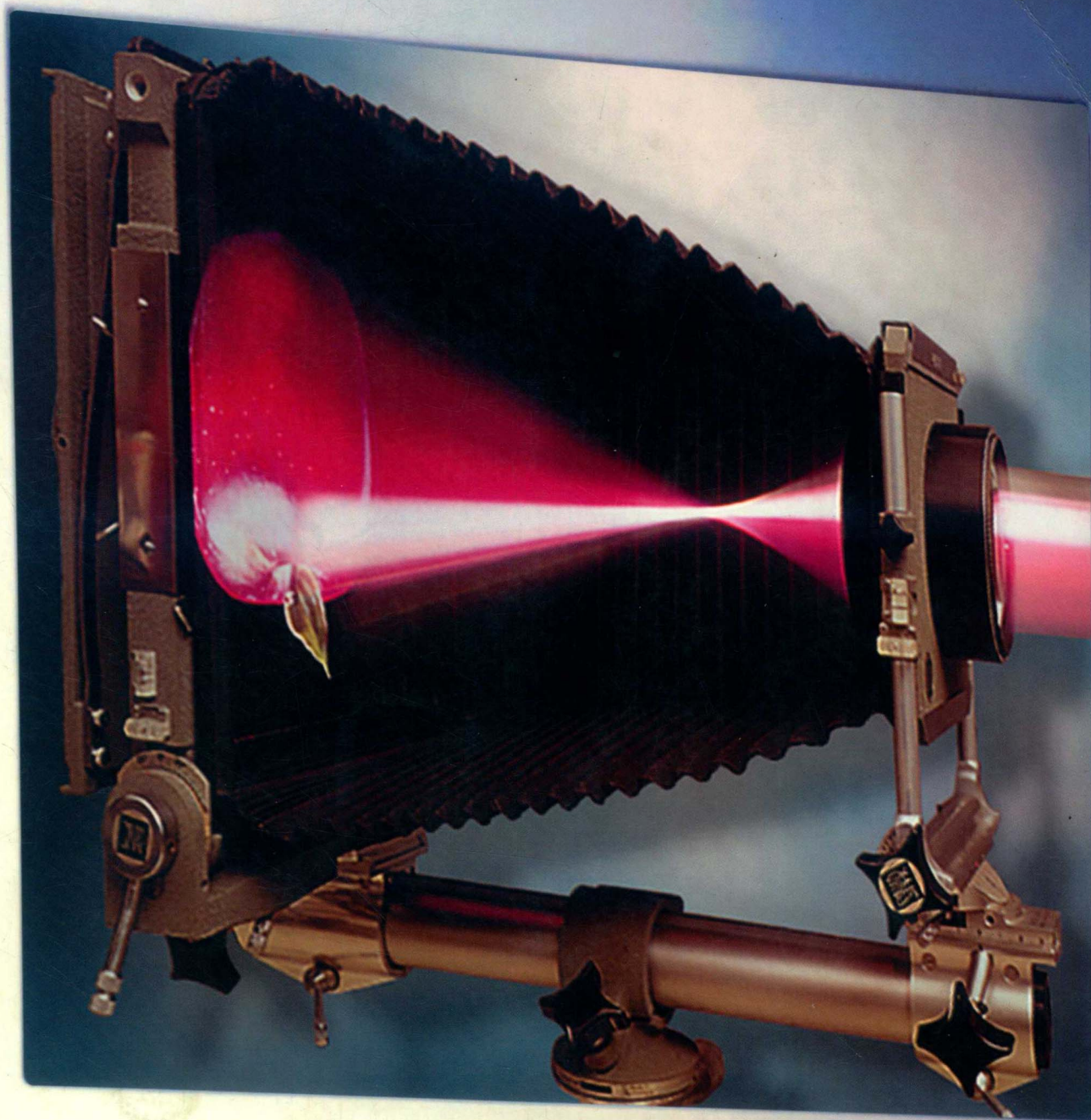


PHOTOGRAPHY

Eighth Edition

London • Upton • Stone • Kobre • Brill

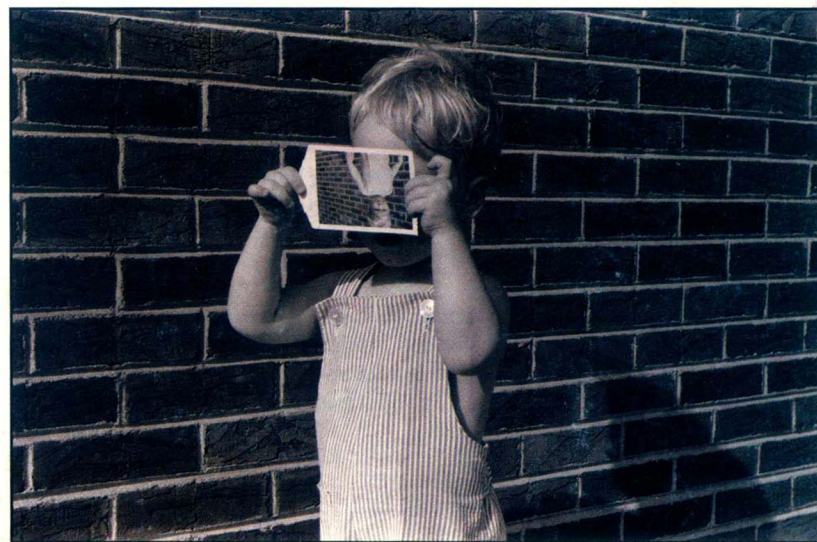




PHOTOGRAPHY

E I G H T H E D I T I O N

Barbara London
John Upton
Jim Stone
Kenneth Kobre
Betsy Brill



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Prentice
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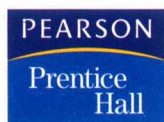
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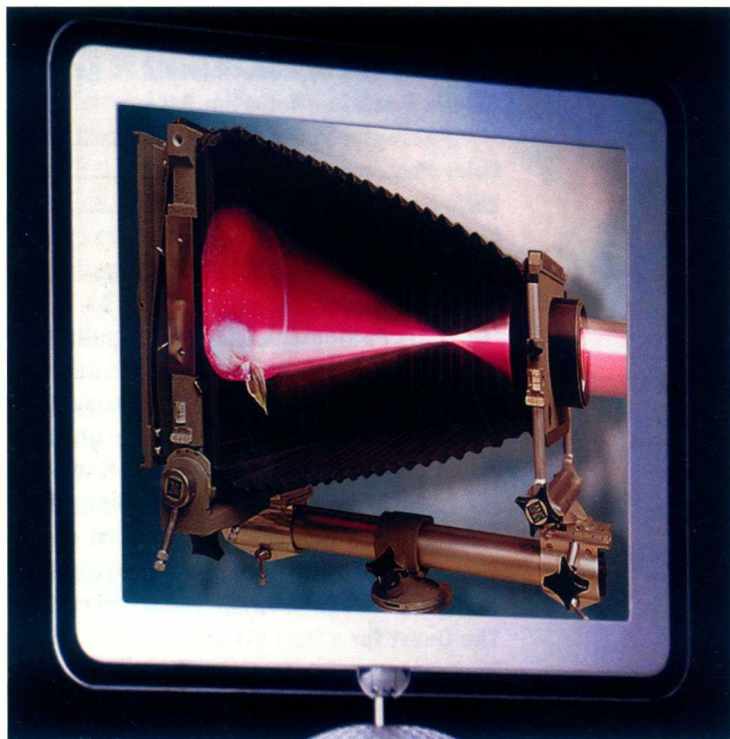
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preface



*Photography is changing, and this edition of **Photography** reflects that change. Digital imaging has increasingly become part of the photographic process. Here, a computer screen displays a cutaway view of a view camera, a type of camera that has been in use since the invention of photography.*

Throughout this book, you will find information about both conventional film photography and digital imaging, plus information on techniques such as lighting and composition that apply to both. This book shows how to use these 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 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.

The emphasis of this edition 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 the film ‘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 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.
- “More About . . .” boxes on many pages cross-reference related topics in other parts of the book.

The general organization of technical information has been maintained, with updates for this new edition.

- General photographic techniques are covered completely in Chapters 1–8: camera, lens, film, exposure, developing and printing black-and-white film, and mounting.
- Chapters 10 and 11 expand and update information on digital imaging, focusing on the

information that beginning students need to know.

- Chapters 9, 12, 13, 14, and 15 cover color photography, lighting, special techniques (such as making cyanotypes), view camera use, and a specialized method of exposure and development—the Zone System.
- Throughout the book, changes have been made to meet the needs of students using more digital imaging.
- A fully illustrated Troubleshooting Appendix, beginning on page 400, 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 put to use various technical concepts. See for example:

More about . . .

- **Camera controls, pages 16–17**

- The photographs illustrating lens focal length on pages 45, 47, and 49, or how one photographer uses electronic flash plus available light on page 285.
- Photographer at Work pages throughout the book feature interviews with photographers who have developed successful careers in everything from sports photography (pages 90–91) to an integration of digital imaging with documentary photography (pages 252–253).
- Chapter 16, Seeing Photographs (pages 340–365), 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 17 (pages 366–399) surveys the history of photography so that you can place today's photography—and your own—in a historical context.

New to the Eighth Edition

- Chapters 10 and 11 expand and update information on digital imaging.
- Two new Photographer at Work profiles continue the coverage of coverage of contemporary photography (158–159, 252–253).
- Many new fine art photographs illustrate technical concepts and help students develop visual awareness.

We are pleased to offer a Companion Website.

Please visit the site at <http://prenhall.com/london>. This free online study resource contains many features, including:

- Simulations and demonstrations of various photographic processes
- A study guide
- Chat rooms
- Links to other photography e-sites

- An electronic instructor's manual. Please contact your Prentice Hall representative for a password.

An integrated student lab manual/journal is also available.

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:

Terry Abrams, Waushnetaw Community College
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Without editorial and production assistance, a book of this size and complexity would be impossible to complete. Many thanks to Terry Abrams for his work on the digital imaging chapters. We appreciate his expertise and his sense of what you need to know—and what you don't. Peggy

Jones and Megan Jacobs made suggestions for picture choices and more. Sean Upton reviewed the manuscript with skill and attention. Christine Chin located photographs and photographers, navigating representatives, collections, and estates in several countries and languages, all with grace and humor.

At Prentice Hall, special thanks to Kimberly Chastain, Amber Mackey, Sarah Touborg, and Charlyce Jones Owen, and to Barbara Taylor-Laino for somehow keeping track of it all.

Many equipment manufacturers and technical reviewers were helpful—lending equipment, reviewing material, and answering questions. In no particular order, thanks to Chuck Westfall at Canon USA, Lindsay Silverman of Nikon, Ed Warner at Eastman Kodak, Polaroid's Barbara Hitchcock, Linda DiSalvo from Apple Computers, Steve Upton of Chromix.com, Adobe Software's Gwyn Weisberg and John Nack, and Ross James from Epson America.

Jim Stone owes special thanks for support and tolerance to his parents, Sylvia and Charles, wife Linda, and son Skye—now three years old—who is already making great photographs because of this book.

This is a book that students keep. They refer to it long after they have finished the basic photo course for which it was purchased. Some 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.

Dedicated to everyone who is part of this new edition.

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PATRICK JABLONSKI
Trees, Mist, Sunlight, 1991

getting started/1



LEN JENSHEL Moonrise, Mount St. Helens National Volcanic Monument, Washington, 1992

How do you photograph trees—or a building or a person or anything else? Black and white or color, horizontal or vertical? There are as many ways as there are photographers. In the photograph left, Patrick Jablonski uses sunlight coming from behind to create a mysterious environment. Above, Len Jenshel's car headlights illuminate in the night a forest burned by volcanic eruption.

If you are just getting started in photography, this chapter will walk you through the first steps of selecting and loading film, 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.

Once you know something about the technical basics, the interesting question is—what will you photograph? Here you will find some help in selecting a subject and composing your photograph so that it effectively conveys what you saw.

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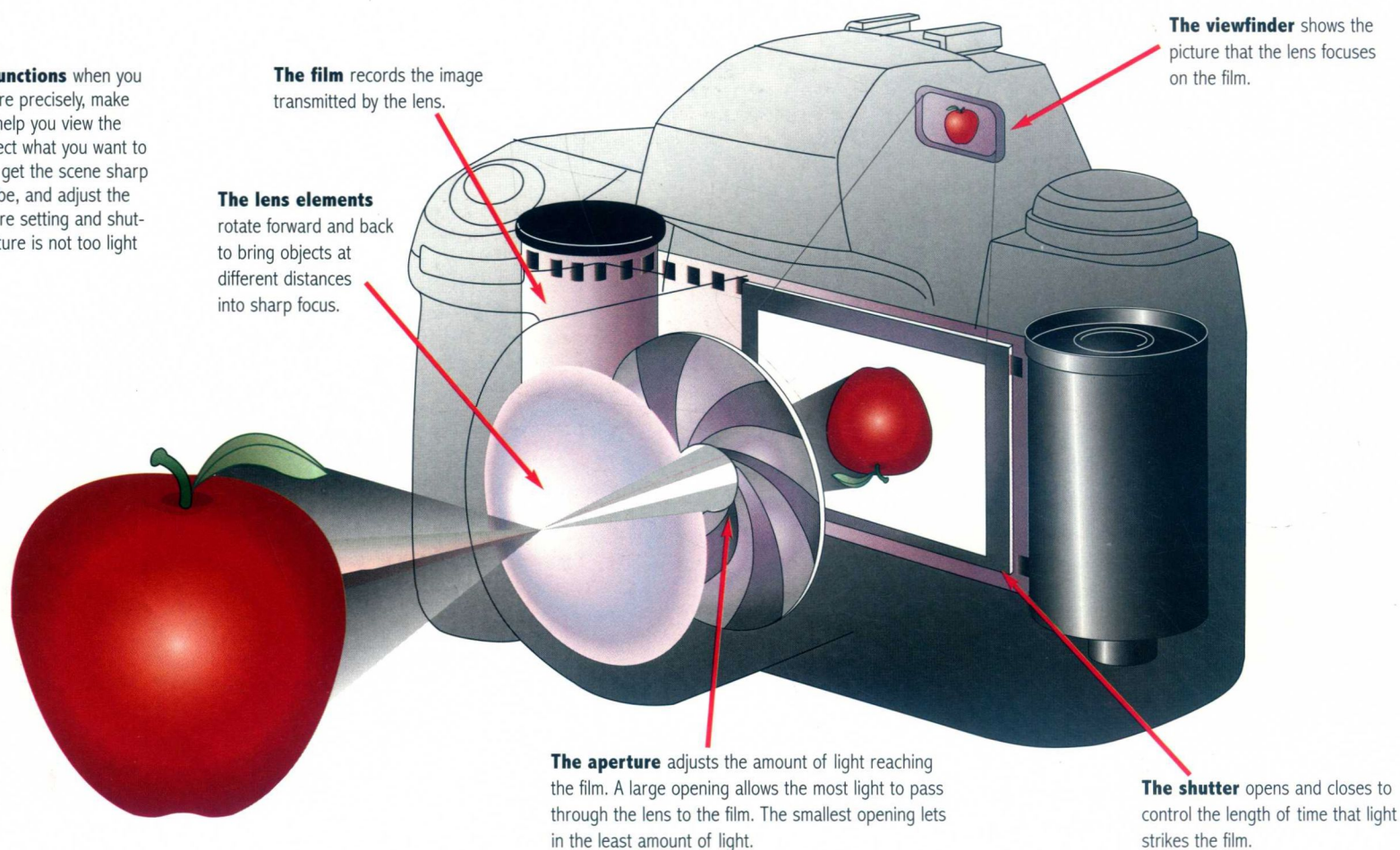
The steps in this chapter are a basic checklist. Modern cameras vary greatly in design, so read your model's instruction manual or talk to someone who is familiar with your camera. We start with cameras that use film. For the differences with digital cameras see page 202. Most of the steps in this chapter apply to the camera you are likely to be using: a 35mm single-lens reflex. For more about different types of film cameras, see pages 30-33.

Cameras have become increasingly automatic, often including automatic 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." 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.

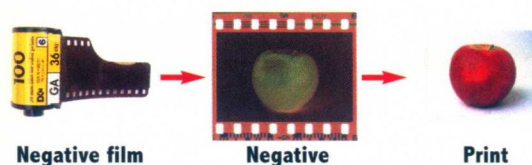
CAMERA AND FILM

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.

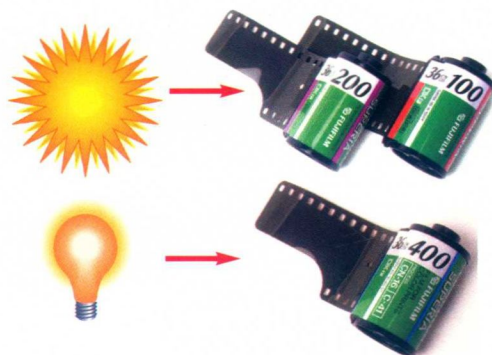


CHOOSE A FILM

If you want prints, select a negative film, either color or black and white. The film is developed to a negative image, then printed on paper to make a positive one.



Film speed (ISO 100, 200, and so on) describes a film's sensitivity to light. The higher the number, the more sensitive ("faster") the film, and the less light it needs for the picture to be neither too light nor too dark. For your first exposures, choose a film with a speed of 100 to 200 for shooting outdoors in sunny conditions. In dimmer light, use film with a speed of 400 or higher.



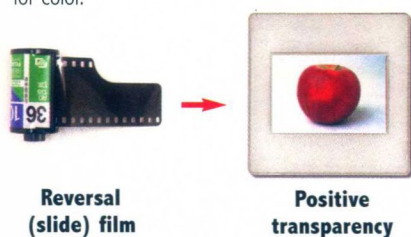
Film speed

Number of exposures



Expiration date

If you want slides or transparencies, select a reversal film, one that produces a positive image directly on the film that is in the camera. Most reversal films are for color.

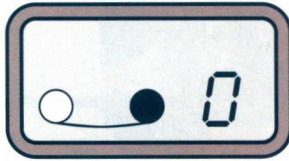


More about . . .

- Camera controls, pages 16–17
- Film characteristics, pages 68–75

OPEN AND LOAD THE CAMERA

Make sure there is no film in the camera before you open it. Check that the film-frame counter shows empty or that the film-rewind knob (if there is one) rotates freely. If there is film in the camera, rewind it (see page 8). Make sure the camera has fresh batteries.



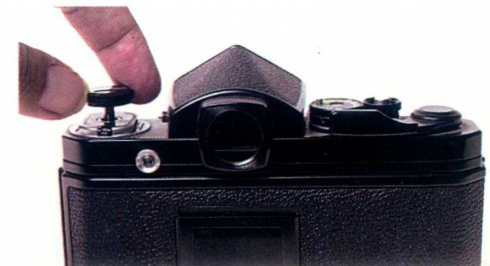
Automatic Camera

A camera that loads film automatically probably will have a release lever to open the camera. Open the camera by sliding the release lever to its open position.



Manual Camera

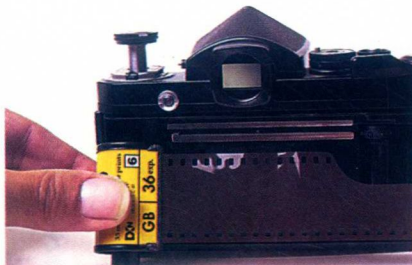
A camera that loads film manually will have a rewind knob on the top. This type of camera usually opens by pulling up on the rewind knob.



INSERT AND THREAD THE FILM

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

Insert the film cassette. A 35mm single-lens reflex camera usually loads on the left, with the extended cassette nub down. The film should lie flat as it comes out of the cassette. If needed, rotate the cassette to the right.



Automatic Camera

Automatic loading. 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.



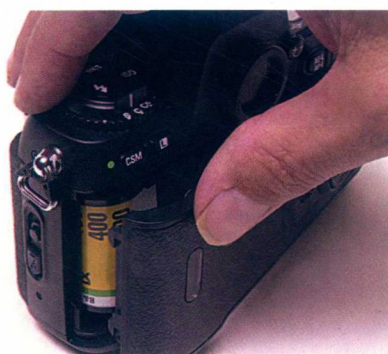
Manual Camera

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

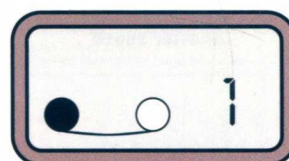
Close the camera back. You'll need to advance the film past the exposed film leader to the unexposed film.



Automatic Camera

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 Camera

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 FILM SPEED

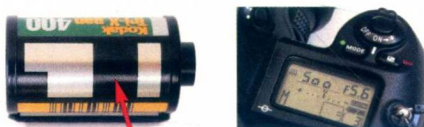
Set your camera to the speed of the film you are using. Film speed (ISO) is marked on the film box and on the film cassette.



Film speed

Automatic Cameras

DX codes can set the film speed automatically. On some cameras the film speed is detected and set by the camera as it loads the film. The film must be DX coded, marked with a code of polished squares that is read by a sensor in the camera. DX-coded films have "DX" printed on the cassette and box. Newer cameras indicate in their data display panels whether DX-coded films currently are loaded.



DX Code

Manual Cameras

On some cameras you must set the film speed manually. Turn the film-speed dial (marked ISO or sometimes ASA) to the speed of your film. Here it is set to a speed of 100.



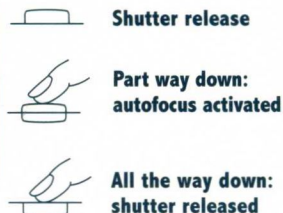
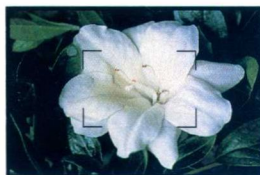
FOCUS

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 to bring 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

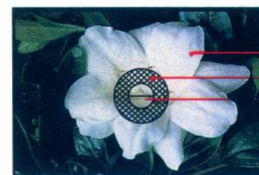
Part way down:
autofocus activated

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 sensitivity of the film (its speed) 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 film.



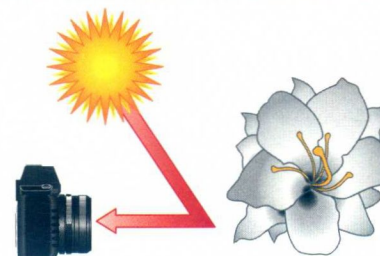
Aperture size



Shutter speed



Film speed



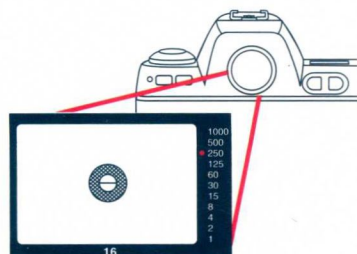
Amount of light

More about . . .

- Exposure and metering, pages 94–107
- Film speed, pages 70–75
- Focusing, pages 52–55
- Shutter speed and aperture, pages 17–29

EXPOSURE READOUT

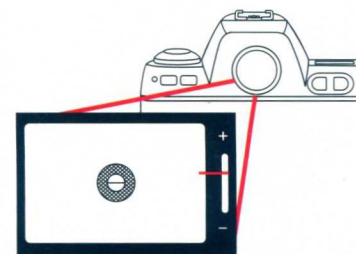
Exposure readout about the shutter speed and aperture appears in the viewfinder of many cameras that have a built-in exposure meter. Most cameras have an on/off switch that activates the light meter. Here, the viewfinder displays 1/250 sec shutter speed, f/16 aperture.



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.



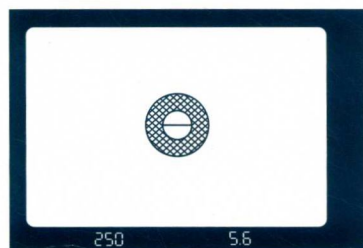
This needle-centering display appears in some viewfinders. It doesn't show the actual shutter speed and aperture settings, but it does show when the chosen exposure is correct. You change the shutter speed and/or the aperture until the needle centers between + (overexposure) and - (underexposure).



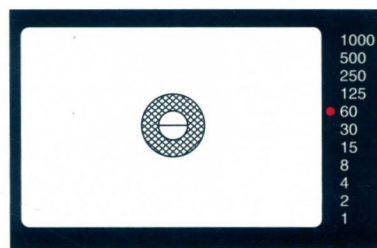
SET THE EXPOSURE—Automatic

With automatic exposure, the camera sets the shutter speed or aperture, or both, for you.

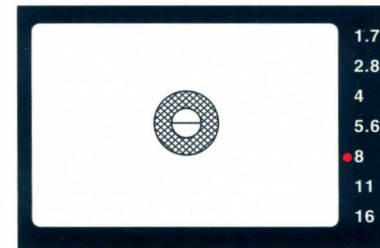
With programmed automatic exposure, each time you press the shutter-release button, the camera automatically meters the light, then sets what it determines is the best shutter speed and aperture combination.



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 packaged with the 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 a shutter speed closest to the film speed number. For example if the film speed is 100, set the shutter speed to 1/125 of a second 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
<small>* f/5.6 for backlit close-up subjects † Subject shaded from sun but lighted by a large area of sky</small>				

You can use a camera's built-in meter for manual exposure. (Below is yet another way you may see information displayed in a 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 50 mm lens. A shutter speed of 1/125 sec is safer.



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.



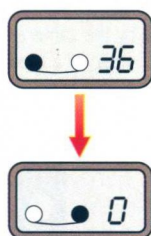
Keep a record of your exposures. For example, write down the frame number, subject, f-stop and shutter-speed settings, and any other relevant information. Then you won't forget what you did by the time you develop and print the film.

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

- Make sure you have film in the camera. If you do, reload the film in case it's not engaged properly.
- 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.
- Try changing from autofocus to manual.
- With a manual camera, advance the film or open the advance lever.
- Try a new roll of film; this one may be damaged, jamming the camera.

REWIND THE FILM

After your last exposure on the roll, rewind the film all the way back into the cassette before opening the camera. Store film away from light and heat until developed.



Automatic 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.



Manual 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.



More about . . .

- Keeping the camera steady, page 35