Using an SLR camera

Cameras may differ in appearance but the basic controls are the same.

Nikon FM2 (1982 - 2001)
A 35mm Manual Film SLR camera

Nikon F100 (1999 - 2006)
A 35mm Automatic Film SLR camera (with added electronics)

ISO / ASA

What is ISO?

- Film is light sensitive. This sensitivity is specified by ISO (International Standards Organization).
- Different films have different ISO's. Typical ISO ratings might be 100, 200, 400, 800, 1600.
- The higher the ISO number on the film the less light it takes to put a picture on a film. (e.g. A higher ISO film of 400 needs only half the amount of light than a 200 ISO film)

35mm Films with different ISO's i.e. 100, 400, 800 and 1600

Why do we need different ISO's?
The range allows photographers flexibility and creative control.

Do digital camera's use ISO? Yes, Digital Cameras are based on film cameras. Instead, you select the ISO your require through a series of buttons which in effect mimics the ISO of films by increasing the sensitivity of the sensor.

When to typically use high or low ISO's?

- Fast ISO's of 400, 800 or higher work in dimmer lighting conditions. They also has other benefits like allowing photographers to work without the need of a tripod (more on this later).
- Slow ISO's in the 100 range are ideal for brightly lit situations e.g. outdoor or studio photography.

Trade Off: The higher the ISO the more grain/noise and less detail you get.

Film grain / digital noise

Grainy high speed B&W film negative

Image source: https://en.wikipedia.org/wiki/Film_speed

Grain in a B&W print

Image source: https://en.wikipedia.org/wiki/Film_grain

Grain effect added to a digital image with software in digital darkroom

Image source: https://blog.phaseone.com/film-grains-photorealistic-right-way/

The ISO dial

The ISO dial tells the camera the speed of your film. Set the ISO you are using at the start of your shoot.
With film photography this ISO setting should remain the same from the first to last exposure in your roll of film.
Each time you load a film you should check your ISO camera setting and if needed, reset it to match the film you are using.

The ISO dial may be marked as ASA

There may not be a physical dial but it is be accessed though a series of button presses.

The shutter and shutter speed

- The Shutter is like a small curtain in the camera that sits just in front of the film or sensor (in a digital camera).

- The speed at which this shutter opens and closes is known as the Shutter Speed. The higher the number, the faster the shutter will open and close.

- Shutter speeds are measured in fractions of a second. e.g 1/2s, 1/4s, 1/8s, 1/60s, 1/125s etc.

- A shutter can be set to stay open for seconds or even minutes, if extremely long exposures are required.

The shutter speed effects Exposure and Blur

Shutter speed & Exposure

In these two photos taken on a digital SLR camera the shutter speed of the left image was 1/50s (a fiftieth of a second. In the image on the right the shutter speed was 1/200s (a two hundredth of a second).

Notice the difference between the two exposures. The slower shutter (i.e 1/50s) allows more light to shine onto the film/image sensor, so the the brighter the picture. The faster shutter speed allow less light through so the image appears darker.

It would make sense then that one of the ways to control exposure is by changing shutter speeds.

1/50s

1/200s

Shutter speed - Time, Motion and Blur

A longer shutter opening will let in more light but may also cause blurring if any motion occurs while the photograph is being taken...either from the subject moving (e.g. child running, leaves blowing) or by camera shake on the part of the photographer.

Image source: https://commons.wikimedia.org/wiki/File:Windflower-05237-nevit.JPG

Fast Shutter Speed ⟵ ⟶ **Slow Shutter Speed**

Insert other shutter speed photo examples

Source: Horikawa Gojo CC-BY-3.0

Exposure time: 20/1 (20secs)
F-number: f/25
ISO speed rating: 100
Lens focal length: 30mm

Source: Cestina Zavodici CC-BY-3.0

Exposure time: 1/1000s
F-number: f/8
ISO speed rating: 400
Lens focal length: 85mm

The Aperture - Where is it?

- The aperture is a small set of blades in the lens that controls the amount of light entering the camera. It is often described as being similar to the iris in your eye. In your eye your iris dilates in dimmer lighting conditions and contracts in brighter lighting.

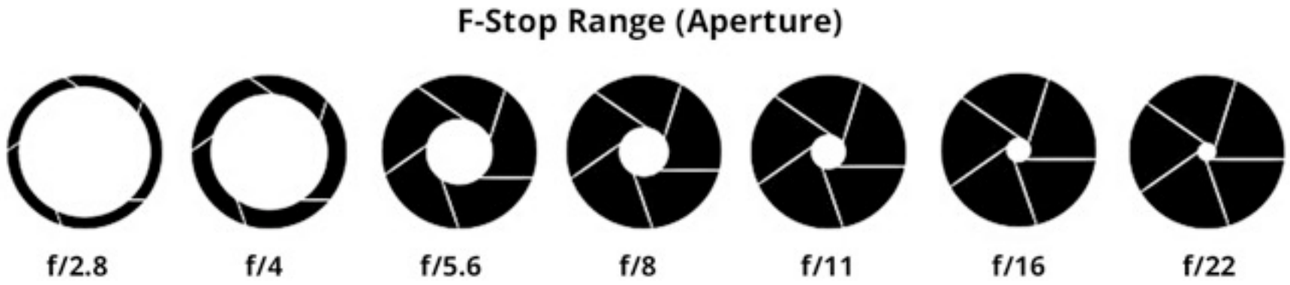
Image source: https://en.wikipedia.org/wiki/Aperture

File:Lens_aperture_side.jpg

On this lens the aperture ring can be rotated to select the aperture you want to use.

In other camera/lens combinations the aperture may be set by using a series of buttons & dials.

The Aperture



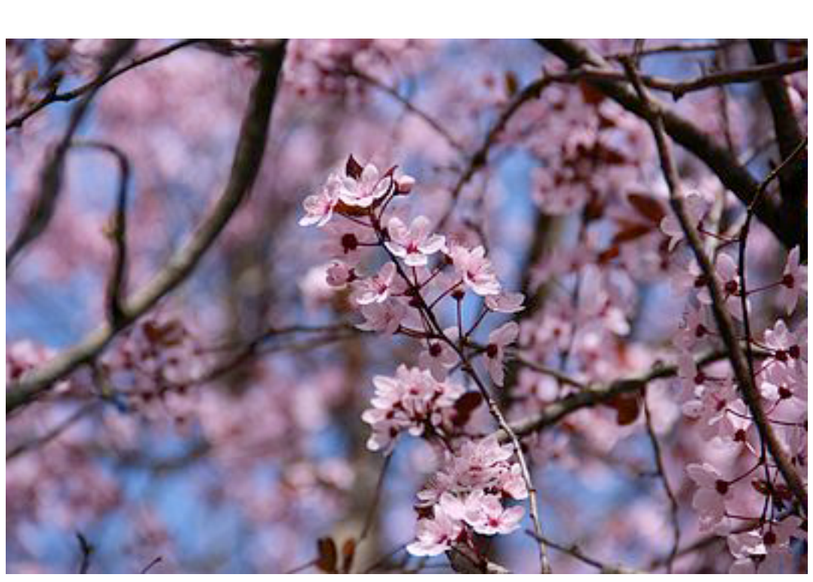
- Aperture sizes are measured by f-stops.
- A high f-stop like f16 means the hole is quite small and a low f-stop like f2.8 means the aperture opening is quite large.
- Similarly to how the shutter speed controls the amount of light hitting the film/sensor, the aperture also controls the amount of light entering the camera through the lens.
- Exposure can also be controlled by opening or closing the aperture allows more or less light through the lens.

The aperture (f-Stop settings) effects Exposure and Depth of Field

The Aperture & Depth of Field

What is Depth of field?

- Depth of field is the distance between the nearest and furthest objects in a photograph that appear sharp.
- The aperture controls the Depth of Field and aperture f-stop settings can be changed allowing the photographer control over how much of a picture is in focus and how much is out of focus.
- Further reading: https://photographylife.com/what-is-aperture-in-photography



f5.6, 1/400s V. f36 1/8s

Shallow Depth of Field

Deep Depth of Field

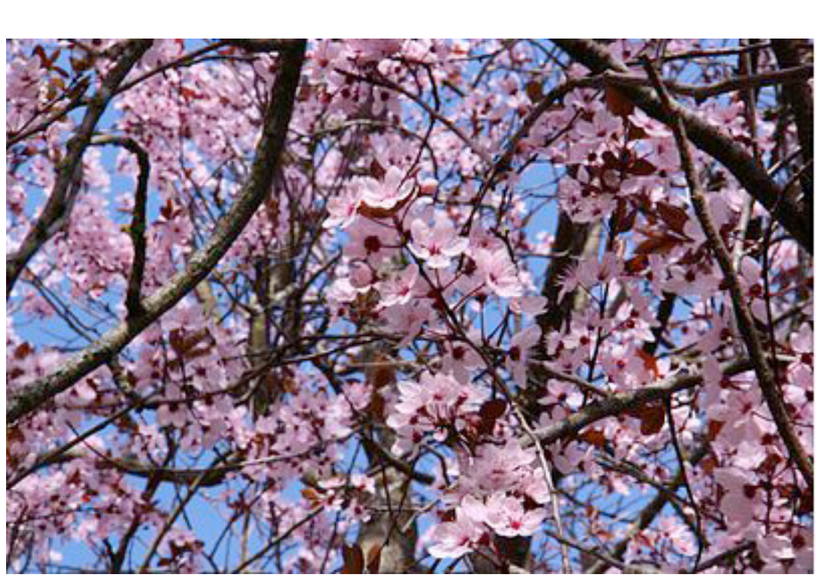


Image source: https://commons.wikimedia.org/wiki/File:Depth_of_field_flowers.JPG

Examples of DOF

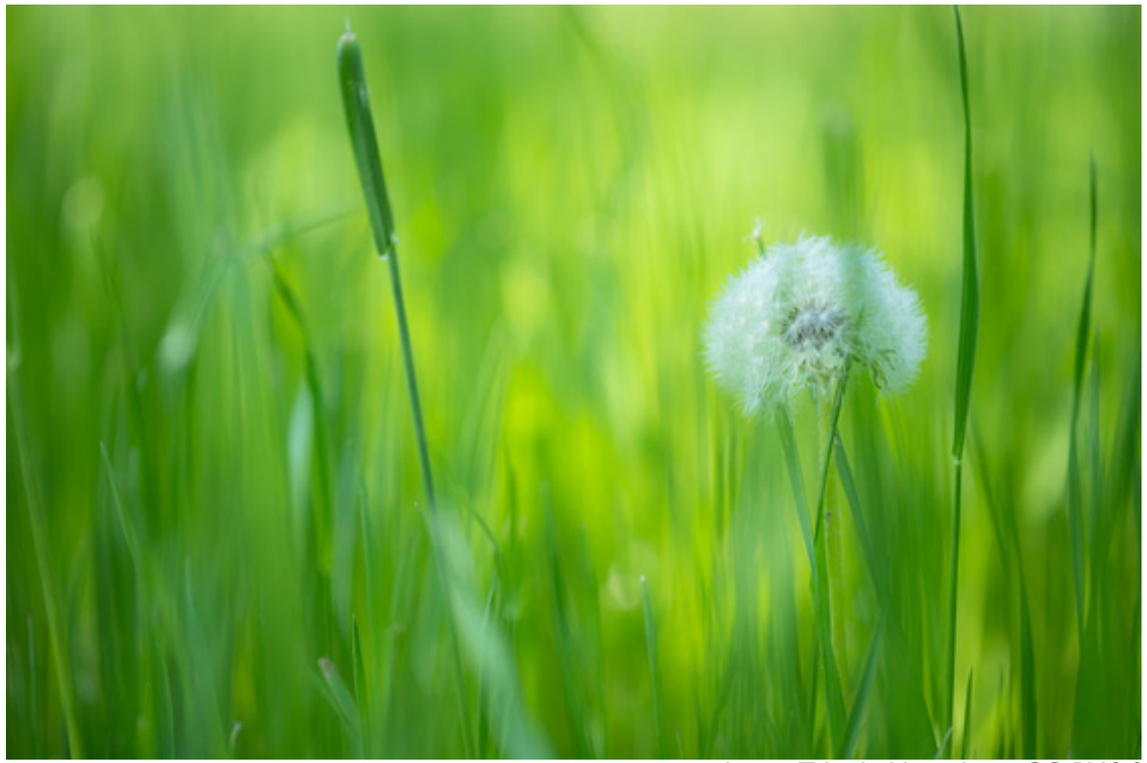
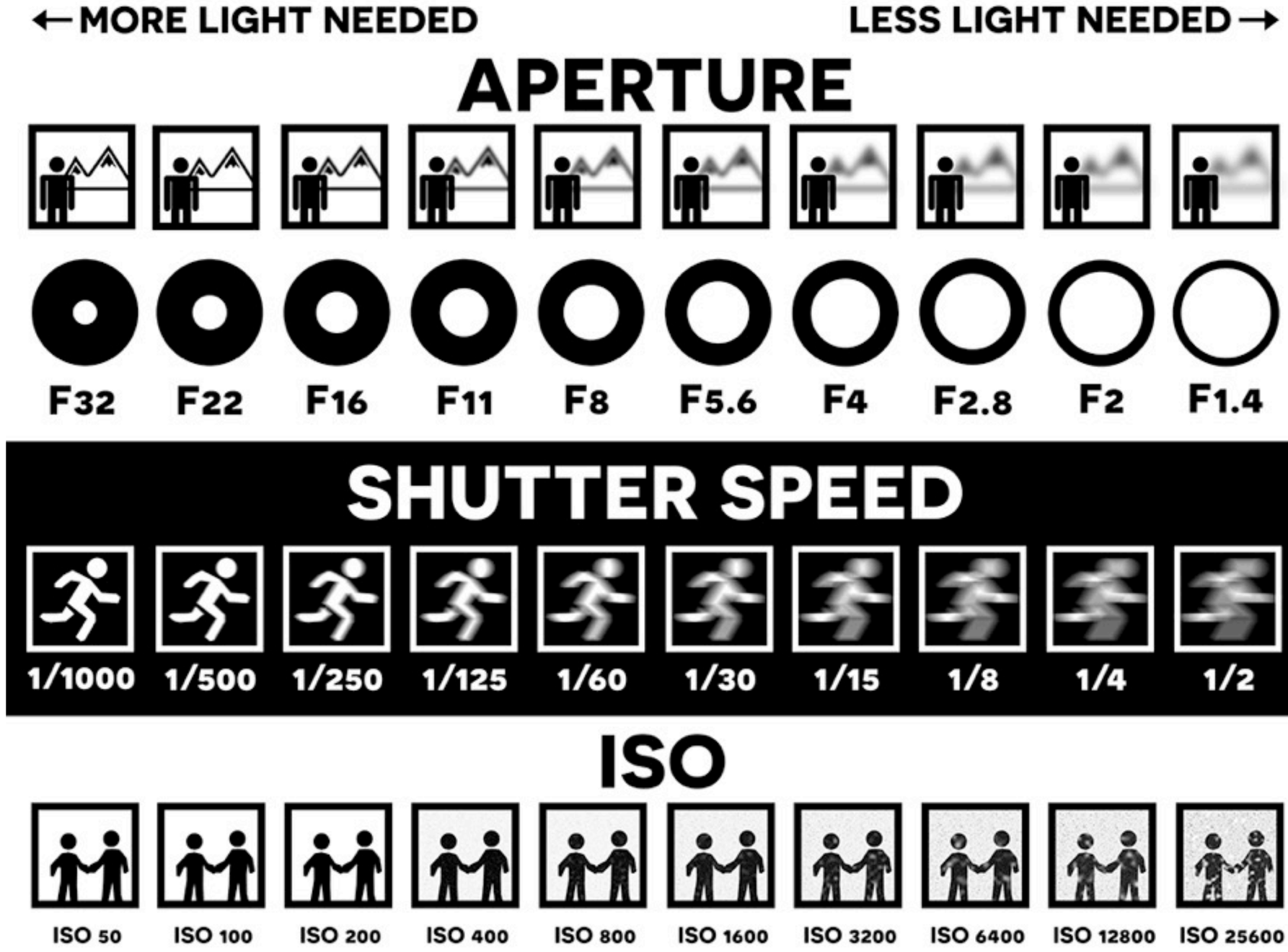


Image: Takashi Horoshima CC-BY-2.0

Exposure time(shutter speed): 1/125 sec
F-number: f/4.2
ISO speed rating: 100
Lens focal length: 200mm

Image: Aileen Drohan

Exposure time(shutter speed): 1/20 sec
F-number: f/22
ISO speed rating: 200
Lens focal length: 50mm


←MORE LIGHT NEEDED
LESS LIGHT NEEDED→
APERTURE
F32
F22
F16
F11
F8
F5.6
F4
F2.8
F2
F1.4
SHUTTER SPEED
1/1000
1/500
1/250
1/125
1/60
1/30
1/15
1/8
1/4
1/2
ISO
ISO 50
ISO 100
ISO 200
ISO 400
ISO 800
ISO 1600
ISO 3200
ISO 6400
ISO 12800
ISO 25600

Camera light meters

On SLR cameras the exposure level indicator is usually located by looking through the viewfinder. It should look something like, but not exactly the same, as the image below. In this image the exposure level indicator is showing underexposure by one stop.

How would we fix this?

Source image: tutsplus.com

A DSLR camera display screen showing the exposure meter reading at almost one stop under exposed (or 2/3 to be percise)

Image: KediCobani CC-BY-SA-4.0

Reading your camera light meter

Correctly Exposed Meter

Under Exposed Meter

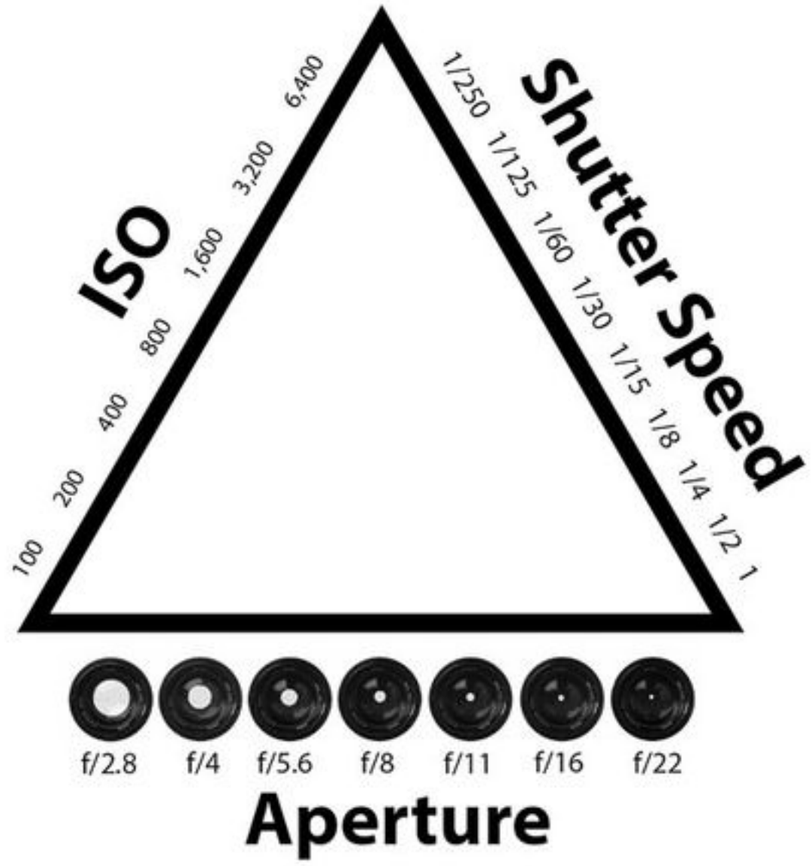
Over Exposed Meter

- The exposure meter built in to a camera is a reflective light meter. In other words it measures the amount of light reflected from the surface of an object.
- The light meter is an internal function of a camera that gives you a visual indication of how dark or light the image is. Most cameras usually display the range from at least -2 (two stops underexposed) to + 2 (two stops overexposed)
- The light meter sees a scene as if it were Black and White. It measures everything against mid grey.

Can exposure errors can happen?

Yes and most particularly when shooting against an almost black or almost white background. Why is this?

The exposure triangle



ISO, Shutter speed and aperture work together to create an exposure and are often referred to as the exposure triangle with a cause and effect relationship.

When you have your camera set for a perfect exposure and you then adjust one element, another element must then be changed to capture the same exposure. Otherwise you risk under or over exposing your film.

Worked example: Using an IS0 of 100 the aperture/shutter speed combinations listed below will give exactly the same exposure (f1.4 and 1/1000s has exactly the same exposure as f32 and 1/4s)

ISO	Aperture	Shutter Speed
100	f1.4	1/1000s
100	f2.8	1/500s
100	f4	1/250s
100	f5.6	1/125s
100	f8	1/60s
100	f11	1/30s
100	f16	1/15s
100	f22	1/8s
100	f32	1/4s

The Mode Dial - on automatic and digital cameras

https://en.wikipedia.org/wiki/Mode_dial

Some dials have more modes than others. The main ones are:

M - Manual Mode allows full control of all camera settings.
S or Tv- Shutter priority allows the photographer to select the shutter, leaving the camera select aperture & ISO(if you use auto ISO).
A - Aperture priority allows the photograph to select the aperture, leaving the camera select shutter & ISO (if you use auto ISO).
P - Program restricts control over the shutter speed and aperture.

Cameras may also have automatic Scene modes for landscape, portrait, macro etc.

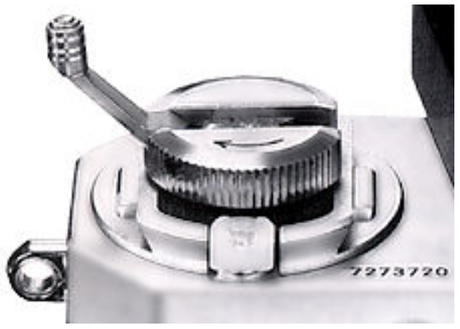
How to load and remove film in an SLR camera

https://www.youtube.com/watch?v=FjCfcTFP50E

The rewind release and rewind crank

The rewind release allows to to rewind your film. It is usually a small button located on the base of your camera, slightly recessed into the base of the camera body. Pressing this releases the film which is normally locked to only move forwards and not backwards while shooting.

The rewind crank lets you wind your film back into the film canister. It usually has a flip out lever to make the process of rewinding the film easier. Some motorized cameras don't have this at all and these camera automatically takes care of the rewind or may have a switch to do so.



Lenses

Tamron 10-24mm

Sigma 100-400mm f/5-6.3

Tamron SP AF 17-50mm F/2.8

Sigma 50mm f/1.4