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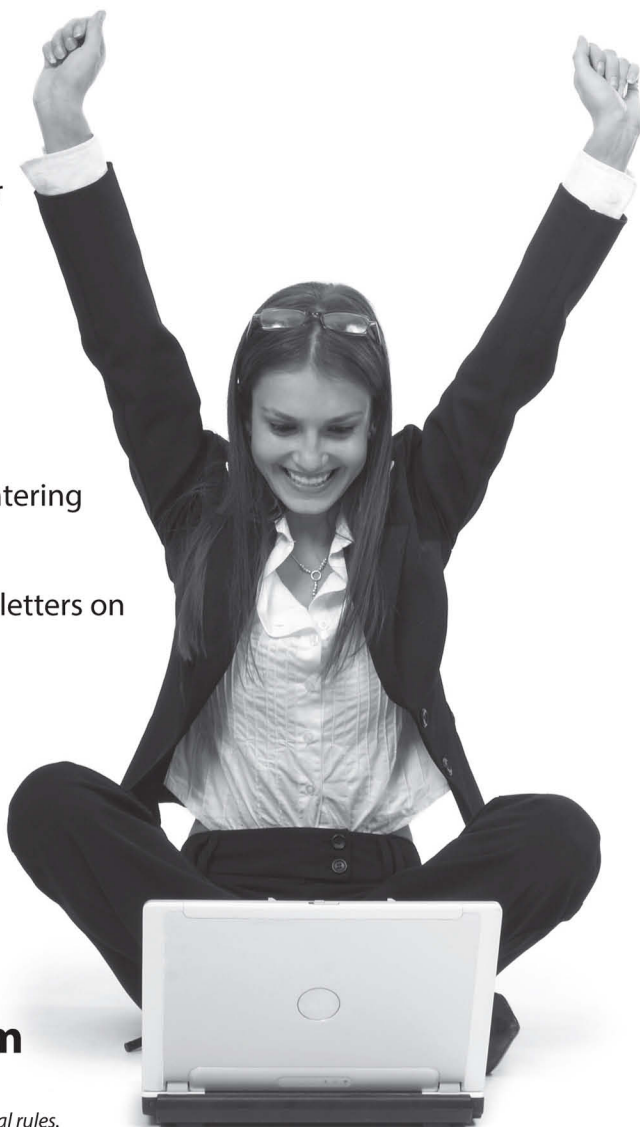
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Contents at a Glance

<i>Introduction</i>	<i>1</i>
<i>Part I: Getting Started with Digital SLR Cameras and Photography</i>	<i>5</i>
Chapter 1: The Digital SLR Difference	7
Chapter 2: Safari Inside a dSLR	29
Chapter 3: Tracking the Ideal dSLR	53
<i>Part II: Accessorizing Your Digital SLR</i>	<i>69</i>
Chapter 4: Saving and Archiving Your Photos	71
Chapter 5: Gearing Up Your dSLR	79
Chapter 6: Mastering the Multi-Lens Reflex	93
Chapter 7: External Flash Lighting	111
<i>Part III: Oh, Shoot!</i>	<i>121</i>
Chapter 8: Taking Control of Your dSLR	123
Chapter 9: Movies and Special Features of dSLRs	143
Chapter 10: Action, Flash, and Other Challenges	159
Chapter 11: Composition and dSLRs	179
Chapter 12: Applied Techniques	199
<i>Part IV: Fine-Tuning Your Output</i>	<i>211</i>
Chapter 13: Working with RAW and Other Formats	213
Chapter 14: Fixing Up Your Images	231
Chapter 15: Hard Copies Aren't Hard	261
<i>Part V: Part of Tens</i>	<i>271</i>
Chapter 16: Ten Ways to Improve Your dSLR Photography	273
Chapter 17: Ten Things You Never Thought of Doing with Your Digital SLR	287
Chapter 18: Ten Online Showcases for Digital SLR Photography	303
<i>Index</i>	<i>315</i>

Table of Contents

Introduction 1

About This Book	2
Foolish Assumptions.....	2
Icons Used in This Book	3
Beyond the Book	3
Where to Go from Here.....	4

Part I: Getting Started with Digital SLR Cameras and Photography..... 5

Chapter 1: The Digital SLR Difference 7

dSLR: dNext Great Digital Camera.....	8
Resolution: Peak or plateau?	10
Full frame: Is it for you?.....	10
Improving Your Photography with a dSLR	10
Composing shots with a more accurate viewfinder	11
Flexing the powerful sensor	13
Reducing noise in your photos	15
Reclaiming depth-of-field control	16
Taking photos faster.....	17
A dSLR works like a camera.....	19
Getting more lens flexibility	20
Freeing yourself from image editors	21
Where Did All Those Downsides Go?.....	22
Lack or expense of superwide lenses: Vanquished!.....	22
Fending off dirt and dust: Automatic!.....	24
LCD preview: Live, and in person!	24
Carrying that weight: Heft not mandatory!.....	26
In-camera editing!.....	26

Chapter 2: Safari Inside a dSLR 29

Megapixels and Why dSLRs Have More of Them	29
Pixelementary, my dear Watson	31
How many pixels does your camera need?	
18 to 24MP and beyond!	31

Matching pixels to print sizes and printers.....	32
Nothing's super about superfluous pixels.....	34
Touring a Digital SLR.....	35
Sensorship	36
Controlling exposure.....	41
Taking time out for viewing.....	43
Through the looking glass	46
Storage	46
Dual memory cards	48
Overcoming Quirks of the dSLR	49
Out, out damned spot: Trends in self-cleaning sensors	49
Multiplication fables: Working around the crop factor	50

Chapter 3: Tracking the Ideal dSLR..... 53

Identifying Features for Now and the Future	53
Spotting Breadcrumbs on the Upgrade Path	55
Discovering Your dSLR Type	57
Basic dSLR cameras.....	57
Enthusiast dSLRs	59
Advanced amateur/semipro dSLRs	59
Professional dSLR models	60
Rebirth of mirrorless and EVF alternatives.....	61
Checking Out Key Features	63
Lenses.....	63
Sensors and image processors	64
Exposure systems.....	64
Focusing systems.....	65
Special features	65

Part II: Accessorizing Your Digital SLR..... 69

Chapter 4: Saving and Archiving Your Photos 71

Choosing Memory Cards in a Flash.....	71
The right write speed	72
Finding the key to the (capa)city.....	73
Perfect pairs	75
Storing Your Images	75

Chapter 5: Gearing Up Your dSLR	79
Filtering Factors	79
The Tripod: Your Visible Means of Support	82
Putting a tripod to good use	82
Choosing a tripod	84
Connecting to Apps, Wi-Fi, and GPS	85
Smartphone/Tablet apps	86
Oh my, Wi-Fi	86
Gee, P.S.	88
Other Must-Have (Or Maybe-Have) Gear	89
A second camera	89
Sensor cleaning kit	90
Close-up equipment	90
Movie-shooting aids	91
Chapter 6: Mastering the Multi-Lens Reflex	93
Optical Delusions	94
Shooting in low light	94
Improving your shutter speed	95
Producing sharper images	95
Taking a step back	96
Getting closer	96
Focusing closer	97
Choosing Your Prime Lens — or Zoom	97
Prime time	98
Zoom, zoom, zoom	99
Special (lens) delivery	101
Understanding Lens Concepts	102
Different strokes	102
Going for bokeh	103
Using Lenses Creatively	104
Creative use of wide angles	105
Creative use of telephotos	106
Checking Lens Compatibility with Earlier Cameras	108
Chapter 7: External Flash Lighting	111
Illuminating Yourself about Electronic Flash Types	111
Perusing different types of flash units	113
Triggering an external flash	114
Making Good Use of an Electronic Flash	116
Choosing a Dedicated Electronic Flash Unit	118



Part III: Oh, Shoot!..... 121

Chapter 8: Taking Control of Your dSLR.....123

Discovering the Secrets of Exposure	124
Understanding why exposure is tricky	124
Getting exposure right with the histogram	126
Fine-Tuning Exposure with the Metering System.....	128
Metering works how?	129
Choosing a metering scheme	129
Adding metering options to the mix.....	131
The Many Ways to Choose Exposure	132
Adjusting exposure the easy way	132
Giving up control (in Program and Scene modes)	133
Taking control	134
Exotic ISO settings: Is ISO 409600 for real?	137
Focus Pocus	137
Focusing manually	138
Oughta autofocus.....	139
Focusing in Live View.....	140
Choosing among Sequencing, Multiple Exposure, and Burst Modes	141

Chapter 9: Movies and Special Features of dSLRs143

Making Movies	144
Choosing a resolution and frame rate.....	145
Using Video OUT in the age of HDTV	146
Feel the Noize at Night.....	146
A fast lens . . . or not?	146
Taking night shots at short shutter speeds	147
Noise Reduction Made Easy.....	147
Shake, Shake, Shake	149
Leaving camera-shake myths behind	150
Testing for tremors.....	151
Everyday solutions for shakiness.....	153
Image stabilization: The ready-steady-shoot technology	153
Time Waits for Someone: Creating Time-Lapse Sequences	156
Better Infrared than Dead.....	157

Chapter 10: Action, Flash, and Other Challenges159

Kind of a Lag.....	160
Comparing point-and-shoot cameras to dSLRs.....	160
Understanding the sources of lag	161
Minimizing shutter lag.....	162

Minimizing first-shot delays	164
Minimizing shot-to-shot delays	165
Minimizing flash delays	166
Stopping Action in Its Tracks	167
Going with the flow (or panning)	168
Catching peak action	170
Zapping action with flash	171
Discovering the Keys to Good Flash Photography	171
Understanding flash at different distances	171
That sync-ing feeling: Coordinating flash and shutter	173
Getting the right exposure	175
Yo, Trigger! Setting Off an External Flash	175
Shooting in Sequences	177

Chapter 11: Composition and dSLRs 179

Composing a Photo: The Basics	180
Composing for message and intent	181
Applying the Rule of Thirds	183
Posers and Poseurs	184
Shooting individual portraits	185
Shooting group photos	186
Tips for Publicity and PR Photography	188
Capturing Architecture	190
Reeg, your perspective is out of control!	190
Charge of the lighting brigade	193
You've been framed!	195
Designing Your Landscape Photos	195
Compositional Ideas That Travel Well	197

Chapter 12: Applied Techniques 199

Essentials of Sports	200
Choosing lenses	200
. . . is everything! Timing	201
People Who Need People	202
Getting a good look	202
When you're having more than one	203
Before you go	204
Nature and Landscapes	204
A broad landscape	205
Wildlife	207
Ready for Your Close-Up?	208

Part IV: Fine-Tuning Your Output..... 211**Chapter 13: Working with RAW and Other Formats.213**

So Many Formats, So Little Time	213
Worth the Fuss: Understanding the Main Formats	216
Don't get TIFFed	216
JPEG o' my heart	217
The RAW deal	219
Choosing a File Format	219
TIFF enuff	220
JPEG junkies unite!.....	221
JPEG+RAW	223
Working RAW	224
Using RAW Files as Digital Negatives	224
Salvaging images from RAW files	224
Archiving RAW files	226
Finding RAW image-editing applications	226

Chapter 14: Fixing Up Your Images231

Editor-ial Comments: Choosing an Image Editor	232
Adobe Photoshop CS6.....	232
Adobe Photoshop Elements	237
Alternative image editors	239
Workflow Work-arounds	239
Fixing Your Photos	242
Cropping	242
Fixing murky or contrasty photos	244
Correcting those colors	250
Removing spots.....	252
Look sharp, be sharp.....	257
Blurring for effect.....	257
Fixing with filters.....	258

Chapter 15: Hard Copies Aren't Hard261

Prints? What Prints?	262
You Pays Your Money, You Takes Your Choice.....	264
Doing it yourself.....	264
Live and in person!	265
Choosing a Printer	266

Part V: Part of Tens 271**Chapter 16: Ten Ways to Improve Your dSLR Photography 273**

Does Lighting Ever Strike Twice?	273
Choosing a Righteous Resolution and Other Settings	275
Changing environments	276
Living with limited memory card space	276
Shooting for a low-resolution destination	277
Hurrying along	277
Stop! What's That Sound?	278
Working the Right F/Stop	279
Focus Is a Selective Service	280
Playing the Angles	281
Through a Glass Brightly	281
Feel the Noize	283
Editing, Retouching, and Compositing Images	284
Reading the Funny Manual (RTFM)	285

Chapter 17: Ten Things You Never Thought of Doing with Your Digital SLR 287

Capturing Hidden Detail with High Dynamic Range Photography	287
Capturing the Invisible with Infrared Photography	289
Lighting for All in Tents and Purposes	291
Turning Your dSLR into a Pinhole Camera	292
Warping Time with Time-Lapse Photography	293
Expanding Your Creativity with Slow Shutter Speeds	295
Capturing an Instant in Time with Fast Shutter Speeds	296
Making Your Own Effects Filters	297
Shooting the Works!	298
Going for Baroque	300

Chapter 18: Ten Online Showcases for Digital SLR Photography . . 303

About Facebook	303
Google+Ultra	304
All Your PBase Are Belong to Us	306
Digital Photography Viewed and Reviewed	307
Flickr	309

Getting Your Mug Smug	310
Pop Goes the Photos!	311
Adobe Revel-ation	312
Your Zen Folio	313
Travel, HDR, and More	314

<i>Index</i>	<i>315</i>
--------------------	------------

Introduction

The digital single-lens reflex (dSLR) is the great step upward for photographers who want to expand their creative horizons — or simply just get better pictures. Whether you want to become a serious photo hobbyist, have a hankering to turn pro, or want to take advantage of the improved control that digital SLRs give you over your photography, discovering how to use this tool should be high on your priorities list.

The latest digital SLRs have features that no one even dreamed of back when I wrote the first edition of this book, including Wi-Fi and GPS capabilities built right into many cameras. These features give you the ability to embed global positioning service (GPS) data in your images or upload your shots directly from your camera to your computer or sites like Facebook.

All the major bugs of the earliest dSLRs have been magically transformed into killer features in the latest models. Today, you can preview your images by using Live View features before you snap the shutter. Dust that collects on the sensor causes much less of a problem thanks to built-in sensor-cleaning features. You get better image quality than in earlier models, thanks to higher resolutions (you can commonly get 16 to 20 megapixels and up, even in low-cost dSLRs), super-sensitive sensors that can capture images in near darkness, and inexpensive but effective anti-shake technology built into cameras or lenses.

Your digital SLR probably can capture extended tonal range images using a technique called High Dynamic Range (HDR) processing and grab HDTV-quality video with monaural or stereo sound.

Best of all, all these capabilities are eminently affordable. Digital SLRs in the \$500 to \$1,000 range today can outshoot the \$5,000 professional models of five years ago and are light-years ahead of even the best point-and-shoot models. Compared to a point-and-shoot, the dSLR

- ✓ Provides more control over what portions of your image you want in sharp focus.
- ✓ Boasts lower levels of the annoying grain effect called *noise*.
- ✓ Operates fast enough to capture the most fleeting action.

If that isn't enough, you can change lenses, too, adding superwide perspectives or the huge magnification possibilities of long, long telephoto lenses to your repertoire.

Almost all the other advantages of digital photography come with your digital SLR camera, too. You can review your image immediately, upload the photo to your computer, make adjustments, and print a sparkling full-color print within minutes. You never need to buy film. You decide which images to print and how large to make them. You can proudly display your digital photographic work framed on your wall or over your fireplace. You can even make wallet-size photos, send copies to friends in email, or create an online gallery that relatives and colleagues can view over the web.

About This Book

Technology and techniques — you find both in this book.

Understanding how a point-and-shoot digital camera works offers you little advantage because such entry-level cameras don't give you the creative control that a dSLR does. However, understanding exactly how a digital SLR works can help you use its capabilities more fully.

By mastering the technology, you're better equipped to understand how to use interchangeable lenses, set up speedy continuous-shooting burst modes, apply selective focus, and shoot under the lowest light levels.

A little knowledge about dSLR technology also provides the grounding you need to work with advanced photographic techniques, such as the ones I discuss in this book. I fill these pages with basic information and tips that you can use to hone your skills while you grow as a digital SLR photographer.

Foolish Assumptions

This book is written for both experienced and budding photographers who have a good grasp on how to use their computers and navigate the operating system, as well as at least a cursory knowledge about the operation of their digital SLR cameras. You needn't be an expert photographer; all you need is a desire to improve your skills and knowledge.

Because dSLRs are a more-advanced type of digital camera, you might be making the upgrade from a conventional film SLR. At the very least, I assume

that you aren't new to photography and have some knowledge about conventional photography. If so, this book helps you fine-tune your abilities.

Although most of the emphasis in this book is on picture-taking, I offer a couple of chapters on image-editing, too. You can get the most from those chapters if you have some familiarity with an image editor, such as Corel PaintShop Pro, Adobe Photoshop, or Adobe Photoshop Elements.

Icons Used in This Book

I use the following icons throughout the book:



The Tip icon marks tips (what a surprise!) and shortcuts that you can use to work more easily with your digital SLR.



Remember icons mark information that's especially important. To siphon off the most important information in each chapter, skim through these icons.



The Technical Stuff icon marks information of a more technical nature that you can normally skip over, unless you have a special interest in the background info I discuss.



The Warning icon tells you to watch out! It marks important information that might save you headaches, heartaches, and even cash-aches — especially when your dSLR starts acting in unexpected ways or won't do exactly what you want it to do.

Beyond the Book

Beyond might suggest outer space, but in this case, look no further than the Internet for these fine resources:

- ✓ **Cheat Sheet** (www.dummies.com/cheatsheet/digitalslrcamerasandphotography): This guide is a quick “feature finder” that shows you the typical location and layout of the most common controls found on digital SLR cameras, along with concise descriptions of what these buttons, dials, and readouts do.

✓ **Dummies.com online articles** (www.dummies.com/extras/digital-slrcamerasandphotography): The Web Extras for this book include additional recommendations and tips you can put to work to enhance your digital SLR's performance and utility. I list my ten favorite gadgets priced under \$100; explain how to print your images over the web using Snapfish, Shutterfly, and other sites; offer tips on finding the best location to shoot a variety of sports; and explain the mysteries of firmware upgrades.

Where to Go from Here

Organization is your friend! All the chapters in this book are grouped together into parts that address a broad, general area of interest. If you're especially keen to know more about a particular topic, such as how to select the perfect dSLR or its accessories, turn to the part of the book that includes that material. You don't have to read this book in any particular order. You can absorb each part and chapter on its own. (If I explore a certain topic, such as shutter lag or infrared photography, in more detail elsewhere in the book, I give you a cross-reference pointing to the relevant section in case you want more information.) Skim through and study the photo examples or examine only the odd-numbered pages, if you prefer. It's your choice. I hope that eventually you wade through the whole thing, but my top priority is delivering the information that you need right now to take better photographs.

Part I

Getting Started with Digital SLR Cameras and Photography



Learn more about digital photography and much much more at Dummies.com. Learn more and do more with Dummies!

In this part . . .

- ✓ Discover why dSLRs produce better results faster than other cameras, and you can master the technology behind these advanced cameras.
- ✓ Select the best digital SLR for your needs.
- ✓ Learn which accessories can help you do a better job.
- ✓ Understand the sensors, shutters, and how exposure works.
- ✓ Find a list of the features you need, want, and wish you had.

The Digital SLR Difference

In This Chapter

- ▶ Discovering why digital SLRs are a big deal
- ▶ Exploring dSLR advantages
- ▶ Looking at downsides? What downsides?

Now that you can buy a fully featured digital SLR (or dSLR) for five Benjamins or less, virtually everyone (including your grandmother) probably knows that SLR stands for *single lens reflex*. However, your Nana — or you, for that matter — might not know precisely what single lens reflex means. *SLR* is a camera (either film or digital) that uses a marvelous system of mirrors or prisms to provide bright, clear optical viewing of the image that you're about to take — through the same lens that the camera uses to take the picture. The very latest dSLRs offer an even more interesting option: the capability to bypass the optical viewfinder and preview your image right on the LCD (liquid crystal display) on the back of the camera (which also uses the same lens that the camera uses to take the picture).

But the key thing to know about dSLRs is that they're very cool tools that you can use to take photos electronically.

Welcome to the chapter that tells you exactly how smart you were when you decided to upgrade from whatever you were using previously to a digital single lens reflex camera. In this chapter, you find out how a digital SLR transforms the way you take and make pictures, why you may find the strengths of the dSLR important, and how even the very few downsides of previous digital SLRs have been vanquished in recent years. Now that digital SLRs have become a big deal, you can get in on the action.

In this chapter, I compare digital SLRs, for the most part, with point-and-shoot cameras, and explain the advantages of the dSLR versus P&S models. From time to time, I also mention a newer type of camera, the mirrorless



interchangeable lens camera (ILC), which is very dSLR-like. But, for the most part, the comparisons are between digital SLRs and amateur cameras with fixed lenses, including point-and-shoot cameras and superzoom/electronic viewfinder models.

dSLR: dNext Great Digital Camera

Digital SLRs are now available to suit every budget. They range from surprisingly capable entry-level models that barely nudge above the \$500 price point, to robust intermediate models built for avid amateurs with \$1,000 to spend, on up to semipro and pro models for \$2,000 and up. So, almost anyone who wants more picture-taking flexibility than a smartphone or point-and-click camera provides can afford to make the jump to a digital SLR. If you already have, you've discovered that the dSLR lets you take pictures the way they're *meant* to be taken.

It's easy to see why enthusiast photographers interested in taking professional-looking photos embrace these features of a digital SLR:

- ✓ **You can view a big, bright image that represents (almost) exactly what you see in the final picture.** No peering through a tiny window at a miniature version of your subject with a tiny viewfinder window, or squinting at the LCD of your cell phone or point-and-shoot camera. Digital SLRs have big and bright viewfinders that show virtually the entire image, so you don't have to wonder whether you chopped off the top of someone's head. Using the optical viewfinder, which comes as standard equipment on every dSLR, means that you don't have to squint to compose your image at arm's length on an LCD (liquid crystal display) viewfinder that washes out in bright sunlight. However, if lighting conditions permit, all newer digital SLRs also enable you to preview your picture on the back-panel LCD using *Live View* (just like a point-and-shoot camera), giving you the best of both viewing worlds.
- ✓ **A dSLR responds to an itchy trigger finger almost instantly.** Forget about pressing the shutter release and then waiting an agonizing moment before the camera decides to snap the shot. Although newer point-and-shoot cameras are more responsive than older versions, few can match the capability of dSLRs to crank out shots as fast as you can press the button. Even fewer point-and-shoot cameras are capable of the 4-to-11 frames-per-second continuous shooting rates available with some of the digital SLRs aimed at more advanced photographers.
- ✓ **You have the freedom to switch among lenses.** Yes, there are some non-dSLR cameras (so-called *mirrorless* models) that are dSLR-like in many ways, and can use interchangeable lenses. But none of them can match

the selection of optics available for the typical dSLR camera, even when you use an adapter that allows fitting lenses from other camera models. You can switch among an all-purpose zoom lens, a superwide-angle lens, an extra-long telephoto lens, a close-up lens, or other specialized optics quicker than you can say *170–500mm F/5–6.3 APO Aspherical AutoFocus Telephoto Zoomexpialidocious*. (Best of all, you don't even have to know what that tongue twister of a name means!)

Just be prepared to succumb to *lens lust*, a strange malady that strikes all owners of dSLRs sooner or later. Before you know it, you find yourself convinced that you *must* have optical goodies, such as the lens shown in Figure 1-1 — a telephoto lens that's absolutely essential (you think) for taking photos of wildlife from enough of a distance to avoid scaring away the timid creatures.

✓ **If you're a movie nut, you can shoot the best movies of your life.**

The latest dSLRs are truly all-in-one cameras, capable of capturing razor-sharp stills and either 720p or 1080p high-definition movies with equal aplomb. They produce better-looking movies than most point-and-shoot cameras, and even exceed the capabilities and quality of the average dedicated camcorder, too. There's an old saying that "The best camera is the one you have with you." It's equally true that the best movie camera is the one you're already holding in your hands when a video opportunity pops up unexpectedly.



Figure 1-1: Playing with lenses, lenses, and more lenses is one of the inevitable joys of working with a dSLR.

If you're ready to say *sayonara* to film, *adiós* to poorly exposed and poorly composed pictures, and *auf Wiedersehen* to cameras that have sluggardly performance, it's time to get started.

The sections that follow (as well as other chapters in this part) introduce you to the technical advantages of the digital SLR and how you can use the dSLR features to their fullest. When you're ready to expand your photographic horizons even further, Parts II, III, and IV help you master the basics of digital

photography, go beyond the basics to conquer the mysteries of photo arenas (such as action, flash, and portrait photography), and then discover how you can fine-tune your images, organizing them for sharing and printing.

Resolution: Peak or plateau?

Only a few years ago, it was common to buy a digital camera based only on the number of pixels — measured in millions of pixels or *megapixels* — because a camera with 24 gazillion pixels obviously must be superior to one with only 18.14159625 gazillion pixels, right? Then photographers discovered that one vendor's 18MP camera produced much better images than another vendor's 24MP camera, especially in terms of image-quality characteristics unrelated to resolution (say, visual noise or color accuracy).

In recent years, digital SLRs have continued to boast more and more pixels, but those other image qualities have gained equal stature in terms of importance. Photographers are looking at the overall picture, in other words. As I write this, resolution seems to be averaging around 21–24 megapixels, with 16–18MP at the low end for entry-level and intermediate models, and 21–24MP for more advanced cameras. Because additional resolution isn't as important as reduced visual noise and other image quality factors, I expect resolution to plateau or peak at the current high of about 36MP during the life of this book.

Full frame: Is it for you?

So-called full-frame cameras have become more affordable, with some models available for less than \$2,000. Equipped with sensors the same size as a 35mm film frame — 24 x 36mm — these cameras enjoy the double benefit of offering “true” (non-cropped) fields of view and improved low-light/visual noise characteristics thanks to their larger, light-hungry pixels. (You find out more about lens cropping in Chapter 2.) Wide-angle lenses of a given focal length have a wider field of view when mounted on a full-frame camera, and conversely, longer lenses don't have the same “cropped” telephoto “reach” as they do on a camera with a smaller sensor. Full-frame cameras are generally more expensive, larger, and may force you to buy a whole new complement of lenses that can bathe their larger sensors with light. So, whether one of these models is for you depends on what features you need and how much you want to pay for them. I explain the advantages and disadvantages of full-frame cameras in more detail in Chapter 2.

Improving Your Photography with a dSLR

The differences between digital SLRs and the camera that you used before you saw the (digital SLR) light depends on where you're coming from. If your most recent camera was a point-and-shoot digital model, you know the advantages of being able to review your photos on an LCD screen an

instant after you take them. And, if you're serious about photography, you also understand the benefits of fine-tuning your photos in an image editor. If you're one of the few remaining holdouts only now making the long-delayed switch to a digital SLR from a film SLR, you're likely a photo enthusiast already and well aware that a single lens reflex offers you extra control over framing, using focus creatively, and choosing lenses to produce the best perspective. And, if you're making the huge leap from a point-and-shoot non-SLR film camera to a digital SLR, you're in for some *real* revelations.

A digital SLR has all the good stuff available in a lesser digital camera, with some significant advantages that enable you to take your photo endeavors to a new, more glorious level of excellence. Certainly, you can take close-ups or sports photos by using any good-quality digital camera. Low-light photography, travel pictures, or portraits are all within the capabilities of any camera. But digital SLRs let you capture these kinds of images more quickly, more flexibly, and with more creativity at your fingertips. Best of all (at least, for Photoshop slaves), a digital SLR can solve problems that previously required you to work long hours over a hot keyboard.

Despite the comparisons you can make to other cameras, a digital SLR isn't just a simple upgrade from another type of camera. In the sections that follow, I introduce you to the advanced features and inner workings of a dSLR so that you can begin getting the most out of your camera.

Composing shots with a more accurate viewfinder

When you use non-SLR cameras, what you see isn't always what you get.

Theoretically, an electronic viewfinder (EVF) or the LCD on the back of a digital camera *should* show exactly what you get in the finished picture — and an increasing number of these do just that, offering a 100-percent view of the image you end up with. After all, the same sensor that actually captures the photo produces the EVF or LCD image. In practice, although an electronic viewfinder can be used under a variety of conditions, you might find the typical back panel LCD difficult to view under bright light. It also appears so small when you hold the camera at the requisite arm's length that you may feel like you're trying to judge your image by looking at a postage stamp that's gone through the wash a few times.

You probably find the view through an optical viewfinder window — if it even has one — even worse than the camera's LCD screen: diminutive, inaccurate enough to make chopping off heads alarmingly easy, and offering no information about what is (or isn't) in focus.

More advanced cameras might use an electronic viewfinder, which is a second, internal LCD or OLED (organic LED) that the user views through a window. You can find this kind of viewfinder in many so-called *superzoom*

cameras that have a fixed lens with a versatile, relatively long zoom range. The mirrorless cameras I mention earlier (including the various interchangeable lens models from Panasonic, Olympus, Fuji, or Sony) also may have a built-in or optional supplementary EVF-style viewfinder that you clip onto the top of the camera. EVFs provide a larger image that's formed by the actual light falling on the sensor, and you can use an EVF in full sunlight without the viewfinder washing out. However, EVFs might not have enough pixels to accurately portray your subject, and they may degenerate into blurred, ghosted images if the camera or subject moves during framing. They also don't always work as well in low light levels, when the available light reaching the sensor must be amplified to be easily viewed on the EVF. Although an EVF can be a good compromise between an optical viewfinder and a back panel LCD, an EVF doesn't enable you to preview an image as easily as a dSLR's optical viewfinder does. However, some of the newest mirrorless models include EVFs with up to 2.4 million pixels, and viewing quality so good you think you're peering through an optical viewfinder.

A digital SLR's optical viewfinder, in contrast, closely duplicates what the sensor sees, even though the image is formed optically and not generated by the sensor itself. What you see in the viewfinder is all done with mirrors (and other reflective surfaces) that bounce the light from the lens to your viewfinder, sampling only a little of the light to measure exposure, color, and focus. As a result, the viewfinder image is usually big and bright.

Check out Figure 1-2 and decide which view of your subject you'd rather work with. You may find the 3-inch LCD on the mirrorless interchangeable lens model (in the upper-left corner of Figure 1-2) difficult to view in bright light; the electronic viewfinder (in the upper-right corner of the figure) can give you fuzzy images, making it hard for you to judge focus. The digital SLR's big, bright viewfinder (at the bottom of Figure 1-2) is, as Goldilocks would say, just right.

A dSLR's optical viewfinder shows you approximately what is and isn't in sharp focus (the *depth-of-field*), either in general terms (all the time) or more precisely when you press a handy button called the *depth-of-field preview*, which many dSLRs have. You probably find your dSLR viewing experience more pleasant, more accurate, and better suited for your creative endeavors. If you switch to a camera's Live View mode (if your camera includes that mode) to preview the image on the back-panel LCD, you can often perceive depth-of-field. However, under high light levels, the LCD can be just as difficult to see as on a point-and-shoot camera.



Figure 1-2: A back panel LCD viewfinder (upper-left) or an EVF LCD (upper-right) is no match for a dSLR's optical system (bottom).

Flexing the powerful sensor

With very few exceptions, digital SLR sensors are physically *much* bigger than their point-and-shoot camera counterparts. This size gives them a larger area that can capture light and, potentially, great sensitivity to lower light levels, along with improvements in the ability to make larger prints or crop tightly. (Some non-SLR cameras give up compactness to provide somewhat larger sensors, and mirrorless models can use the same size sensors as dSLR cameras.)

A dSLR's extra sensitivity pays off when you want to

- ✓ Take pictures in dim light.
- ✓ Freeze action by using shorter exposure times.
- ✓ Use smaller lens openings to increase the amount of subject matter that's in sharp focus.

Within the Canon digital camera line alone, you find digital SLRs that have 22.2mm-x-14.8mm to 24mm-x-36mm sensors (the size of a 35mm film frame). By comparison, some of Canon's digital point-and-shoot cameras use a sensor that measures only 7.8mm x 5.32mm. Put in terms that make sense to humans, the dSLR sensors have 8 to 20 times more area than their Lilliputian point-and-shoot sensor-mates. Figure 1-3 gives you a better idea of the relative sizes.

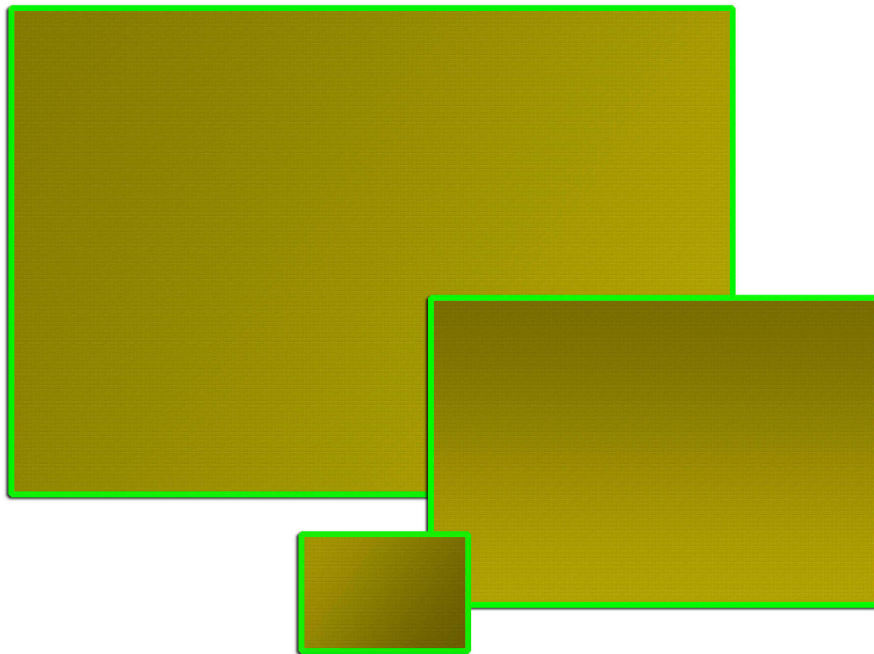


Figure 1-3: These images represent the comparative sizes of a dSLR's 24mm-x-36mm sensor (upper-left) and 22.2mm-x-14.8mm sensor (center), and a point-and-shoot digital camera's 7.8mm-x-5.32mm sensor (bottom).

If you think of a sensor as a rectangular bucket and the light falling on it as a soft drizzle of rain, the large buckets (or sensors) can collect more drops (or the particles of light called *photons*) more quickly than the small ones. Because a certain minimum number of photons is required to register a picture, a large sensor can collect the required amount more quickly, making it more sensitive than a smaller sensor under the same conditions.

In photography, the sensitivity to light is measured by using a yardstick called ISO (International Organization for Standardization). Most point-and-shoot digital cameras have a sensitivity range of about ISO 50 to ISO 100 (at the low end) up to a maximum of ISO 800 to ISO 3200 or 6400 (at the high end). Some point-and-shoot models have even higher sensitivity settings, but it remains to be