

Free Gray/Color Checker Card Inside!

Alan Hess

# Exposure

## *Digital Field Guide*





# Exposure

*Digital Field Guide*



# Exposure

## *Digital Field Guide*

Alan Hess



Wiley Publishing, Inc.

## Exposure Digital Field Guide

Published by

**Wiley Publishing, Inc.**

10475 Crosspoint Boulevard

Indianapolis, IN 46256

[www.wiley.com](http://www.wiley.com)

Copyright © 2010 by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

ISBN: 978-0-470-53490-8

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, 201-748-6011, fax 201-748-6008, or online at <http://www.wiley.com/go/permissions>.

**LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEB SITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OF WEB SITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEB SITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.**

For general information on our other products and services or to obtain technical support, please contact our Customer Care Department within the U.S. at (877) 762-2974, outside the U.S. at (317) 572-3993 or fax (317) 572-4002.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Library of Congress Control Number: 2009935828

Trademarks: Wiley and the Wiley Publishing logo are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates. All other trademarks are the property of their respective owners. Wiley Publishing, Inc. is not associated with any product or vendor mentioned in this book.



# About the Author

**Alan Hess** is a San Diego based commercial photographer specializing in concert and event based photography, but has photographed everything from portraits to products. He is the author of two previous Digital Field Guides, the *Sony Alpha DSLR-A700 Digital Field Guide* and the *Sony Alpha DSLR-A200 Digital Field Guide*.

His concert and backstage images have appeared in numerous online and print publications and have been used for promotional purposes and music packaging.



He is a member of the National Press Photographers Association and the National Association of Photoshop Professionals and Nikon Professional Services.

Alan is a key contributor to the Lexar Pro Photographer Web site and has written articles on concert photography and technology. Alan has taught concert photography at Photoshop World and has taught photography, digital photography workflow using Adobe Bridge and Adobe Photoshop Lightroom at Essy's Studio in San Diego.

Alan can be contacted through his Web site [www.alanhessphotography.com](http://www.alanhessphotography.com) where he writes a regular blog.

# Credits

## **Acquisitions Editor**

Courtney Allen

## **Technical Editor**

Haje Jan Kamps

## **Senior Copy Editor**

Kim Heusel

## **Editorial Director**

Robyn Siesky

## **Editorial Manager**

Cricket Krengel

## **Business Manager**

Amy Knies

## **Senior Marketing Manager**

Sandy Smith

## **Vice President and Executive Group Publisher**

Richard Swadley

## **Vice President and Executive Publisher**

Barry Pruett

## **Project Coordinator**

Kristie Rees

## **Graphics and Production Specialists**

Carrie A. Cesavice

Jennifer Henry

Andrea Hornberger

Jennifer Mayberry

## **Quality Control Technician**

Laura Albert

## **Proofreading and Indexing**

Cindy Ballew

Ty Koontz



*For Nadra*



# Acknowledgments

Special thanks to my wife for her amazing patience as I wrote this book. I know that I am not the easiest person to get along with when facing deadlines.

I would like to thank my parents, brothers, sisters-in-law, and all the nephews and nieces for being the supporting family that everyone should be lucky enough to have.

Thanks to all my family and friends for allowing me to always be pointing a camera at you and letting me use the photos in this book.

Special thanks to Brian Ross, David Baron, and Maya at PR Photo — you all opened new doors and shooting opportunities for me, and I thank you.

My deepest gratitude to Courtney and Cricket for all their guidance; this is our third book together and I am glad for all your help. Thanks to Haje Jan Kamps and Kim Heusel for all their hard work as well.



# Contents

Introduction	xvii
--------------	------

<b>CHAPTER 1</b>	
<b>Understanding Exposure</b>	<b>1</b>

Defining Exposure	2
Stop	3
Exposure value	3
Equivalent Exposures	4
Exposure Modes	6
Program auto mode	6
Shutter speed priority mode	6
Aperture priority mode	7
Manual mode	8
Metering Light	8
Camera Metering Modes	10
Spot metering	10
Center-weighted metering	11
Scene metering	11
Exposure Compensation	13
Exposure Compensation versus Flash Compensation	14
Bracketing Your Exposures	14
Using the Histogram	16
Using the Clipping Information	18
File Formats	19
RAW	19
TIFF	20
JPEG	20

<b>CHAPTER 2</b>	
<b>Working with Light</b>	<b>21</b>

Direction of Light	22
Front lighting	22
Back lighting	23
Overhead lighting	24
Side lighting	25
Intensity of Light	25
Color of Light	26
Color temperature	27
White balance	28

Daylight. . . . . 30

Tungsten or incandescent light. . . . . 32

Fluorescent light. . . . . 33

Using a Flash. . . . . 35

Fill light . . . . . 37

Color gels . . . . . 38

**CHAPTER 3**

**Shutter Speed 41**

Controlling the Shutter Speed. . . . . 42

Camera controls . . . . . 43

Program auto mode . . . . . 44

Shutter speed priority mode . . . . . 44

Manual mode. . . . . 45

When Shutter Speed Is More Important Than Aperture. . . . . 45

Freezing the Action . . . . . 46

Superfast shutter speeds . . . . . 47

Very fast shutter speeds. . . . . 49

Fast shutter speeds . . . . . 50

Normal shutter speeds. . . . . 50

Slow shutter speeds. . . . . 51

Very slow shutter speeds . . . . . 54

Panning . . . . . 55

**CHAPTER 4**

**Aperture 57**

Controlling the Aperture . . . . . 58

Understanding f-stops . . . . . 58

Camera controls . . . . . 59

Program auto mode . . . . . 59

Aperture priority mode . . . . . 60

Manual mode . . . . . 60

Depth of Field . . . . . 60

Defining the depth of field . . . . . 61

Controlling the depth of field . . . . . 62

Shallow depth of field. . . . . 63

Middle depth of field. . . . . 64

Deep depth of field. . . . . 65

Aperture versus Shutter Speed. . . . . 66

Understanding Lens Limitations . . . . . 67

Lens speeds . . . . . 67

Diffraction. . . . . 69





Variable and constant aperture lenses . . .	69
Variable aperture lenses. . . . .	70
Constant aperture lenses. . . . .	72
Macro lenses, aperture, and depth of field . . . . .	74

## **CHAPTER 5**

### **ISO** **77**

Understanding ISO and Light Sensitivity. . . .	78
Digital Noise . . . . .	81
High ISO Noise Reduction. . . . .	82
Noise reduction through exposure . . . . .	82
Noise reduction using software or camera settings . . . . .	83
Using a Higher ISO . . . . .	84

## **CHAPTER 6**

### **Event Photography** **87**

Exposure Considerations. . . . .	88
Shooting outdoors . . . . .	88
Using available light . . . . .	88
Using a flash . . . . .	91
Shooting in low light . . . . .	92
Shooting inside. . . . .	93
Using available light . . . . .	93
Using a Flash . . . . .	94
Checking the exposure. . . . .	94
Concert Photography. . . . .	95
The Right Equipment for the Job . . . . .	98
Camera . . . . .	98
Lenses . . . . .	99
Fast lenses. . . . .	99
Telephoto and zoom lenses. . . . .	101
Prime lenses . . . . .	102
Accessories . . . . .	102
Camera bags . . . . .	102
Photo vests . . . . .	103
Shooting Events . . . . .	104
Shooting Tips. . . . .	106

## **CHAPTER 7**

### **Portrait Photography** **107**

Exposure Considerations. . . . .	108
Aperture . . . . .	108
Shutter speed. . . . .	109



Considering Lighting and Location . . . . . 112

Indoors . . . . . 112

Outdoors. . . . . 114

Portrait tones . . . . . 115

High-key portraits. . . . . 115

Mid-key portraits . . . . . 116

Low-key portraits . . . . . 117

Working with People . . . . . 118

Children. . . . . 118

Groups . . . . . 119

The Right Equipment for the Job . . . . . 121

Lenses . . . . . 121

Lights . . . . . 122

Studio strobes . . . . . 122

Continuous lights . . . . . 124

Portable flashes . . . . . 125

Other accessories. . . . . 126

Reflectors . . . . . 126

Diffusers . . . . . 127

Backdrops . . . . . 129

Light meter . . . . . 130

Shooting Portraits . . . . . 131

Shooting Tips. . . . . 135

**CHAPTER 8**

**Landscape and Nature Photography 137**

Exposure Considerations. . . . . 138

When to shoot . . . . . 138

Shoot in Aperture priority mode . . . . . 139

Metering modes . . . . . 140

Shooting snow . . . . . 140

Checking the exposure. . . . . 141

The Right Equipment for the Job . . . . . 142

Lenses . . . . . 142

Accessories . . . . . 143

Tripods. . . . . 144

Filters . . . . . 144

GPS receiver . . . . . 145

Macro Nature Photography . . . . . 146

Panoramic Photography. . . . . 148

Shooting Landscapes and  
Nature Photographs . . . . . 150

Shooting Tips. . . . . 153





## CHAPTER 9 Night and Low-Light Photography 155

Exposure Considerations . . . . .	156
Long shutter speeds . . . . .	156
Wide open aperture . . . . .	157
High ISO . . . . .	157
The Right Equipment for the Job . . . . .	158
Cameras and lenses . . . . .	159
Accessories . . . . .	159
Tripods . . . . .	159
Cable release and remote control . . . . .	161
Photographing Light Trails and Fireworks . . . . .	162
Photographing Silhouettes . . . . .	165
Sunrise and Sunset Photography . . . . .	166
Shooting at Night and in Low Light . . . . .	167
Shooting Tips . . . . .	169

## CHAPTER 10 Sports and Action Photography 171

Exposure Considerations . . . . .	172
Shooting outside during the day . . . . .	172
Shooting inside . . . . .	175
Shooting outside at night . . . . .	176
The Right Equipment for the Job . . . . .	177
Cameras . . . . .	177
Lenses . . . . .	178
Accessories . . . . .	180
Shooting Sports and Action Photographs . . . . .	182
Get into position . . . . .	182
Figure out which mode to use . . . . .	184
Get good non-action action shots . . . . .	185
Shooting Tips . . . . .	186

## CHAPTER 11 Wedding Photography 189

Exposure Considerations . . . . .	190
The bride and groom . . . . .	190
Shooting inside . . . . .	191
Exposing for movement . . . . .	192
Evaluating exposure . . . . .	192
The Right Equipment for the Job . . . . .	193
Camera bodies . . . . .	193
Lenses . . . . .	195



Dedicated flash. . . . . 197

Accessories . . . . . 197

Shooting a Wedding . . . . . 198

    Getting ready for the bride . . . . . 199

    Getting ready for the groom . . . . . 200

    The ceremony . . . . . 200

    The formal portraits . . . . . 202

    The reception . . . . . 203

Shooting Tips. . . . . 204

**CHAPTER 12**

**Wildlife and Animal Photography 205**

Exposure Consideration. . . . . 206

    Using Aperture priority mode . . . . . 206

    Picking the right metering mode . . . . . 207

        Spot metering mode . . . . . 207

        Scene metering mode . . . . . 208

The Right Equipment for the Job . . . . . 209

    Cameras . . . . . 209

    Lenses . . . . . 209

        Telephoto lenses . . . . . 210

        Teleconverters . . . . . 211

        Fast lenses. . . . . 212

    Accessories . . . . . 213

        Tripods . . . . . 213

        Monopods . . . . . 214

        Beanbags . . . . . 214

        Remote triggers. . . . . 214

Pet Photography . . . . . 215

Shooting Wildlife and Animal

    Photographs . . . . . 218

Shooting Tips. . . . . 222

**CHAPTER 13**

**Creative Exposure 223**

Exposure Considerations. . . . . 224

High exposure . . . . . 225

Underexposure . . . . . 227

Using Exposure to Create a Mood . . . . . 229

Using ISO Noise Creatively . . . . . 231





<b>APPENDIX A</b>	
<b>Software</b>	<b>233</b>
Adobe Photoshop .....	234
Adobe Camera Raw .....	234
Photoshop .....	236
Adobe Photoshop Lightroom .....	237
Library module .....	238
Develop module .....	238
Adobe Photoshop Elements .....	239
Apple Aperture .....	241
iPhoto .....	243

<b>APPENDIX B</b>	
<b>How to Use the Gray Card and Color Checker</b>	<b>245</b>
 <b>Glossary</b>	 <b>247</b>
 <b>Index</b>	 <b>255</b>

# Introduction

This Digital Field Guide is not camera specific or even brand specific, it is all about exposure, but what does that actually mean? Exposure is a very simple concept — allow the light sensitive sensor (film) to be exposed to the light that is reflected from the scene you want to capture. That's the basics of taking a photograph. When you press the shutter release the camera opens the shutter and the light travels through the lens and is allowed to reach that sensor and you have a photograph.

As photographers you get to control the amount of light that reaches the sensor by controlling how long the shutter is open and how big a hole the light enters through. You also get to decide how much the signal from the sensor is amplified and it is those decisions that are the essence to taking photographs and getting a proper exposure.

I get a lot of questions about photography both through my blog at [www.alanhessphotography.com](http://www.alanhessphotography.com) and in person when out photographing. Most of the time the questions are about how I managed to capture a certain image or what settings I use for my photos. The answer is pretty simple: I use the best exposure settings for the situation.

In this book, I start by covering exactly what an exposure is and what controls you have to adjust it. It explains how your camera measures light and what each of the settings mean, as well as which of the metering modes works best for different situations. It also covers the exposure modes found on most cameras and when the best time to use them is.

Next up is all about light. Because photography is capturing light, it is important to understand the direction, color, and intensity of light in any scene. It is only after you can see and understand the light, that you can really go about capturing it. Shutter speed, aperture, and ISO are also covered in detail. Each of these sections not only cover the controls you have at your disposal, but the pros and cons of each one.

After the generalities of shutter speed, aperture and light are covered, it is time to get a little more specific starting with event photography, which includes one of my favorite photographic subjects — concert photography. I also cover outdoor events, indoor events, and those that take place all day long. You will learn about the exposure considerations and what can be done to get the best images possible.

Next is all about shooting people, from individual to group portraits, from shooting outside to dealing with studio lights. How to deal with the exposure problems that arise when shooting portraits is covered along with the best ways to check your exposures are all covered here.

Shooting landscapes and nature is also covered — from the exposure considerations when shooting landscapes and nature photography to controlling the depth of field to make sure that the whole landscape is in focus and even what the best times to shoot landscapes are.

Low light and night photography is up next. By definition, low light and night photography deals with photography when there is minimal light. Photographing light trails and fire works as well as how to shoot those beautiful sunrises and sunsets are all covered, as well as a look at the best way to shoot a silhouette, a technique that will let you use silhouettes creatively from now on.

While you normally use long shutter speeds when photographing in lower light, when it comes to sports and action photography, the opposite is often true. You use very short shutter speeds to freeze the action. How fast of a shutter speed is needed and what are the consequences are covered in this chapter. It doesn't matter if you are shooting your kids playing a soccer game or if you are on the sidelines of a high school, college, or professional football game, the basics are the same.

Everybody loves a wedding; it is a time of joy and happiness...unless you are photographing the event. Wedding photography can be a very stressful experience for a photographer, with only one chance to get it right. Weddings can also be a real challenge when it comes to getting proper exposures due to the traditional bright white dress and dark tuxedos. In this chapter I cover the problems and the solutions with shooting weddings that will hopefully help if you ever find yourself as the wedding photographer.

Wildlife and animal photography is another favorite to photograph. It can range from photographing pets to taking a trip to the local zoo or an animal park, but the skills you need to get great shots are the same.

Finally, you get a look at some creative exposure options — the different ways to achieve your artistic vision and some fun ways to experiment during the image creation.

## Introduction

Because this book is all about digital photography I also spend some time at the end covering some of the software options and a bit about what can be done in post processing to adjust your exposure. However, even with the advances in software and the amazing things that can be done on a computer these days, remember it is still best to get the exposure right in the camera first.

This Digital Field Guide includes a new feature; a gray card/color checker that can be removed and used to help you get true and accurate colors in your images.

One quick note: this book is made specifically to go with you. It isn't some tabletop tome that can't leave the house, its made to go in your camera bag, so dog ear the pages, use a highlighter to underline the parts that are important to you, but the main thing is for you to take the book with you, use it as a guide when out shooting. And, if you really love the book and don't want to get it worn and torn, I have no problem with you buying two.



# Understanding Exposure

Photography is the art of capturing light. You use your camera's lens to focus the light and the sensor to record the light, creating an exposure. As a photographer, your job is to decide how much light the sensor is allowed to record, how long the shutter is opened, and how big the opening is in the lens to let in light. You also get to decide how sensitive the sensor is to light. All these factors let you control the exposure. You need to understand the exposure modes and light metering to help get the proper exposures and how to use the histogram to check your exposures. Picking the right file type to store your image is also important because it can make a big difference if you need to adjust the exposure in post processing.

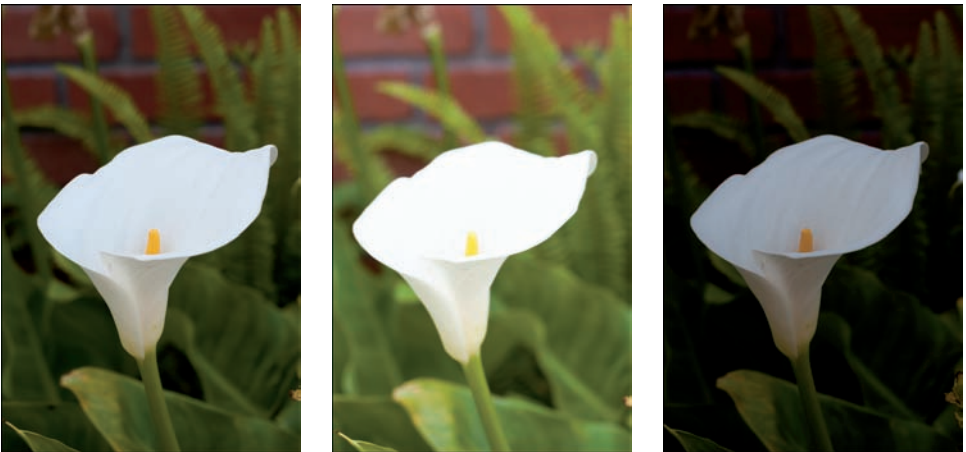


**Using the proper settings enabled me to capture the light cat in the darker shadows without losing detail in either. 1/320 second, f/4.5, ISO 800.**



# Defining Exposure

The basic definition of exposure is very simple: The exposure is the amount of light that is allowed to reach the sensor in your camera to create a photograph. The amount of light that reaches the sensor is controlled by two main factors: the length of time the shutter is open (shutter speed) and the size of the opening through which it flows (aperture). A third factor — ISO — changes the sensitivity of the camera's sensor to light, which can be used to modify the exposure. The question becomes how much light is needed to create the look you want. No matter what settings you use, the sensor in your camera records the light being reflected at the camera. If too much light reaches the sensor, the image is overexposed or too bright; if too little light reaches the sensor, the image is underexposed or too dark. The goal is to let through enough light so the bright areas in your image are not too bright and the dark areas in your image are not too dark.



**1.1** These three images were taken around the same time. The left image shows the calla lily in good exposure (1/160 second, f/6.3, ISO 200), while the middle and right images show the same flower when overexposed and underexposed. Notice the lack of detail in the light areas when overexposed and the lack of detail in the dark areas when underexposed.

When discussing exposure, a set of standard terms are used that help you to define the exposure. Shutter speed is described using time, aperture is described using size, and ISO has a standard numerical value. You also need to understand what happens when you change the shutter speed, aperture, or ISO and the relationship among these different exposure factors. The basic unit used when describing this relationship is called a *stop*.





You can also use the Exposure Value to describe the settings used to achieve a proper exposure.

## Stop

A *stop* is the change between one shutter speed and the next, where the change is exactly double or half the original shutter speed. The difference between a 1-second and 2-second shutter speed is one stop because the amount of light that is let in during the 2-second shutter speed is twice as much as the light let in by the 1-second shutter speed. There is a stop difference between 1/60 second and 1/30 second as well since 1/60 second is half as much as 1/30 and lets in half as much light. A stop also describes the change in aperture where the new aperture is double or half the current aperture and it is the change in ISO between one value and a value that is either double or half the current ISO.

Each time you double or halve the ISO, it changes the sensitivity by one stop. For example, the difference between ISO 200 and ISO 400 is one stop, with the image taken at ISO 400 needing half as much light as an image taken at ISO 200 because the sensor is twice as sensitive to light.

A one-stop difference in the shutter speed, aperture, or ISO will either double or halve the exposure, but most modern cameras allow you to set the shutter speed, aperture, and ISO in 1/2 or 1/3 stop increments allowing for more choices.

You may hear a photographer say things like opening up a stop or stopping down. Opening up a stop means increasing the light entering the camera by a stop by increasing the size of the aperture. While stopping down is just the opposite: it is used to describe decreasing the amount of light reaching the sensor by decreasing the size of the aperture. So, don't let the fancy talk confuse you; using the word stop when talking about photography is just a way to describe adjusting the exposure.

## Exposure value

Your camera indicates what the built-in light meter has determined to be the correct exposure. Cameras use a numerical value called the exposure value or EV to describe the exposure. The EV for a correctly exposed image has the value of 0. Negative values are scenes that the built-in light meter has determined are underexposed and need more light, while positive values are scenes that the built-in light meter has determined are overexposed and need less light. The values are measured in stops. When you look through your camera's viewfinder, you see a readout showing the exposure value.

When you use the Program auto exposure mode, Shutter speed priority mode and Aperture priority mode have an EV of 0. When the camera is set to Manual mode, you can use EV to determine if the settings you have entered are close to what the camera considers the correct exposure. You can adjust your settings according to what the EV shows.

For example, if the EV value shows a  $-1$ , then according to the camera you are letting in too much light and overexposing the image by one stop. You can correct this by increasing the shutter speed by one stop, stopping down the aperture by one stop, or reducing the ISO by one stop.

## Equivalent Exposures

Equivalent exposures are an important part of getting the best exposure for each situation. The idea behind equivalent exposures is that different combinations of shutter speed, aperture settings, and ISOs can create the same exposure. This is because the three work together to create an exposure. For example, if you use a fast shutter speed and a wide aperture, you can get the same exposure with a slower shutter speed and narrower aperture.



**1.2** This flower was shot at 1/400 second, f/1.8, ISO 200.



**1.3** This flower was shot at 1/50 second, f/5.6, ISO 200.

Think of the sensor in your camera as a glass and the light coming in as water. You want to get the perfect amount of water in the glass, so you turn on the faucet and the water flows into it. If the faucet is opened all the way, it can stay open for a short period of time to get the desired amount of water. If the faucet is opened only partway, it must be open for a much longer period of time for the same amount of water to fill the glass.

The easiest way to explain equivalent exposures is to show how it works. Say that you have an exposure setting of ISO 100 with a shutter speed of 1/125 second and an f-stop of f/16. If you increase the shutter speed by one stop, which halves the time the shutter is open, you must double the size of the aperture. So, for an ISO of 100 and a shutter speed of 1/250 second, the f-stop must be f/8. This works in reverse as well; if you leave the shutter open for twice as long, 1/60 second, you need to make the aperture smaller, letting in half as much light, which is f/32.

As you can see, the flower in figures 1.2, 1.3, 1.4 and 1.5 looks the same in all four images because the exposure is the same for all four images, yet the images are not identical. If you look at the background, it changes drastically from being completely out of focus to being easily identifiable depending on the combination of shutter speed, aperture and ISO used.



**1.4** This flower was shot at 1/500 second, f/3.5, ISO 800.



**1.5** This flower was shot at 1/3 second, f/22, ISO 200.

# Exposure Modes

Today's digital cameras come with a fully automatic mode, and most consumer cameras have scene modes to help you get the right exposure under specific circumstances. For example, both the Nikon D90 and the Canon EOS Rebel T1i have five scene modes: portrait, landscape, close-up, sports, and night portrait. These scene modes help photographers get the best results in specific situations, but the other exposure modes give you the maximum control over your images, and control is what it is all about. The modes I focus on in this book are Program auto mode, Shutter speed priority mode, Aperture priority mode, and Manual mode.

## Program auto mode

When your camera is set to Program auto mode, the camera decides the shutter speed and aperture, and in some cases the ISO. But what separates this from a full auto mode is your ability as the photographer to adjust the shutter speed or the aperture and let the camera adjust accordingly to make a proper exposure. This is a great mode to learn with because the camera is basically picking the starting point for both the shutter speed and aperture.

## Shutter speed priority mode

This mode lets you pick the shutter speed and lets the camera pick the aperture to create a proper exposure. You use this mode when you want to control how long the shutter is open or when you want to control the motion in your images. Fast shutter speeds let in less light but will freeze motion while slow shutter speeds allow in more light but can cause blurring of moving objects in your image.



**1.6** For the image of the BMX rider flying through the air, I used a fast shutter speed of 1/2000 second to freeze the moment. Taken at 1/2000 second, f/2.8, ISO 100.



I cover using shutter speed to control the exposure and what effect that can have on your images in Chapter 3.

## Aperture priority mode

Aperture priority mode lets you select the aperture, and then the camera picks the shutter speed to achieve proper exposure. Controlling the opening or aperture in the lens that allows light to reach the sensor also controls the *depth of field* (which is the area that is in front of and behind what you are focusing on that is in acceptable focus). Because this mode involves setting the size of the opening in the lens, and by doing so lets the camera decide on the best shutter speed, it is a great way to get blurry images. When used at the right time it offers a great deal of creative control over your images.



Depth of field is covered in much greater detail in Chapter 4.



**1.7** I used a shallow depth of field in this image to blur the background so the flowers stayed the center of attention. Taken at 1/320 second, f/4.0, ISO 200.



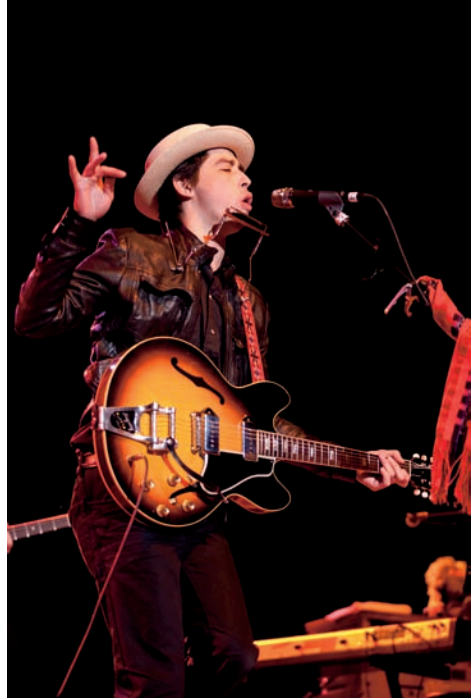
## Manual mode

In Manual mode, you get to set the shutter speed and aperture. This mode gives you the most control over your exposures. Being able to set both the shutter speed and aperture allows you to determine what the sensor captures, but it also is the easiest way to underexpose or overexpose your image because the camera won't do anything to help you. The camera shows you what the built-in light meter believes is the correct exposure and whether your settings will produce an image that is lighter or darker than the camera's choice.

## Metering Light

Metering light is simply measuring the brightness of the scene you want to capture. The best way to determine the amount of light needed to create a proper exposure is to use a light meter. All light meters work on the same basic principle: They convert the amount of light in a scene into a measurable form and then translate that information into a form useful to a photographer. The light meter uses that value to determine the shutter speed and aperture settings, given the ISO.

In the past, light meters were an extra piece of equipment that photographers used to get the correct exposure settings to set the camera manually, but all the DSLR and point-and-shoot cameras today have built-in light meters. The built-in light meter measures the light coming through the lens, the same light that reaches the sensor when the shutter is moved out of the way. This type of metering is called TTL or Through the Lens metering and can constantly adjust to the changes in the exposure. The entire process now happens in the camera.



**1.8** This concert photo of musician Jackie Greene was taken in Manual mode to counteract the rapidly changing lights. Taken at 1/200 second, f/2.8, ISO 1600.