

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*



Digital Photography

9th Edition

by Julie Adair King

for
dummies[®]
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Digital Photography For Dummies®, 9th Edition

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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 be 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.

- » 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 autofocus 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.

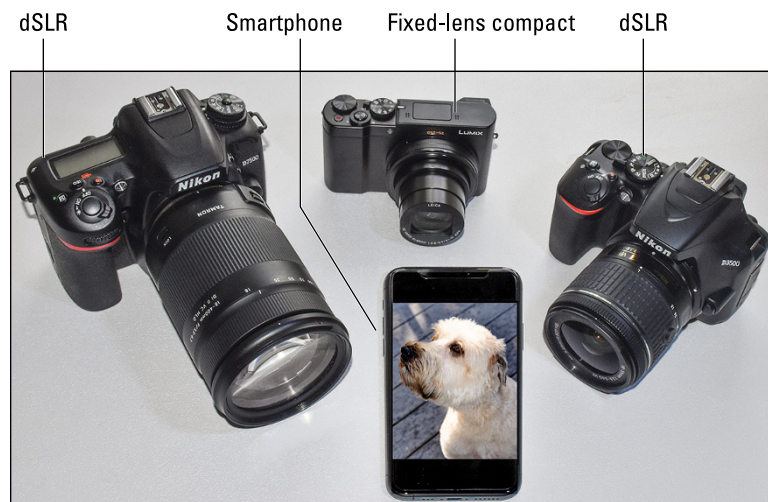


FIGURE 1-1: Each of these cameras plays a different role in my photography life.

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

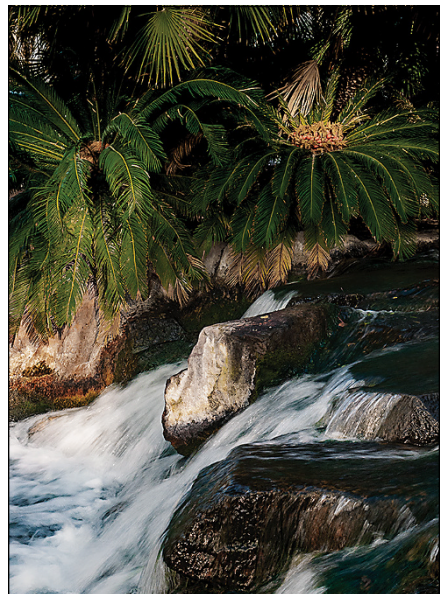


FIGURE 1-3: Auto mode typically renders a waterfall similar to the left example; you need control over shutter speed to get the misty look shown in the right image.



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.

Large depth of field



Shallow depth of field



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 <i>burst mode</i> , 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 <i>frame rate</i> 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 autofocus, choose a model that lets you select a specific focus point, use continuous autofocus (tracks a moving subject), and decide when to lock focus. Also note the number of focus points; the more, the better. Because autofocus 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	<i>Focal length</i> 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?



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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.

High resolution print (300 ppi)



Low resolution print (50 ppi)



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?



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.

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.



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Image file format: JPEG versus Raw



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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.