# THE ART OF SHOOTING FILM DEMYSTIFIED

By Kermit V. Gray



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Dedicated to

Bill, his Nikon FA,

and

my many mentors who sparked a lifelong passion:

Paul Kimball, Warren Sward, Doug Moore, Lester Couch, & Kjell Sandved.

I heartily thank you all.

My hope for this book is to break complex and abstract subjects into bite-size bits that are easily understood. Whenever possible, infographics explain the principles. Despite what film photography seems to be, it really is not as complex as it may appear.



Shooting film is the process of recording an image (focused light) on film (a photosensitive emulsion that undergoes a chemical process to form the image) by controlling three basic things: 1.) film speed, 2.) lens aperture, or f-stop; and 3.) shutter speed.

**Film speed** determines how **sensitive** the film is to light; **Aperture, or f-stop** controls both the amount of light and depth of field (how much of the scene is in sharp focus); and **Shutter speed** controls both the amount of light and the appearance of motion (blurred or frozen).

Together, these controls determine exposure, but they also give the photographer creative choices through controlling sharpness, motion, establishing perspective, and setting mood.

Unlike digital photography, film does not provide an immediate preview, encouraging the photographer to observe carefully, to make deliberate decisions, and to learn from the result. In a way, this is a hidden advantage.

In case you're in a hurry to get going, the easiest way to operate the camera
- Load the film.
- Set the ISO/ASA to match the film box.
- Choose a shutter speed based on movement. Start with 1/125 second for ordinary subjects.
- Look through the viewfinder at the light meter.
- Turn the aperture ring until the meter indicates correct exposure.
- Focus.
- Take the picture.

If the meter says there is not enough light:
- Open the aperture: move from f/8 to f/5.6
- Use a slower shutter: move from 1/125 to 1/60
- Use faster film, such as ISO 400 instead of ISO 100

If there is too much light:
- Close the aperture: move from f/5.6 to f/8
- Use a faster shutter: move from 1/125 to 1/250

Choose the shutter speed for motion, choose the aperture for depth of field, set the film speed to match the film, and use the light meter to balance the other setting. Or even more simply: Aperture controls the size of the hole. Shutter speed controls how long the hole is open. Film speed controls how sensitive the film is. The meter tells you when the combination is correct.

# TAKING A FILM PHOTOGRAPH: SIMPLE WORKFLOW

1. **LOAD THE FILM**




2. **SET ISO / ASA TO MATCH THE FILM BOX**




3. **CHOOSE A SHUTTER SPEED BASED ON MOVEMENT**
Start with 1/125 second for ordinary subjects.




4. **LOOK THROUGH THE VIEWFINDER AT THE LIGHT METER**




5. **TURN THE APERTURE RING UNTIL THE METER INDICATES CORRECT EXPOSURE**




6. **FOCUS**



7. **TAKE THE PICTURE**



## IF THE METER SAYS: NOT ENOUGH LIGHT




(Underexposure)

**Choose one of these changes:**




**OPEN THE APERTURE:**
f/8 → f/5.6




**USE A SLOWER SHUTTER:**
1/125 → 1/60




**USE FASTER FILM:**
ISO 400 INSTEAD OF ISO 100
Choose different film before loading the roll or on the next roll.

## IF THE METER SAYS: TOO MUCH LIGHT




(Overexposure)

**Choose one of these changes:**




**CLOSE THE APERTURE:**
f/5.6 → f/8




**USE A FASTER SHUTTER:**
1/125 → 1/250

**These are alternatives.** You normally change one control, then check the meter again.
After changing a setting, recheck focus, composition, and shutter speed before pressing the shutter.

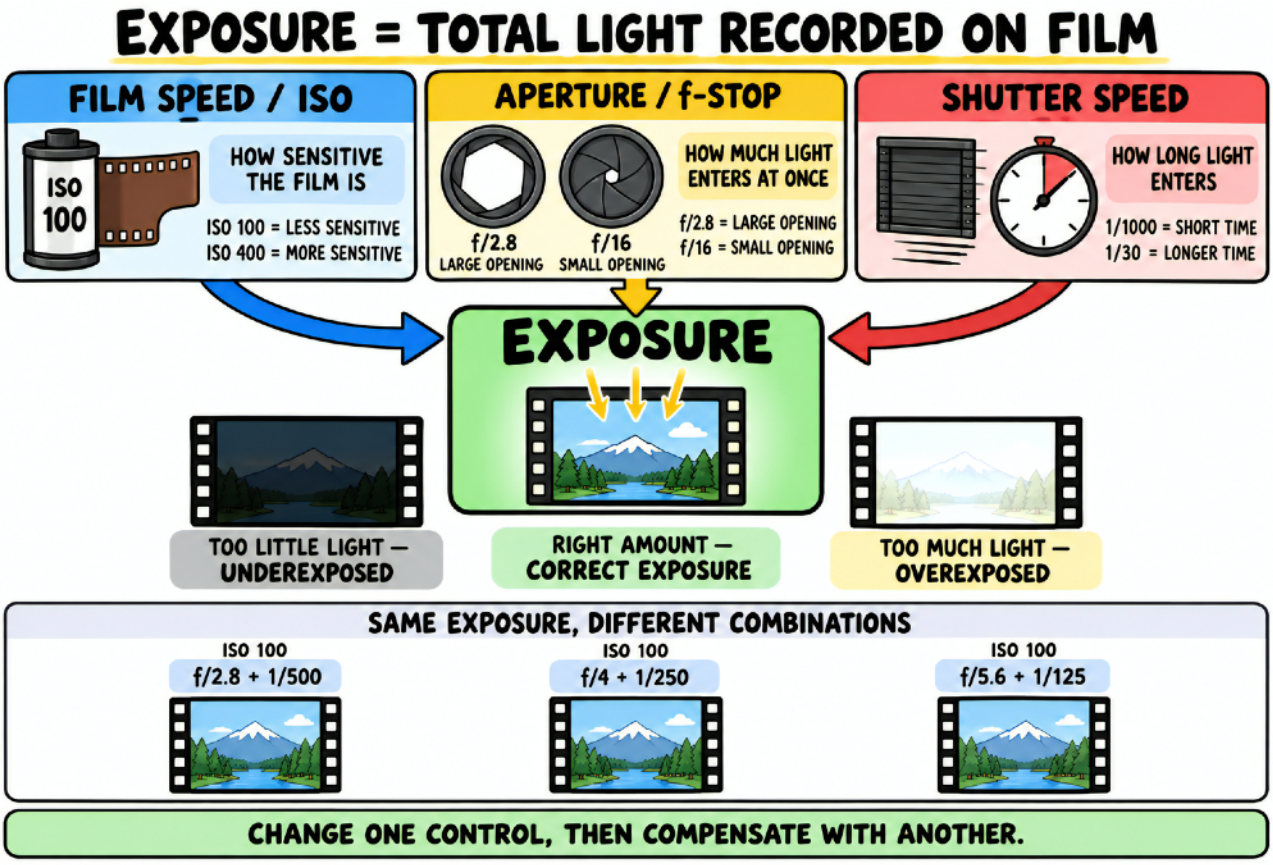
# FILM AND EXPOSURE

Film is a strip of flexible material coated with light-sensitive chemicals. When light reaches the film, it creates an invisible chemical image, called a latent image. Developing the film involves immersing in a sequence of chemicals that makes the latent image visible.

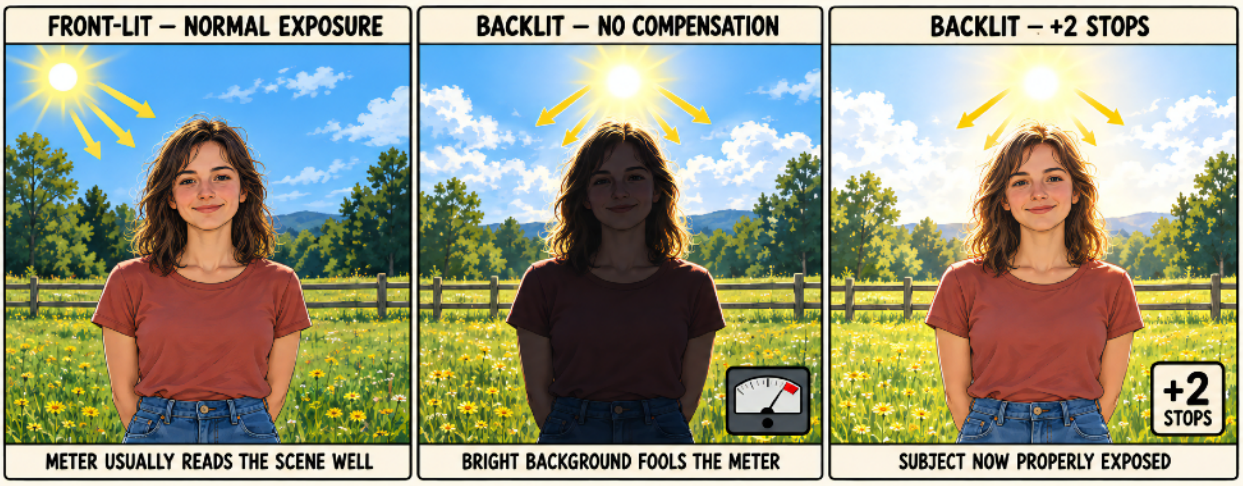
Exposure is the amount of light used to create the latent image. Think of it as a dose of light: Too little light produces too little chemical change and loses shadow detail; too much light overwhelms the film and loses highlight detail. At a certain point, additional light produces no additional detail, so highlights become blank or “washed out.” So, too little light is below the film’s recording threshold; too much exceeds its recording range.

Three controls determine the dose:
Film speed (ASA/ISO): how sensitive the film is.
Aperture, or f-stop: how much light enters at one moment.
Shutter speed: how long the light is allowed to enter.

There is not just one correct combination. Any combination that gives the film the proper dose of light produces the correct exposure. Film has a useful range, called exposure, latitude, or visual dynamic range.



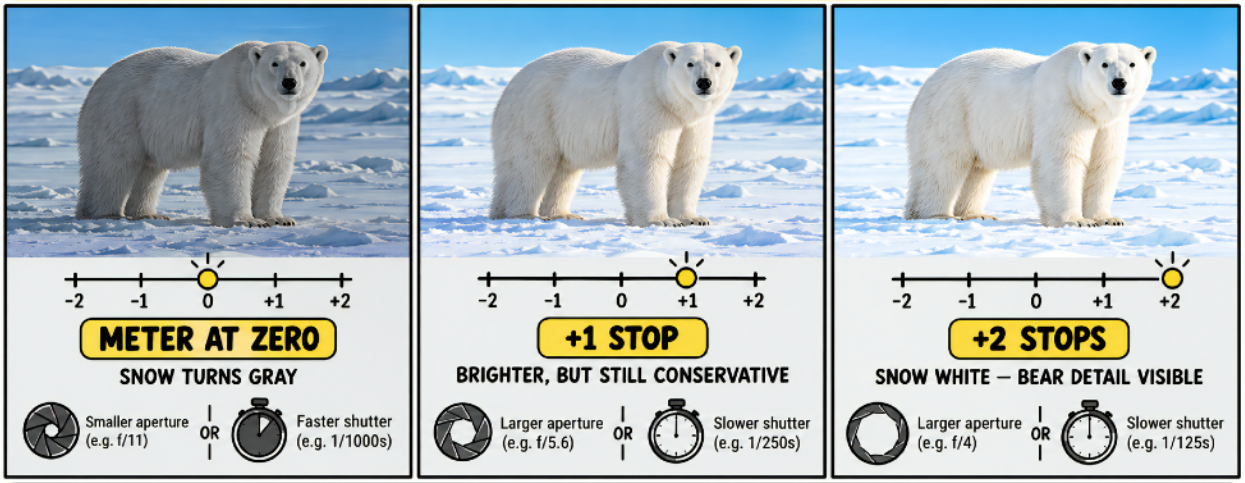
# BACKLIGHTING AND EXPOSURE COMPENSATION




TO BRIGHTEN A BACKLIT SUBJECT: OPEN THE APERTURE OR SLOW THE SHUTTER.

OTHER SOLUTIONS: SPOT-METER THE SUBJECT OR USE FILL FLASH.

# BRIGHT SCENES NEED EXPOSURE COMPENSATION




THE METER TRIES TO MAKE THE SCENE MIDDLE GRAY. SNOW IS SUPPOSED TO BE WHITE.
IN MANUAL MODE: OPEN THE APERTURE OR SLOW THE SHUTTER 1–2 STOPS.

# DARK SCENES NEED EXPOSURE COMPENSATION



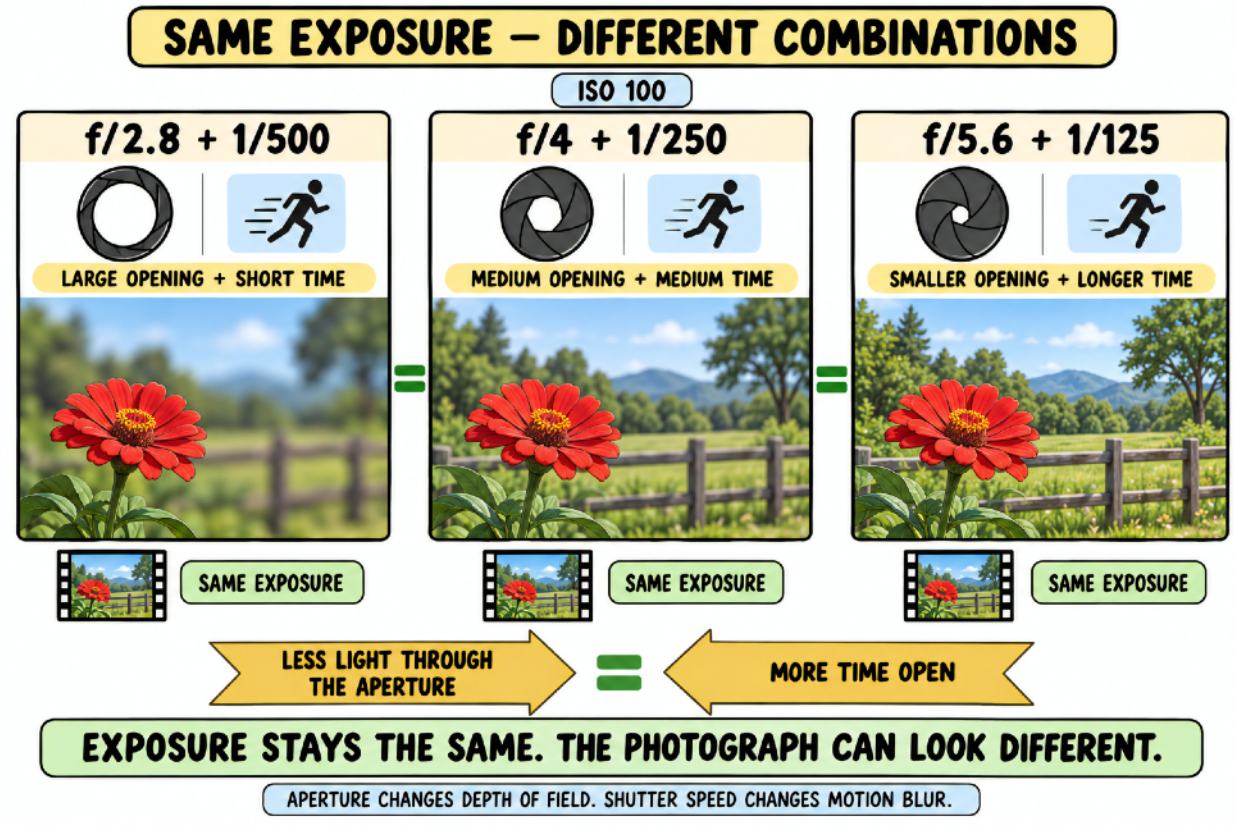

THE METER TRIES TO MAKE THE SCENE MIDDLE GRAY. DARK SUBJECTS ARE SUPPOSED TO STAY DARK.
IN MANUAL MODE: CLOSE THE APERTURE OR SPEED UP THE SHUTTER 1–2 STOPS.

At the same film speed and under the same lighting, aperture and shutter speed can trade light back and forth.

A **one-stop wider aperture** lets in twice as much light. To keep the exposure the same, the shutter must be made **one stop faster**, cutting the exposure time in half. Conversely, a smaller aperture can be balanced by a slower shutter speed.

For example, these settings produce approximately the same exposure:

| Aperture | Shutter speed |
|---|---|
| f/2.8 | 1/500 |
| f/4 | 1/250 |
| f/5.6 | 1/125 |
| f/8 | 1/60 |
| f/11 | 1/30 |



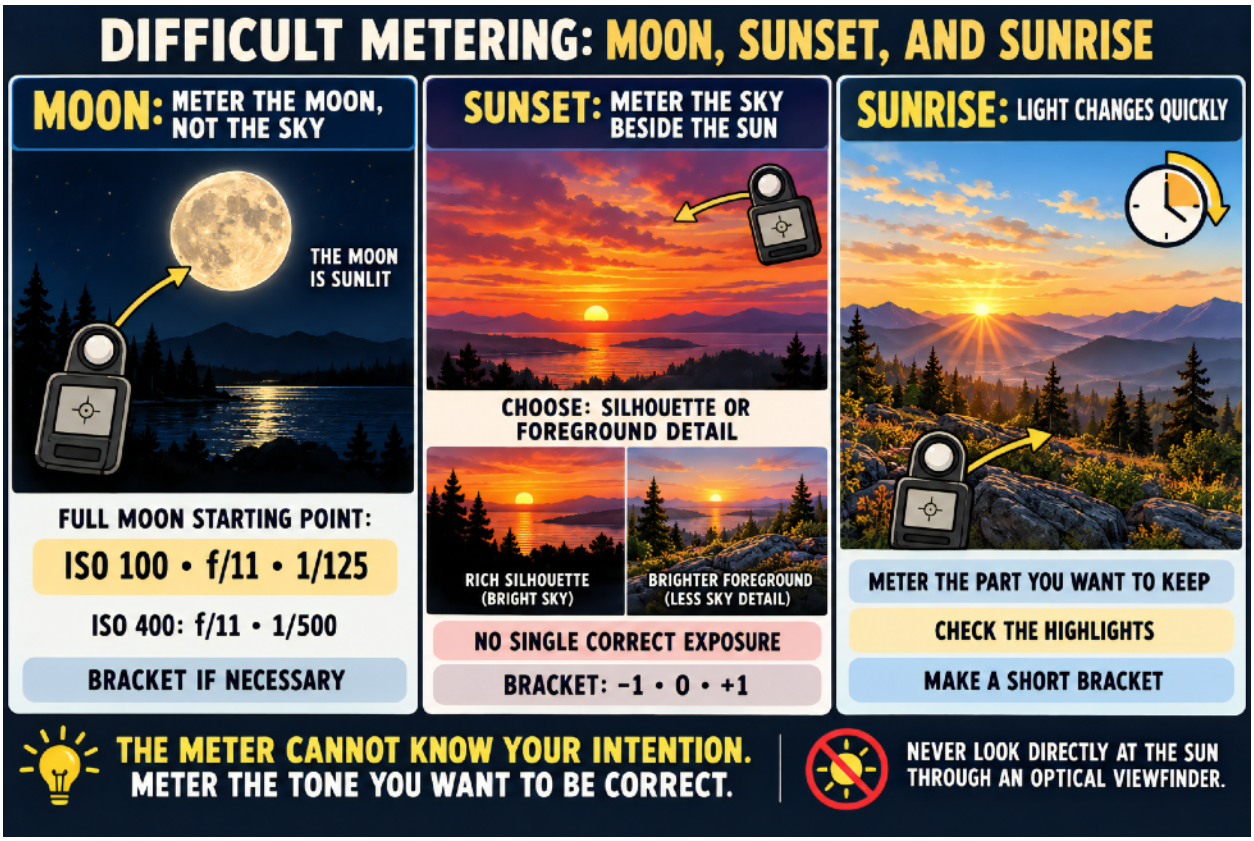
The brightness remains essentially the same, but the photograph changes:

- Wider aperture: less depth of field.
- Smaller aperture: more depth of field.
- Faster shutter: freezes motion.
- Slower shutter: allows motion blur and increases camera-shake risk.

So there is no single "correct" combination but many equivalent exposures. The photographer chooses the combination that gives the desired depth of field and motion effect.

If one setting lets in more light, another setting must let in less light to maintain the same exposure. If you change f-stop the meter will tell you what the new shutter speeds should be. If you change the shutter speed, the meter will tell you what the new f-stop; should be.

Some situations are very difficult to meter properly. The following infographic explains three common situations.



# F-STOPS AND APERTURE

Just like the human eye, a lens has an iris. The iris is called its aperture and the variable sizes of the openings are expressed as f-stops. Aperture is one of the settings that controls exposure by adjusting how much light enters at one moment. Aperture also controls how the photograph will appear by changing its depth of field. The term **depth the field** refers to how much of a scene is in sharp focus from front to back. **Small** apertures **increase** depth of field, while **large** apertures **decrease** depth the field. This gets a little confusing because a bigger f-stop number indicates a smaller opening.

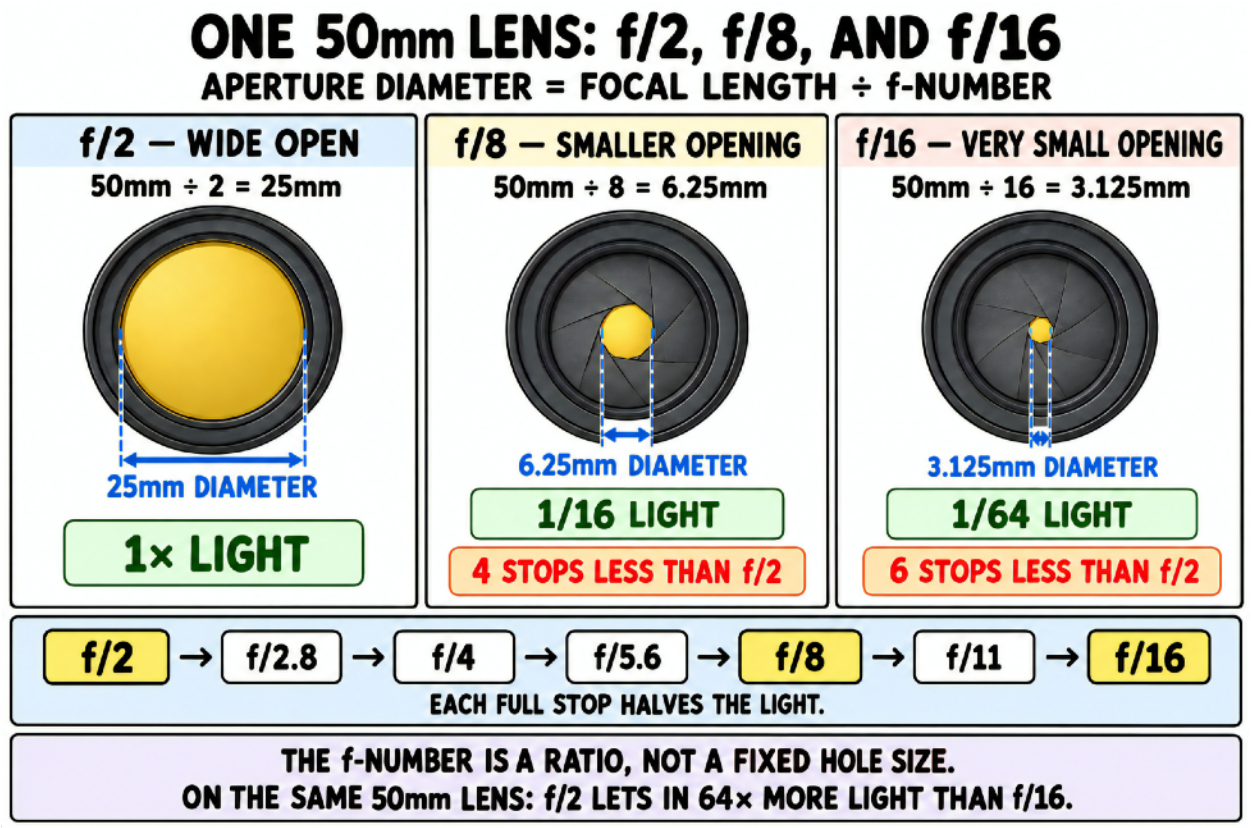
The "f" in f-stop stands for focal length, and the number is the lens's focal length divided by the diameter of the aperture (lens opening). The word "stop" refers to stopping (closing) the aperture down or opening it up by a standard amount of light. Each full f-stop halves or doubles the light.

f/2 → f/2.8 → f/4 → f/5.6 → f/8, → f11, → f16, → f22

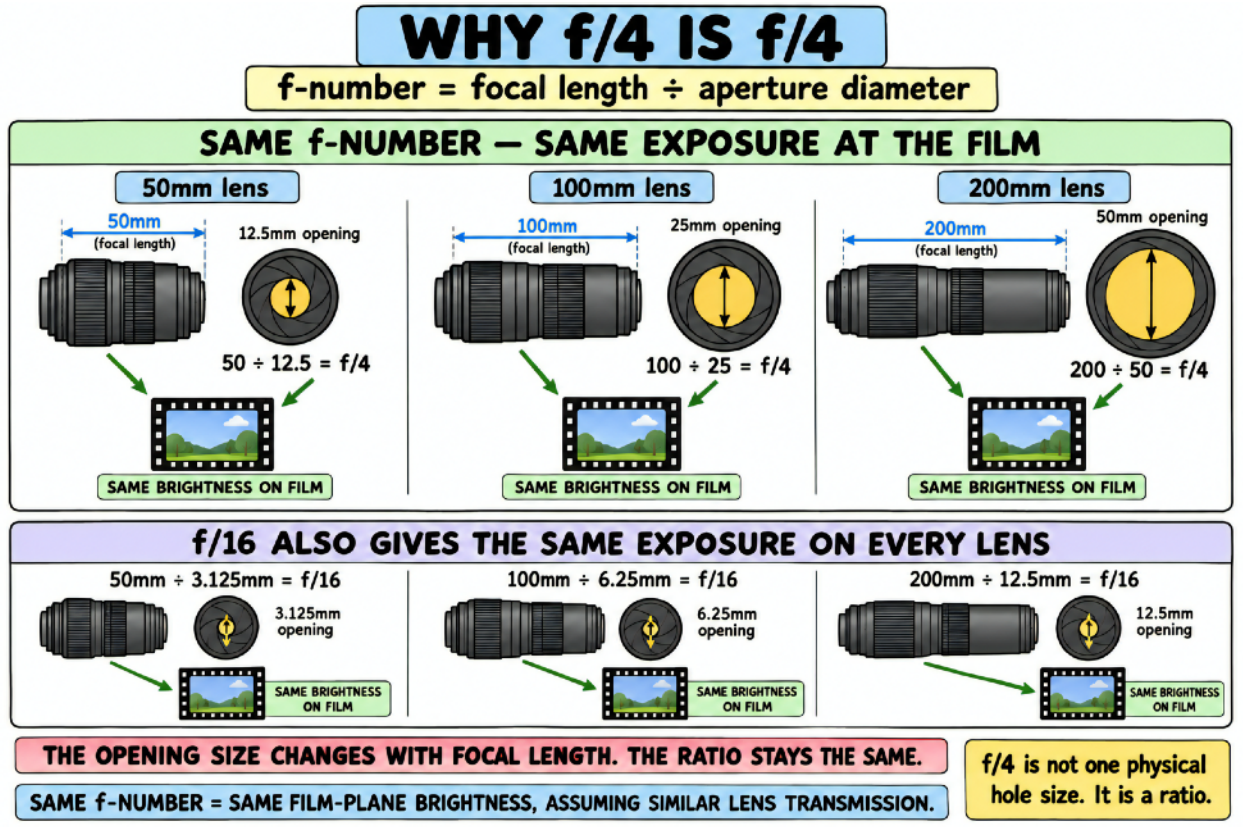
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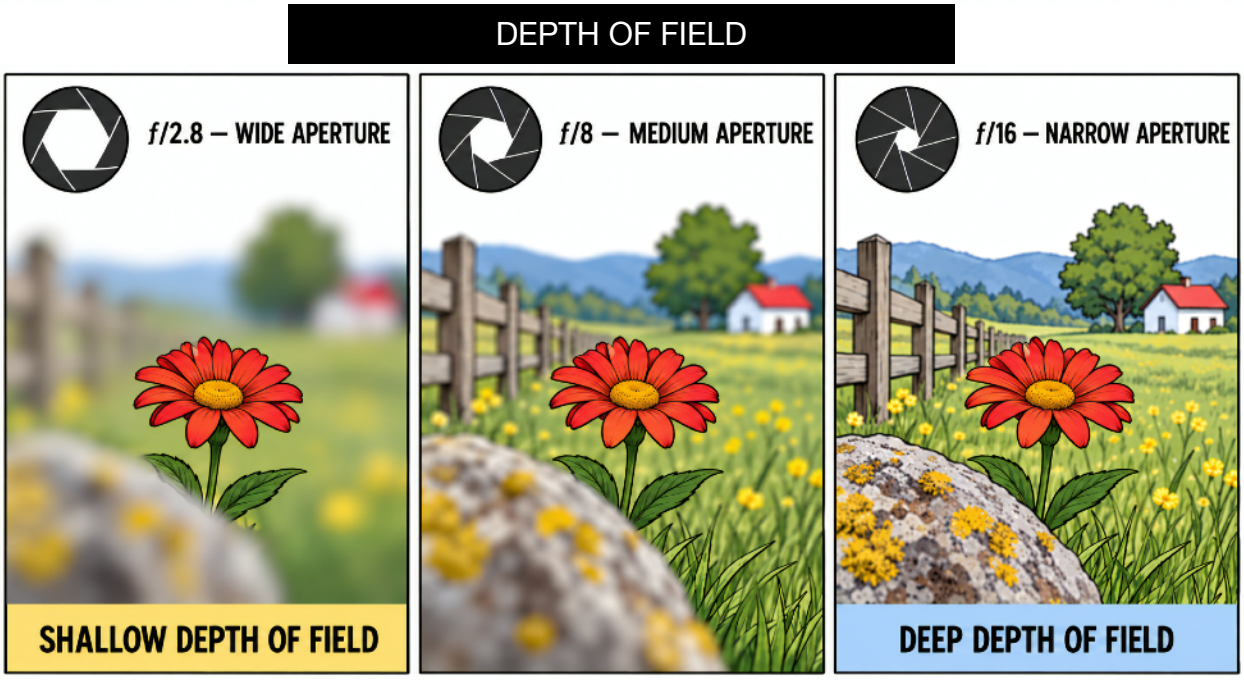
f-number = focal length ÷ aperture (opening) diameter

As an example, for a 50mm lens:
f/2 = 50 ÷ 25mm opening, or 1/2 of the focal length
f/4 = 50 ÷ 12.5mm opening, or 1/4 of the focal length
f/8 = 50 ÷ 6.25mm opening, or 1/8 of the focal length



So f/2 does not mean an 2mm opening. It means the opening's diameter is one-half of the lens's focal length. This system is useful because it works with every lens, regardless of focal length. So f/2 always admits the same amount of light, regardless of the type of lens or the focal length of the lens.



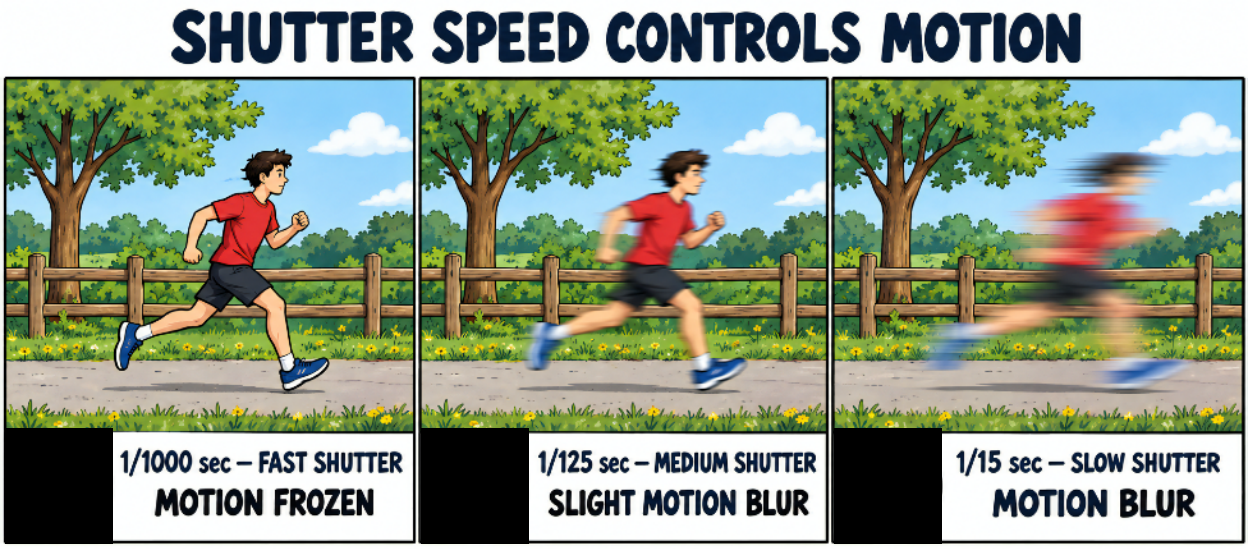
# SHUTTER SPEED

Because film is sensitive to light it has to be kept in complete darkness. When you load film into the camera, the camera keeps the film in complete darkness until it's time to take the photo. Then the camera briefly allows like to fall on the film  by briefly opening, then closing, the shutter.

So the shutter is another one of the controls that sets exposure by changing the amount of light reaching the film by changing how long light falls on the film. The speeds are fractions of a second. The numerator 1/ is omitted for clarity, so the shutter speed 2 is 1/2-second and the shutter speed 1000 is 1/1000-second.

Changing to the next shutter speed doubles or halves the time that light falls on the film, therefore it halves or doubles the amount of light.

Shutter speed also affects how motion is recorded in the photograph. Slow shutter speeds allow rapidly moving subjects to blur while fast shutter speeds freeze the motion of a moving subject. In the context of photography, fast refers to a brief moment that the shutter is open and slow refers to the shutter being open for a longer time. This is a creative tool that can change the mood of a photograph.



# FILM SPEED

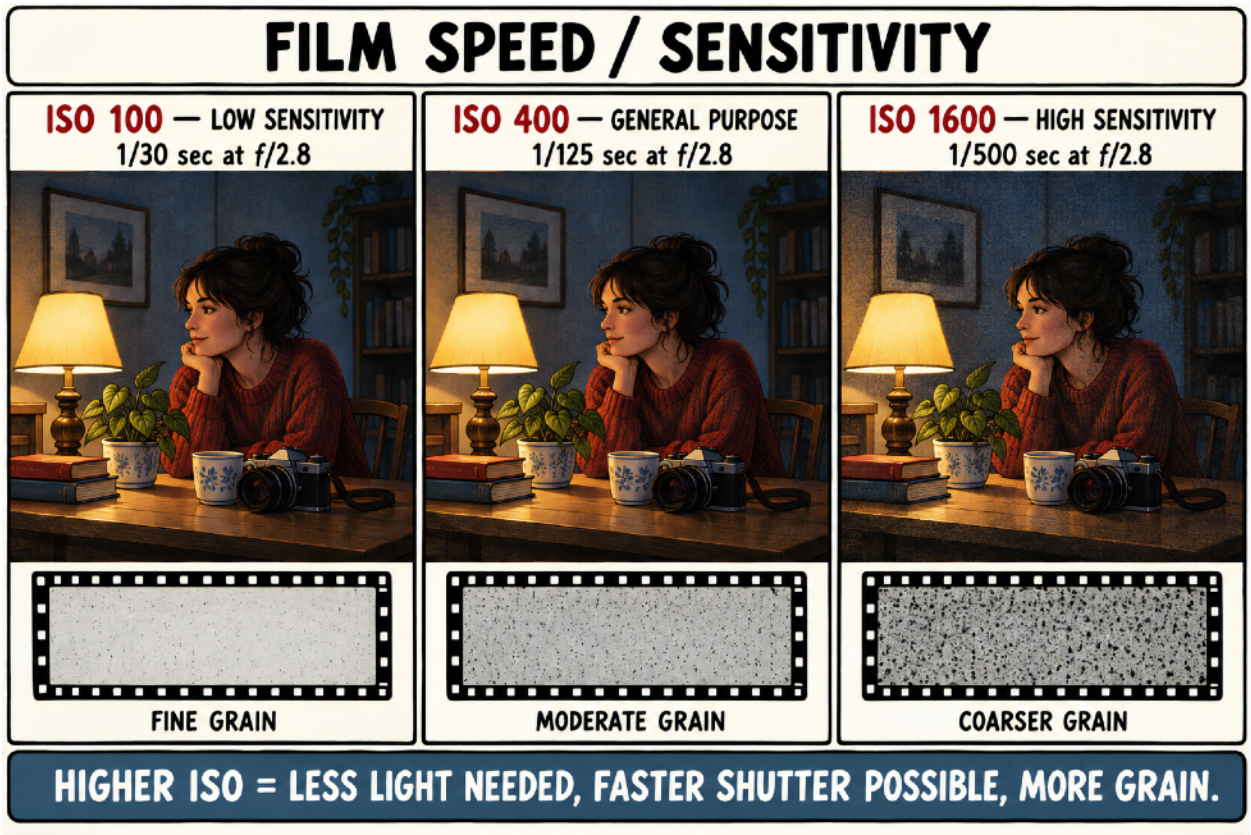
Film comes in a variety of speeds. The term **speed** is used because increasing light sensitivity means that the shutter can be left open for a shorter time, hence a faster or speedier exposure. The term is a holdover from the 19th Century.

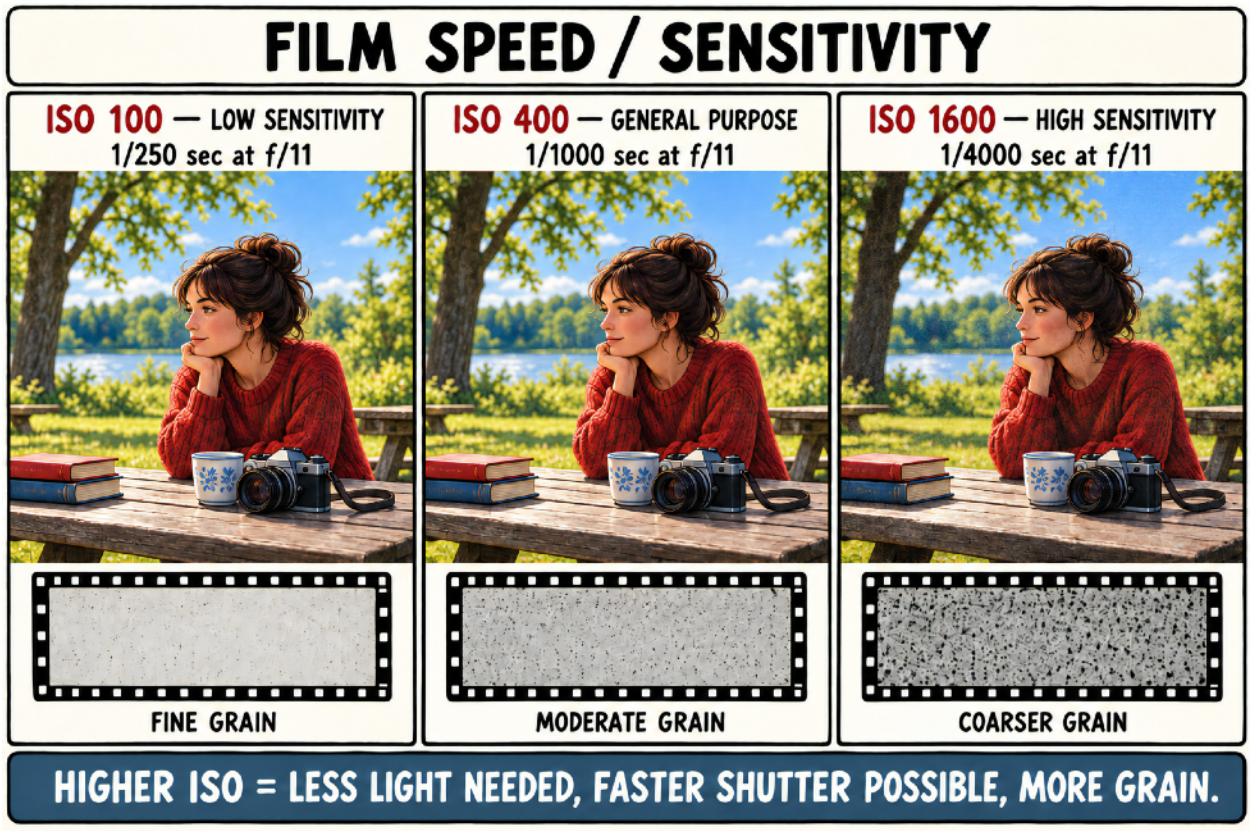
The film box may say ISO 100, 200, 400, or 800. Older cameras may call this ASA.

ISO 25: extremely less sensitive, very fine grain; needs more light
ISO 100: less sensitive, finer grain; needs more light
ISO 200: sensitive, fine grain; needs more light, a good general purpose film
ISO 400: good general-purpose film
ISO 800: more sensitive; useful indoors or in dim light, but grainier
ISO 1600: extremely sensitive; useful indoors or in dim light, but much grainier

Set the camera's ISO/ASA dial to match the film. You set it once for the entire roll.

Some cameras are equipped with what is known as DX Coding, the film cartridge has a series of light and dark squares the camera can reads. The pattern of the squares tells the camera the film speed, so the camera sets the film speed automatically.




FILM SPEED / SENSITIVITY
ISO 100 — LOW SENSITIVITY
1/250 sec at f/11
FINE GRAIN
ISO 400 — GENERAL PURPOSE
1/1000 sec at f/11
MODERATE GRAIN
ISO 1600 — HIGH SENSITIVITY
1/4000 sec at f/11
COARSER GRAIN
HIGHER ISO = LESS LIGHT NEEDED, FASTER SHUTTER POSSIBLE, MORE GRAIN.

# EXPOSURE MODES AND EXPOSURE METER PATTERNS

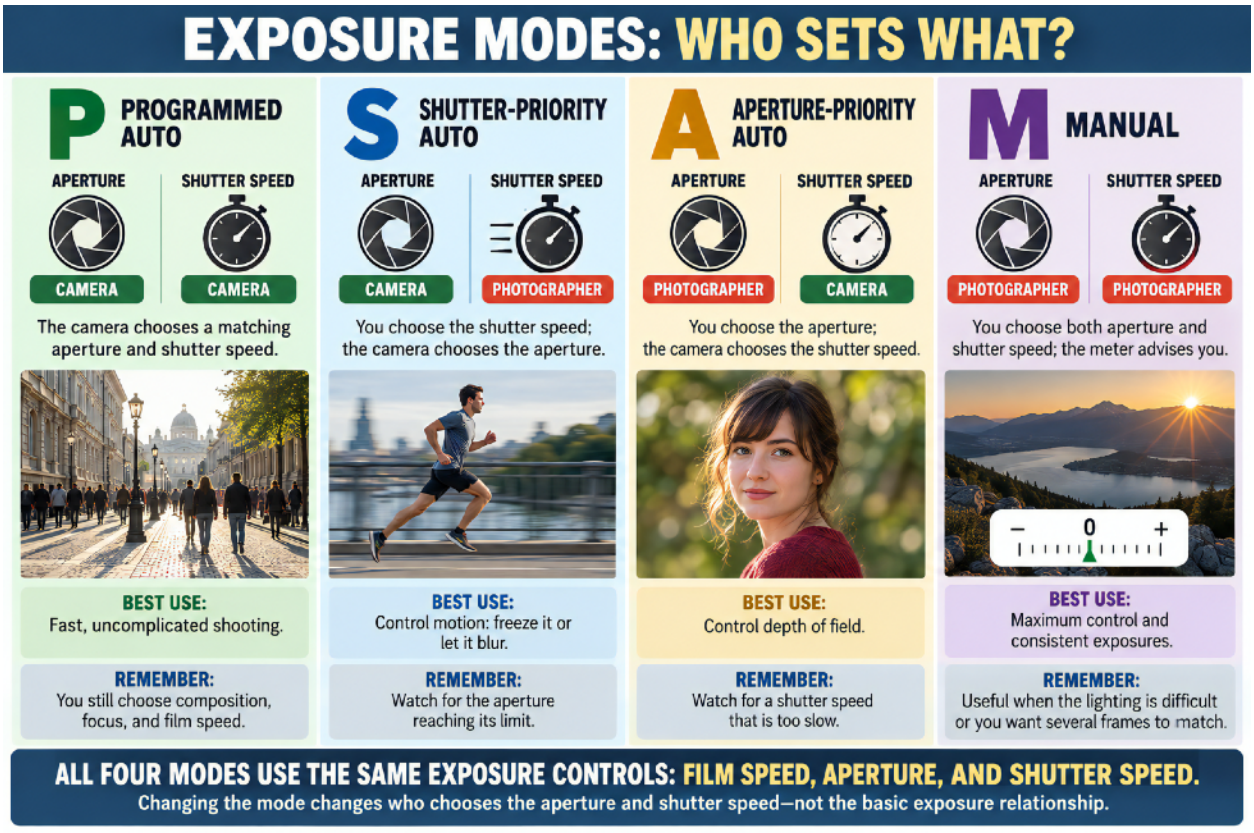
At one time, you had to use a handheld exposure meter then transfer the settings to the camera's controls. Modern cameras have the meter built-in. Automatic cameras offer differing exposure modes.

Recall that exposure is the amount of light recorded by the film. Film speed determines how much light the film needs; aperture controls how much light enters; shutter speed controls how long it enters. The camera's metering sequence is simple:

Film speed tells the meter how much light is needed → the metering pattern examines the scene → the exposure mode determines who chooses the settings → aperture and shutter speed provide the exposure.

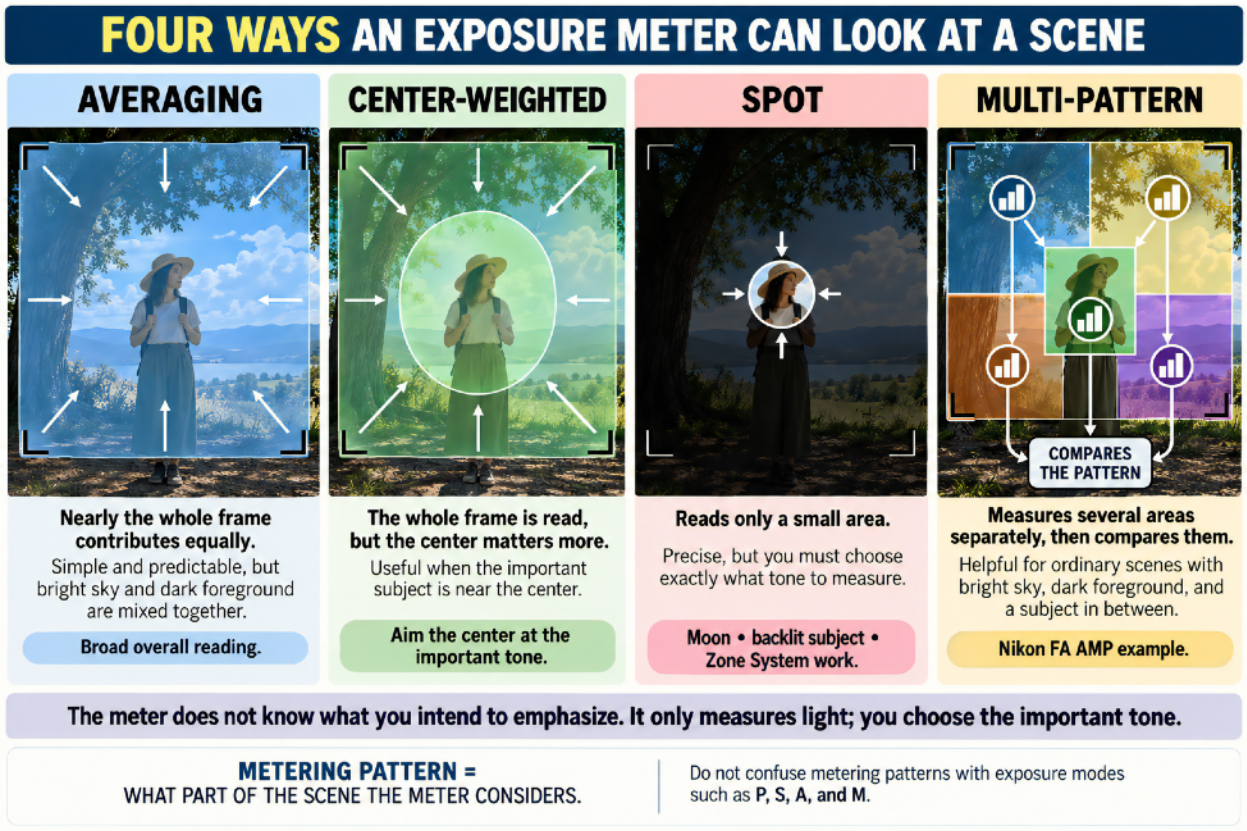
**Exposure Mode** determines who sets the aperture and shutter speed:

Program Mode: the camera sets both the aperture and shutter speed.
Shutter Priority: you set the shutter speed; the camera sets the aperture.
Aperture Priority: you set the aperture; the camera sets the shutter speed.
Metered Manual: you set both the aperture and shutter speed; the meter tells you whether the combination is too much, too little, or about right.



**Metering Pattern** determines which part of the scene the camera considers when recommending an exposure:

- Averaging Metering considers nearly the entire frame.
- Center-weighted Metering considers the entire frame but gives extra importance to the center.
- Multi-segment Metering measures several areas separately and compares them.
- Spot Metering considers only the a small area in center of the frame.



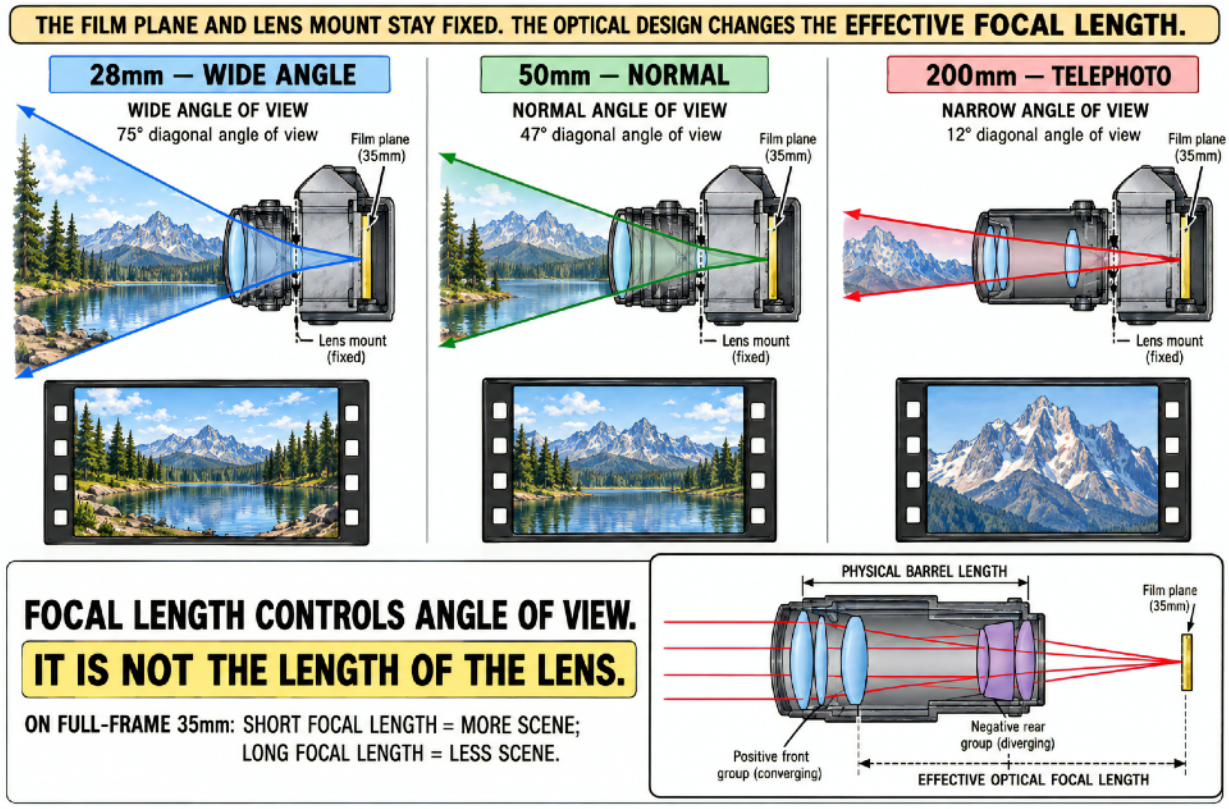
# LENS BASICS

Lenses can be classified by their focal length or by their type, usually both are combined, emptied the description of the lens.

Focal length is an optical measurement, expressed in millimeters, that determines how wide a lens can see. It is measured from the lens's effective optical center to the film plane when the lens is focused at infinity. It is not necessarily the physical length of the lens barrel.

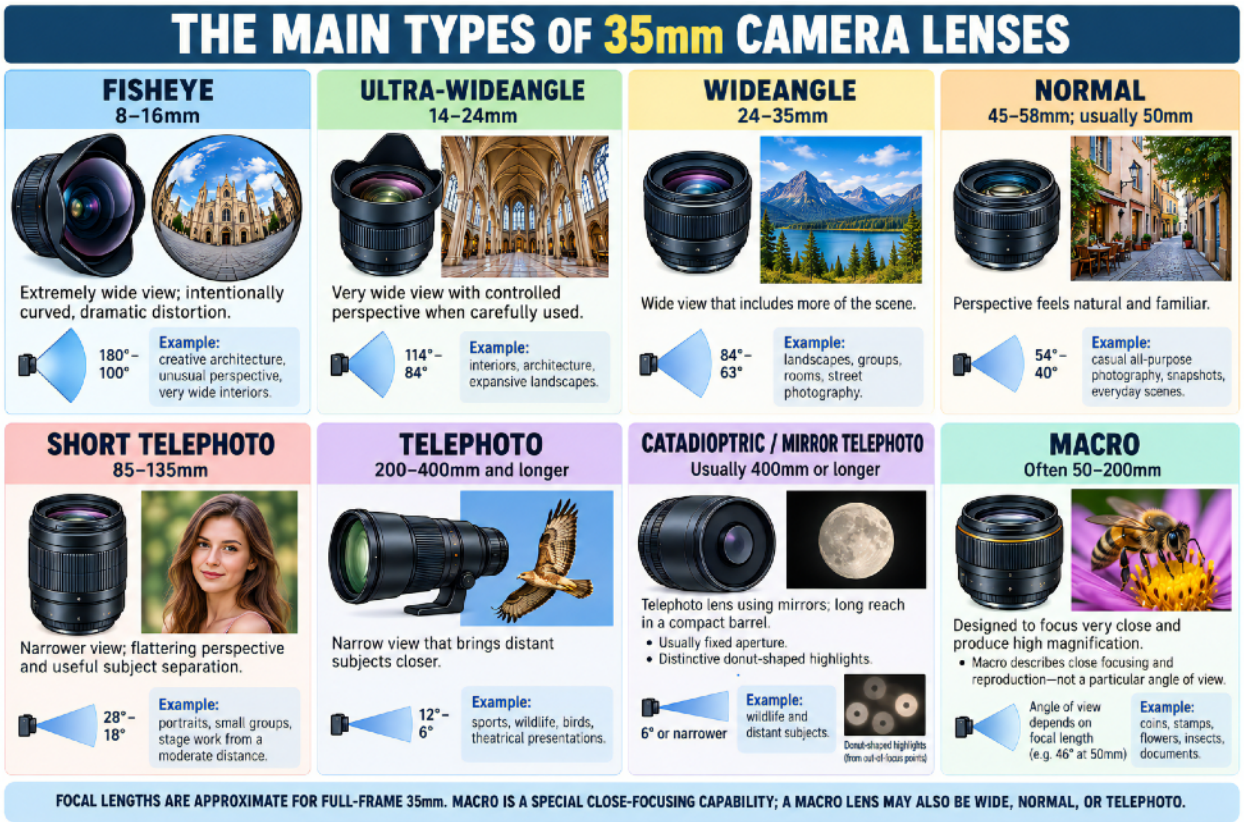
On full-frame 35mm film:
- 28mm is considered wide angle; includes much of the scene.
- 50mm is considered normal view; approximately like human vision.
- 200mm is considered telephoto; a narrow view that makes distant subjects appear larger. Basically, it's a telescope.

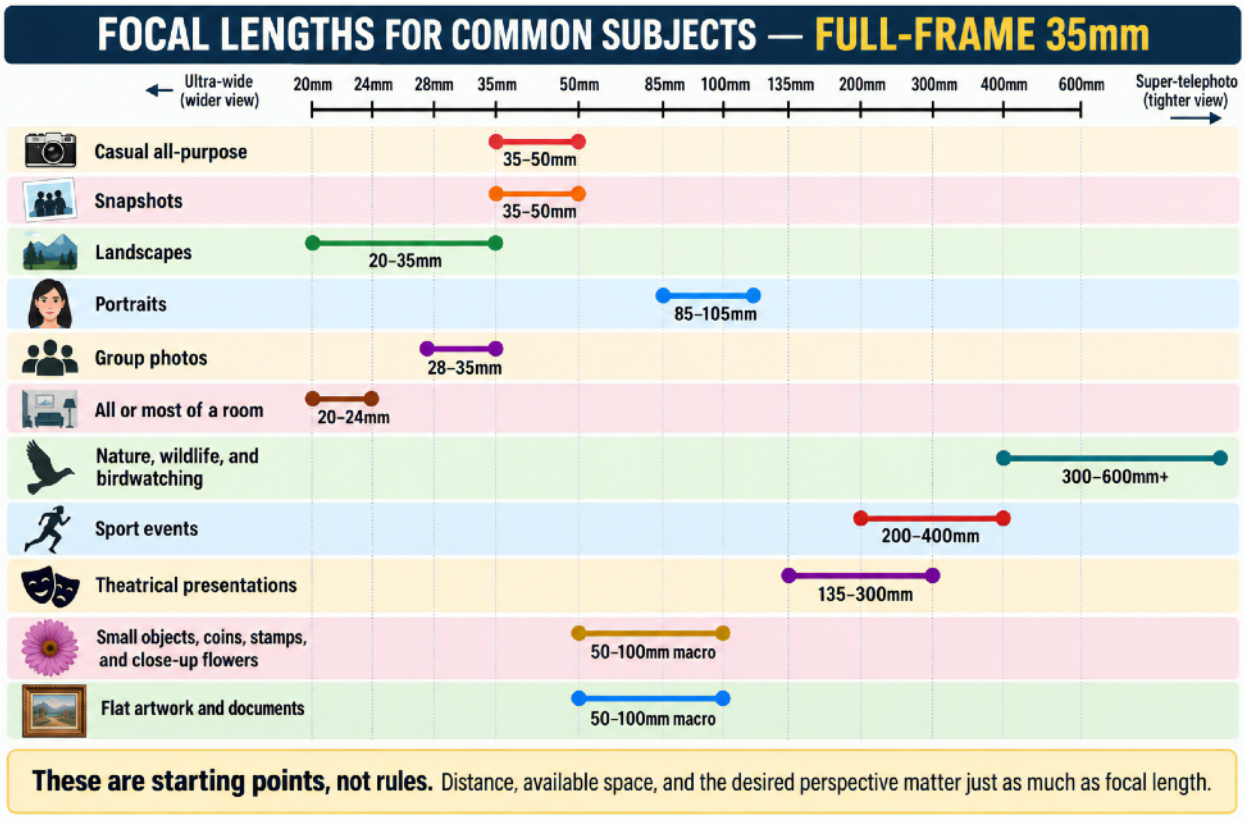
A short focal length gives a wide angle of view. A long focal length gives a narrow angle of view. The camera's film plane remains in the same place; the lens's internal optical design determines how the light is redirected to form the image there. Strictly speaking, focal length does not change perspective. The camera's position does. But changing lenses often causes the photographer to move, which changes perspective.



Some common lens types are listed below.

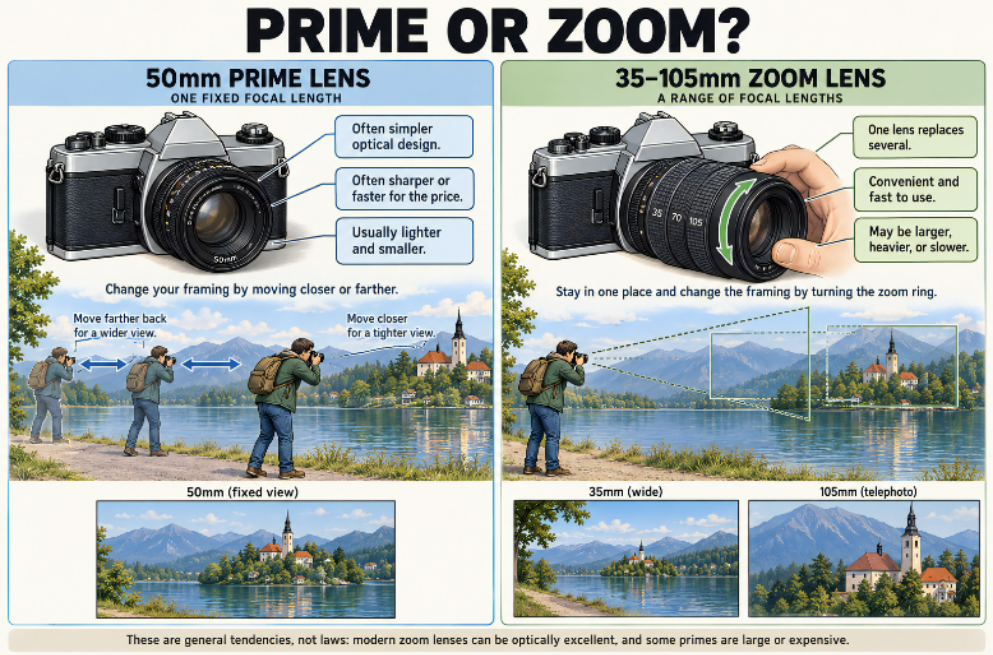
- Normal lens: Gives a natural-looking view similar to ordinary human vision; about 50mm on full-frame 35mm.
- Wide-angle lens: Shows more of the scene than a normal lens; useful for landscapes, groups, and interiors.
- Ultra-wideangle lens: Shows an exceptionally broad view; useful for very tight spaces and dramatic perspectives.
- Fisheye lens: An extremely wide lens that intentionally produces strong curved distortion.
- Short telephoto lens: Provides moderate magnification and flattering perspective; commonly used for portraits.
- Telephoto lens: Gives a narrow angle of view and makes distant subjects appear larger; useful for sports, wildlife, and stage performances.
- Catadioptric or mirror lens: A telephoto lens that uses mirrors to achieve long focal lengths in a relatively short barrel; usually has a fixed aperture and distinctive ring-shaped highlights.





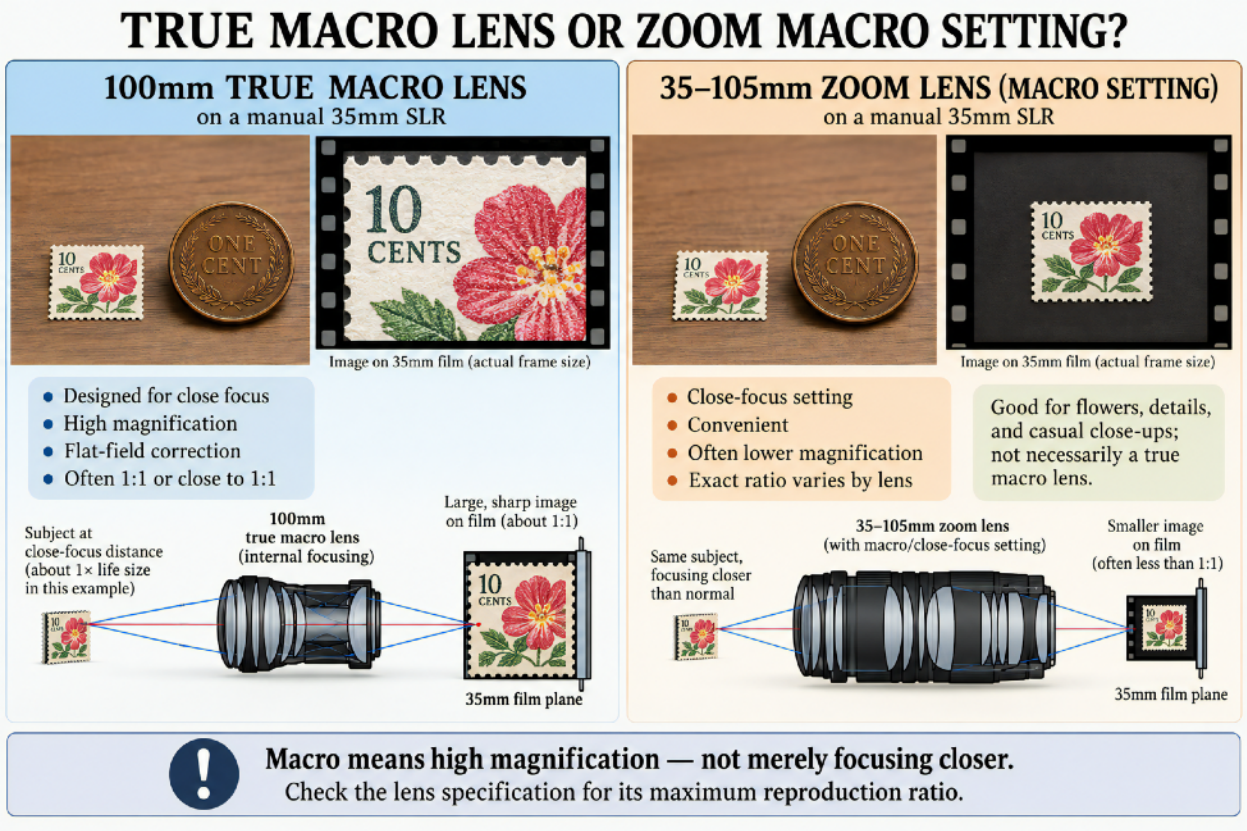

## PRIME VERSUS ZOOM LENSES

Prime lenses have one fixed focal length. They are often simpler, lighter, faster, and sharper. Zoom lenses conveniently cover a range of focal lengths, replacing several prime lenses. They are usually slower and often not as sharp optically as a prime lens. Modern zoom lenses are so good that it's very difficult to tell the difference though.



## MACRO VERSUS MACRO

Macro lenses are designed to focus very close and produce high magnification. They are useful for photographing flowers, insects, coins, stamps, and documents. A true macro lens is a prime lens optimized for a flat field reproduction absent of any curvature distortion. They are used for photographing an object at a 1:1 ratio, in other words, life-size. What gets confusing is that some zoom lenses have a “macro” setting. Macro describes close-focusing ability, not a particular focal length.

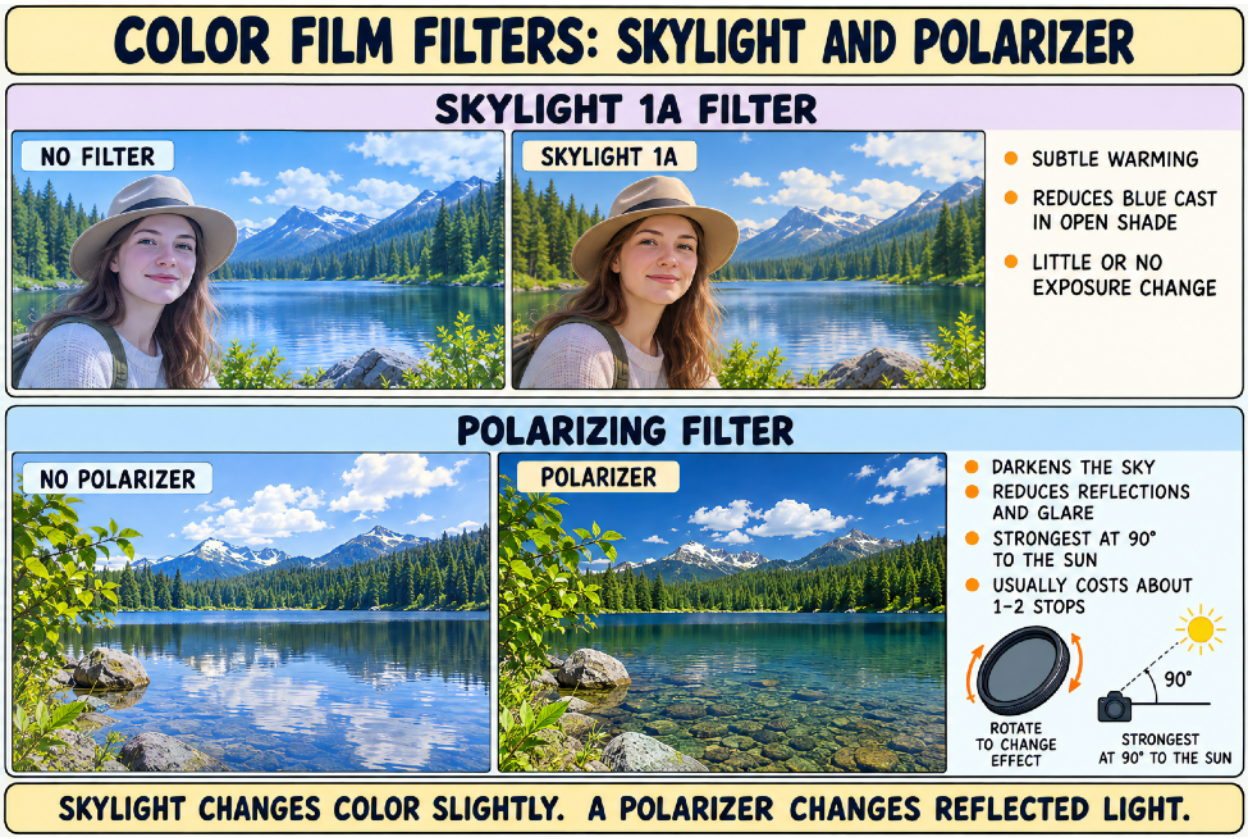


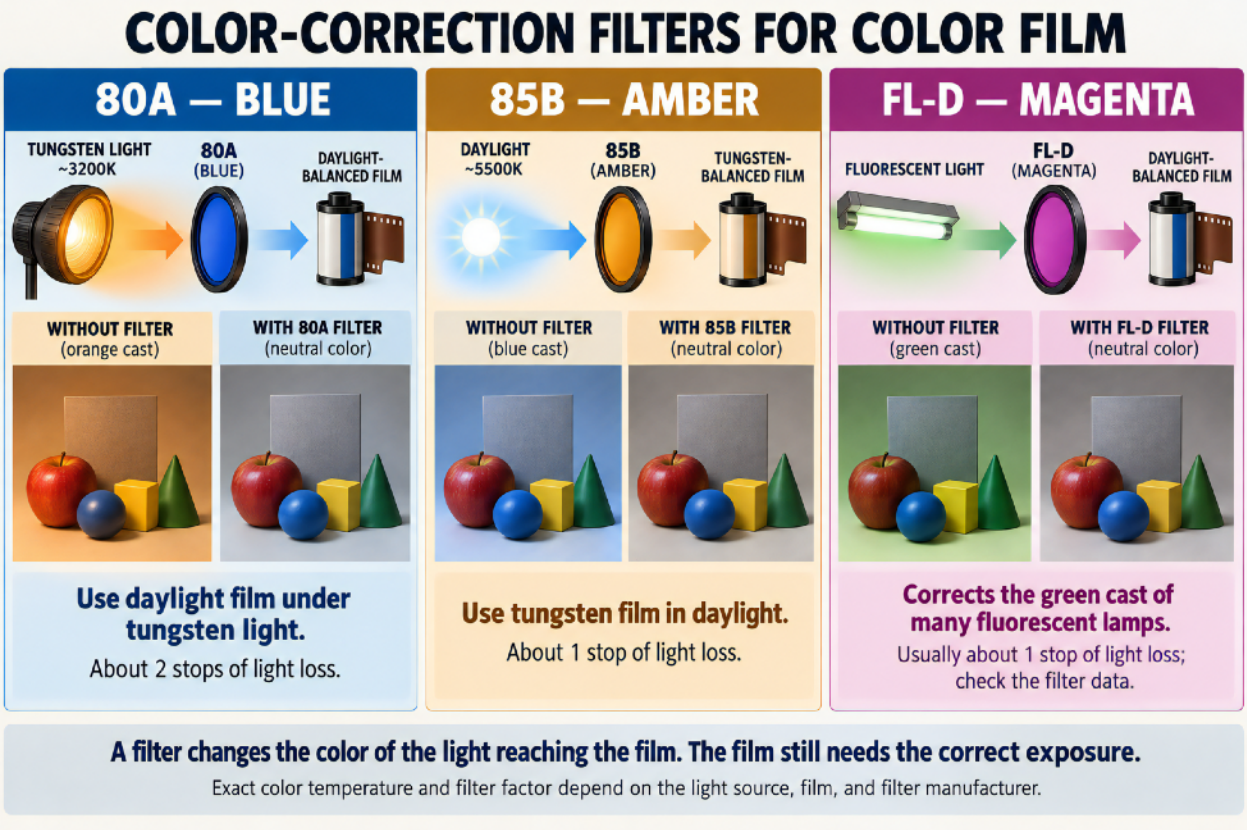
# FILTERS

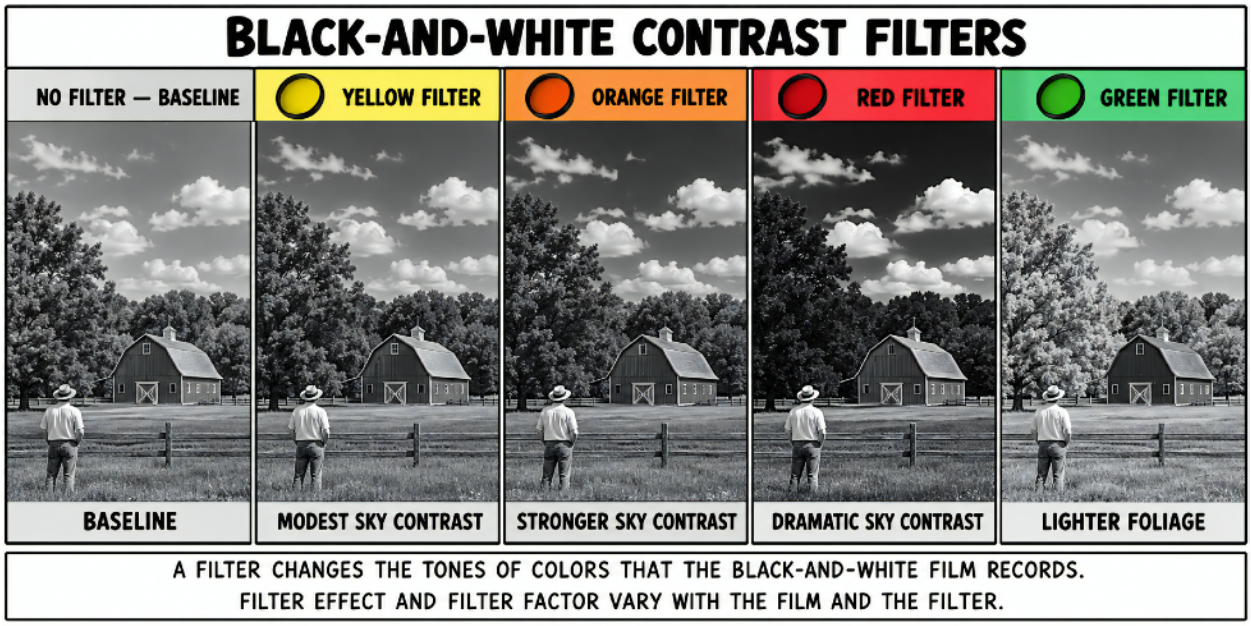
A filter is a piece of glass or gelatin placed in front of the lens to change the light before it reaches the film. Filters are not required for every photograph; they are tools used for a specific purpose.

- Black-and-white filters: Change how different colors appear as shades of gray, allowing control over contrast.
- Color-correction filters: Correct a mismatch between the light source and the film, such as tungsten light, daylight, or fluorescent light.
- Polarizing filters: Reduce reflections and glare, and can darken a blue sky.
- Skylight or UV filters: Make subtle color corrections and may provide some protection for the front lens element.
- Neutral-density filters: Reduce the amount of light without changing color, allowing a wider aperture or slower shutter speed in bright conditions.

Every filter absorbs or changes some light, so the exposure may need to be adjusted. A filter should be used because it improves the photograph, not simply because one happens to be attached to the lens.



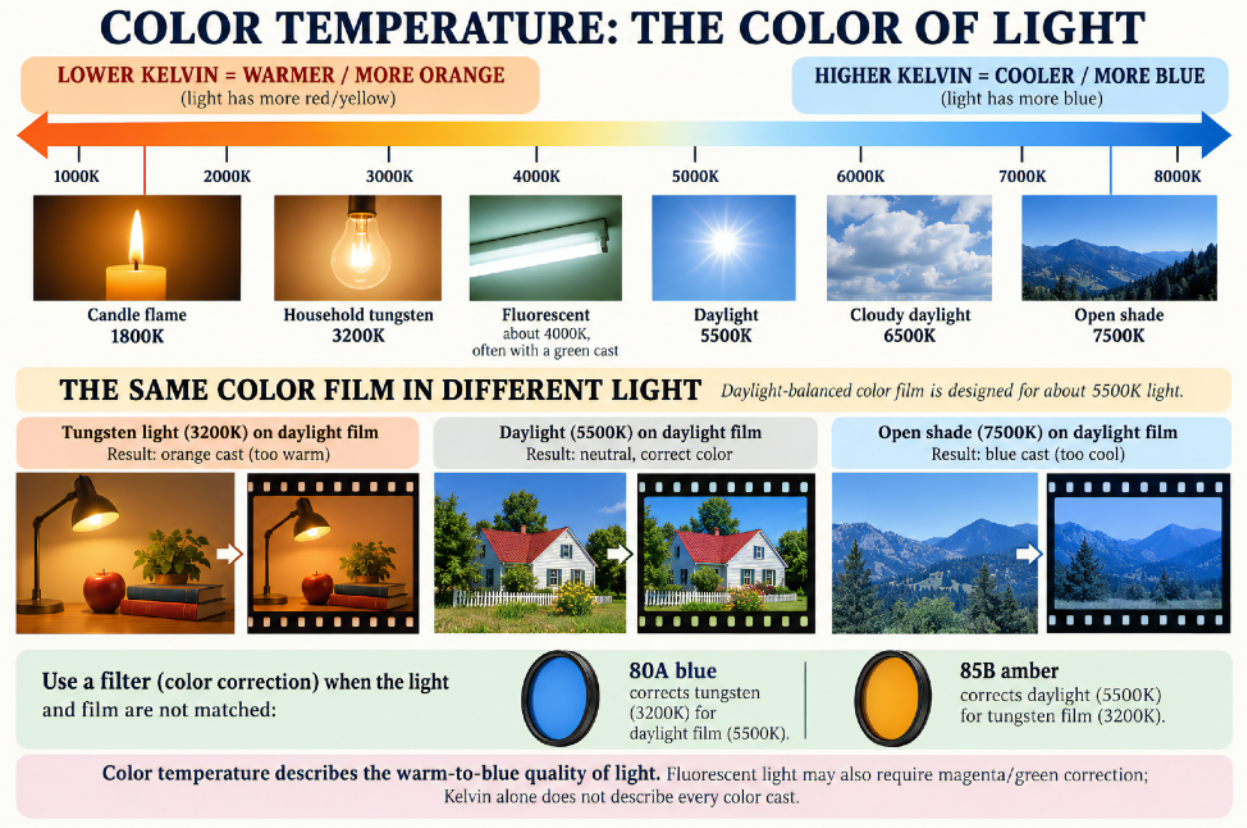

COLOR-CORRECTION FILTERS FOR COLOR FILM
80A — BLUE
TUNGSTEN LIGHT ~3200K
80A (BLUE)
DAYLIGHT-BALANCED FILM
WITHOUT FILTER (orange cast)
WITH 80A FILTER (neutral color)
Use daylight film under tungsten light.
About 2 stops of light loss.
85B — AMBER
DAYLIGHT ~5500K
85B (AMBER)
TUNGSTEN-BALANCED FILM
WITHOUT FILTER (blue cast)
WITH 85B FILTER (neutral color)
Use tungsten film in daylight.
About 1 stop of light loss.
FL-D — MAGENTA
FLUORESCENT LIGHT
FL-D (MAGENTA)
DAYLIGHT-BALANCED FILM
WITHOUT FILTER (green cast)
WITH FL-D FILTER (neutral color)
Corrects the green cast of many fluorescent lamps.
Usually about 1 stop of light loss; check the filter data.
A filter changes the color of the light reaching the film. The film still needs the correct exposure.
Exact color temperature and filter factor depend on the light source, film, and filter manufacturer.


BLACK-AND-WHITE CONTRAST FILTERS
NO FILTER — BASELINE
YELLOW FILTER
ORANGE FILTER
RED FILTER
GREEN FILTER
BASELINE
MODEST SKY CONTRAST
STRONGER SKY CONTRAST
DRAMATIC SKY CONTRAST
LIGHTER FOLIAGE
A FILTER CHANGES THE TONES OF COLORS THAT THE BLACK-AND-WHITE FILM RECORDS.
FILTER EFFECT AND FILTER FACTOR VARY WITH THE FILM AND THE FILTER.

COLOR TEMPERATURE

Color temperature describes whether light appears warm and orange or cool and blue. It is measured in Kelvin (K):
• Lower Kelvin: warmer, more orange light, such as candlelight or tungsten lamps.
• Higher Kelvin: cooler, more blue light, such as open shade or overcast sky.

Color film is balanced for a particular color temperature, usually daylight. If the film and the light do not match, the photograph develops an unwanted color cast. Filters can correct that mismatch.



# TRIPODS

A tripod is a three-legged support that prevents the camera from moving during the exposure. It is not used only for very long shutter speeds. A telephoto lens magnifies camera movement, and close-up photography magnifies it even more, so a tripod can be valuable even when the shutter speed seems reasonably fast.

When a tripod is most useful.
- Slow shutter speeds: interiors, night scenes, landscapes, and long exposures.
- Long focal lengths: telephoto lenses magnify small camera movements.
- Macro photography: close focusing produces very little depth of field, making careful composition and steadiness important.
- Precise composition: architecture, still life, copy work, and carefully arranged scenes.
- Bracketing: multiple exposures of the same scene can be made without changing the composition.
- Self-portraits and group photographs: the camera can remain in place while the photographer joins the picture.
- Low-light work: especially when a slower shutter is preferable to using a wider aperture or faster film.

A tripod will not stop a moving subject from blurring. It only prevents movement of the camera.

A good tripod should be rigid, stable, reasonably portable, and easy enough to use that you will actually carry it. Look for:
- Stiff legs and secure leg locks. Larger-diameter legs and three-section designs are generally more rigid than very thin or highly segmented legs.
- A stable center column. The center column should be kept down whenever possible; raising it makes the tripod less stable.
- Adequate height. Choose one that brings the camera near eye level without requiring the center column to be fully extended.
- A strong head. The head must hold the camera and lens without creeping. A ball head is quick and convenient; a three-way head offers more precise control for architecture and still life.
- A secure quick-release plate. It should lock firmly and remain attached to the camera without twisting.
- A generous load margin. Manufacturer ratings are not standardized. A tripod and head rated comfortably above the weight of the camera and largest lens will be more stable and last longer.
- A practical weight. A massive tripod may be very stable, but it is useless if it stays at home. Aluminum tripods are often good values; carbon fiber is lighter and usually better at damping vibration, but costs more.

**USE TIPS**

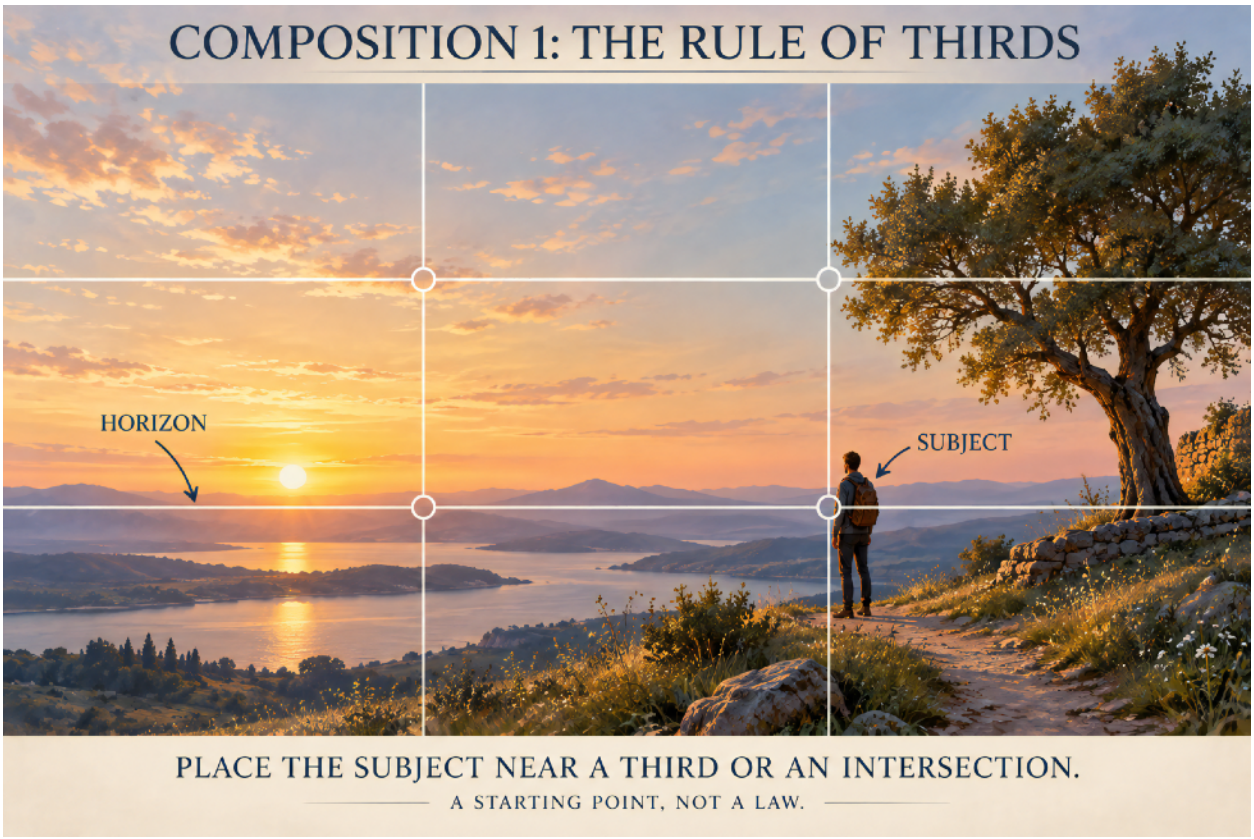
- Spread the legs wide,
- Place the tripod on firm ground,
- Keep the center column low, and
- Make sure every lock is secure.
- Use a cable release or the camera's self-timer so you do not shake the camera when pressing the shutter.
- In wind, remove anything that can flap from the camera.
- Do not assume that hanging a heavy bag from the center column always improves stability but it can also introduce movement.

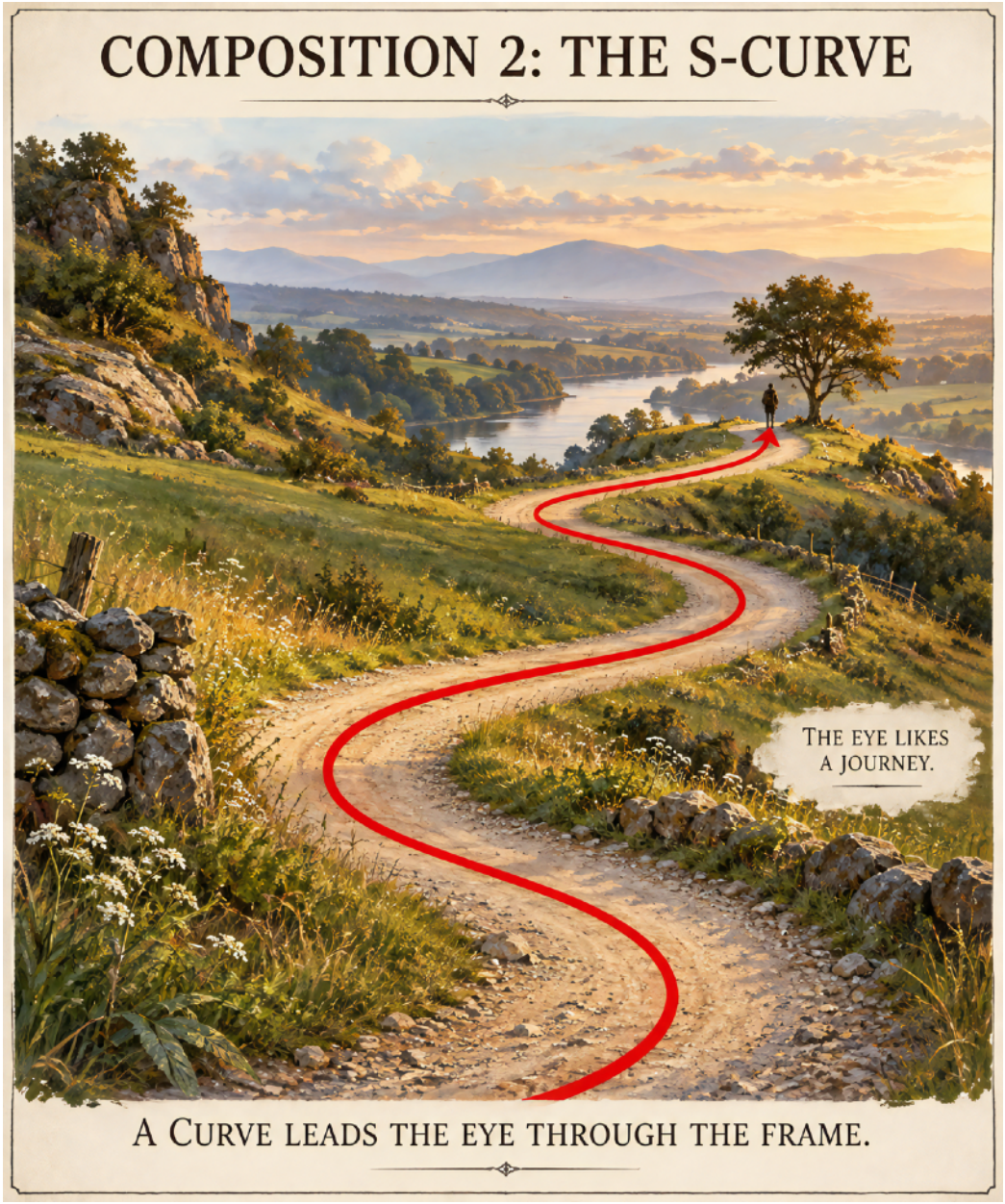


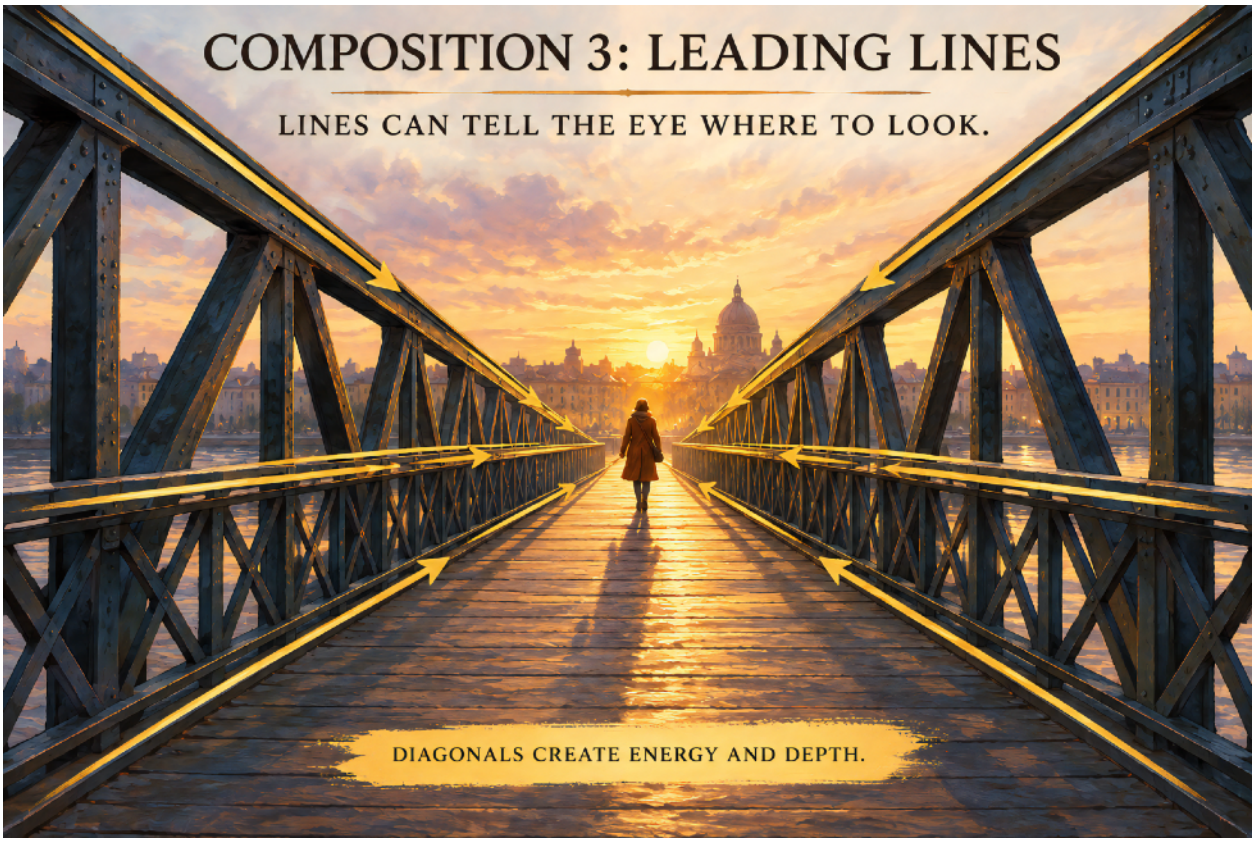
# FOUR BASIC PRINCIPLES OF COMPOSITION

Creativity is not about inventing a beautiful subject. It is making useful choices about what to notice, what to include, and how to arrange it. An engineering analogy may help: the scene is raw data; composition is selecting the significant variables and defining the boundaries of the problem. Here are four of the most commonly used rules of composition that artists rely on.

1. Rule of thirds: Imagine the frame divided into nine equal rectangles. Placing important subjects near the lines or their intersections often creates a more balanced and interesting composition than placing everything in the exact center.
2. S-curve and the line of beauty: An S-shaped line leads the eye gracefully through the photograph. Roads, rivers, paths, stairways, and curved figures can create movement and elegance.
3. Leading lines and diagonals: Lines such as fences, rails, shadows, or architectural edges guide the viewer's eye toward the subject. Diagonal lines add energy, depth, and a sense of movement.
4. Framing, negative space, and balance: Framing uses an arch, doorway, branches, or another object to surround or point toward the subject. Negative space is deliberately empty space that gives the subject room to breathe. Balance distributes visual weight so that one side of the image does not overpower the other.




COMPOSITION 2: THE S-CURVE
THE EYE LIKES A JOURNEY.
A CURVE LEADS THE EYE THROUGH THE FRAME.


COMPOSITION 3: LEADING LINES
LINES CAN TELL THE EYE WHERE TO LOOK.
DIAGONALS CREATE ENERGY AND DEPTH.


COMPOSITION 4: FRAME, SPACE, AND BALANCE
FRAME
NEGATIVE SPACE
BALANCE
EMPTY SPACE GIVES THE SUBJECT ROOM TO BREATHE.
WHAT YOU LEAVE OUT IS AS IMPORTANT AS WHAT YOU INCLUDE.

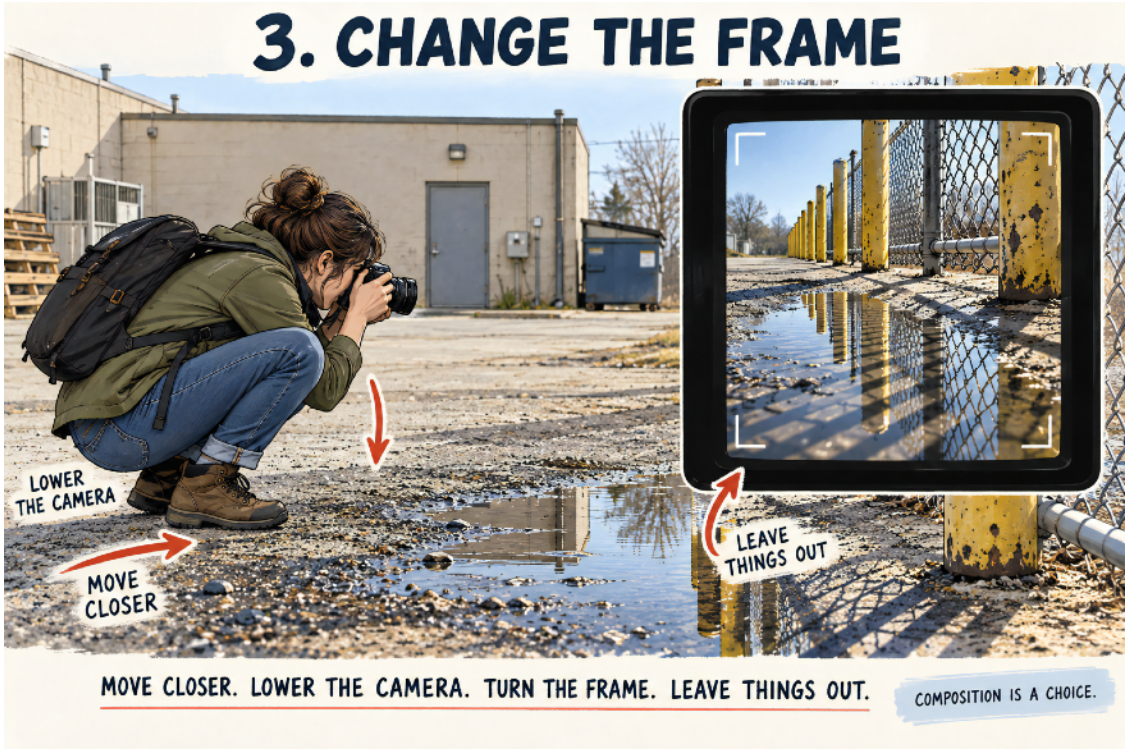
# ARTISTIC PHOTOGRAPHS ARE EVERYWHERE

So how do you find them?

1. Begin with an ordinary, unattractive scene.
2. Stop looking for “subjects” and notice lines, shapes, texture, light, repetition, and contrast.
3. Change the camera position and deliberately choose what to exclude.
4. Make twelve distinct photographs before leaving.

The central idea is, again: Creativity is not about inventing a beautiful subject. It is making useful choices about what to notice, what to include, and how to arrange it.




3. CHANGE THE FRAME
LOWER THE CAMERA
MOVE CLOSER
LEAVE THINGS OUT
MOVE CLOSER. LOWER THE CAMERA. TURN THE FRAME. LEAVE THINGS OUT.
COMPOSITION IS A CHOICE.


4. MAKE TWELVE PHOTOGRAPHS BEFORE YOU LEAVE
LINE
PATTERN
TEXTURE
REFLECTION
SHADOW
DETAIL
CONTRAST
NEGATIVE SPACE
MATERIAL
VIEWPOINT
SCALE
GESTURE
CREATIVITY IS NOT WAITING FOR A BEAUTIFUL SUBJECT. IT IS MAKING USEFUL CHOICES.
ONE PLACE. TWELVE WAYS OF SEEING.