



PHOTOGRAPHY

Barbara **London** | Jim **Stone** | John **Upton**

*40th
Anniversary
Edition*

TWELFTH EDITION

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PHOTOGRAPHY

Barbara **London** | Jim **Stone** | John **Upton**



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Brief contents

PREFACE	xii
1 GETTING STARTED	2
2 CAMERA	14
3 LENS.	38
4 EXPOSURE, SENSORS, AND FILM.	68
5 LIGHT AND COLOR	94
6 DEVELOPING A FILM NEGATIVE.	110
7 PRINTING IN A DARKROOM.	126
8 BASICS OF DIGITAL PICTURES	158
9 IMAGE EDITING	172
10 PRINTING DIGITALLY.	194
11 ORGANIZING, STORING, AND PRESENTING WORK	206
12 LIGHTING	220
13 EXTENDING THE IMAGE	254
14 VIEW CAMERA.	280
15 SEEING PHOTOGRAPHS	300
16 HISTORY OF PHOTOGRAPHY	326
TROUBLESHOOTING	386
GLOSSARY.	397
BIBLIOGRAPHY	402
CREDITS	407
INDEX	408

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RINKO KAWAUCHI
Untitled,
from the series *Illuminance*, 2007

Contents

Preface xii

1 GETTING STARTED 2

Introducing the Camera	4
Getting Your Camera Ready	5
Focusing and Setting the Exposure.	6
Taking Your Picture	8
What Will You Photograph?	9
Some Basic Guidelines to Get You Started	9
Photographing People	10
Photographing Places	12

2 CAMERA 14

Basic Camera Controls	16
The Shutter.	18
The Shutter and Light	18
The Shutter and Motion	20
Conveying Motion in a Still Photograph	22
The Aperture.	24
The Aperture and Light	24
The Aperture and Depth of Field	26
Using Shutter and Aperture Together	28
Choosing a Camera.	30
Digital Cameras	31
Film Cameras	32
Keeping the Camera Steady	34

■ **photographer at work**

Photojournalist Lynsey Addario 36

3 LENS 38

From Pinhole to Lens	40
Lens Focal Length.	42
Normal Focal Length	44
Long Focal Length	46
Short Focal Length	48
Zoom Lenses	50
Special-Purpose Lenses	51
Focusing Your Lens	52
Manual Focus	52
Automatic Focus	54
Focus and Depth of Field	56
Controlling Depth of Field	58
Zone Focusing	60
Focusing on the Hyperfocal Distance	61
Perspective.	62
Guidelines for Buying a Lens.	64
Getting the Most from Your Camera and Lens	65

■ **photographer at work**

Fine-Art Photographer Alec Soth 66

4 EXPOSURE, SENSORS, AND FILM 68

Exposure Basics	70
Equivalent Exposures	70
How Exposure Meters Work	71
In-Camera Exposure Meters	72
Automatic Exposure	73
How to Meter	74
An Overall Reading of a Scene with Average Tones	74
Using Different Types of Meters	75
Metering High-Contrast Scenes	76
Exposing for Specific Tones and Bracketing	78
Hard-to-Meter Scenes	79

The Histogram	80
Measures a Digital Photograph	80
Three Histograms for Color	81

Exposure Latitude and Dynamic Range	82
How Much Can Exposures Vary?	82

Responding to Light	84
Silver and Pixels	84

Selecting and Using Film	85
---	----

Film and Sensor Speed	86
Speed and ISO	86
Grain and Noise	87

Using Filters	88
--------------------------------	----

Extending Beyond Visible Light	90
Infrared Photographs	90

Using Exposure	91
---------------------------------	----

■ **photographer at work**

Advertising Photographer Clint Clemens	92
---	----

5 LIGHT AND COLOR 94

Color: Additive or Subtractive	96
---	----

Color Photographs: Three Image Layers.	97
---	----

Color Characteristics	98
--	----

Color Balance	100
Color Changes throughout the Day	100
Color Temperature	101
Color Casts	102
Mixed Light	103

Color Modes and Gamuts	104
---	-----

Color Management	105
-----------------------------------	-----

Adjusting Color with Film	106
Filters to Balance Color	106

■ **photographer at work**

Another Angle on Sports –Walter looss, Jr	108
--	-----

6 DEVELOPING A FILM NEGATIVE 110

How to Process

- Black-and-White Roll Film** 112
- Equipment and Supplies You'll Need 112
- Processing Chemicals and
How to Handle Them 113
- Chemical Safety 114

Processing Black-and-White Roll Film Step by Step 116

How Film Processing Affects Your Picture 122

Exposure and Development: Under, Normal, Over 124

7 PRINTING IN A DARKROOM 126

Black-and-White Printing 128

- Equipment and Supplies for Printing 128
- The Enlarger 130
- Printing Papers 132

Making a Black-and-White Print Step by Step 134

- A Contact Sheet: A Whole Roll at Once 134
- Setting Up an Enlargement 136
- A Test Strip for Your Print 138
- A Trial Print—and Then a Final Print 139
- Processing a Black-and-White Print 140

Evaluating Density and Contrast in a Print 144

Controlling Contrast 146

- Graded-Contrast
and Variable-Contrast Papers 146

Dodging and Burning 148

Spotting to Remove Minor Flaws 150

Archival Processing for Maximum Permanence 151

Toning for Color and Other Effects 152

Making a Color Print from a Negative 154

- Equipment and Materials You'll Need 154
- Exposing a Test Print 155
- Judging Color Balance in a Print
Made from a Negative 156

8 BASICS OF DIGITAL PICTURES 158

Hardware and Software 160

- An Overview 160

Capturing Detail 161

- Resolution and Bit Depth 161

Photographs Are Files 162

- File Formats 162

Channels 164

- Color or Black and White? 164

Importing Your Images 166

- Downloading from a
Camera/Scanning 166
- Making a Scan 167

Setting Up a Workflow 168

Workflow Applications 169

■ **photographer at work**

Online Impresario Jim Casper 170

9 IMAGE EDITING 172

Digital Post-Processing:

Getting Started 174

- Choosing Software 174
- Your Work Area and Tools 175

An Image-Editing Workflow 176

- A Step-by-Step Process 176

Adjusting Shape 178

- Crop and Rotate 178

Adjusting Color and Value 180

- Different Approaches 180
- Using Levels 181
- Curves 182

Adjusting All or Part of an Image 184

- Selection Tools 184
- Using Layers 185

Other Editing Commands 186

- High Dynamic Range 186
- Filters for Special Effects 187
- Sharpening 188
- Retouching 189

Compositing 190

■ **photographer at work**

RetouchShope— Scalese and Villarreal 192

10 PRINTING DIGITALLY 194

Printers and Printing 196

- Printer Choices 196
- Drivers and RIPs 197
- Profiles and Soft Proofing 198
- Papers and Inks 199

Printing Options 200

- Panoramic Photographs 200
- Printing in Black and White 202

Displaying Your Work 204

- The Internet—Gallery
and Resource 204

Ethics: How Far Can You Go? 205

11 ORGANIZING, STORING, AND PRESENTING WORK 206

Image Storage	208
Size Matters	208
Metadata: Data About Your Files	209
Software to Keep You Organized	210
Archiving Digital Images	211
Archiving Film and Prints	212
Mounting a Print	214
Equipment and Supplies You'll Need	215
Dry Mounting	216
Cutting an Overmat	218
Framing and Glazing	219

12 LIGHTING 220

Direction of Light	222
Degree of Diffusion:	
From Hard to Soft Light	224
Available Light—Outdoors	226
Available Light—Indoors	227
Artificial Light	228
Lights and Other Lighting Equipment	228
Qualities of Artificial Light	229
The Main Light:	
The Dominant Source	230
The Fill Light:	
To Lighten Shadows	232
Lighting with Flash	234
Flash Equipment	235
Basic Flash Techniques	236
Manual Flash Exposures	238
Automatic Flash Exposures	239
Fill Flash: To Lighten Shadows	240
Controlling Background Brightness	242
Simple Portrait Lighting	244

Multiple-Light Portrait Setups	246
Lighting Textured Objects	248
Lighting Reflective Objects	249
Lighting Translucent Objects	250
Using Lighting	251

■ **photographer at work**

Dance Photographer Lois Greenfield	252
---	-----

13 EXTENDING THE IMAGE 254

Using Scale	256
Pictures Very Large and Very Small	256
Multiple Images	258
More is Better	258
Fabricated to be Photographed	260
Text and Image	262
The Photograph as Object	264
Using Projections	266
Making a Book	267
Alternative Processes	268
Cyanotype Printing	268
Platinum and Palladium Printing	269
Gum Bichromate Printing	270
Collodion and Tintypes	271
A Photogram: A Cameraless Picture	272
Pinhole Photography	274
How to Make a Close-Up Photograph	276
Close-Up Exposures	277
Copying Techniques	278

14 VIEW CAMERA 280

Inside a View Camera	282
The Zone System	283
View Camera Movements	284
Rise and Fall	284
Shift	286
Tilt	288
Swing	290
Using a View Camera to Control the Image	292
Controlling the Plane of Focus	293
Controlling Perspective	294
Equipment You'll Need	296
What to Do First—and Next	297
Loading and Processing Sheet Film	298

15 SEEING PHOTOGRAPHS 300

Basic Choices	302
Content	302
Framing the Subject	304
Backgrounds	306
Basic Design	308
Spot/Line	308
Shape/Pattern	310
Emphasis/Balance	312
More Choices	314
Using Contrasts of Sharpness	314
Using Contrasts of Light and Dark	316
Placing the Subject within the Frame	318
Perspective and Point of View	320
Looking at—and Talking About— Photographs	322
Showing Your Work to Editors and Others	324

16 HISTORY OF PHOTOGRAPHY 326

The Invention of Photography	328
Daguerreotype: “Designs on Silver Bright”	329
Calotype: Pictures on Paper	330
Collodion Wet-Plate: Sharp and Reproducible	331
Gelatin Emulsion/Roll-Film Base: Photography for Everyone	332
Color Photography.	333
Early Portraits.	334
Early Travel Photography.	336
Early Images of War	337
Time and Motion in Early Photographs.	338

The Photograph as Document	339
Photography and Social Change	340
Photojournalism	342
Photography as Art in the 19th Century	346
Pictorial Photography and the Photo-Secession	347
The Direct Image in Art.	348
The Quest for a New Vision	350
Photography as Art in the 1950s and 1960s	352
Photography as Art in the 1970s and 1980s	354
Color Photography Arrives—Again	356
Digital Photography Becomes Mainstream	358
A Gallery of Contemporary Photography	360

Troubleshooting	386
Glossary	397
Bibliography	402
Credits	407
Index	408

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JAMES HENKEL

Volume 1-7, 2004

Henkel has often made photographs that “address the form and authority which we associate with books.”

Out of respect for that authority, Henkel says, he initially found it difficult to destroy them for his Stacks series, “but once I cut the first few it was quite easy.”

Preface



*Photography is continually changing, and each version of **Photography** reflects that change. View cameras yielded to 35mm. Black-and-white photography gave way to color. Manually adjusted cameras became automatic. Digital photography has relegated film to being an alternative process. The tools and practice of photography are constantly changing, and so are the images we make with it.*

This book changes with the medium and with the times; as with each new edition, this book updates the traditional practice of photography as well as incorporating current technologies.

In response to changing technologies, this book is available as both a print book and an eText. But its fundamental goal remains, it shows how to make photographs, how to control photographic processes, and how different photographers employ them for their own creative purposes.

More than a million copies of *Photography* are now in print. Many people who have used this book have become professional photographers, exhibiting artists, or photography instructors, or are continuing to pursue their personal interest in photography. Whatever your interest in photography, this book is designed to teach the skills that you will need to use the medium confidently and effectively.

This edition continues that tradition; it lays out what you need to know to make photographs. This book presents all facets of photography, both traditional and digital. The emphasis, however, continues to be in two major areas—technique and visual awareness. The technical material helps you learn how to control the photographic process, or as Ansel Adams put it, to understand the way that the lens “sees” and any light-sensitive material “sees.” Equally important, this book can help you see by showing you the choices that other photographers have made and that you can make when you raise a camera to your eye.

Clarity and convenience have always been a focus of this book. In this edition even more effort has been made to organize and format information into an easy guide for beginning photographers and a quick reference for those with some experience.

- The easy-to-use format has been maintained, with every two facing pages completing a single idea, skill, or technique.
- Boldfaced topic sentences outline the text on every page.
- Workflow routines are easy to understand and to follow, presented in a step-by-step manner.

The general presentation of technical information has been maintained, with some reorganization for this new edition.

- General photographic techniques and camera handling are covered completely in Chapters 1–5: digital and film cameras, lenses, sensors and film, and exposure, along with color theory and practice.
- Chapters 6–7 are for those using film. Black-and-white film development and darkroom printing are shown in detail, along with equipment information and safety procedures.
- Chapters 8–11 present information on digital photography, focusing on the information that a beginning student needs to know about bringing images into the computer, adjusting and printing them, and then creating a system so digital files can be safely stored and easily found. Also included are procedures for mounting,

- presenting, and archiving prints, both darkroom-made and digitally produced.
- Chapters 12–13 cover lighting, ways to extend the photographic medium, and special techniques (such as the making of pinhole cameras, cyanotypes, and gum bichromate prints).
- Chapters 15–16 continue the presentation of great historic and contemporary photographs, and discuss the reasons they succeed and the ways your own photographs might aspire to similar great accomplishment.
- A fully illustrated Troubleshooting section for film processing, darkroom printing, and digital photography, begins on page 386. It groups together technical problems, their causes, and ways to prevent them.

Improving visual awareness is a major emphasis of the book. Many demonstration photographs make topics easy to understand. Throughout the book you will find hundreds of illustrations by the best photographers showing how they have made effective use of various technical concepts. See the examples detailed here:

- The photographs illustrating lens focal length on pages 44–49, or how two pho-

tographers use electronic flash plus available light on page 243.

- *Photographer at Work* pages throughout the book feature interviews with photographers who have developed successful careers, with an internationally exhibited artist (pages 66–67), and an advertising photographer who photographs cars that aren't really there (pages 92–93), as well as an interview with the originator of an online photo destination that reaches over 1.5 million people each month (pages 170–171).
- Chapter 15, *Seeing Photographs* (pages 300–325), deals with composition, tonality, sharpness, and other visual elements that will help you make better pictures yourself, and see other people's photographs with a more sophisticated eye.
- Chapter 16 (pages 326–385) surveys the history of photography so that you can place today's photography—and your own—in a historical context.

Reasons to use the new 40th Anniversary

Twelfth Edition: In addition to complete coverage of traditional photographic materials, procedures, and techniques, the twelfth edition encompasses the current photography that is captured, shaped, transmitted, printed, and saved electronically.

- Digital and chemical camera techniques are integrated throughout. The book meets the needs of students using an all-digital, all-chemical, or mixed workflow.
- Updated chapters dedicated to digital technique. Four chapters, 8–11, explore the current state of digital photography. Chapter 8 introduces software applications that manage a digital workflow, and they are integrated throughout the following chapters. Chapters 9 and 10 survey the options you have when adjusting or printing a single image. Chapter 11 covers the organizing of an archive for storing photographs that may have no physical form and can't be saved in a shoebox. It also suggests methods and products to help you to quickly find one image among thousands, and offers finishing techniques for making your

prints look great on the wall of your bedroom or your classroom—or of a major museum.

- Over two dozen new fine art photographs illustrate technical concepts and help you develop visual awareness. This edition adds a wealth of images from contemporary and twentieth-century photographers including Sam Abell, Andrew Borowiec, Bill Burke, Larry Clark, Gregory Crewdson, Andrew Crooks, Doug DuBois, Filip Dujardin, Adam Ekberg, Andrew Hancock, Todd Hido, Laurisa Galvan, Katy Grannan, Todd Hido, György Kepes, Adrees Latif, An-My Lê, David Leventi, Martina Lopez, Hellen van Meene, Joel Meyerowitz, Richard Misrach, Joseph Mougel, Shirin Neshat, Michael Peven, Martin Roemers, Charles Sheeler, Joel Sternfeld, Roger Vail, and Jeff Wall.

Every edition of *Photography* has been a collaborative effort. Instructors, students, photographers, manufacturers, editors, gallery people, and many others participated in it. They fielded queries, made suggestions, responded to material, and were unfailingly generous with their time, energy, and creative thinking.

Special thanks go to instructors who reviewed the previous edition of *Photography*, as well as parts of this edition, and who volunteered many good ideas. They brought a particularly useful point of view, contributing many ideas on not only what to teach, but how to teach it:

Donald Bevirt, Southwestern Illinois College

Jennifer Daly, Butte College

Jennifer Formica, Dowling College

Frank Hamrick, Louisiana Tech University

Steven Herrnstadt, Iowa State University

Tyler Hewitt, Moraine Valley Community College

Kathleen Robbins, University of South Carolina

Stan Strembicki, Washington University
Anderson Wrangle, Clemson University

Without editorial and production assistance, a book of this size and complexity would be impossible to complete. Steve Martel and the team at SPi Global somehow managed to keep track of pictures, pages, and punctuation—perfectly. Magnum's Michael Shulman and Getty's Christiana Newton assisted cheerfully. Sam Abell made the remarkable photograph that appears on the cover. Special thanks for editorial, production, and marketing support go to Roth Wilkofsky, Joe Scordato, Ben Ferrini, and Corin Skidds at Pearson Education.

Many equipment manufacturers supplied photographs of, and information about, products, joining other experts who answered questions. In no particular order, thanks to Adobe Software's Julieanne Kost and Tom Hogarty, David Bram from *Fraction Magazine*, and *Macworld's* Ben Long. Thanks are also due to Phase One, Plustek, Sony, Fuji, X-Rite, Delkin, Nikon, Seagate, Ricoh, Canon, SanDisk, and the MAC Group—all of them forward-thinking corporations, many of which have made their product photographs readily available on the web, simplifying the process of illustrating up-to-date equipment.

Jim Stone owes everything to his mother, Sylvia, who recently and with clarity greeted her second century. Exceptional gratitude for continual support and tolerance is due to his wife Linda. Their son Skye, now fifteen, and ten-year-old daughters Amber and Jade, are not only willing models for demonstration photographs, but are making their own great photographs because of this book.

Students keep this book. They refer to it long after they have finished the basic photo course for which it was purchased. Many of the people who contributed to this edition used the book themselves when they were studying photography, and still have their original, now dog-eared, edition. As you work with the book, you may have suggestions on how to improve it. Please send them to us. They will be sincerely welcomed.

This is dedicated to everyone who is part of this new edition.

The authors would like to honor the memory of Lewis Baltz, John Chervinsky, Bart Parker, and Lars Tunbjörk, great artists whom we have lost since the previous edition of this book.



RICHARD MISRACH

Desert Croquet #1 (Deflated Earth), Black Rock Desert, Nevada, 1987



DANIEL J. McLAIN

U.S. Naval Academy Graduation and Commissioning Ceremony, Annapolis, Maryland, 2005

How do you photograph a graduation—or a building, or a tree, or anything else? Is the picture black and white or color, horizontal or vertical, straight-on or looking up? There are as many ways as there are photographers. In this photograph of a graduation at the U.S. Naval Academy, Photographer's Mate 2nd Class Daniel McLain used a very low point of view to include both the newly commissioned officers and the symbolically thrown hats.

1

The eye
and the camera
see more
than the mind
knows.

...Nathan Lyons

Getting started

In this chapter you'll...

...learn the names of your camera's main controls and their functions.

...walk through the first steps of getting your camera ready, focusing an image sharply, adjusting the camera settings so your photographs won't be too light or too dark, and making your first exposures. (You can go directly to Chapter 2 if you prefer more detailed coverage right away.)

...consider how to select a subject and compose your photograph so that it effectively conveys what you see.

Introducing the Camera	4
Getting Your Camera Ready	5
Focusing and Setting the Exposure	6
Taking Your Picture	8
What Will You Photograph?	9
Some Basic Guidelines to Get You Started	9
Photographing People	10
Photographing Places	12

The steps in this chapter are a basic checklist. Modern cameras vary greatly in design, so read your model's instruction manual or talk to someone who is familiar with your camera. We introduce two kinds of cameras: those that use film and those that record a digital image. To print pictures from a digital camera, you will use a digital printer. If you record your images on film, you can print them in a darkroom, or convert them to digital images by scanning them.

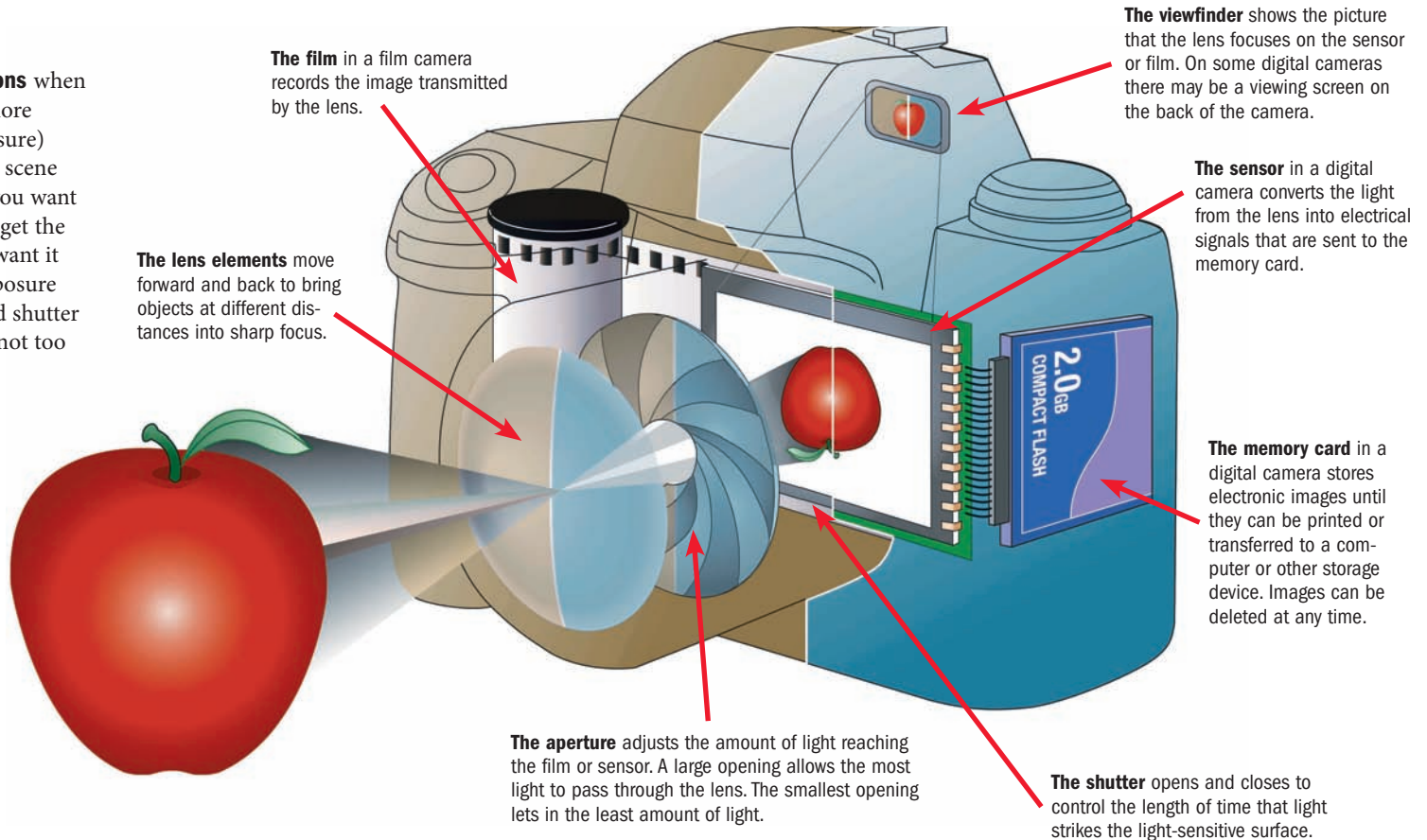
Modern cameras can adjust themselves automatically, including the choices of exposure and focus. Nevertheless, many photographers prefer to use manual operation to make their own exposure and focusing decisions. If you are in a photography class, your instructor may ask you to operate the camera manually for your first exposures to help you learn basic camera controls. The following pages cover both manual and automatic operation.

Once you have gotten the basics down, how do you get better? Many of the photographers whose work appears in this book were asked that question. Their advice was surprisingly consistent. "Take more pictures." "Shoot, shoot, shoot." "Persevere." "Just keep after it; you can't help but improve if you do." Even if this sounds obvious—no secrets or inside information—it seems to be advice that works. These photographers volunteered such comments often and with feeling. They knew how they had improved their skills, and they knew what you should do to get better, too. Don't forget to have fun.

Introducing the Camera

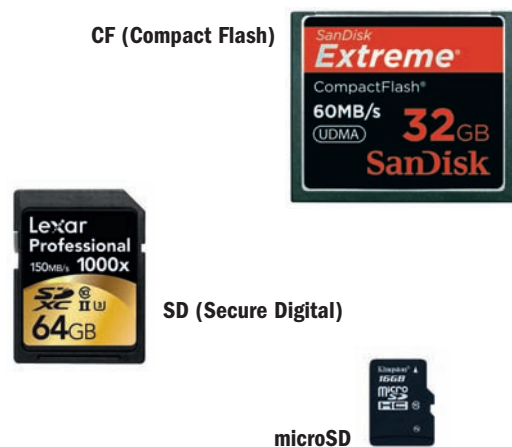
A camera's main functions when you take a picture (or more precisely, make an exposure) are to help you view the scene so you can select what you want to photograph, focus to get the scene sharp where you want it to be, and adjust the exposure (the aperture setting and shutter speed) so the picture is not too light or too dark.

Read your camera's owner's manual. The basic adjustments of all cameras are the same but the way you set them varies considerably.



CHOOSE A MEMORY CARD

Digital cameras store pictures on memory cards that vary in capacity and transfer speed. Digital cameras have evolved, and there have been several card types that are not interchangeable. Make sure you have one that fits your camera. The microSD card (bottom, below) may be placed in an adapter to fit cameras designed for the larger SD card.



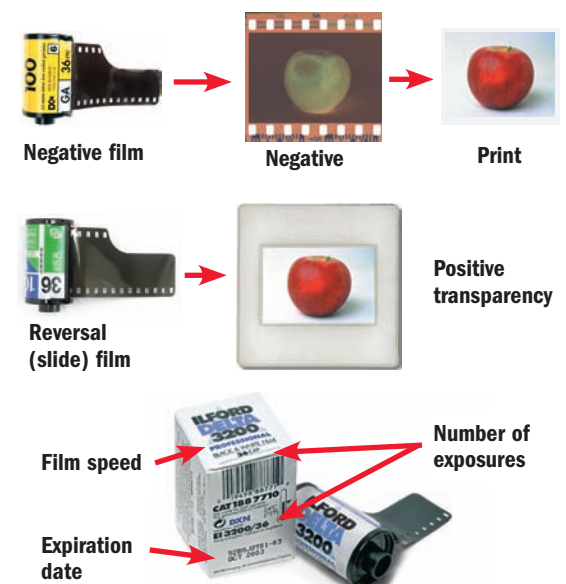
CHOOSE A SPEED

ISO Speed (50, 100, 200, and so on) describes a sensor's or film's sensitivity to light. The higher the number, the more sensitive (or "faster") it is, and the less light it needs for the picture to be neither too light nor too dark. Digital cameras allow the user to select one speed out of several choices and to change it for each picture. Film is made in several speeds; all the pictures on one roll will have the same ISO.

For your first exposures, choose a speed of 100 to 200 for shooting outdoors in sunny conditions. In dimmer light, use a speed of 400 or higher.



For a film camera, choose negative film for prints or reversal film for slides. Negative film, either color or black and white, is developed with chemicals to a negative image, then printed onto paper to make a positive one. Reversal films produce a positive image directly on the film that was in the camera.



Getting Your Camera Ready

DIGITAL CAMERA

Check the Batteries

Make sure the batteries are fresh or the power cell is charged. Your camera won't work at all without power, so keep a spare, fully charged power cell or extra batteries handy.



Insert the Memory Card

The camera must be turned off when the memory card is installed or removed. Avoid touching any exposed electrical contacts on the camera or card. Make sure the card is seated properly and close the cover.

Turn the power on and check the display. The number of remaining exposures will be visible. This number varies with the capacity of the card and your camera settings.



Set the Menu Options

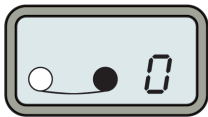
Turn the power on and press the menu button. The first time you turn your camera on, correctly set the date and time. The camera's default settings will be fine for your first photographs, but you should read the owner's manual to become familiar with your choices.



AUTOMATIC FILM CAMERA

Open and Load the Camera

A camera that loads film automatically probably will have a release lever to open the camera. First check the film-frame counter to make sure there is no film in the camera. If there is film in the camera, rewind it, then open the camera by sliding the release lever to its open position. Make sure the camera has fresh batteries.



Insert and Thread the Film

Check for dust in the camera. Clean using a small brush or compressed air. Don't touch the fragile shutter curtain at the camera's center.

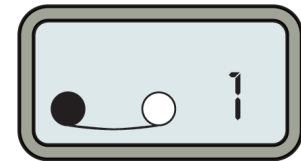
Automatic loading. Insert the film cassette. Pull out the tapered end of the film until it reaches the other side of the camera. Usually a red mark or other indicator shows where the end of the film should be. The film won't advance correctly if the end of the film is in the wrong position. Make sure the sprocket holes are engaged.



Advance Film to the First Frame

Automatic film advance. Depending on your camera, you may simply need to close the camera back and turn on the power switch to advance the film to the first frame. Some cameras also require you to depress the shutter button.

If the film has correctly advanced, the film-frame counter will display the number 1. If it does not, open the camera back and check the loading.



MANUAL FILM CAMERA

Open and Load the Camera

A camera that loads film manually will have a rewind knob on the top. This type of camera usually opens by pulling up on the rewind knob. If not, you will find a release lever on the side.



Insert and Thread the Film

Manual loading. Push down the rewind knob. Pull out the tapered end of the film until you can insert it into the slot of the take-up spool on the other side of the camera. Alternately press the shutter-release button and rotate the film-advance lever until the teeth that advance the film securely engage the sprocket holes at the top and bottom of the film and any slack in the film is reeled up by the take-up spool.



Advance Film to the First Frame

Manual film advance. With the camera back closed, alternately press the shutter-release button and rotate the film-advance lever. Repeat two times.

If the film is advancing correctly, the film-rewind knob will rotate counterclockwise as you move the film-advance lever. If it does not, open the camera and check the loading. Don't rely on the film-frame counter; it may advance even though the film does not move.



Focusing and Setting the Exposure

SET THE ISO SPEED

Set your camera to an ISO speed, a measure of how sensitive the sensor or film is to light. Film is made in different speeds; the ISO number is marked on the box and on the cassette. Digital cameras can be set to one of several speeds that may be changed for each picture. See page 86.



Film speed

DIGITAL CAMERAS

A digital camera lets you choose an ISO within a specific range, or set the camera to choose one for each shot automatically. A newer camera may allow settings from 100 to 12,800, some even more. Consult the owner's manual to find the range of ISO settings for your camera and how to adjust it.



FILM CAMERAS

DX codes can set the film speed automatically. Some cameras detect the film speed from the code of polished squares on the film cassette and show it on a display. On other cameras you must set the film speed manually. Turn the film-speed dial (marked ISO or sometimes ASA) to the speed of your film.



Automatic

Manual

FOCUS

Focus on the most important part of your scene to make sure it will be sharp in the photograph. When photographing a person, this is usually the eye. Practice focusing on objects at different distances as you look through the viewfinder so that you become familiar with the way the camera focuses.



AUTOMATIC FOCUS

Automatic focusing. Usually this is done by centering the focusing brackets (visible in the middle of the viewfinder) on your subject as you depress the shutter release part way. The camera moves the lens for you, bringing the bracketed object into focus. Don't push the shutter release all the way down until you are ready to make an exposure.



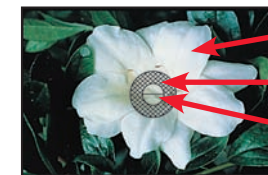
Shutter release

Part way down:
autofocus activated

All the way down:
shutter released

MANUAL FOCUS

While looking through the viewfinder, rotate the focusing ring on the lens until the scene appears sharp. The viewfinder of a single-lens reflex camera has a ground-glass screen that displays a scene sharply when it is in focus. Some viewfinders also have a microprism, a small ring in which an object appears coarsely dotted until focused. Others have split-image focusing in which part of an object is offset when it is out of focus.



Ground glass

Microprism

Split image

FACTORS THAT CONTROL EXPOSURE

To get a correctly exposed picture, one that is not too light (overexposed) or too dark (underexposed), you—or the camera—set the lens opening (aperture) and shutter speed depending on the ISO speed you have selected for your digital camera or the film you have loaded, and on how light or dark your subject is. The aperture size determines how much light passes through the lens; the shutter speed determines the length of time that the light strikes the light-sensitive surface inside your camera.



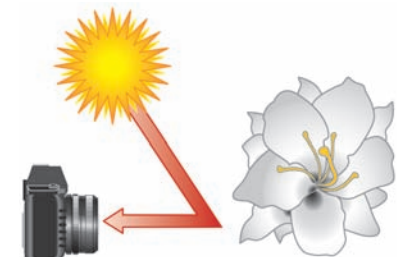
Aperture size



Shutter speed



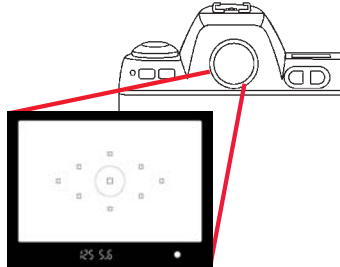
ISO setting or
film speed



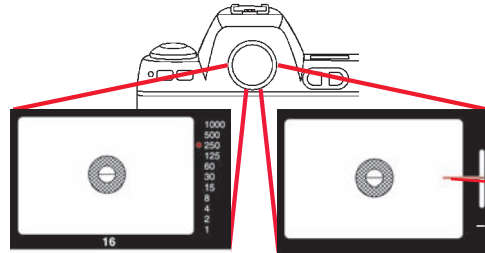
Brightness of subject

EXPOSURE READOUT

Exposure readout about the shutter speed and aperture appears in the viewfinder of most cameras, often along with other information. Here, the viewfinder of a digital camera displays 1/125 sec shutter speed, f/5.6 aperture.



Some older film cameras use a needle-centering display (below right) instead of showing aperture and shutter speed (below left). You change the shutter speed and/or the aperture until the needle centers between + (overexposure) and - (underexposure).

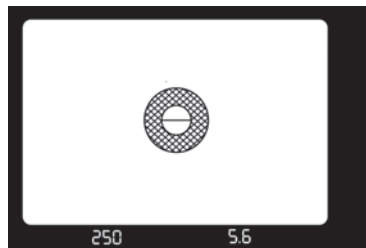


An LCD data panel appears on many cameras, displaying shutter speed and aperture settings (here, 1/500 sec shutter speed, f/5.6 aperture), plus other information. On digital cameras, there is usually also a color LCD monitor on the camera back for data, menus, and pictures. Make sure you know where the essential exposure information is shown on your camera.

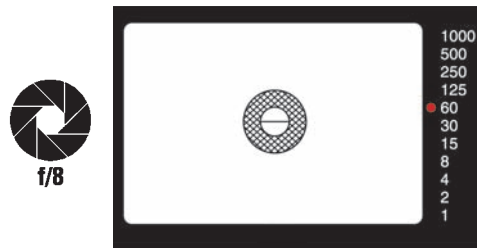


SET THE EXPOSURE-AUTOMATIC

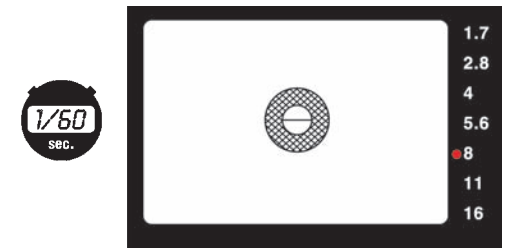
With automatic exposure or programmed automatic exposure, each time you press the shutter-release button, the camera automatically meters the light, then sets what it determines is the best shutter speed and aperture combination.



With aperture-priority automatic exposure, you set the aperture (the f-stop) and the camera sets the shutter speed. To keep the picture sharp if you are hand holding the camera (it is not on a tripod) the shutter speed should be 1/60 sec or faster with a 50mm lens. If the shutter speed is slower than 1/60 sec, set the aperture to a larger opening. (The larger the opening, the smaller its f-number. For example, f/8 is larger than f/11.)



With shutter-priority automatic exposure, you set the shutter speed and the camera sets the aperture. To keep the picture sharp if you are hand holding the camera (it is not on a tripod), select a shutter speed of 1/60 sec or faster with a 50mm lens.



SET THE EXPOSURE-MANUAL

With manual exposure, you set both the shutter speed and aperture yourself. How do you know which settings to use? At the simplest level you can use a chart sometimes packaged with film, like the one at right. Decide what kind of light is on the scene, and set the shutter speed and aperture accordingly. The chart is based on what is sometimes called the "Sunny 16" rule. On a sunny day, set the aperture to f/16 and use the shutter speed closest to the ISO number. For example, if the ISO speed is 100, set the shutter to 1/125 of a second (or 1/100 if your camera allows it) and the aperture to f/16. The chart at right shows an equivalent exposure—a faster shutter speed at a wider aperture, 1/250 sec at f/11.

ISO 100 film Outdoor exposures for average subjects				
Shutter Speed 1/250		Shutter Speed 1/125		
Bright or Hazy Sun on Sand or Snow f/16	Bright or Hazy Sun (Distinct Shadows) f/11*	Weak, Hazy Sun (Soft Shadows) f/8	Cloudy Bright (No Shadows) f/5.6	Open Shade † or Heavy Overcast f/4

* f/5.6 for backlit close-up subjects
† Subject shaded from sun but lighted by a large area of sky

You can use a camera's built-in meter for manual exposure. (Below is yet another way you may see information displayed in a film camera's viewfinder. Depending on your exposure, one of the three indicators would light up.) Point the camera at the most important part of the scene and activate the meter. The viewfinder will show whether the exposure is correct. If it isn't, change the shutter speed and/or aperture until it is.

To prevent blur caused by the camera moving during the exposure (if the camera is not on a tripod), use a shutter speed of at least 1/60 sec with a 50mm lens. A shutter speed of 1/125 sec is safer.



Taking Your Picture

HOLD THE CAMERA STEADY

For horizontal photographs, keep your arms against your body to steady the camera. Use your left hand to support and focus the camera, and your right forefinger to press the shutter release.



For vertical photographs, support the camera in either your right or left hand. Keep that elbow against your body to steady the camera.



A tripod steadies the camera for you and lets you use slow shutter speeds, such as for night scenes or other situations where the light is dim.



TAKE A PICTURE

Make an exposure. Recheck the focus and composition just before exposure. When you are ready to take a picture, stabilize your camera and yourself and gently press the shutter release all the way down.



Make some more exposures. You might want to try several different exposures of the same scene, perhaps from different angles. See opposite page for some ideas.



Keep a record of your exposures. With film cameras, write down the frame number, subject, f-stop and shutter-speed settings, and any other relevant information. Then you won't forget what you did by the time you develop and print the film. Digital cameras record much of the technical data automatically but you may still want to note details about the subject or a reminder of your intent.

NOTE: What to do when your camera won't let you take a picture

- Make sure the camera is switched on and you have some indication—a signal light or menu display—of electrical power.
- Check that the battery is installed properly. If not, reinstall.
- If the battery is properly placed, rub the top and bottom of the battery with a pencil eraser to clean the contacts. If this doesn't work, replace the battery.
- Make sure you have the appropriate memory card or film in the camera. If you do, reload the film or re-seat the card in case it's not engaged properly.
- If you are taking a close-up, try moving back. Try changing from autofocus to manual.
- With a manual film camera, advance the film or move the advance lever.
- Try a new roll of film or a new memory card; the one you are using may be damaged.

DOWNLOAD THE PICTURES: DIGITAL CAMERA

When your memory card is full, or you are finished with a shooting session, download (transfer) the picture files to a computer or portable storage device and—for safety—back them up by duplicating as soon as possible. You can download files from the camera through a cable or Wi-Fi, or remove the card to a card reader. Erase (or reformat) the card from the camera's menu or the computer when you are certain the files are safely stored.



REWIND THE FILM: AUTOMATIC FILM CAMERA

Some cameras rewind automatically at the end of a roll. Others send a signal when no more frames are available, then rewind when you press a rewind button. Rewind the film back into its cassette before opening the camera. Store film away from light and heat until developed.



REWIND THE FILM: MANUAL FILM CAMERA

You'll know that the roll of film is at its end when the film advance lever will not turn. The film-frame counter will also show the number of exposures you have taken. Activate the rewind button at the bottom of the camera. Lift the handle of the rewind crank and turn it clockwise until its tension releases.



What Will You Photograph?

Some Basic Guidelines to Get You Started

WHERE DO YOU START?

One place to start is by looking around through the viewfinder. A subject often looks different isolated in a viewfinder than it does when you see it surrounded by other objects. What interests you about the scene? Why do you want to photograph it?



GET CLOSER (USUALLY)

Often people photograph from too far away. What part of the scene attracted you? Do you want a picture of your friend from head to toe, or are you interested in the expression on her face?



LOOK AT THE EDGES

How do the edges of the photograph intersect the subject? Does the top edge cut into the subject's head? Is the subject down at the bottom of the frame with a lot of empty space above it? See what you've got and see if you might want something a little different.



LOOK AT THE BACKGROUND (AND FOREGROUND)

How does your subject fit within its surroundings? Will details in the background detract from your main subject? Is there a pole or a tree that appears to grow out of someone's head?



CHECK THE LIGHTING

Is the light more or less even overall? If these are your first pictures, you are most likely to get a good exposure if you photograph an evenly lit scene, not one where the subject is against a very light background, like a bright sky.



BUT WHY NOT EXPERIMENT, TOO?

See what happens. Include a bright light in the picture (but don't stare directly at the sun through the viewfinder). Try a different angle. Instead of always shooting from eye level, try getting up high and looking down, or try kneeling and looking up.

