reference, Figure 10-11 shows my circular polarizer filter, which offers a max light reduction of 2 stops of light, next to my highest-density ND filter, which results in a whopping 9-stop reduction of light. You might use this density of ND filter when you want to use a really slow shutter speed and a wide-open aperture on a very bright day. If you've seen seaside shots where the water almost looks like glass and the clouds appear as long streaks in the sky, for example, a strong ND filter has likely been used — such photos typically require exposure times longer than 30 seconds.

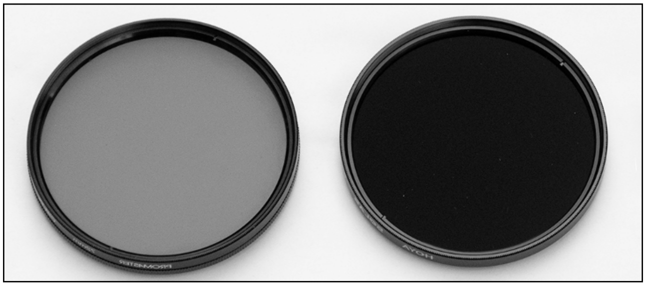


FIGURE 10-11: The filter on the left has a variable light reduction of 1.5 to 2 stops; the one on the right is a single-density filter that cuts light by 9 stops.

A few more bits of ND filter knowledge to pass through your brain:

- **Most ND filters come in a single density, but you can also buy *variable ND filters.*** As their name implies, these filters enable you to vary the amount of light reduction (by rotating a ring on the filter, just as with a circular polarizer). For example, you can buy a variable ND filter that offers a range of 1 to 5 stops of exposure change.

  The downside to this flexibility is that because of the technology used in variable ND filters, image quality can be affected by minor color defects and *vignetting* (darkening at the corners of the image). Unfortunately, the top-notch performers in this category are more expensive than single-density filters. In addition, if you need a really high-density filter, you probably won't find it in a variable form.

- **Some scenes may benefit from a graduated ND filter.** This type of ND filter is a 50/50 proposition. That is, half of the filter is clear, and the other half has the coating that reduces light (again, the reduction is determined by the exposure factor of the filter you buy). The darkening grows gradually stronger from the clearest point of the glass to the other edge of the filter (thus, the *graduated* part of the filter name).

The idea of a graduated filter is to enable you to cut the light from a portion of the scene but catch all the light from the rest, as when you're taking a picture of a bright sunset at the beach. Without the filter, you have to expose for the sunset, leaving the beach dark, or expose for the beach, blowing out the sunset. Underwater photographers sometimes use graduated ND filters to balance the exposure of over/under shots — where the top of the image is above water; the lower portion below water.

TIP

- **If you already own a polarizing filter, it may be an adequate stand-in for an ND filter.** If you only need a small amount of light reduction, a circular polarizer can do double duty, saving you some cash and space in your camera bag. You enjoy the light reduction whether or not you adjust the filter to produce the polarizing effect. The left filter in Figure 10-11 is my circular polarizing filter, for example, which cuts light between 1.5 to 2 stops depending on where I set the ring that adjusts the polarizing effect.

WARNING

FIND YOUR FILTER SIZE

When buying a lens filter, match the diameter of the filter with the diameter of the lens you plan on using with it. For example, if the diameter of your lens is 72mm, you need a 72mm filter. Also make sure that your lens has threads for attaching a filter; if not, you can buy an adapter or select the type of filter that sits in a holder that you mount on the lens.

To determine the diameter of your lens, look at the numbers printed on the border around the lens glass or check the specs on the lens box or sales material. The lens diameter is preceded by a special symbol — the letter *o* with a slash through it, as in ø72. Don't confuse this number with the lens focal length, which is also usually printed on the lens.

If you have multiple lenses and not all are the same diameter, you don't have to buy a separate filter for each. Instead, you can buy adapters that enable you to mount the filter on a lens with a different diameter. These adapters are called *step-up rings* or *step-down rings*, depending on whether they're designed for putting a larger filter on a smaller diameter lens or vice versa.

Taking a Panoramic View

In photography lingo, the term *panorama* refers to an image that's significantly wider than it is tall, like the example shown in Figure 10-12. This photographic aspect ratio is a popular alternative to the normal 3:2 or 4:3 proportions captured by most cameras when they're set to their default capture modes.

FIGURE 10-12: A panoramic image has an uber-wide, short aspect ratio.

Most smartphones and even many regular cameras have a built-in tool for creating a panorama. The tool normally displays an alignment aid and instructions to move the camera horizontally after pressing the shutter button. When the shutter closes, the camera processes the image into a panorama automatically for you.

I find using these automated tools difficult for several reasons. First, it's hard to keep the camera level as I pan, and second, when I'm shooting in bright daylight, glare on the display makes it difficult to see exactly what I'm capturing. Finally, I have no control over how the phone's image-processing tool handles exposure, color, and so on as it processes the panorama.

That's why I typically go "old school" when creating panoramas, shooting the individual frames myself and then stitching them together in a photo editor after downloading them to my computer. Figure 10-13 shows five frames that I captured to create the panorama in Figure 10-12. I stitched the frames together using a free program called Hugin Panorama Stitcher (`www.hugin.sourceforge.net`), shown in action in Figure 10-14. Other stitching programs to consider are PTGui (`www.ptgui.com`, $144), Panoweaver (`www.easypano.com`, $150), and PhotoStitcher (`www.photostitcher.com`, $20).

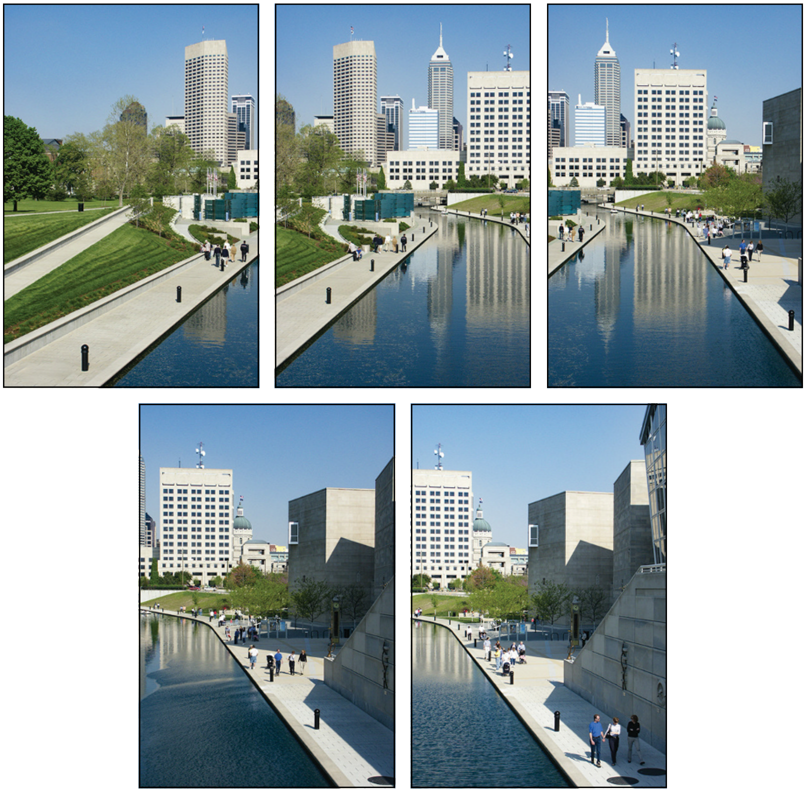


FIGURE 10-13: Here are the five individual frames I combined into the panorama shown in Figure 10-12.

Some dedicated stitching tools can be a little complicated to use because they offer controls that let you manually align the frames of your panorama and make other fine-tuning adjustments. If you want to go a simpler route and you own Adobe Photoshop or Lightroom, you already have a tool that automates the process — good because it makes your life easy; not so great in terms of the amount of control you have over the finished product.

Whatever software you use, the success of the stitching process depends on the images you feed the software. So follow these tips when you snap frames for a homemade panorama:

- **Shoot in vertical orientation and include extra margin at the top and bottom of the image.** In order to do its thing, panorama-stitching software typically needs to crop a little off the top and bottom of the combined frames, as you can see in Figure 10-14. Shooting in vertical orientation leaves you with a taller image after the cropping, enabling you to produce a final panorama with greater height than if you shoot in landscape orientation. Framing loosely ensures that the tops of buildings or other important structures don't get lopped off in the final panorama.

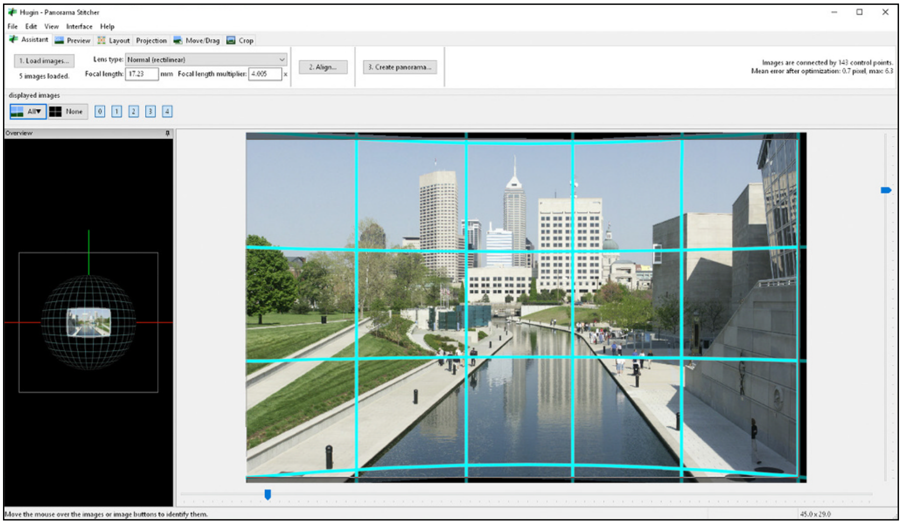


FIGURE 10-14: Some panorama-creation programs, like this free one from Hugin Software, offer advanced tools for aligning and blending the individual pieces of your panorama.

- **Include at least 30 percent of horizontal overlap in each frame.** In other words, the second frame you shoot should include one-third of the area captured on the right side of the first frame. (See the examples in Figure 10-13 to see what I mean.) This overlap makes it easier for the stitching software to see how all the pieces of the panorama should fit together.
- **Use manual focus and manual exposure, and maintain the same focus distance, f-stop, shutter speed, and ISO for all frames.** If the lighting varies considerably across the vista you're shooting, choose exposure settings based on an area of medium brightness. Remember that a higher f-stop value produces a larger depth of field, keeping more of the scene within the zone of sharp focus.
- **Put the camera on a tripod and ensure that the camera remains level to the horizon for all shots.** Also, don't change the height of the camera between shots.
- **For panorama perfection, find the lens *nodal point* and rotate the camera based on that axis as you pan to take each frame.** Oy, that's a mouthful of technical babble, eh? Here's what it means: *Nodal point* is a fancy way of saying "optical center of the lens." Rotating the camera on this axis avoids the changes in perspective that can otherwise occur between frames, creating some problems when the stitching software puts the images together. It's not such a big problem when you're shooting natural landscapes, but with city scenes that contain lots of complex structures, it can help ensure a more seamless panorama.

TIP

CREATING MAGIC-HOUR LIGHT

Most landscape photography guides encourage you to shoot during the *golden hours:* early morning or late afternoon, when the sun casts a beautiful golden glow on the scene. And then you're also supposed to take advantage of *blue hour* light, which is the cool color cast that appears just before sunrise and after sunset.

I have no problem with either of those recommendations, but let's be honest: You can't always fit your photography into those so-called *magic hours.* But there are a couple of tricks you can use to mimic magic-hour light when your schedule requires you to shoot at other times of day.

You can buy colored lens filters that warm or cool colors — film photographers have been using them for years — but a free solution is built right into most digital cameras: By playing with the white-balance setting, you can manipulate colors to warm or cool the scene. For example, if you're shooting under a cloudless sky in the middle of the day, try changing the white-balance setting to Cloudy if you want colors to have a slight golden cast. I used this trick when shooting the scene shown here, taken at high noon. The left image shows the original, actual colors; the right image shows how the camera rendered colors when the white balance was set to Cloudy. (Note that you won't get this result if the sky is actually cloudy.) Use your camera's live preview mode so you can see how the various settings affect colors. No luck with the preset white-balance settings? Your camera may enable you to make specific, fine-tuning color adjustments and then save those changes as a custom white-balance setting.

Chapter 7 discusses white balance as well as other color tools.

And how, you ask, do I find out where the nodal point is on my lens? Well, if you're lucky, the lens manufacturer will indicate the location on the lens — maybe with a silver or gold ring around the lens barrel, for example. Check the lens manual to find out whether these markings are just for decoration or actually mean "nodal point." No markings? There's a manual process for finding the nodal point by taking a series of shots of certain subjects. It's too involved to get into here, but you'll find tons of online videos and tutorials on the subject.

TIP

If you plan to get into panoramic photography in a big way, you may want to invest in a specialty panorama tripod head that helps you properly position the camera to ensure nodal-point rotation.

- **If you can't fit the entire height of the scene into one frame, create a double-decker panorama.** That is, set the tripod at one height to capture the series of frames that capture the bottom half of the scene. Then raise the tripod and shoot a second series to capture the top half. Check the help system for whatever stitching software you use to find out how to put the two rows together into a single panorama.
- **Don't want to go to the fuss of shooting and stitching a panorama? It's okay to cheat.** By that, I mean just frame your scene with enough top and bottom margin that you can crop the image to create an image that is really wide and not so tall.

WARNING

However, if you go this route, you're limited in the height of print you can create — you're working within the confines of the vertical pixel count left after you crop your photo. Multiply that number by 300 to figure out the maximum possible height of your print. (Quality prints require about 300 pixels per linear inch.)

Photographing Tall Structures

When shooting buildings and other tall structures, you may have to deal with perspective and distortion problems. You may discover that vertical structures appear to lean inward or outward from the left and right edges of the frame. You also may notice that structures seem to be leaning toward or falling away from the camera. The left image in Figure 10-15 offers an illustration. The fault here lies not with the photographer, but with the lens. With the exception of very expensive lenses designed for architectural photography — *tilt-shift lenses* — most lenses produce this type of result.

Original

After perspective correction

FIGURE 10-15: If your architectural shots display distortion (left), you can straighten things out using a photo editor or in-camera tool.

In addition, some lenses create *barrel distortion*, which makes the object at the center of the frame appear larger and closer to the lens than it really is — imagine a face wrapped around the front of a barrel, and you get the idea. The opposite problem, known as *pincushion distortion*, pinches everything toward the center of the frame so that your subject appears smaller and farther from the lens.

When you shop for a new lens, read reviews carefully to find the lens that produces the least amount of distortion in your price range. (Less distortion usually means a higher-priced lens.) In the meantime, try these two inexpensive (and maybe even free) solutions to correct distortion:

- **Check your camera's menus to find out whether you can enable automatic distortion correction.** Usually, this feature is found only on intermediate and advanced cameras and works best with the camera manufacturer's own lenses.
- **Look for a lens-correction option in your camera menus or photo-editing software.** Figure 10-16 shows one of the perspective correction tools found in Adobe Photoshop, and Figure 10-17 shows a look at the tool found on some Nikon cameras. As you might expect, the camera-based tools are usually simpler and more automated than those found in photo-editing programs, so for severe corrections, you may not be able to do the job in camera.

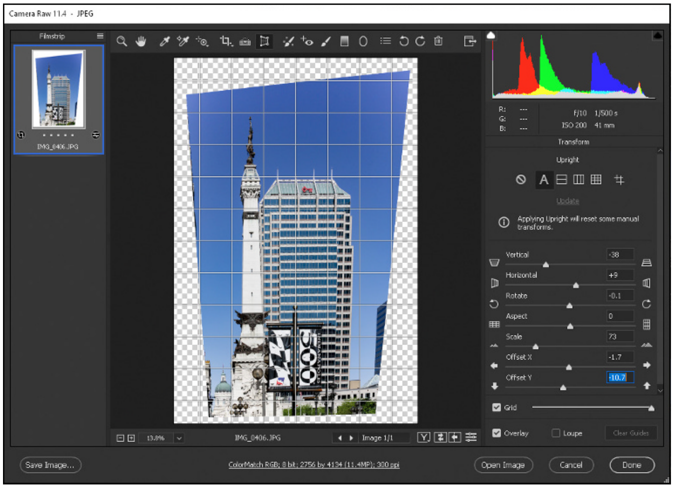


FIGURE 10-16: Adobe Photoshop offers a batch of tools for correcting perspective problems.

WARNING

Some of your original image area will be lost as a result of the correction process, which requires the software to actually distort your photo, tugging on corners and stretching the edges this way and that. (See Figure 10-16 to see what I mean.) So when shooting buildings and other tall structures, such as monuments, include a large margin of background all around the edges of the frame. That way, critical parts of the subject don't get lost in the correction process.

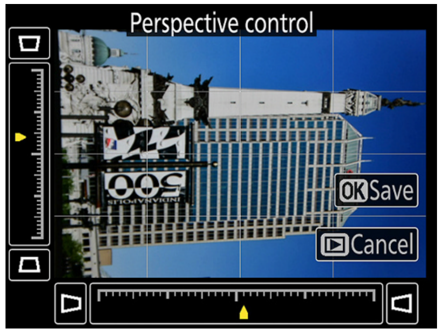


FIGURE 10-17: Here's a look at the simpler perspective correction tool built into some Nikon cameras.

Catching the Night Lights

Some special photographic opportunities arise when the sun goes down. This section includes a look at some common after-dark subjects; the following list explains how to capture them.

REMEMBER

Most of these shots require a long exposure time. So using a tripod is essential if you want to avoid the blur that results from camera shake. Additionally, some cameras don't allow an exposure time longer than 30 seconds unless you use bulb or time modes, often accessible only when the camera is set to manual exposure. See "Pick the right exposure mode," earlier in this chapter, for an explanation. You also need to be especially gentle when you press the shutter button. With a very slow shutter, you can easily create enough camera movement to blur the image even when the camera is on a tripod. If you can operate your camera via remote control, this is a good situation in which to do so.

Now for some specifics:

- **Shooting fireworks:** Thanks to my good friend William Stanko for the excellent fireworks shot shown in Figure 10-18. What sets this image apart from many fireworks photos you see is that it's not just streaks of color in an empty sky. The lights on the bridge at the bottom of the frame anchor the scene, and the reflections in the water also add interest.

f/20, 6 seconds, ISO 200; lens, 67mm

FIGURE 10-18: The lights on the bridge and reflections in the water add the special sauce that makes this fireworks shot a standout.

Courtesy of William Stanko

After scoping out a setting that offers something interesting in the foreground or background, put your camera on your tripod and use these tactics to capture the best images:

  - *Use a short focal length (wide-angle lens).* If your camera has a zoom lens, zoom out to the shortest focal length. This will give you the widest angle of view and also help produce a large depth of field, keeping more of the scene in focus. (See the section "Remember the impact of depth of field" for more on this topic.) You may not always be able to go really short with focal length, of course, depending on how far you need to be from the display. But when you have a choice, wider is better.

- *For cameras that offer manual focusing, switch to that mode and set focus at infinity.* This is the farthest possible focus point your lens offers — often marked by the infinity symbol. If using autofocus, lock onto the most distant object you can see. Don't try to autofocus on the fireworks themselves; they're not solid or still enough for the camera to use to calculate focusing distance.
- *If available, use manual exposure and experiment.* Choose a relatively high f-stop setting — say, f/16 or so — and start at a shutter speed of 1 to 6 seconds. From there, it's simply a matter of experimenting with different shutter speeds. No manual exposure mode? Try shutter-priority autoexposure mode instead. Some cameras have a Fireworks scene mode, too, in which case you can let the camera take the reins.
- *Release the shutter at various intervals.* In addition to experimenting with shutter speed, play with the timing of the shutter release, starting some exposures at the moment the fireworks are shot up, some at the moment they burst open, and so on. For the example featured in Figure 10-19, I used an exposure time of about 5.4 seconds and began the exposure as the rocket was going up — that's what creates the corkscrew of light that rises up through the frame. I ended the exposure after the final explosion of color. And yes, I did break my own rule by not including any foreground or background objects in the shot. But in this case, I think the spinning formation creates enough visual interest on its own. By the way, this is one of those cropped images I refer to at the start of the chapter. The original included a lot of empty sky and a few small, unremarkable background buildings at the bottom of the frame.

f/16, 5.4 seconds, ISO 250; lens, 42mm

FIGURE 10-19:
For this shot, I opened the shutter as the rocket began its upward journey and waited until the final burst of color appeared to end the exposure.

» **Creating car light trails:** Figure 10-20 shows a special effect you can create by using a slow shutter speed when cars or other vehicles are moving through the scene: The long exposure turns headlights and taillights into blurry neon trails. I used a shutter speed of 10 seconds for this shot. And again, as you can no doubt deduce from the proportions of the image, I cropped away some of the original frame.

f/25, 10 seconds, ISO 125; lens, 37mm

FIGURE 10-20: A shutter speed of 10 seconds turns the taillights of passing cars into trails of neon light.

» **Perfecting sunrise and sunset exposure:** At sunrise or sunset, base exposure on the sky. The foreground will be dark, but you can usually brighten it in a photo editor, if needed. Or you may decide to keep the foreground in silhouette, as I did for Figure 10-21. Either way, if you base exposure on the foreground, the sky will become so bright that all the color will be washed out — a problem you can't fix after the fact because all you have is a mass of white pixels as your raw material. A darker shade of white is gray, and the only way to colorize that sky is to add paint in a photo editor.

REMEMBER

This exposure tip doesn't apply if the sunrise or sunset is merely serving as a gorgeous backdrop for a portrait. In that case, enable your flash and expose for the subject. The flash won't reach much beyond the subject, so the skies should remain colorful. Also see the earlier section related to lens filters; you may find a graduated ND filter helpful for your sunset and sunrise shots.

» **Shooting the moon:** I don't know about you, but it seems that my local weather reporter now urges me on almost a weekly basis to stay up late to photograph a "once in a decade" moon, made special by some atmospheric conditions, alignment of the planets, or other phenomenon. Frankly, I've wasted enough time lugging my gear outside, setting up the camera, and waiting for this very special moon to appear, only to have clouds roll in and obscure my view at the last moment. And to be honest, I don't find a picture of the moon in and of itself that interesting. To me, the best moon (and stars) images include something in the foreground or background, like the bare tree that leads the eye upward to the crescent moon in Figure 10-22. I think the smaller bright object is Venus, but don't quote me on that. It could also be an alien ship that decided I wasn't worth picking up.

f/16, 1/40 second, ISO 200; lens, 97mm

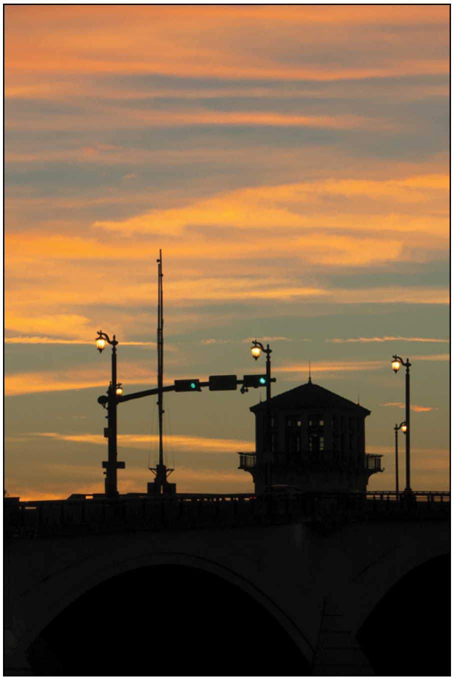


FIGURE 10-21: For this image, I chose exposure settings that would keep the drama in the skies, letting the foreground remain in silhouette.

f/14, 13 seconds, ISO 320; lens, 97mm

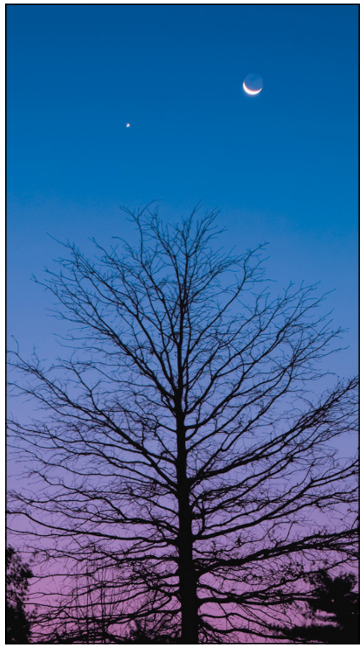


FIGURE 10-22: The bare tree leads the eye from the predawn colors on the horizon to the crescent moon.

Capturing Small Wonders

Not all landscape photography takes in a large vista. As you explore your surroundings, look for potential close-up subjects, too — a magnificent bloom on a rose bush, an interesting detail on a gate, or a cute critter who calls the place home.

In addition to the tips presented in the first half of this chapter, the following list offers some additional help when you're shooting close-ups:

- **Check your camera or lens manual to find out the minimum close-focusing distance.** How "up close and personal" you can get varies depending on your equipment. Many cameras and lenses also have a Close-up or Macro focusing mode; you may have to enable this setting to achieve the closest focusing distance.

* **Keep depth of field *and* shutter speed in mind.** Both are important when you photograph the flora and fauna in a landscape. Figure 10-23 shows an example. For this shot, I wanted a shallow depth of field to help separate the subject from the similarly colored background, but I also needed to freeze motion. My subject was repeatedly opening and closing the pink part of its throat, and I wanted to catch the moment when the throat was fully open. To get shallow depth of field, I set the f-stop to f/5.6 and used a relatively long focal length of 157mm; to freeze action, I set the shutter speed to 1/200 second. An ISO of 200 enabled me to expose the image at those settings.

  Wind conditions also impact your shutter speed requirements. If you're photographing in a garden, for example, you may need a pretty fast shutter speed to get a sharp shot of a flower that's swaying in the breeze.

f/5.6, 1/200 second, ISO 200; lens, 157mm

FIGURE 10-23: When photographing this garden inhabitant, I used settings that delivered a shallow depth of field along with a shutter speed fast enough to freeze motion.

* **If aperture-priority autoexposure isn't available, try the Close-up scene mode.** In this mode, sometimes called Macro mode, the camera automatically opens the aperture to achieve a short depth of field.

  WARNING

  Close-up mode means and does different things depending on the camera. In some cases, it simply adjusts the close-focusing distance; in others, it affects aperture as well as some color and contrast characteristics of the image. Check your manual for details.

* **Try using fill flash for better outdoor lighting.** Using flash often improves outdoor close-ups when the sun is the primary light source and especially when the brightest light is behind your subject. Figure 10-24 offers an example of the difference flash can make; for the right photo, I used my camera's built-in flash. With flash, the details and colors in the gate and the dragon are much more visible.

No flash; f/6.3, 1/320 second, ISO 640

Built-in flash; f/8, 1/250 second, ISO 640

FIGURE 10-24: Adding flash enabled me to get a better exposure of the dragon and gate without making the background brighter.

Why not just increase exposure to make those elements brighter? It's an option, but adjusting the exposure that much for this image would have totally washed out the colors in the background and sky, which was already pretty bright.

There are some caveats you need to know about using flash outdoors in daylight; see Chapter 6 for the full story. Also remember that with a built-in flash, the top shutter speed you can use on most cameras is limited. For the camera I was using, 1/250 second was the fastest shutter speed available. As soon as I enabled the flash, the camera automatically reduced the shutter speed to that value. To keep the exposure of the background the same for both shots, I had to compensate for the longer exposure time. I stopped down the aperture a tad, to f/8.0, letting less light into the camera during the exposure.

» **To get really close to your subject, invest in a macro lens or a set of diopters.** A macro lens enables you to focus at a very short distance so that you can capture even the tiniest of critters or, if you're not into nature, details of an object. I used a 90mm macro lens to snap an image of the ladybug in Figure 10-25 just before she flew away home.

f/10, 1/125 second, ISO 320;
lens, 90mm macro

FIGURE 10-25:
A macro lens enables you to focus close enough to fill the frame with even the tiniest subjects.

TIP

Notice how shallow the depth of field is: The extreme background blurring is due to the long focal length of the lens and the short distance between the lens and the subject. I used an f-stop of f/10, which may seem high when you're going for a shallow depth of field. But because the focal length and subject distance already combined for a very shallow depth of field, I needed that higher f-stop to keep the entire subject in the focus zone.

Unfortunately, a good macro lens isn't cheap; prices range from a few hundred to a couple thousand dollars. If you enjoy capturing the tiny details in life, though, it's worth the investment.

For a less-expensive way to go, you can spend about $40 for a set of *diopters,* which are like reading glasses that you screw onto your lens. Diopters come in several strengths — +1, +2, +4, and so on — with a higher number indicating a greater magnifying power. With most sets, you can stack one diopter on top of another for increased power. The downside of a diopter is that it typically produces images that are very soft around the edges, a problem that doesn't occur with a good macro lens.

4

After the Shot

IN THIS PART . . .

Take advantage of cool playback features, such as magnifying a photo to check for small flaws and displaying all pictures taken on a certain date.

Understand various options for moving files from your camera to a computer, hard drive, or another storage device, and read my take on the best ways to ensure the longevity of your digital files.

Get help with the process of converting Raw files to a standard photo format.

Find tips for ensuring top print quality and for preparing your files for online sharing.

IN THIS CHAPTER

- » Customizing playback display
- » Zooming in to check important details in your photos
- » Displaying shooting settings
- » Protecting and deleting photos
- » Viewing photos and movies on a TV

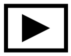
Chapter 11
Discovering Cool Playback Features

One of the best things about digital photography is being able to view your pictures right away. This lets you see whether you got the shot you wanted or need to try again. But on most cameras, viewing your images is just the start of the things you can do after you put the camera in playback mode. You may be able to assign ratings to images, for example, or protect them from accidental erasure. Some cameras even have tools for editing and enhancing your photos. This chapter introduces you to some of these practical and creative playback features.

Switching to Playback Mode

On most cameras, pictures appear briefly on the monitor immediately after you take the shot. To take a longer look, shift the camera into playback mode. Usually, you accomplish this by pressing a button labeled with a right-pointing arrowhead — the universal symbol for playback, shown in Table 11-1.

TABLE 11-1 Playback Symbols

Look for This Symbol	To Access This Feature
	Playback mode
	Magnify image
	Reduce magnification
	Delete image
	Protect image

TIP

If your camera offers touchscreen operation, you can scroll from one picture to the next using the same technique you use on a smartphone or tablet, swiping your finger across the screen to move from one image to the next. No touchscreen? Check your camera manual for instructions on how to advance from one photo to the next; usually, you press right and left on a rocker switch or rotate a dial on the camera.

Adjusting the Playback Display

If you don't like how your camera shows your images by default, check your menu system for settings that enable you to customize the display. You may have access to some or all of the following options:

- **Display more or less data:** Usually, the default playback display includes some basic file information, such as the name of the file, as shown on the left in Figure 11-1. But you may be able to display the major camera settings you used when taking the picture, as shown in the middle image, or go the opposite direction and view your photo without any of this *metadata* (hidden camera data, which I explain later in this chapter). Often, you implement the display change by pressing up/down on a rocker switch or pressing a DISP or INFO button. You first may have to enable the various display modes via a menu option.

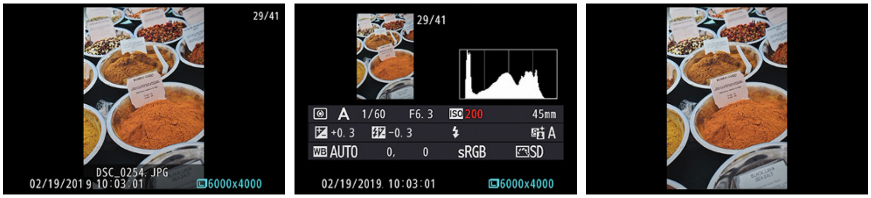


FIGURE 11-1: You may have the option to vary the amount of data displayed with each photo.

» **Rotate vertical images:** When you take a picture, many cameras tag the image file with the camera orientation: that is, whether you held the camera horizontally or vertically. When you view the picture, the camera can then read the data and rotate the image so that it appears upright in the monitor, as shown on the left in Figure 11-2, instead of on its side, as shown on the right. Most photo-viewing and -editing apps and software programs recognize the camera's orientation tag and also automatically rotate images when you open them.

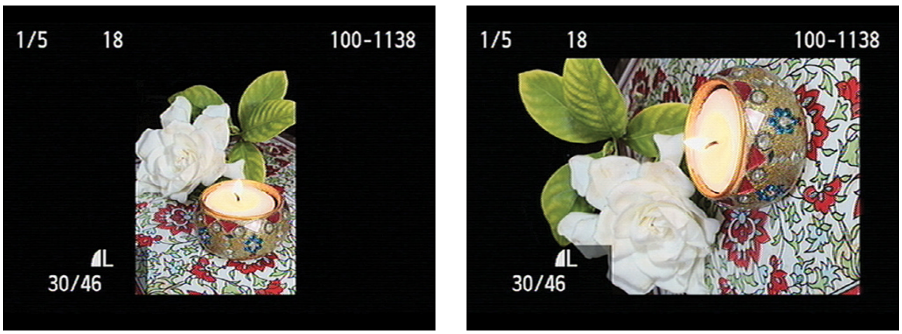


FIGURE 11-2: You usually can choose to display vertically oriented pictures upright (left) or sideways (right).

- **Display the focus point:** Some cameras can display a square or rectangle that marks the focus point (or points) you used when taking the picture, as shown in Figure 11-3. Being able to see the focus point is helpful for diagnosing focus problems because it tells you whether the camera focused on the wrong thing or that blurring is due to other causes, such as a too-slow shutter speed. Chapter 7 provides examples of common focus problems and how to solve them.

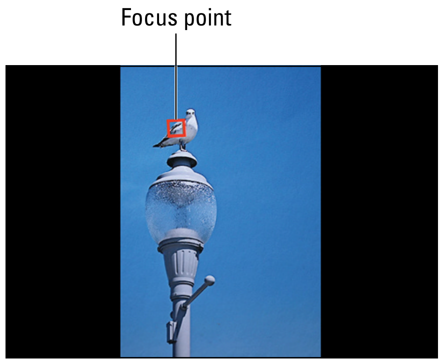


FIGURE 11-3: Some cameras can display the focus point you used when taking the photo.

- **Modify playback timing:** On most cameras, you can specify how long the camera displays each photo during playback. You also may be able to customize a feature known as instant image review, which displays the image automatically for a few seconds after you shoot it.

Getting a Close-Up Look at a Photo

Most cameras enable you to magnify an image so that you can inspect the details, as shown in Figure 11-4. If your camera has a touchscreen, you can use the standard touchscreen gesture to zoom the display: Put your thumb and forefinger at the center of the monitor and then swipe outward, toward the edges of the screen. To reduce magnification, swipe inward from the edges of the screen. (These motions are sometimes known as *pinching in* and *pinching out.*)

FIGURE 11-4: Playback magnification makes it easy to check important details, such as whether a portrait subject's eyes are open.

If your camera isn't touchscreen-enabled, you usually activate the zoom-in and zoom-out features by using buttons or other external controls that are labeled with magnifying-glass symbols like the ones shown in Table 11-1. A magnifying glass with a plus sign means zoom in; the minus sign represents the zoom-out function. When zoomed in, you can scroll left/right/up/down to view the different parts of the image.

Displaying Thumbnails and Calendars

You may be able to set the playback display to show thumbnails of multiple images instead of a single photo. In fact, your camera may let you choose from several thumbnail views, each of which presents a different number of photos. The left image in Figure 11-5, for example, shows a 9-image view. These displays are helpful when you need to scroll through a lot of pictures to find the ones you want to view. After you locate the first image in the bunch, you can shift back to regular, full-frame view, usually by pressing an OK button or a Set button or by using whatever control you normally use to magnify an image. On a touchscreen camera, you may be able to simply tap a photo to exit thumbnails view.

Another useful playback option is *calendar view.* In this display, you can click on a date on a calendar page to quickly view all pictures taken on a certain day. The right screen in Figure 11-5 shows an example of this display.

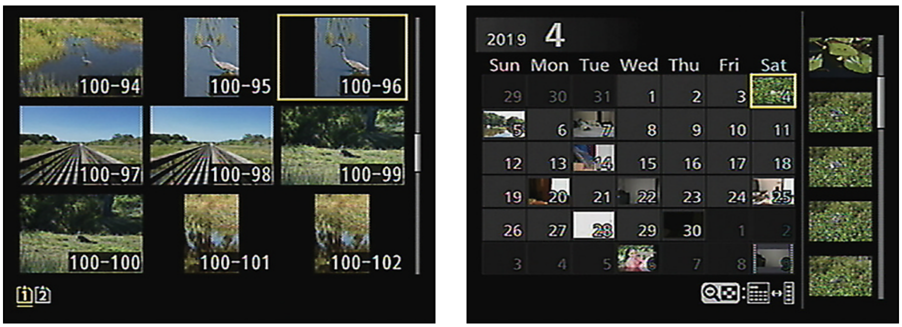


FIGURE 11-5: Many cameras allow you to display multiple images at a time (left) or display a calendar that helps you track down photos from a certain day (right).

Viewing Shooting Settings (Metadata)

When you capture a digital photo, the camera embeds *metadata* — extra data — into the image file. This metadata contains information about the settings you used when recording the picture, including exposure, focus, and color settings as well as the capture date and time. In Figure 11-6, for example, the upper-left corner of the screen reveals the shutter speed and f-stop used (1/40 second and f/5.6). Additional shooting data appears underneath the thumbnail, and on the right side of the screen, you see two *histograms*, which are exposure tools that I explain in the next section.

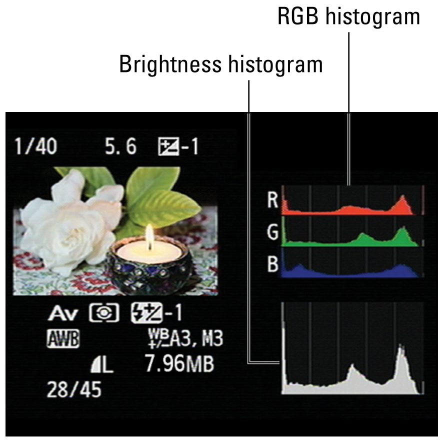


FIGURE 11-6:
Checking picture metadata can help you understand how various settings affect your results.

TIP

Checking picture metadata is a great tool for understanding how different camera settings affect your pictures. If a moving subject appears blurry but the rest of the shot is in focus, for example, the problem is likely a shutter speed that's too slow to freeze motion. You can check the metadata to see what shutter speed you used for the blurry image and then increase the shutter speed and try again. (Chapter 9 details the art of photographing moving subjects without blur.)

Most photo apps and programs can also display shooting data after you download images to your computer or other devices. Often, you tap or click an icon that looks like the letter *I* (for *information*).

Reading histograms

Chapter 5 introduces you to brightness histograms, which are graphs that plot out the brightness values in an image. Some cameras enable you to display a brightness histogram during playback, as shown in Figure 11-6. Checking the histogram is a great tool for making sure that exposure is correct.

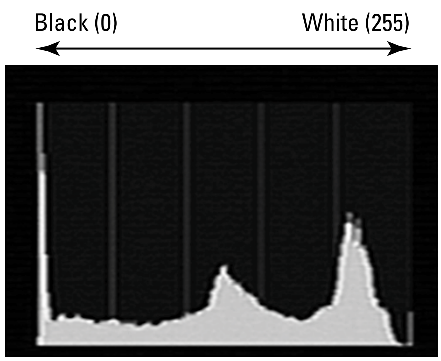


FIGURE 11-7:
A brightness histogram is a useful tool for evaluating exposure.

REMEMBER

Figure 11-7 shows a close-up view of the histogram from the candle image featured in Figure 11-6. The left side of the histogram represents shadows; the right side, highlights. And a peak in the graph represents a large collection of pixels at that brightness value. So if you see a large mass of pixels at the left end of the graph, the image may be underexposed. A clump at the right end may indicate overexposure.

Some cameras offer a second type of histogram, an RGB histogram, labeled in Figure 11-6 and shown in close-up view in Figure 11-8. This type of histogram is based on the fact that digital cameras create photos by combining red, green, and blue light; the histogram displays brightness values for each of those colors. which are stored in individual data vats known as channels.

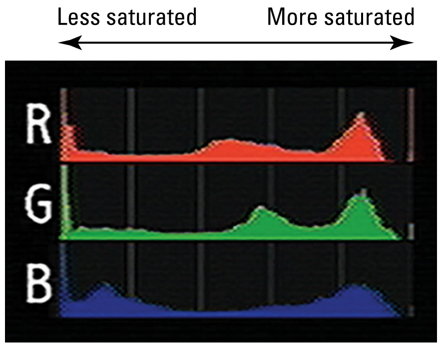


FIGURE 11-8:
An RGB histogram offers both exposure and color clues.

I don't have room in this book to fully explain RGB color theory, but here's what you need to know to glean helpful information from an RGB histogram. If the histogram shows that all pixels for one or two channels are slammed to the right end of the histogram, indicating maximum brightness values, you may be losing picture detail because of overly saturated colors. A rose petal that should contain a spectrum of shades of red may be a big blob of full-on red, for example. On the other hand, if *all three* channels show a heavy pixel population at the right end of the histogram, you're looking at a potential overexposure problem. That's because maximum levels of red, green, and blue create white. And when you have a ton of white pixels, you may have lost details in the brightest parts of your photo.

A savvy RGB histogram reader can also spot color issues by looking at the pixel values. But frankly, color problems are fairly easy to notice just by looking at the image on the camera monitor, so let's leave that discussion for another lifetime, okay? See the last bit of Chapter 7 for help solving color problems.

Displaying highlight alerts ("blinkies")

When a picture is greatly overexposed, areas that should include a range of light tones may instead be completely white, as is the case with the sky in the left image in Figure 11-9. This problem is known as *blown highlights* or *clipped highlights*.

FIGURE 11-9: Blinkies display mode makes it easy to see the location of any blown highlights.

Although it's clear when looking at the image in print that the sky is "blown out," detecting blown highlights on the camera monitor's normal display is often not so easy, especially when you're reviewing pictures outside on a bright day. To solve this issue, some cameras offer a playback mode that causes fully white pixels to blink on and off — this view mode is commonly referred to as "the blinkies." I used this mode to create the image shown on the right side of the figure, capturing a screenshot of the monitor at the moment the highlight blinkies blinked "off." The black areas in the figure indicate the blown highlights.

Whether or not you should make exposure adjustments when blinkies mode indicates blown highlights depends on the situation. In the example photo, decreasing exposure to avoid blown highlights in the sky would have left the building underexposed. Sometimes you simply can't avoid a few clipped highlights when the scene includes a broad range of brightness values. When the blinkies cover an important part of your subject, though, you need to adjust exposure settings and reshoot the photo. Chapter 5 offers some other options for avoiding and fixing exposure problems.

Rating, Protecting, and Deleting Files

In addition to simply viewing your photos in playback mode, you may be able to assign ratings to them, protect them from being accidentally deleted, and send photos you don't like to the digital dumpster. The next sections introduce these features.

Rating files

This feature enables you to assign each file a rating — for example, five stars for your favorite photos or movies and one star for those that you're likely to delete. The idea is to help you easily find your best (and worst) work when you're browsing a memory card filled with a ton of images. You also may be able to set up an in-camera slide show that displays only images tagged with a particular rating. Finally, you may be able to tell the camera to delete all files that have a specific rating.

After you download pictures to your computer, you also can sort your photos by rating. To take advantage of this option, you may need to use the photo software provided by your camera manufacturer, but some third-party programs also recognize ratings that you assign in the camera. (The rating is part of the aforementioned metadata that's buried in each image file.)

How you access this feature, of course, depends on your camera, but it's usually represented by a star symbol like the one you see in Figure 11-10, which shows me in the process of giving myself a five-star rating on a Canon camera. (I grade on a curve.)

FIGURE 11-10:
Rating photos makes it easier to find your best shots later.

Protecting photos

Do you see a button or switch marked with a little key symbol like the one shown earlier in Table 11-1? If so, your camera enables you to protect individual pictures from being erased when you use its Delete option (covered next). No button? Check the Playback menu for a Protect option or, if your camera offers touchscreen operation, a key symbol directly on the screen. However you apply protected status, you usually then see a little key symbol along with the photo, as shown in Figure 11-11. The placement and exact design of the symbol may vary.

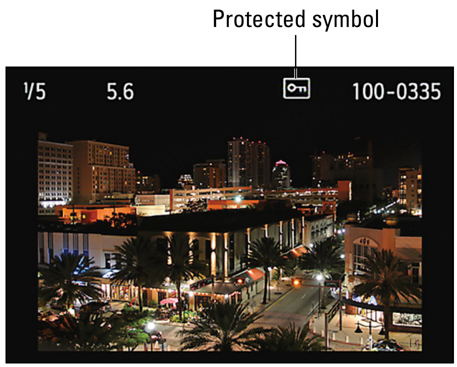


FIGURE 11-11:
A key is the universal symbol for a "locked" file.

Here are two important points about this feature:

WARNING

» **Formatting the memory card erases protected photos as well as unprotected ones.** *Formatting* is a process that wipes a memory card absolutely clean of all data, including protected files. Most cameras provide this function because formatting a card ensures it's prepared properly for the file-storage system the camera uses. Formatting new cards is a good idea, as is formatting your cards on a regular basis for optimum performance, but be sure that you've emptied the card of all files you want to keep — protected or not — before formatting.

» **Protected photos can't be edited until you unlock them.** Locked picture files remain locked even after you download them, which means that you can't edit or delete them on your computer. However, you should be able to unlock the files easily using most photo-editing and -browsing programs. Look for a menu command named something like Unlock Photo or Remove Protected Status — typically, the File menu holds this command. If nothing else, the software that shipped with your camera should enable you to unlock downloaded photos. You can always put the memory card back in the camera and use the camera's protect feature to remove the protected status, too.

Deleting files

Got a clunker image that you don't want to keep? No worries; every camera enables you to erase images easily. You usually get more than one way to dump files, in fact.

To erase a single image, first set the camera to Playback mode and display the photo (or movie file). Then look for a button or onscreen symbol that looks like a trash can, the universal "dump unwanted stuff here" icon. (Refer to Table 11-1 for a look.) After you press the button or tap that icon, the camera likely will ask you for confirmation that you really want to erase the photo. Answer in the affirmative, and that picture's zapped into digital oblivion.

TIP

Deleting photos one by one can be tedious, which is why most cameras also offer a menu command, usually on the Playback menu, that gives you the choice to erase all images on the card or to select specific files to delete. If your camera has a rating feature, you also may have the option to erase all photos that have a particular rating.

Checking Out In-Camera Editing Tools

Some cameras provide retouching tools that enable you to do quick fixes to a problem image and then save the edited photo as a new image file. For intensive photo retouching, I recommend doing the work on your desktop or laptop computer, using your favorite photo-editing software. Not only does that option give you a larger view of your images than you can get on the camera monitor, but your software likely offers more precise and powerful tools than the camera. But if you need a retouched image right away or you just want to make a few quick fixes, in-camera editing is a handy feature. Here's a list of some of the most common tasks you can do:

- **Removing red-eye:** This tool automatically locates red pixels in the eye and replaces them with dark black or brown ones. If you use this tool, be sure to magnify the image, as shown in Figure 11-12, to check the results after you make the correction.

FIGURE 11-12: Some cameras offer a built-in red-eye removal tool that you can use during picture playback.

- **Cropping:** There are several reasons you may want to crop an image. Maybe you want to get rid of a stranger who photobombed your shot from the side or, as in the case of Figure 11-13, your lens wasn't long enough to get the close-up shot you wanted. Here I wanted to feature the two birds by cropping out the extraneous details surrounding them.

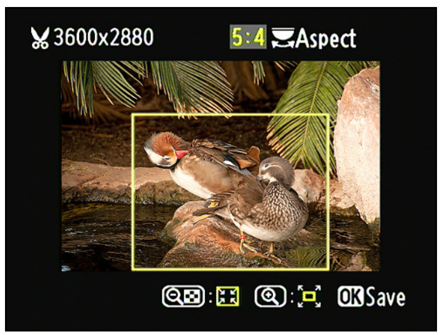


FIGURE 11-13: You also may be able to crop out extraneous background from a photo.

- **Making simple color and exposure changes:** If the color in your image is a little off-kilter or the image is under- or overexposed, you can make simple corrections in-camera. Be aware that these corrections can only be applied to the entire image. If only parts of your image need correcting, you'll need to perform the editing in photo software.
- **Adding special effects:** Many cameras offer a range of special effects that can be applied to your images. For example, you may be able to turn

a photo into a color drawing as shown in Figure 11-14, or add a watercolor effect. Most cameras save the adjusted photo as a separate file with a different filename so you can preserve your original shot.

When you need more powerful editing tools, I make some software recommendations in Chapter 12. See Chapter 14 for a list of my favorite editing and effects apps for mobile devices other than your camera.

FIGURE 11-14: Some cameras even offer simple color and exposure retouching tools.

Viewing Photos on a TV

Want to share your photos with a group of people? You may be able to display those photos on your TV, which is a great alternative to passing around your camera or having everyone huddle around your computer monitor. You can get photos on the big screen in a number of ways. Here are just three:

- **Memory card slots:** Some TVs, DVD players, and other media hubs you may attach to your TV have slots that accept the most popular types of camera memory cards. You can then just pop the card out of the camera and into the slot. Keep in mind that most of these devices can display a still image's JPEG files and movies only (no Raw image files).
- **HDMI or A/V connection:** If your camera has a video-out port, you can connect it with a cable to the video-in port on your TV (or DVD player or whatever as shown in Figure 11-15). After you connect the two devices and turn on the camera, you can navigate through your pictures using the camera's own playback controls. You may even be able to use your TV's

remote control to activate certain playback features. (This option requires that both the camera and remote offer a technology named HDMI-CEC.)

REMEMBER

Most digital cameras sold in North America output video in NTSC format, which is the video format used by televisions in North America. You can't display NTSC images on televisions in Europe and other countries that use the PAL format instead of NTSC. So if you're an international business mogul needing to display your images abroad, you may not be able to do it using your camera's video-out feature. Some newer cameras do provide you with the choice of NTSC or PAL formats.

- **USB connection:** Some TV and video devices even have a USB port. This enables you to connect your camera for picture playback or hook the TV to your computer and access pictures stored on the hard drive (or another computer storage device).

For specifics on these and other connections, track down the manual for your television and camera.

TIP

With some cameras, you can use the same connection for *tethered shooting*, which simply means that the big-screen TV (or monitor) serves as your camera monitor while you shoot. If the monitor is connected to a computer, you can even have your files immediately downloaded to the computer's hard drive for storage. This setup is one that many pros use in a studio because it enables them (and their clients) to get a nice, large view of each image right after it's taken and make adjustments to lighting, poses, and so on, if necessary. With some cameras, you can choose to view everything on both the camera monitor and the large-screen display.

FIGURE 11-15: You may be able to connect your camera to a TV for playback.

IN THIS CHAPTER

» Reviewing photo organization and editing software

» Transferring photos and movies to a computer

» Connecting your camera to a smartphone or tablet

» Processing Raw files

» Preparing photos for online sharing

Chapter 12
Downloading, Editing, and Sharing Photos

After you fill your memory card with images, it's time for the next steps: moving photos to your computer and, if you're so inclined, opening them in a photo program to retouch and enhance them. Then it's time to send your art out into the world. How you do that is up to you. You can make prints, share images via email or social media, create photo gifts, or make an album to pass around to visiting family and friends.

Today's technology makes all those options easily accessible, but as with any digital photography task, there can be pitfalls. You may be dismayed to find that colors in your prints bear no resemblance to the ones you see on your computer monitor, for example. Or your favorite social media site may reject an image for being the wrong file type. To help you avoid these and other possible problems, this chapter offers guidance on preparing your photos for printing and online sharing. In addition, I offer advice on photo software along with tips related to downloading and storing your images.

Sorting through Photo Software

Dozens of good photo programs exist, some aimed at beginners and others at advanced users. Prices vary, too, ranging from free to $50 and up. The next sections introduce you to some programs of the free variety as well as a few to consider if you need more features than the free solutions provide.

Note: In this chapter, I cover programs designed to be used on a computer rather than a mobile device. See Chapter 14 for a list of my favorite tablet and smartphone apps.

Basic (and free) programs

If you don't plan on doing a lot of retouching or other manipulation of your photos but simply want a tool for downloading and organizing your pictures, one of the following free programs may be a good solution:

- **Your camera's own software:** Most manufacturers provide free, downloadable software designed for your camera. Some of them provide only basic photo viewing and organizing, but others are quite capable. Nikon, for example, offers Nikon ViewNX-i, shown in Figure 12-1. This program offers tools for eliminating red-eye, cropping pictures, adjusting color and exposure, and processing Nikon Raw files. You can also display the focus point that you used when taking the picture, as illustrated in the figure.
- **Apple Photos:** Mac users are no doubt familiar with Photos, the browser built into the Mac operating system. Figure 12-2 offers a look at the editing window in this program. (Don't worry if your version of Photos isn't exactly the same; it's constantly being updated and may have a few more features or design elements than you see here.) If you have an older version of the Mac OS, your computer may instead offer an earlier version of this program, called iPhoto.
- **Windows Photos:** Recent versions of Microsoft Windows also offer a free photo downloader and browser. The name varies depending on your version of the Windows operating system; Figure 12-3 offers a look at Windows Photos, which ships with Windows 10. Again, the look and specific features on your computer may be different than what you see in the figure due to updates Microsoft makes on occasion.

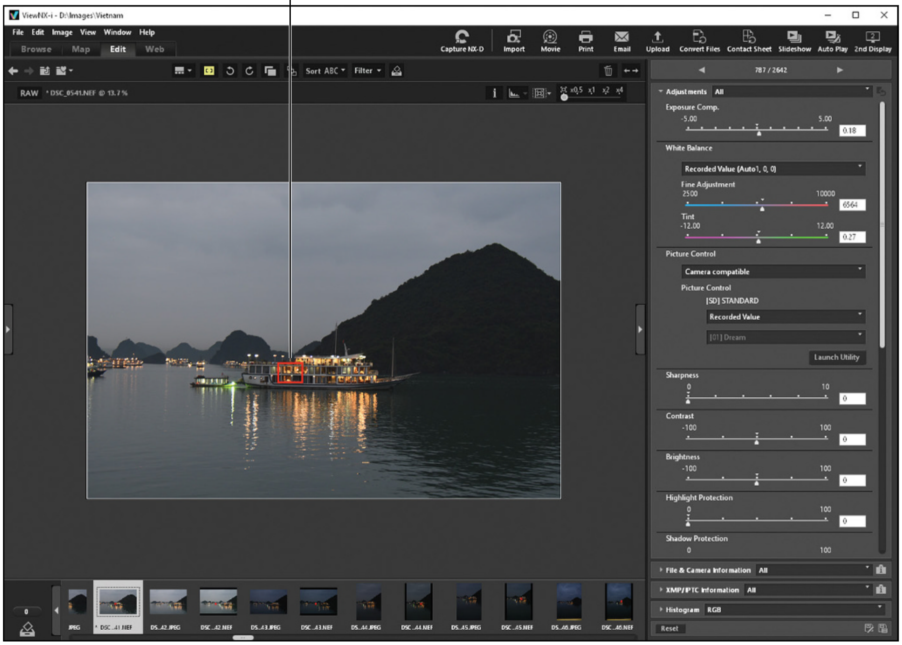


FIGURE 12-1: Most camera manufacturers offer a free image browser and basic photo editor; here's a look at one of Nikon's programs.

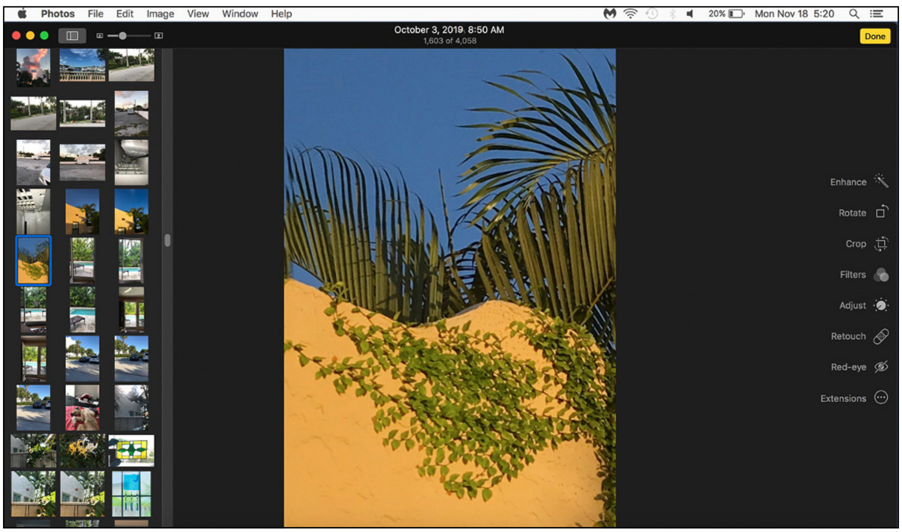


FIGURE 12-2: Apple Photos is a good basic tool for Mac users.

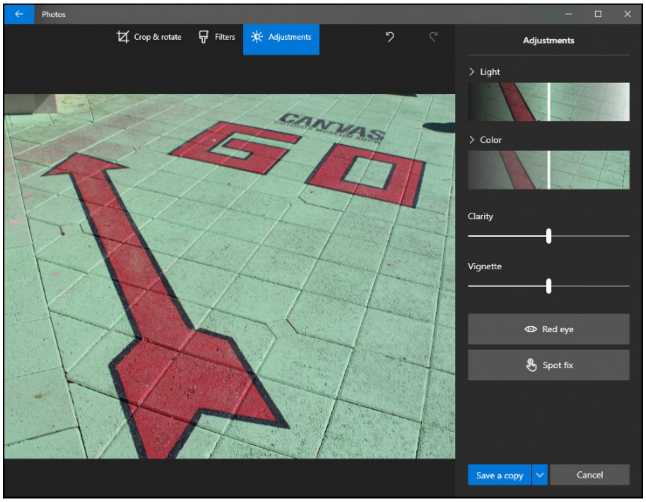


FIGURE 12-3: Microsoft Windows 10 offers its own free Photos program, shown here.

Advanced (and not free) options

Programs mentioned in the preceding section can handle simple photo-editing and -organizing tasks, but if you're interested in serious photo retouching or digital-imaging artistry, you need to step up to a full-fledged, photo-editing program. The following list describes the most popular offerings (prices are the manufacturer's suggested retail):

- **Adobe Photoshop Elements:** With a full complement of retouching tools, step-by-step guides for beginners, and an assortment of templates for creating photo projects such as scrapbooks, Elements offers all the features that most consumers need. But don't think this is a lightweight player — you actually get many high-end editing features as well. The program also includes a photo organizer along with built-in tools to help you print your photos and upload them to photo-sharing sites. You can find out more at `www.adobe.com`. The program sells for $100; add $50 for a bundle that includes Premiere Elements, a video-editing program.
- **Adobe Photoshop and Adobe Photoshop Lightroom Classic:** I mention these two together because Adobe makes them available as a two-tiered solution specifically geared to photographers. Both are available by subscription only; currently, you pay about $10 a month if you subscribe for a year.

  Photoshop offers the industry's most powerful and sophisticated retouching tools. In fact, you probably won't use even a quarter of the tools in the Photoshop shed unless you're a digital-imaging professional who uses the program on a daily basis — even then, some tools may never see the light of day.

Lightroom Classic is popular among professionals who don't always need the high-level tools found in Photoshop. Shown in Figure 12-4, it's geared to processing large numbers of images quickly. For example, with a few mouse clicks, you can make the same color adjustment to an entire series of images from a day's shoot. Visit `www.adobe.com` to find out more. Also note that Adobe offers mobile versions of these programs; I discuss these apps in Chapter 14.

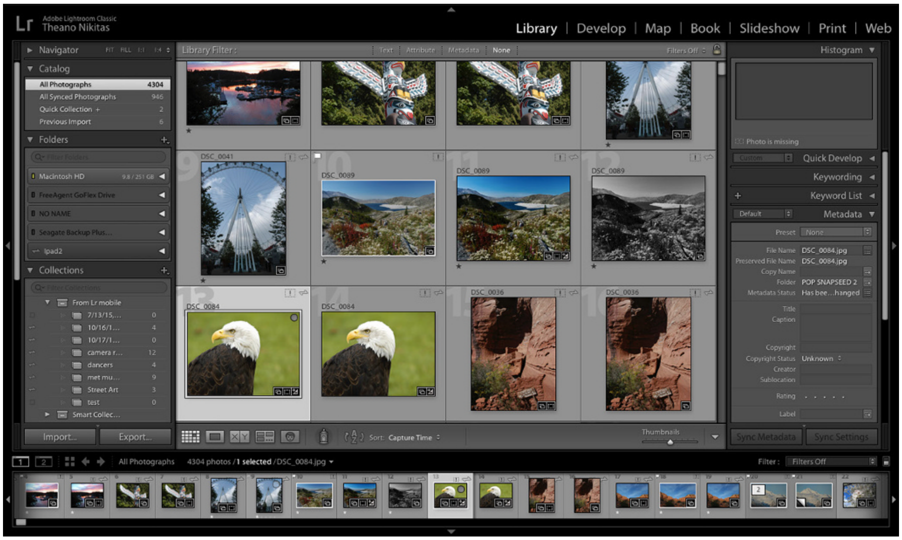


FIGURE 12-4: Adobe Photoshop Lightroom Classic is a popular choice among photographers who need to process lots of images.

Courtesy of Theano Nikitas

- **Affinity Photo:** Available for Mac and Windows, this sophisticated program offers many of the same features as Adobe Photoshop and Lightroom but at a bargain price ($50, `www.serif.com`). An iPad version is also available for $20.
- **Exposure X5:** A solid but easy-to-use program for photo editing, Raw processing, and organization, Exposure really shines when it comes to creative effects. With more than 500 presets that simulate various film looks (including black-and-white and vintage film processes such as daguerreotypes), you can quickly and easily turn even ho-hum photos into beautiful images. Figure 12-5 shows just one example of its creative presets. It can work as a stand-alone program or as a *plug-in* (add-on tool) with Photoshop or Lightroom. (Point your web browser to `www.exposure.com`; the price is either $119 or $150, depending on which version you buy.)

TIP

Not sure which tool you need, if any? Good news: You can download free trials of all these programs from the manufacturers' websites.

FIGURE 12-5: Exposure X5 offers more than 500 presets that simulate various film looks, as shown in this sample image.

Courtesy of Theano Nikitas

Downloading Your Images

Perhaps one of the most hated parts of digital photography is the inevitable task of transferring files from the camera to some sort of digital storage closet, whether it's a computer hard drive or a cloud storage site. Even if you're a computer pro, this process often involves cryptic menu options, tedious setup routines, and unexpected system hiccups. Profanity, although not encouraged, is an understandable part of the deal.

Because the steps required to complete file transfer vary so much depending on your camera, the computing device you use, and the storage option you choose, I can't provide much detailed assistance in this area. But the next two sections provide some general guidance to get you started.

Looking at connection options

To transfer photos from your camera to your computer, the first step is to choose how you want the computer to be able to access your picture files. Depending on your camera, you may be able to use one or all of the following methods:

- **Connect the camera to the computer via a USB cable.** To use this method, your camera must have a USB-out port, and you also need a special USB cable. In case you're new to computers as well as digital cameras,

Figure 12-6 provides a close-up look at a USB port and plug, as well as the symbol used to represent this connection. (USB stands for Universal Serial Bus, which refers to the technology that makes the connection possible.)

Most cameras require a cable that has a standard USB plug that attaches to your computer's USB port and a smaller plug that goes into the camera. If your camera didn't come with the right cable, you can buy one from the manufacturer or from a third-party source that makes the proper cable for your camera.

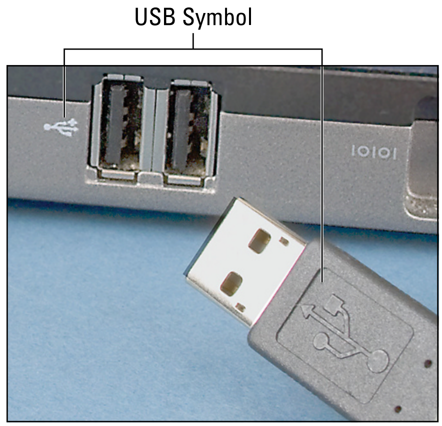


FIGURE 12-6: You can connect most cameras directly to a computer via USB (or USB-C, not shown here).

Note: Many newer computers and accessories come with USB-C connections, which is the latest iteration of USB technology. Adapters are available that enable you to connect USB devices to USB-C devices and vice versa.

WARNING

Before connecting the two devices, be sure to turn off the camera! Otherwise, you risk harming the camera and damaging the files on the memory card. In addition, fully charge your camera battery before beginning the process; if the battery dies during the file transfer, you may lose some picture data.

» **Use a card reader.** A simpler solution for transferring images from a memory card to a computer is using a *card reader.* This is just a device that enables you to ship data directly from a memory card to your computer — no camera or battery power required. You just take the card out of the camera and slip it into the card reader when you want to download photos.

Many computers have built-in card readers; most accept only SD memory cards but some can handle other card types. If your computer doesn't have a built-in card reader or the reader can't recognize the type of card your camera uses, you can buy a stand-alone reader that plugs into your computer's USB or USB-C port. Figure 12-7 offers a look at a reader from Kingston (`www.kingston.com`) that accepts several different types of cards.

WARNING

If you go the card reader route, make sure that the reader not only works with the type of card you use but also can handle the capacity of the card. Some older card readers can't cope with high-capacity cards.

» **Transfer wirelessly.** Some cameras can link to your computer wirelessly, via either a Wi-Fi or Bluetooth connection. You usually need to install computer software provided by the camera manufacturer and do some setup work to enable the camera to connect to your computer. After you take those steps, you can ship images from the camera to the computer over the wireless connection.

  Keep in mind that the speed at which your images are downloaded depends on the speed of the wireless connection. You may find the transfer speed slower than using a wired card reader or cabling your camera to your computer.

FIGURE 12-7: This card reader from Kingston works with types of camera memory cards.

Courtesy of Lexar

Completing the download process

What happens after you establish a connection between a camera or card reader and the computer depends on your computer's operating system and the software you installed. Here are some possibilities:

» **You see an icon representing your camera or memory card on your computer desktop or in the file-management window.** Your computer sees the card as just another drive on your system. In some cases, the camera brand name appears along with or instead of a drive letter.

» **On a computer running Windows, a message box appears to ask you what program you want to use to work with your images.** From this window, you can choose from programs that the system believes can handle image file transfers.

» **An installed photo program automatically displays a photo-download wizard.** For example, the downloader associated with your camera software (assuming you installed that program or another photo program) may leap to the forefront. Usually, the downloader that appears is associated with the software you most recently installed.

If you're using photo-download software, you should be able to view all your photos, select the ones you want to transfer, and specify downloading options such as the name of the folder where you want to store the images. Check the program's Help system for how-to's.

But if you prefer, you can just stick with Windows File Explorer or the Mac Finder and use the same drag-and-drop technique that you use to copy files from a removable storage device to your computer. Normally, you have to open a folder or two to get to the actual image files: They're typically housed inside a main folder named DCIM (for *digital camera images*), as shown in Figure 12-8, and then within a subfolder that uses the camera manufacturer's name or folder-naming structure. After you open the folder, you may see thumbnails of the images or simply the names of the files, as in the figure.

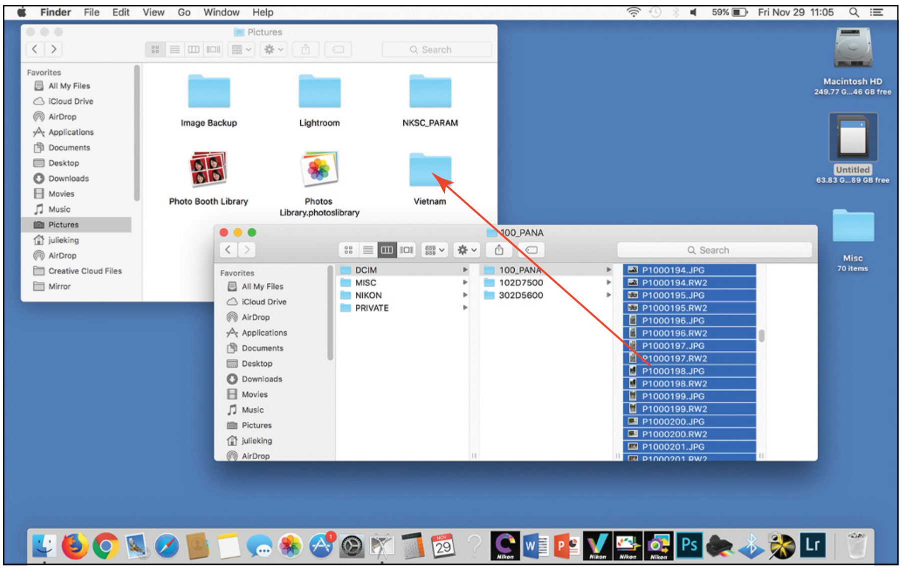


FIGURE 12-8: On a Mac, you can drag and drop files from a memory card using the Finder.

After opening the folder that contains the images, select the ones you want to transfer and then just drag them to the folder on your hard drive where you want to store them, as illustrated in Figure 12-8. Although it's not visible in the figure, you should see a little plus sign next to the cursor when you drag. The plus sign indicates that you're placing a *copy* of the picture files on the computer; your originals remain on the card.

TIP

A few final downloading tips apply no matter which method you use:

- **You don't have to use the same program to edit photos that you use to download them.** You can download using your camera's photo browser, for example, and then open and edit the transferred photos in Adobe Photoshop. In some cases, you first need to *import* or *catalog* the transferred photos into the program, which simply tells the program to build thumbnails for the picture files and notes where to access the originals. This step is required by some versions of Apple Photos, for example, as well as Adobe Lightroom.
- **Watch out for the erase-after-download option.** Many photo downloading tools offer to automatically erase the original images on your card after you transfer them to the computer. Disable that option just in case something goes haywire. It's not a good idea to erase the images on your card until you're confident that they're safely stored on your hard drive and, ideally, in a second backup location.
- **Disable automatic red-eye correction.** Many downloaders attempt to try to remove red-eye during the download process. This option can cause your downloads to take *forever* as the program tries to locate and fix areas that it thinks may be red-eye. It's better to do the job yourself after downloading.
- **You may be able to copy photos to a backup drive at the same time you copy them to your main storage drive.** This feature, found on some photo downloaders, is a great timesaver, for obvious reasons. The initial download may take a bit longer because files are being written to two locations, but you don't have to take the time to select and copy photos to your backup drive later.
- **Unless you're schooled in the art of computer-file organization, copy your files to the default location suggested by the computer.** Depending on your computer's operating system, that folder may be named Pictures, Photos, or My Pictures. Most photo-editing programs, as well as other programs that you may use to work with your pictures, look first in the default folders when you go to transfer, edit, and save pictures. Keeping your images in those folders saves you the trouble of hunting down some custom folder every time you want to work with your photos.

Preserving Your Files

Perhaps the most critical issue for any digital photographer is how to safely store all your files. The following list offers my best advice:

- **Don't rely on a computer hard drive as your only archival storage option.** Drives occasionally fail, wiping out all files in the process. This warning applies to both internal and external hard drives.

  In addition to possible drive malfunction, laptop users have to think about the possibility of theft. I can't tell you how many stories I've heard about people who lost all their baby, wedding, or vacation photos because they kept them on a laptop that was stolen.

  At the very least, a dual-drive backup is in order. You might keep one copy of your photos on your computer's internal drive and another on an external drive. Or you may set up two external drives, if your internal drive is small. That way, if one drive breaks, you still have all your goodies on the other one.

  Note: While all drives can fail, SSD (Solid State Drives) storage is generally less susceptible to problems than mechanical hard drives. And they're faster, too, so you can cut down on image transfer and read/write time when accessing and saving images. As I write this, though, SSD drives are significantly more expensive than mechanical drives.

- **Don't use camera memory cards or flash drives as backups, either.** Both can be damaged if mishandled or exposed to high temperatures, and being of diminutive stature, are easily lost. Memory cards fail, too, and although I've only had it happen a couple of times, I would have been seriously upset had those cards held important images. Also consider that as technology evolves, there's a chance that today's memory cards may not be compatible with tomorrow's card readers.

- **If your computer has a DVD drive, you may want to back up important files to DVD.** Unlike hard drives, flash drives, and memory cards, DVDs themselves aren't subject to mechanical or electrical failure. However, standard DVDs can hold only 4.7GB (gigabytes) of data. With today's high-resolution cameras, which create large image and video files, you may find yourself burning lots of DVDs. In addition, DVD drives aren't provided on many new computers, especially laptops, so you may need to buy an external drive if you want to use this data-storage option. Still, I feel safer putting precious family photos and other can't-be-re-created images on a DVD.

- **Take advantage of cloud storage (online data storage) for another level of file security.** Even if you do back up your files to DVD, I recommend also storing important files at an online storage site. This practice covers you in the event of fire or another catastrophe that takes out both your computer equipment and your DVDs.

  Some cloud storage sites are geared toward photographers, providing not just file storage but also tools for creating slide shows and photo albums, and for sharing your images with others. But if you don't need those features or you want to store documents and other non-image files, cloud services geared toward businesses and other general uses work just as well. Some sites enable you to set up a system of automatic backups, where the computer sends new files to the storage site on a regular basis, with no prompting from you.

  How much you'll pay for cloud storage depends on the amount of space you use and what other tools the company provides. To find the right fit, search online or in your favorite photography or computer magazine for recent cloud-storage reviews. Be sure to note the type and size of files the site accepts (many don't let you store Raw files, for example).

  One final point: *Don't rely on cloud storage alone.* You have no guarantee that the company that's storing your photos won't go out of business, leaving you without any way to get your files back. In addition, although some companies offer financial restitution if their storage hardware fails, that money can't get your photos back. So anything you store online should be also kept on DVD or a regular hard drive.

- **Don't forget to print!** One often overlooked archiving option is to print your favorite photos. Presuming that you store them correctly, prints last a long time and aren't subject to hardware failures, electrical disruptions, and the like. Even if you lose every bit of hardware you own, you can have your prints scanned to create new digital originals.

Converting Raw Files

Many digital cameras can capture images in the Raw file format. Shooting in the Raw format offers a number of benefits, which you can explore in Chapter 2. But if you want to have images printed at a retail lab or to share them online, you need to *process* the Raw files and then save them in a common image format. Ditto for Raw photos that you want to use in a word processing, publishing, or presentation program — actually, in any program except photo software that can understand the particular Raw language spoken by your camera. (Every manufacturer has its own proprietary Raw format, and each new model from that manufacturer produces Raw files slightly differently from the previous models.)

You have a couple options for converting Raw files:

» **Some cameras offer a built-in converter.** For example, Figure 12-9 offers a look at the converter available on some Nikon cameras. These tools enable you to control just a few picture attributes and require you to rely on the camera monitor to make judgments about color, exposure, and sharpness, which isn't ideal given the variations that exist among displays and the size of even the largest camera monitors. Still, having this option is terrific for times when you need to process a Raw file on location or when you're in a hurry.

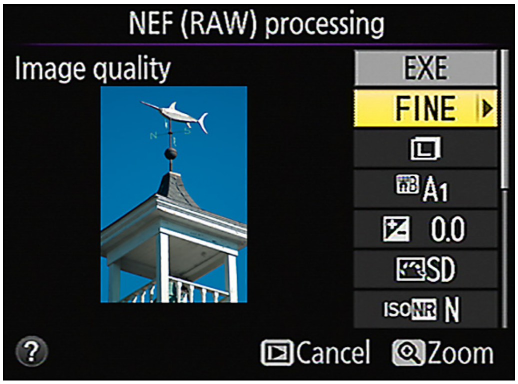


FIGURE 12-9: Here's a look at the built-in Raw converter found on some Nikon cameras.

» **After downloading the Raw files to your computer, you can process them using a photo program that offers a converter.** The software provided by your camera manufacturer may provide a Raw converter, and many photo-editing programs also offer this tool. Figure 12-10 offers a look at the Raw converter found in Adobe Photoshop, for example. The number of parameters you can adjust depends on the software, so investigate this feature carefully when shopping for a program to process Raw files.

For specifics on selecting conversion settings, I need to point you to your camera or software manual. But here are a few general rules:

» **Don't erase your original Raw file.** You may someday want to convert the file using different settings, and retaining the Raw file means that you always have an original image in pristine condition that you can return to, if necessary.

FIGURE 12-10: Adobe Photoshop's ACR (Adobe Camera Raw) offers multiple panels of image-tweaking options in its Raw converter.

Courtesy of Theano Nikitas

- **The settings you use when making your Raw conversion stay with the Raw file, sort of like an invisible recipe card.** The next time you reopen the file in the converter, they're automatically applied as you did them the first time. But because your picture data still is technically "raw," you can apply a whole new set of adjustments without doing any damage to the picture.
- **To retain the highest image quality in the converted file, save it in the TIFF format.** TIFF (tagged image file format) is a *non-destructive* format: It preserves as much of the Raw file's original image data as possible. That translates to the best image quality possible. Most photo-editing, word processing, and publishing programs can work with TIFF files, and most retail labs can print TIFF files as well.

  TIFF does have one downside: Pictures stored in this format are much larger than JPEG files. But that's the price you have to pay if you want to retain your image at its highest quality.
- **If you want to use your converted file online, save a copy in the JPEG format.** TIFF files don't work online or in email. JPEG is the universal online photo format and also is fine for taking photos to retail print shops. Just know that unlike TIFF, JPEG is a *lossy* format. To reduce file sizes, JPEG tosses away some image data as the file is saved. You can read more about this issue in Chapter 2, but as far as Raw conversion goes, the best practice is to save one file in the TIFF format and then save a copy in the JPEG format for online use. See "Preparing Pictures for Online Sharing" for more information.

WARNING

- **Before you do any Raw conversions — or any photo editing, for that matter — calibrate your monitor.** This step, explained in the later section "Getting print and monitor colors in sync," ensures that you're seeing an accurate representation of image color, contrast, and brightness.

Looking at Your Printing Options

When it comes to photo printing, your creative options are almost limitless. Sure, you can get glossy snapshots, but you can also have your favorite images printed on canvas, metal, glass, wood, fabric — pretty much any surface you can think of. You can also show off your favorite photos in albums, on T-shirts, greeting cards, mugs, and calendars and gift them to family and friends. I used the photo and text shown in Figure 12-11 for a get-well card, for example.

FIGURE 12-11: I used a photo as the basis for this custom-made get-well card.

Whatever medium you choose, your options for getting your printing job done boil down to four resources:

- **Local retail stores:** You can take your memory card to almost any drugstore or big-box retailer such as Costco or Walmart, use a do-it-yourself kiosk, and leave with prints of your best images. You may even be able to do some minor retouching, such as cropping and eliminating red-eye, right at the kiosk. You can also usually upload image files to the retail store, fill out an online print order, and then pick up the prints at your convenience or have them delivered to a retail store in another city or state so family and friends can pick up their sets of the images. Specialty photo products such as calendars and mugs are usually available for order as well.
- **Photo-sharing sites:** Most online photo-sharing sites also offer prints and other photo products; check out sites such as Snapfish (`www.snapfish.com`), Shutterfly (`www.shutterfly.com`), and SmugMug (`www.smugmug.com`).

- **Professional photo labs:** You may pay a little more than you would at Walmart, for example, but pro photo labs tend to offer the best quality and widest variety of print options and products. You can order online at labs such as `www.bayphoto.com` and `www.nationsphotolab.com`.
- **Your own printer:** If you're more of a DIY creative and want to be able to print whenever the mood strikes you, all you need is photo-printing paper and a capable inkjet or laser printer. You can even buy portable snapshot printers for printing on the go. Chapter 14 introduces you to some of these pocket-sized (or just a little larger) products.

  The other benefit of doing your own printing is that you have complete control over the output, which is important to many photo enthusiasts, especially those who exhibit or sell their work. If that describes you and you don't already own a stellar photo printer, check photo magazines and websites for reviews on the best models for the type of prints you want to make. Know that most general purpose printers — the kind that you're likely to find in office-supply stores, for example — may not be top performers when it comes to outputting photos.

  WARNING

  One caveat: Good prints require not only high-resolution photos, as outlined in the next section, but also good photo paper. You can save a few bucks by purchasing "store brand" paper, but in my experience, name-brand papers perform better and are available in a wider selection of types (for example, watercolor or canvas). I suggest that you start with paper sold by the manufacturer of your printer because that paper is specifically engineered to work with your printer's inks.

Avoiding Printing Pitfalls

After years of helping people sort out photo-printing problems, I've learned that most printing woes can be traced to a handful of issues. The next sections provide the information you need to avoid them.

Checking resolution: Do you have enough pixels?

For good-quality prints, you need an adequate pixel population. Chapter 2 explains the role of pixel count, or resolution, in detail, but the short story is that you should aim for the neighborhood of 300 pixels per linear inch of your print. If you want to print, say, an 11 x 14-inch photo at 300 ppi, your image needs to contain at least 3300 x 4200 pixels, or roughly 13.8 megapixels. (Here's the math: 11 inches by 300 equals 3300 pixels; 14 x 300 equals 4200 pixels; and 3300 x 4200 pixels equals a total resolution of 13.8 million pixels, or megapixels.)

WARNING

Without enough pixels, prints will look jagged along curved and diagonal lines and exhibit other visual defects. Even though some photo programs enable you to add pixels to an existing image, doing so never improves picture quality.

If you're printing photos at a retail or online site, the printer's order form usually indicates how large a print you can make given the image's pixel count. If you're doing your own printing, you have to be the resolution cop, though. You can find out how many pixels you have by looking at the image file properties during picture playback on the camera. (You may need to change the camera's display settings to do so.) For example, in Figure 12-12, the resolution value reports 4032 x 3024 pixels. (I dimmed everything except that value to make it easier to spot.)

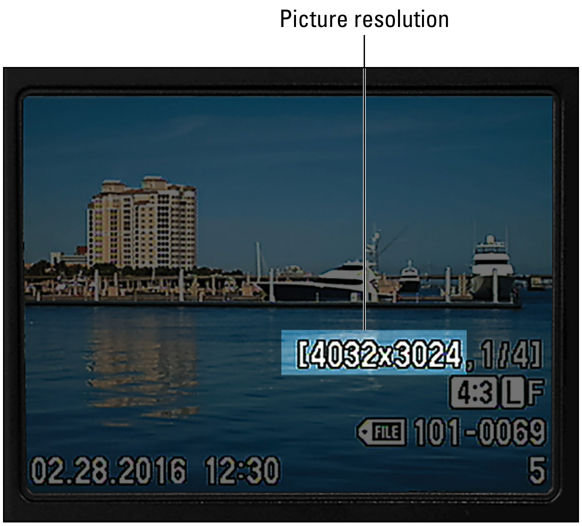


FIGURE 12-12: You can usually choose a playback display mode that indicates the picture resolution.

You also can view resolution information in the photo software after you download pictures to your computer. For example, here's how to get to the resolution data in the free photo programs provided on Windows-based and Mac computers:

- **Windows:** In Windows Photos, click the image thumbnail to display the photo in a window similar to the one shown in Figure 12-13. Click the three dots labeled *Click to open menu* to display a drop-down menu. From that menu, choose File Info to see a panel showing data including the filename, the date the picture was taken, the file size, and the picture resolution.

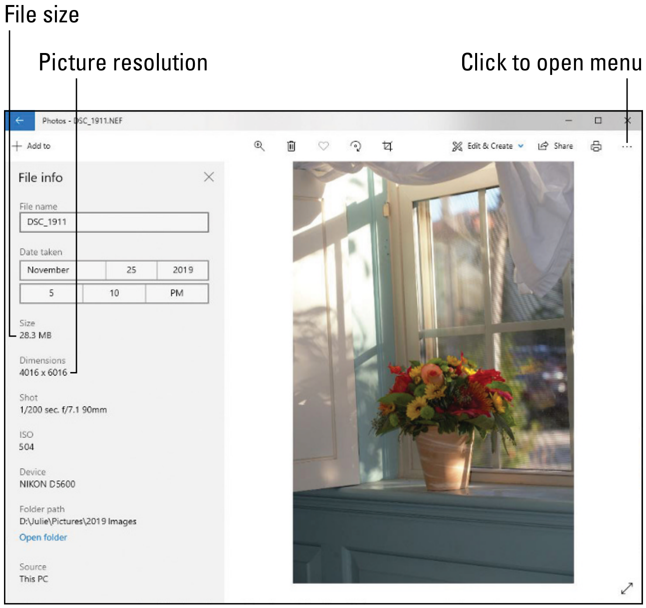


FIGURE 12-13: In WIndows 10 you can check the pixel count by viewing the image in the Photos program.

REMEMBER

Note that the file size value shown here (28.3MB, or megabytes) is not the image resolution, which is stated in megapixels (MP). In this case, the megapixel count is roughly 24.1 MP (4016 x 6016 pixels equals about 24.1 million pixels).

» **Mac:** After launching Photos, click the image thumbnail, open the Window menu, and choose Info. Or just click the **i** button highlighted in Figure 12-14. You then see a box listing an assortment of picture settings, including the resolution, as shown in the figure.

For pictures stored on your smartphone or tablet, you may be able to pull up resolution data in whatever photo viewer the device's operating system provides. If not, many third-party photo apps enable you to get the image file to disclose its hidden metadata. Of course, if you didn't crop the photo and your phone takes pictures at only one resolution setting, you can just check the phone's camera specs to find out the image resolution.

Getting print and monitor colors in sync

Aside from poor picture quality, the number-one printing complaint is that colors on the computer monitor don't match the ones that show up in print. When this problem occurs, most people assume that the printer is to blame, but in fact the most likely culprit is the monitor. If the monitor isn't accurately calibrated, the colors it displays aren't a true reflection of your image colors.

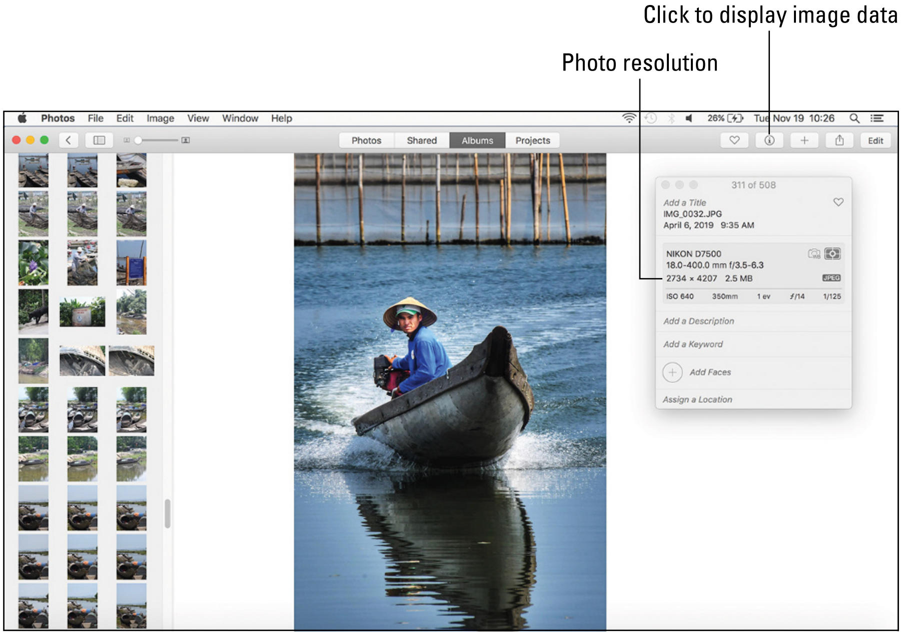


FIGURE 12-14: In the Mac Photos program, click the **i** button to display resolution data.

You can start with a software-based calibration utility, which is a program that. The program guides you through the process of adjusting the monitor by displaying various color swatches and other graphics and asking you to provide feedback about what you see on the screen.

Both the Windows and Mac operating systems offer built-in calibration programs. If you use a Mac, the utility is called Display Calibrator Assistant. Windows 10 offers a similar tool named Display Color Calibration.

For a more accurate calibration, you may want to invest in a device known as a *colorimeter*, which you attach to or hang on your monitor, to measure and calibrate the display. See Chapter 14 for a look at this tool.

If your monitor *is* calibrated, color-matching problems may be caused by these other issues:

- **One of the print nozzles or heads is empty or clogged.** Check the manual to find out how to perform the necessary maintenance to keep the nozzles or print heads in good shape.
- **You chose the wrong paper setting in your printer software.** When you set up the print job, be sure to select the correct paper-type — glossy, matte, and so on. This setting affects how the printer lays down ink on the paper.

TIP

Some paper manufacturers provide *ICC profiles,* which are small data files that help your printer and computer better translate your image colors to the specific paper you're using. (ICC stands for International Color Consortium, the group that developed the universal color translator on which this system is based.) After you download and install the profiles, you should see the related paper types (for example, Epson Premium Luster) in the list of options in your printer settings dialog box. If you're using paper made by the printer manufacturer, though, the profiles are usually automatically added when you install the printer software during initial setup.

- **Your printer and photo software are fighting over color-management duties.** Some photo programs offer features that enable the user to control how colors are handled as an image passes from camera to monitor to printer. Most printer software also offers color-management features. The problem is, if you enable color-management controls in both your photo software and your printer software, you can create conflicts that lead to wacky colors.

  Unless you're schooled in color management, I recommend letting your printer handle things. However, it's wise to do a few test prints to see whether results are better when you hand the job to your photo software. Check your photo software and printer manuals to find out the color-management options available to you and how to turn them on and off.

REMEMBER

Even if all the aforementioned issues are resolved, however, don't expect perfect color matching between printer and monitor. Printers simply can't reproduce the entire spectrum of colors that a monitor can display. In addition, monitor colors always appear brighter because they are, after all, generated with light.

I also caution you against using a laptop monitor or tablet to evaluate images because the displayed colors, brightness, and sharpness can change when you adjust the screen angle or even move your head a little. I recommend buying a separate monitor that you can connect to your laptop when you need to work on your images.

Finally, be sure to evaluate print colors and monitor colors in the same ambient light — daylight, office light, whatever — because that light source has its own influence on the colors you see. If your prints will be displayed in a gallery, you also should make sure that colors look good in whatever lighting the gallery uses. Ditto for prints you hang in your own home, of course.

Preparing Pictures for Online Sharing

Getting your digital photos ready for online use, whether you want to use them on your own web page, post them on a social media site, or send them via email, involves two tasks. First, you need to check the size of the image file and, most likely, create a lower-resolution copy for online use. Second, you need to check the file format; for online use, you need to use JPEG.

Some cameras have built-in tools for handling both tasks. You also can do the job after downloading photos to your computer, using whatever program you typically rely on to edit images.

I don't have room to provide you with detailed instructions for either task, because the steps vary greatly depending on which tool you use. But the next two sections offer some general guidelines.

Sizing photos for screen display

How many times has a well-meaning friend or relative sent you a digital photo that's so large you can't view the whole thing on your monitor? This occurs when people attach their original, high-resolution photos to their emails — the files simply have way too many pixels to fit on the screen. (Chapter 2 explains why high-resolution photos take up so much screen space.)

Fortunately, the latest email programs have tools that automatically adjust the display of large images to make them viewable. Even so, that doesn't change the fact that sending someone a mega-resolution picture means that you're sending them a very large file, and large files mean longer downloading times and, if recipients choose to hold on to the picture, a big storage hit on their hard drives.

Sending a high-resolution photo *is* the thing to do if you want the recipient to be able to generate a good print. But for simple email sharing, I suggest limiting photos to about 800 pixels on the longest edge. This limit ensures that people who use an email program that doesn't offer the latest photo-viewing tools can see your entire picture without scrolling.

The same sizing usually works well for Facebook, Instagram, and other social media sites, but check the site's image restrictions before you post. If the picture will be used on a business website, the web administrator or designer should be able to tell you the size guidelines to follow.

Some cameras have built-in tools for creating a web-sized copy of your image. If yours doesn't, you can do the job in any photo editor.

Saving files in the JPEG format

In addition to paying attention to file size, you need to be sure that your files are in the JPEG file format, which is the only format that's sure to be viewable in all web browsers and email programs. Most cameras are set to shoot in the JPEG format by default, but if you shoot only in the Raw format (rather than JPEG or Raw + JPEG), you first have to convert the Raw file and save a copy in the JPEG format for online use. You may be able to create this copy right in the camera; if not, you can use a photo-editing program to do the job.

What about PNG (pronounced "ping") and GIF, the other two online formats you may encounter? Well, PNG is a less-common image standard on the web, so I don't recommend it. And GIF files can contain only 256 colors, so photos appear splotchy when saved to this format. GIF is designed for logos and other simple graphics that contain only a few colors.

TECHNICAL STUFF

To avoid some potential confusion when you save files in the JPEG format in a photo editor, here's advice about a couple of options you may encounter:

- **Quality:** Inside the program's file-saving dialog box, you usually see an option named Quality. In some cases, you may find this feature instead provided within the overall program-preferences settings; in that case, the program uses the same setting for all files you save in the JPEG format.

  Either way, the Quality option relates to the how the JPEG format achieves its smaller file sizes, which is to remove some of the original picture data from the file — a process known as *lossy compression.* A higher Quality setting results in less lossy compression, which translates to a better-looking image but a larger file size. As you lower the Quality setting, more data is tossed, the file size shrinks, and the image quality is further degraded.

  The good news is that if you first reduce the resolution of your photos as suggested in the preceding section, your files shouldn't be too large for most online uses even if you select the highest Quality setting (least amount of compression). Remember that with onscreen images, pixel count only changes the size of the display, not the quality, whereas the amount of JPEG compression *does* affect picture quality. See Chapter 2 for more on this issue.

WARNING

- **File naming:** If you're saving a low-resolution copy of a JPEG original, *be sure* to give the copy a name that's different from the original. Otherwise, the full-resolution version will be overwritten by the smaller file. You may even want to save your screen-size images in a separate folder so that you can track them down more easily when it's time to upload them to their final online destination.

5 The Part of Tens

IN THIS PART . . .

Got a problem photo? Maybe one that's overexposed, out of focus, too red or blue, or (yikes) all of the above? Look here for easy solutions to the most common picture-taking pitfalls.

Get tips on finding the best essential camera accessories, from camera bags to tripods.

Discover other cool tools that can make your photography easier or just plain more fun, from innovative camera straps to editing and effects apps for your smartphone or tablet.

IN THIS CHAPTER

» Adjust under- or overexposed photos

» Avoid blurry images

» Remove or diminish visual distractions

» Straighten and crop photos

» Fix color problems

» Deal with a few digital defects

Chapter 13
Ten Fixes for Common Photo Flaws

When you return from a photo outing, don't be discouraged if you like only a handful of images out of all the frames you shot. A 100 percent good-to-garbage ratio is unrealistic, especially when you're photographing kids, wildlife, or other unpredictable subjects. And don't be quick to delete flawed photos — you may be able to fix them in a photo-editing program or mobile photo app. Your camera may even have some retouching tools built in. This chapter offers tips to help you avoid common picture problems and covers some tools that help you repair mistakes after the fact.

Discover a Few Easy Exposure Fixes

Autoexposure is a beautiful thing, sparing you the task of choosing (and fully understanding) all the exposure settings your camera offers. But sometimes, the autoexposure system delivers a picture that's darker or brighter than you have in mind. When that happens, you may be able to get the result you want by using one of the following solutions:

- **Turn on exposure compensation.** This common exposure-correction tool, usually represented by a plus/minus sign like the one in the margin here, tells the camera to increase or decrease exposure for your next shot. The default setting is EV 0.0, which applies no adjustment. (EV stands for *exposure value.*) Raise the value for a brighter exposure; lower the value to get a darker result. Figure 13-1 shows an example of a scene that benefited from applying an exposure compensation value of EV +1.3.

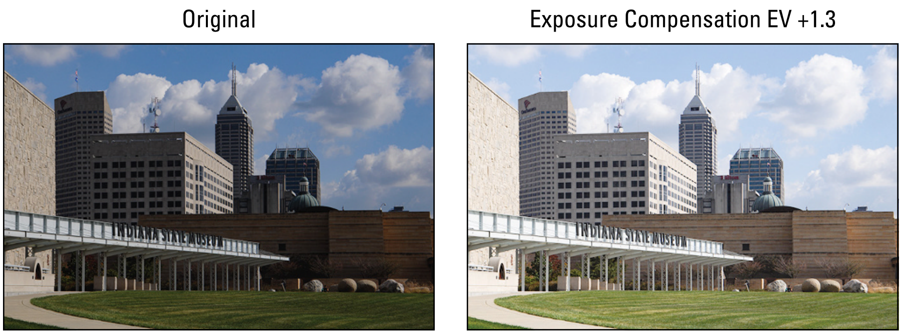


FIGURE 13-1: For a brighter image, raise the exposure compensation value.

- **Add flash.** When the light is behind your subject, the camera may mistakenly underexpose the subject, as shown at the top in Figure 13-2. Using flash typically solves the problem; the bottom image in the figure offers an example of the change you can expect. This solution assumes that you're close to your subject, though; a built-in flash usually can't reach farther than about 10 to 15 feet from the camera.
- **Investigate camera modes designed for high-contrast scenes.** A high-contrast scene is one that contains both very dark and very bright areas. When you shoot in Auto mode, you often get a result like the one on the left in Figure 13-3, where the brightest areas are almost white and yet the shadows are a little too dark. Many digital cameras now offer settings designed to produce a much better result, like the one shown on the right in the figure.

These tools go by various names depending on the camera, and they work in a couple of different ways. For this image, I used a mode known generically as automatic HDR (high dynamic range).

Chapter 5 provides more details on exposure-correction tools; Chapter 6 covers flash photography. Also check out Chapters 8 through 10 for exposure tips specific to portraits, action shots, and landscapes.

No flash

With flash

FIGURE 13-2: When subjects are in front of the light, use flash to better illuminate them.

FIGURE 13-3: Many digital cameras offer tools designed to deliver better results than Auto mode when you shoot high-contrast scenes.

Take Steps to Avoid Blurry Pictures

A blurry photo can result from a number of issues, each of which requires a different solution. Chapter 7 provides in-depth coverage of this topic, but here are some quick tips to help you sidestep three common causes of out-of-focus photos:

- **Mount the camera on a tripod to avoid camera shake.** An image that's blurry throughout the whole frame, like the one shown on the left in Figure 13-4, is due to *camera shake* (movement of the camera during the time the picture is being exposed). If you don't have a tripod handy, try raising the shutter speed. A shorter exposure time increases the odds of a shake-free handheld shot because you don't have to hold the camera still as long. Also enable image stabilization, if your camera or lens offers that feature, which is designed to compensate for a little camera shake.
- **When autofocusing, compose the shot so that your subject falls under the active focus point.** By default, most cameras focus on the object closest to the lens or at the center of the frame. Many cameras enable you to specify a different focus point, however. On touchscreen cameras, you often can simply tap your subject on the screen to set focus on that area. See Chapter 7

to get a better understanding of digital-camera autofocusing systems and take the time to figure out which autofocus settings are available on your camera. The topic is a bit of a snore, but it makes a huge difference in your autofocusing success.

- **Use a fast shutter speed to capture moving subjects without blur.** How fast a shutter speed you need depends on how fast your subject is moving. Chapter 9 has a table of suggested shutter speeds to get you started as well as additional tips for capturing tack-sharp action shots. If you can't control shutter speed on your camera, see whether it offers a Sports scene mode, which is designed to use the fastest shutter speed possible.
- **If your camera has a viewfinder, be sure to adjust it to your eyesight.** Otherwise, scenes that are in focus may appear blurry, and vice versa. A sidebar in Chapter 2 provides information to help you make this adjustment.

Handheld, 1/2 second exposure

Tripod mounted, 1/2 second exposure

FIGURE 13-4: Allover image blur (left) is usually due to camera movement during the exposure; use a tripod to eliminate the problem (right).

Scan the Frame Before You Shoot

At first glance, the left photo in Figure 13-5 looks like a winner. The exposure is fine, focus is sharp, and my subjects appear happy and relaxed. But on closer inspection, the astute portrait photographer notices two frame-spoiling issues: a tree appears to be growing out of the head of the male subject; and the black purse strap on the woman's shoulder draws the eye away from her face.

In this case, the fix was easy. Before taking the second shot, I asked my friend to put down her bag, and then I moved the pair a few feet to the right of the tree. Sometimes, though, you need to work a little harder to eliminate distracting elements. Look for a camera angle that doesn't include nearby objects, for example. Another option is to shoot with a telephoto lens, which includes less background than a wide-angle lens.

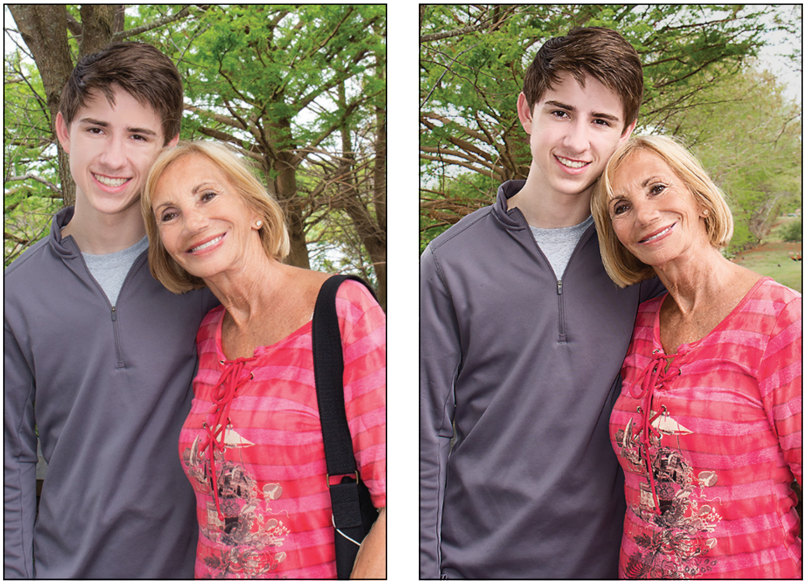


FIGURE 13-5: The tree directly behind the head of my male subject, along with the bag on the woman's shoulder, marred the left portrait; eliminating those distractions produced the better image on the right.

Blur a Busy Background

If you can't eliminate intrusive background objects, you can diminish their impact by using settings that throw the background out of focus — in photo terms, produce a *shallow depth of field.* The scene shown in Figure 13-6 offers an example. I wanted to photograph the paella pan because I thought the dish was so colorful and interesting that it deserved at least a few frames. But with other dinner guests eager to dig in, I didn't have time to completely arrange the background objects to my liking. So, I used the shallowest possible depth of field to blur everything except the pan and its contents. The bread bowl and other dishes add some interest to the background, but because they're blurry, they don't compete with the star of the show.

REMEMBER

You can reduce depth of field in three ways: by setting the aperture to a low f-stop value; using a lens that has a long focal length; and getting closer to your subject. For the example image, I used an f-stop of f/5.6; focal length was 117mm; and I was about 2 feet from the paella pan. See Chapter 7 for help with understanding these settings and other issues related to depth of field.

FIGURE 13-6: A shallow depth of field blurs background objects, making them less visually intrusive.

Level the Horizon

For reasons I have given up trying to understand, I can't seem to keep my camera level when handholding shots like the one in Figure 13-7. In this case, the horizon line tilts noticeably downward to the right.

FIGURE 13-7: Either the ocean is sliding off the edge of the earth or I didn't hold the camera level when shooting the picture.

A fail-safe solution is to mount the camera on a tripod that has a built-in level. But here are two other options:

- **Enable a viewfinder or monitor alignment grid, if available on your camera.** For example, Figure 13-8 offers a look at a viewfinder grid. Check your camera manual to find out whether you have this feature and, if so, how to enable it.
- **Apply a straighten tool in your photo-editing program.** Even most free programs offer this type of tool. On computers running the latest iteration of Windows 10, for example, the free Photos program shown in Figure 13-9 can do the job. You simply click the Straighten button, and the program automatically rotates the horizon so it's level. In other programs, you may instead need to drag the mouse across a line that should be horizontal (or vertical). The software rotates the image as needed based on that input.

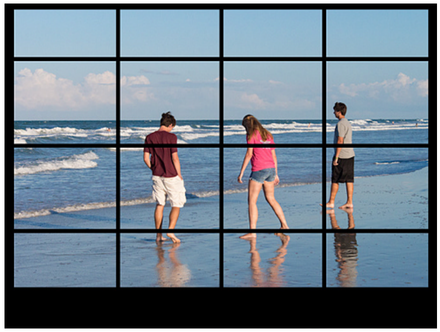


FIGURE 13-8: Some cameras enable you to display a grid in the viewfinder to help you frame your scene so that the horizon line is level.

TIP

Cameras that have built-in retouching tools sometimes offer a leveling tool as well. It often goes by the name Straighten tool.

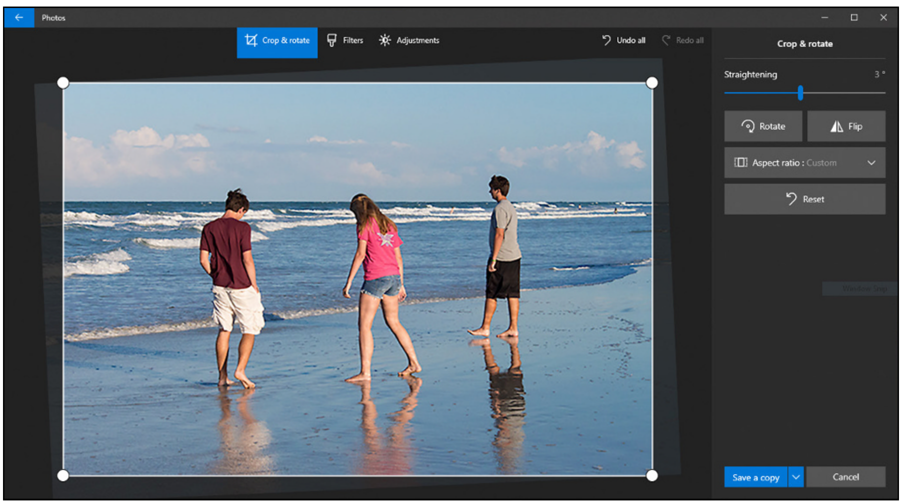


FIGURE 13-9: Windows Photos offers an easy-to-use straightening tool.

Figure 13-10 shows the corrected seaside scene. Notice that the resulting image contains slightly less image area than the original, which is a necessary outcome of the leveling process. So framing the image a little loosely is a good idea when taking a shot in which the horizon line is prominent. That way, you don't lose important aspects of the scene when you straighten the image.

FIGURE 13-10: The straightened image contains slightly less image area than the original, which is an unavoidable result of the correction.

Crop Away Excess Background

To *crop* an image means to trim away some of the perimeter of the photo. Cropping enables you to eliminate excess background when circumstances didn't enable you to get close enough to your subject to fill the frame when shooting the photo. You may also want to crop a photo to produce an image that fits a particular frame size or to create a composition that you didn't capture in the original image.

Some cameras have built-in tools that make a cropped copy of the original photo. If your camera doesn't, any photo editor should offer one. You can also find crop tools in most photo apps for phones and tablets. Figure 13-11 shows a crop in progress, this time featuring the Gallery app available on some Android mobile devices.

Notice the crop tool symbol labeled in the figure; this shape is the standard crop-tool icon. It's designed to look like the mechanical cropping tools used in film-printing darkrooms, in case you're wondering. In the digital world, all crop tools operate pretty much the same way: After you see an initial cropping frame, you drag the edges of the frame as needed to adjust it. Sometimes, you see special corner handles to drag, as in the figure. When you execute the crop, areas outside the crop frame are clipped away, and you can then save your cropped photo. Give the cropped version a new name if you want to retain the original file.

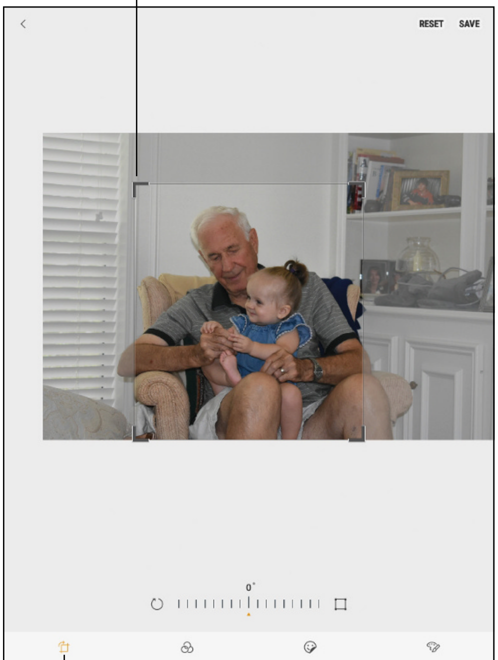


FIGURE 13-11: After selecting the crop tool, adjust the boundaries of the crop box to control how much background to eliminate.

WARNING

If the photo also needs straightening or distortion or perspective correction, an issue covered in Chapter 10, make those changes *before* you crop. You want all the original pixels available to make these types of corrections because they result in the loss of some image area.

Solve Color Miscues

If image colors appear off when you review pictures on your camera monitor, try adjusting the white-balance setting and retaking the shot. This setting is designed to compensate for the colors cast produced by different types of lighting.

Normally, the default setting, AWB (automatic white balance) works well. But when more than one type of light is hitting the subject, the camera can get confused and render colors inaccurately. Most cameras enable you to dump out of AWB mode and select an option geared to a specific type of light. Choose the one that matches the most prominent light source. If your camera offers a live preview, the monitor will reflect the change so that you can find the setting that works best for the scene.

WARNING

It's a good idea to reset the camera to AWB after you finish shooting the scene that caused you to switch from that setting. Otherwise, you can easily forget that the camera is set up for a specific light source and end up with wildly incorrect colors on your next shoot. I made that very mistake when shooting the first image in Figure 13-12. I left the white balance set to Incandescent, used for some interior shots, when I went outside to shoot the harbor scene. The strong blue tint was the result of using the Incandescent setting in bright daylight. Changing back to AWB fixed the problem, producing the image shown on the right.

FIGURE 13-12: The strong blue cast in the left image happened because I mistakenly used a white-balance setting designed for indoor lighting; switching to automatic white balance (AWB) fixed the problem.

Turn Down the Noise

Noise is a digital defect that has the appearance of small grains of sand, as shown in Figure 13-13. Noise can occur for two reasons: a high ISO (light sensitivity) setting and/or a long exposure time (slow shutter speed).

To lessen the chances of noise, then, shoot with the lowest ISO setting and the fastest shutter speed that enable you to expose the picture given the lighting conditions and the aperture (f-stop setting) you want to use. Chapter 5 talks more about noise as well as other exposure issues.

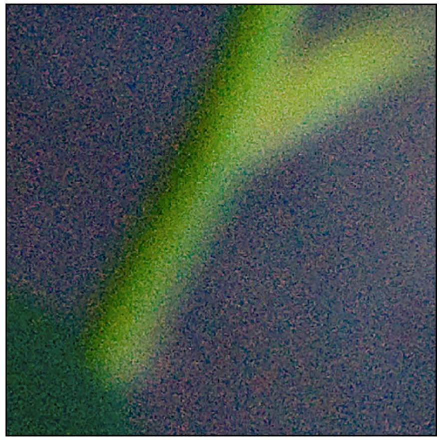


FIGURE 13-13: Here's a close-up look at image noise, which can be caused by a high ISO setting, long exposure time, or both.

Deal with Dust Spots and Lens Flare

Starting to see dark spots — or just a single spot, like the one in Figure 13-14 — on your images? It could be that you have dirt or dust on your lens, in which case a careful cleaning will resolve the problem. If the spots remain, it's fairly certain that debris on your image sensor is the problem. (The *image sensor* is the part of your camera that absorbs light and converts it into a digital image.)

Most cameras have an internal sensor-cleaning system, so check the instruction manual to find out how to perform a cleaning cycle. No luck? Take your camera to a repair shop to have the sensor cleaned manually. On removable-lens cameras, you can take off the lens and

Sensor dust spot

FIGURE 13-14: This spot was caused by dust or dirt on the image sensor.

try to do the job yourself, but you can easily damage the sensor if you're not careful. I say leave it to the pros, but you be your own judge.

REMEMBER

Don't confuse the type of spot seen in Figure 13-14 with the one in Figure 13-15, which is caused by an entirely different issue: Light hitting the lens at just the right angle caused *lens flare.* Some lenses come with a lens hood that's designed to shield the lens from the stray beams of light that cause lens flare; you can see one on the right in Figure 13-15. You also can just hold your hand above the lens in a position that eliminates the flare. You'll be able to see the flare in the viewfinder or monitor after you compose your shot.

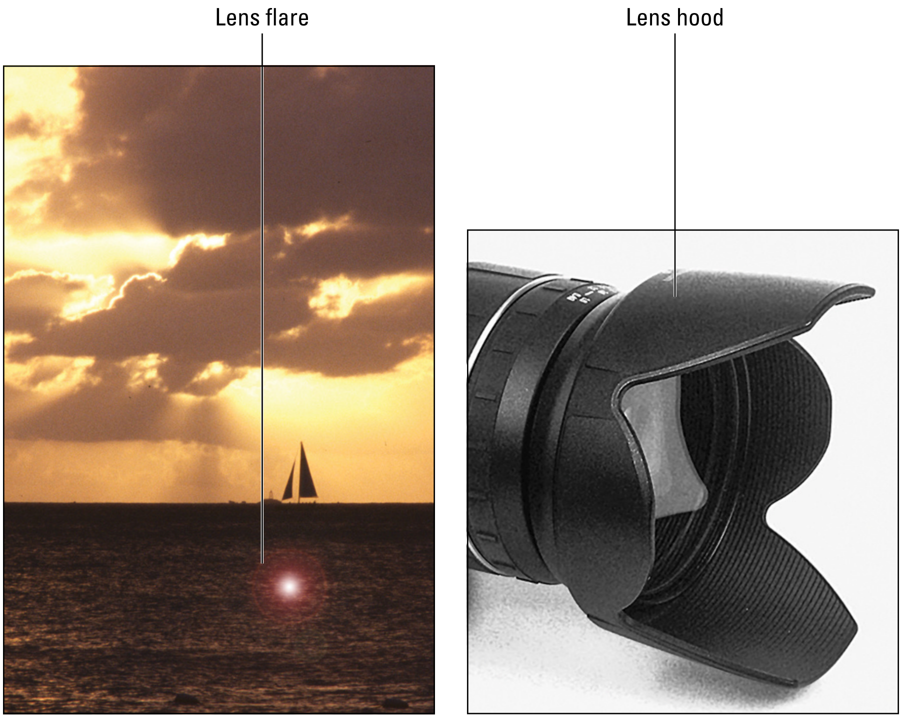


FIGURE 13-15: Bright spots like the one in this photo are caused by lens flare, not sensor dust.

Watch Out for Weird Halos

Figure 13-16 displays a defect that I see more and more these days: large halos of white along the borders between light and dark areas of the photo — in this case, the areas where the palm fronds meet the sky.

FIGURE 13-16: The white halos around the palm branches are the result of applying an excessive amount of shadow recovery to the photo.

These halos sometimes occur when you use the shadow-recovery and HDR tools that I discuss in the first section of this chapter. So when you use these tools, don't set the degree of adjustment so high that the solution becomes worse than the problem.

IN THIS CHAPTER

» Grab a great camera bag

» Pick out a tripod

» Ease the load with a specialty camera strap or carrier

» Make your camera screen easier to see in sunlight

» Calibrate your computer or laptop monitor

» Download some awesome apps

» Put a dive suit on your camera

» Exchange your mouse for a pressure-sensitive pen and tablet

» Choose the right printer for DIY printing

Chapter 14
Ten Accessories to Enhance Your Photography

Chapter 1 kicks off this book by providing tips for choosing a camera and lens. Later chapters cover certain must-have camera accessories, such as memory cards, along with tools specific to shooting certain types of images, such as lighting gear for shooting indoor portraits (Chapters 6 and 8) and lens filters designed for landscape photography (Chapter 10). To wrap things up, this chapter tells you about a few more bits of camera gear to consider putting on your shopping list or, better yet, your birthday or holiday wish list.

Invest in a Good Camera Bag

Perhaps the most important accessory you can buy is a camera bag to protect your equipment. Luckily, you have many good options, with manufacturers including Tenba, Lowepro, Think Tank Photo, Tamrac, and Pelican offering products designed for all types of cameras and photographers. You can find traditional shoulder bags, waist packs, messenger bags (worn slung across your chest), backpacks, and even wheeled bags that meet airline carry-on size requirements.

With all the choices available, in fact, you can drive yourself crazy trying to find the perfect do-it-all bag. Don't. It doesn't exist. Instead, start with a bag that will work for your daily photography outings, maybe just big enough to hold your camera and your personal stuff — phone, wallet, and so on. Then add to your bag collection when you invest in more gear or your needs change. For example, if you need to take your laptop or tablet with you, many bags have pockets for those devices.

TIP

A few more tips on this subject:

- **For backpacks, consider both security and accessibility.** A skilled thief can open the back of a backpack and snag your gear in a flash. So choose a backpack that makes that prospect difficult — such as one that opens on the side or has strong fasteners to keep the back pocket securely closed. At the same time, give extra points to a model that enables you to access your camera without having to take the pack off completely. For example, Figure 14-1 shows a sling-style backpack from Lowepro (www.lowepro.com). This style has one shoulder strap plus a strap that goes around your body to further secure the pack. To get to your gear, you swing the backpack around to the front, as shown in the figure.

FIGURE 14-1: Sling-style backpacks enable you to access your gear without completely removing the pack.

- **If you regularly need to ship gear or send it as checked baggage when traveling, invest in a case especially designed for that purpose.** You can find hard-sided, watertight cases that cushion your gear in customizable foam. Pelican is the best-known brand for this type of case.
- **Taking your tripod? Look for a bag that offers a way to attach it for all-in-one portability.** The rolling backpack shown on the right in Figure 14-2 has this feature, for example. This model is from Think Tank Photo (`www.thinktankphoto.com`).

Courtesy Think Tank Photo

FIGURE 14-2: Rolling backpacks with stowage for a tripod are great for travelling.

Pick a Sturdy Tripod

For nighttime shots and other photos that require long exposure times, using a tripod is essential. Otherwise, you run the risk of camera shake during the exposure, which can cause blurry photos.

Although you can buy inexpensive tripods for about $30, I encourage you to pony up a bit more — okay, a lot more — for a more substantial, pro-grade product. What's the difference between a $30 tripod and one that costs $150 or more? First, strength and stability. Especially if you're shooting with a dSLR and a large lens, you need a tripod capable of supporting all that weight without the risk of tipping over if you take your hands off of it. You also get convenience features, such as a head that enables you to rotate the camera from horizontal orientation to vertical with ease, and a *quick-release plate,* which allows you to mount and dismount the camera in seconds. Note that when you get to a certain grade of tripod, you buy the head separately from the base, giving you extra flexibility in getting gear you like.

Other factors to consider are the maximum height of the tripod when fully extended; the minimum height when the tripod is collapsed; the ease with which you can make those leg adjustments; and whether you can adjust the angle of each leg independently of the others. This last issue is important when you need to set up the tripod on an uneven surface and so need one leg to be longer and at a different angle than the others. A built-in level on the head and/or the base is another nice feature.

Finally, pay attention to the combined weight of the tripod and head. After all, unless you have a designated tripod toter, you're going to be carrying that sucker around when you move from site to site. Luckily, there are some great lightweight yet sturdy solutions today, some made of carbon fiber and others of aluminum. The best of these lightweight models aren't cheap, but to me, they're worth their weight in . . . nah, too easy. Let's just say that I'm old and tired, so I'm willing to pay extra for a tripod that's both good and lightweight.

Consider Smaller Stability Solutions

TIP

A great option for times when you don't want to carry a full-size tripod is a product like the Joby GorillaPod (`www.joby.com`). Made of stiff but flexible gripping legs, it can stand as a short tripod or wrap around something and hold on — such as a tree, as shown in Figure 14-3. The GorillaPod comes in a variety of sizes, shapes, and colors for all types of cameras.

FIGURE 14-3: The Joby GorillaPod lets you mount a camera nearly anywhere.

Courtesy of Joby, Inc.

Depending on the type of photography you do, these products may work for you as well:

- **Monopods:** A *monopod* is a collapsible stick that lets you hold your camera steady but doesn't stand on its own. You frequently see sports photographers at football games traipsing around the sidelines with a big camera, a big lens, and a monopod. And this is the exact situation that calls for a monopod: You need some added camera support, but you're moving frequently from place to place and don't have room or time to transport a big, three-legged tripod between shots. However, for long-exposure shots, monopods don't offer the same protection as a regular tripod simply because it can be difficult to hold the monopod still long enough to avoid the blur produced by camera shake.
- **Hybrids:** Some innovative tripod/monopod hybrids exist; they look like monopods, but you can pop out three mini legs for extra stability. Even with the feet, though, a hybrid model isn't as stable as a standard tripod, so don't stand too far from your camera if there is a strong wind blowing. Alternatively, some tripods can be disassembled so you can use one leg as a monopod.

Find a More Comfortable Camera Strap

If you find the strap that came with your camera to be a pain in the neck — literally — take a look at some of these alternatives:

- **BlackRapid straps:** BlackRapid makes a line of straps that screw into the tripod mount on the bottom of a camera instead of attaching to the rings found on the sides of most cameras. You wear the strap like a cross-body purse or messenger bag, so that the strap crosses your chest, and the camera hangs at your hip. This design takes some strain off your neck. When you're ready to shoot, you can immediately bring the camera up to your eye by sliding it along the strap.
- **Cotton Carrier vest:** Slip on this vest-like contraption to carry the weight of the camera on your chest, as shown on the left in Figure 14-4. Or, if you regularly like to carry two camera bodies, the company offers a version that accommodates that need. Built-in and optional accessories enable you to carry additional gear, including a small umbrella.

» **SpiderPro Holster:** Shown on the right in Figure 14-4, this product is designed for carrying the weight of the camera on your hip, with no weight on your neck or shoulders. You can buy add-on tools that allow you to attach other bits of equipment, such as a lens pouch.

FIGURE 14-4: The Cotton Carrier (left) and SpiderPro Holster (right) offer two alternative options to the traditional camera strap.

Courtesy of Cotton Carrier, LTD

Courtesy of Spider Gear LLC

The product photos shown here feature dSLR cameras, but you can find variations of the same concepts for all sizes of cameras. Also, several manufacturers other than the ones mentioned make these types of products, so shop around.

Get a Better View of Your Monitor

No matter how good a camera's monitor, it can be difficult to see the displayed image in bright light. You can solve this problem in a couple ways: Attach a monitor shade, such as the one shown on the left in Figure 14-5, which is sold by Delkin Devices (`www.delkindevices.com`), or a product such as the HoodLoupe (`www.hoodmanusa.com`), shown on the right. The shade featured here adheres to the back of the camera with a special mounting adhesive and offers extra monitor protection when closed. Loupe-style viewers are usually not affixed to the camera; instead, you can wear them on a lanyard around your neck until you need to view a picture.

FIGURE 14-5: To make it easier to see your monitor in bright light, consider a pop-up monitor shade (left) or loupe (right).

Courtesy of Delkin Devices

Courtesy of Hoodman USA

Download Some Cool Apps

In addition to whatever photo apps may be provided as part of your mobile device's operating system, you'll find countless more if you visit the Apple App Store or, for Android devices, the Google Play Store. The following list offers a few of my favorites. I limited my selections to apps that are either free or sell for under $10 and are available for both Apple iOS and Android devices.

- **Snapseed (free):** Offered by Google, Snapseed is one of the most fully featured free apps I've found. It offers a huge assortment of retouching tools; Figure 14-6 shows a portion of the main tool-selection screen. Swipe through the built-in tutorial to find out how to access and use them all.
- **Adobe Photoshop and Lightroom mobile apps (monthly subscription required):** If you already subscribe to Adobe's desktop Creative Cloud software programs — Photoshop and Lightroom Classic being the two primary offerings for photographers — you get free access to versions designed for smartphones and tablets, including Photoshop Express, Photoshop for iPad, and Lightroom CC (Creative Cloud). Not an Adobe subscriber? Check the app specs for details on monthly subscriptions that may work for you.

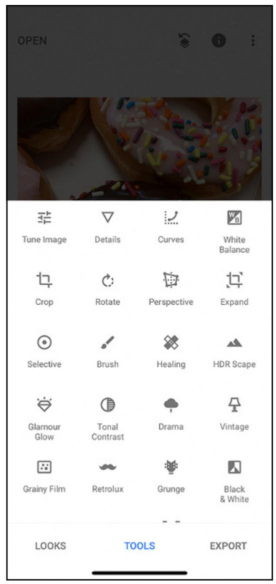


FIGURE 14-6: The Google Snapseed app is full-featured and, even better, free.

- **Handy Photo ($2.99):** This app has basic retouching tools, but I turn to it most for its special-effects filters. Figure 14-7 offers a look at one of the filter options screens.

  Experimenting with special-effects apps is a fun pastime, but effects can serve a practical purpose, too. You can use them to disguise a variety of photo flaws, from digital defects such as noise (grain) to obtrusive background objects. Figure 14-8 offers an example. The left image shows the original; the right image shows the "after effects" result. Notice that the textures and lighting effects I applied not only gave the image a dreamy look but also obscured the foliage and other stuff visible through the window in the original.

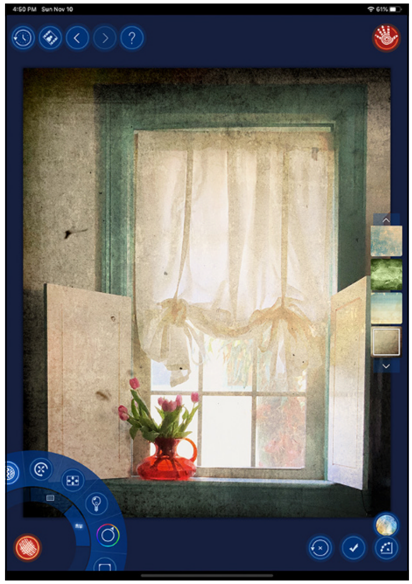


FIGURE 14-7: Handy Photo from ADVA Soft offers some great special effects and costs just a few bucks.

- **TouchRetouch, $1.99:** Don't want to use special effects to cover up unwanted objects? Try this app, from the same developer as Handy Photo (ADVA Soft), to get rid of problem areas without them. You drag your finger over the offending object, and the app creates a realistic patch to cover it. It works best on objects set against a plain background, such as overhead phone lines marring an otherwise perfect sky.
- **The Photographers Ephemeris (TPE) ($9.99 for iOS and $2.99 for Android):** Designed for landscape photographers, this app helps you plan your shoots by telling you what lighting conditions to expect at a particular location throughout the day. Moonlight predictions are provided as well. (***Note:*** The iOS version is more fully featured than the Android one, thus the price difference.)
- **Your camera manufacturer's app(s), free:** If your camera offers wireless capabilities, the manufacturer likely provides an app that enables the camera to communicate with your mobile devices. Most of these apps let you transfer files from your camera to the device for easy online sharing. You also may be

able to use your device as a wireless remote control. In addition to this type of app, some manufacturers offer a separate app that lets you access any online photo-storage and -sharing site they may provide.

FIGURE 14-8: My original photo was okay (left), but applying a few special-effects filters added atmosphere and obscured the busy landscape visible through the window (right).

Calibrate Your Monitor with Precision

In the printing section of Chapter 12, I mention the necessity of calibrating your computer monitor to make sure that it accurately displays image colors and brightness. For the most precise calibration, don't rely on the DIY calibration software built into the Windows and Mac operating systems; instead, invest in a piece of hardware known as a colorimeter. This device runs tests on your monitor display and then builds a color profile that gets loaded every time you fire up your computer. The profile tells your computer how to adjust the display to provide a neutral platform for viewing your images.

Companies such as Datacolor (`www.spyderx.datacolor.com`) and X-Rite (`www.xritephoto.com`) sell this type of product. Figure 14-9 shows the Datacolor SpyderX Pro, which sells for about $170.

FIGURE 14-9: Monitor calibration tools such as this one from Datacolor ensure a more accurate display of your images.

Courtesy of Datacolor

Dive In with a Waterproof Housing

Enjoy scuba diving or snorkeling? With a waterproof housing for your camera, you can safely take pictures of your adventures. Some camera manufacturers offer housings custom-made for their cameras, but third-party companies like Nauticam and Ikelite generally offer more sophisticated options. If you live in or visit an area that has a dive shop, consider checking there for guidance on the best products for the type of underwater exploration you do. Backscatter (`www.backscatter.com`) has a dedicated underwater-camera shop with extremely knowledgeable staff.

TIP

Be sure that the housing you choose enables you to easily operate the camera, providing access to all the camera's external controls and not just the shutter button.

Treat Your Wrist to a Graphics Tablet

If you do a lot of photo editing on a desktop computer, give your wrist a break and attach a graphics tablet, which enables you to edit photos using a stylus instead of a mouse. If you do a good deal of intricate touch-up work on your pictures or you enjoy digital painting or drawing, you'll wonder what you ever did without a graphics tablet after you get one. The tablet in Figure 14-10 is from Wacom, long considered a leader in this product category. Wacom makes a variety of tablets for different types of users; check them out at `www.wacom.com`.

FIGURE 14-10: Intricate photo-editing tasks become easier when you set aside the mouse in favor of a drawing tablet and stylus like this Wacom model.

Courtesy of Wacom Technology Corp.

Pick Up a Portable Printer

Portable printers are perfect for creating instant mementos at parties or family events. You can share hard copies of photos with guests and don't have to worry about following up and sending photos later on.

Some portable printers are designed to output images only from a mobile device; you transfer your images to the printer via Bluetooth wireless technology. Others enable you to print from a memory card or use a wireless connection. Note that some portable printers, like the pocket-sized HP Sprocket 2nd Edition, shown in Figure 14-11, have a maximum print size of 2 x 3 inches. For regular, 4 x 6-inch snapshot prints, look at models such as the Canon Selphy, shown in Figure 14-12. It retails for about $100; add the optional battery for around $60 for true portability (you won't have to hunt for an electrical outlet or carry the AC power unit).

Courtesy of Theano Nikitas

FIGURE 14-11:
Pocket-sized printers like the HP Sprocket 2nd Edition produce 2 x 3 inch prints from your mobile device.

Courtesy of Canon, Inc.

FIGURE 14-12:
Need snapshot-size prints on the go? Check out larger portable printers such as the Canon Selphy.

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Dedication

This book is dedicated to my parents, Francis Dale King and Barbara Ellen Harris King.

About the Author

Julie Adair King has been teaching and writing about digital photography for more than two decades. Along with this best-selling book, her other titles include a series of *For Dummies* guides to Nikon, Canon, and Olympus cameras. Other works include *Digital Photography Before & After Makeovers, Digital Photo Projects For Dummies,* and *Julie King's Everyday Photoshop For Photographers.* When not writing, King teaches master classes in digital photography and image editing. A native of Ohio and graduate of Purdue University, she resides in West Palm Beach, Florida.

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