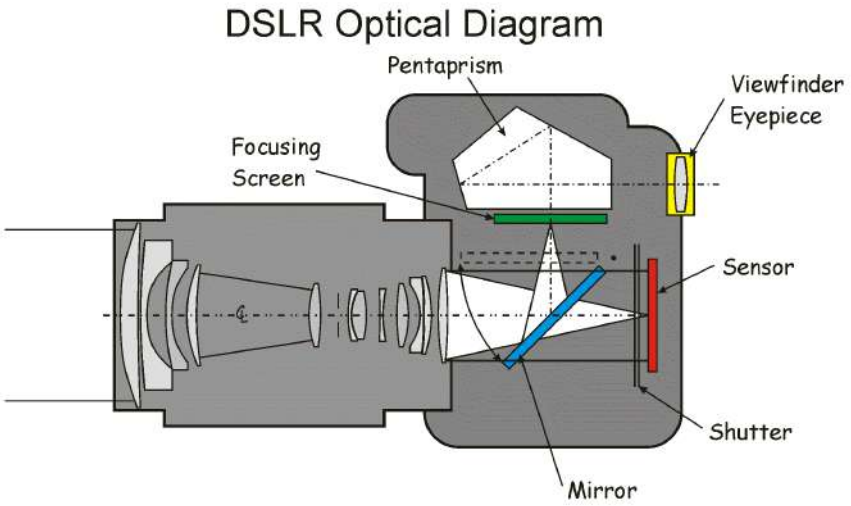
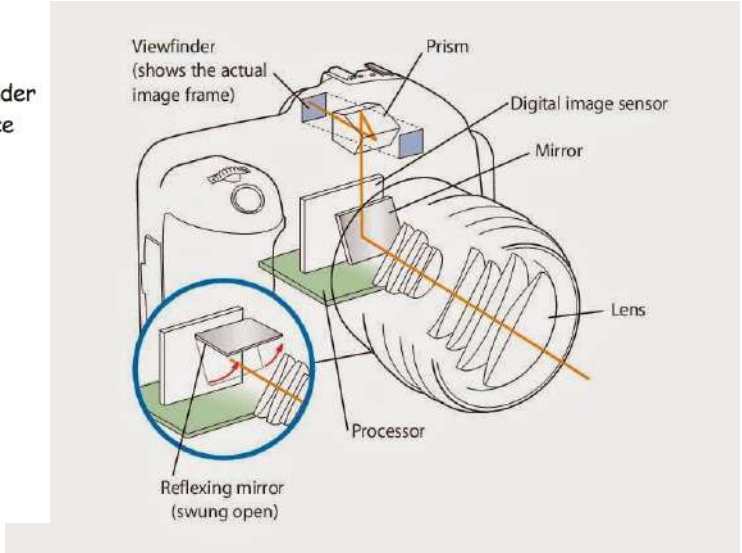
CAMERA BASICS

DSLR Camera

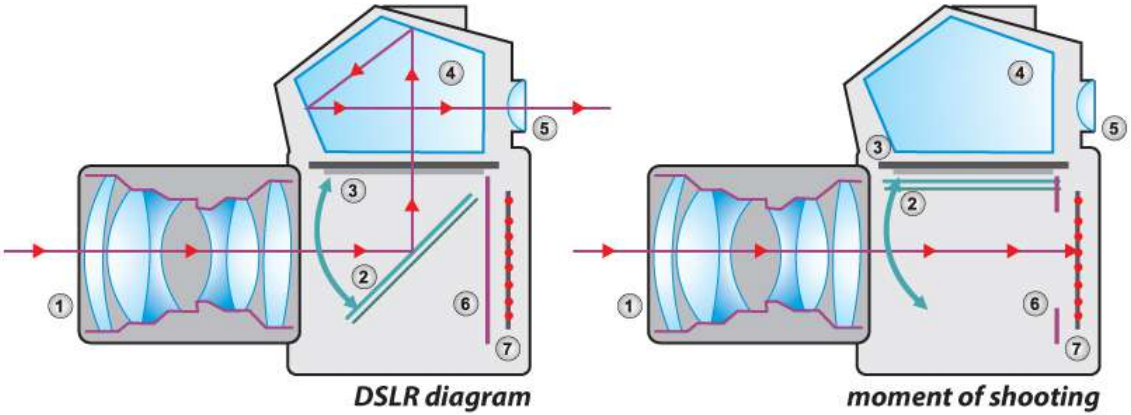
The Camera

DSLR Viewing System





DSLR Viewing System



1. Lens
2. Reflex mirror
3. Matte focusing screen
4. Pentaprism
5. Eyepiece
6. Focal-plane shutter
7. Sensor

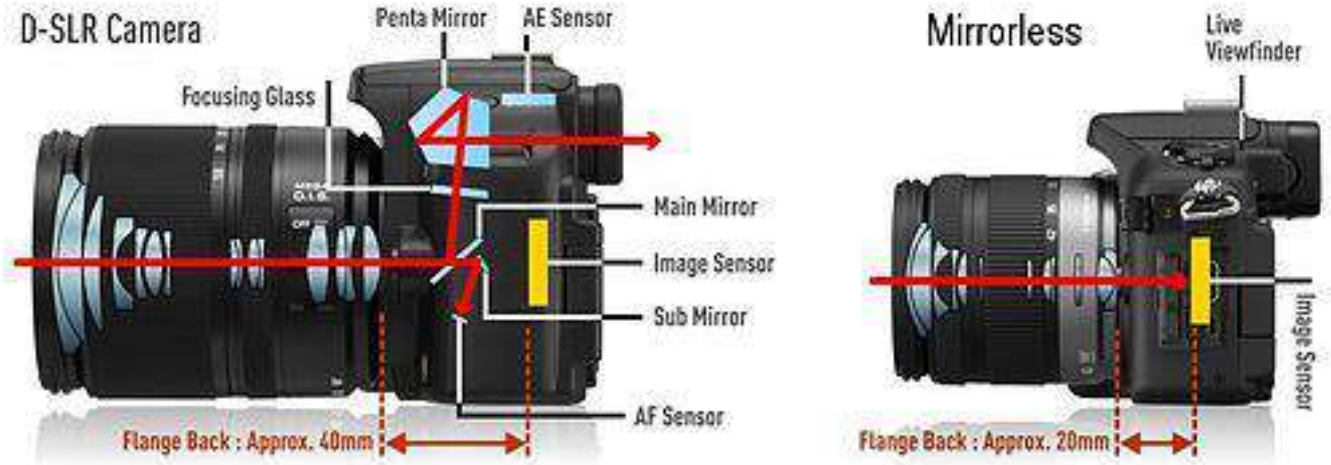
light

The Camera

The mirror in an DSLR camera directs an accurate image of what you are seeing into the viewfinder. When you hit the shutter button, the mirror flips up so the image is projected onto the image sensor.

The Camera Controls

DSLR Cameras



Camera Lens

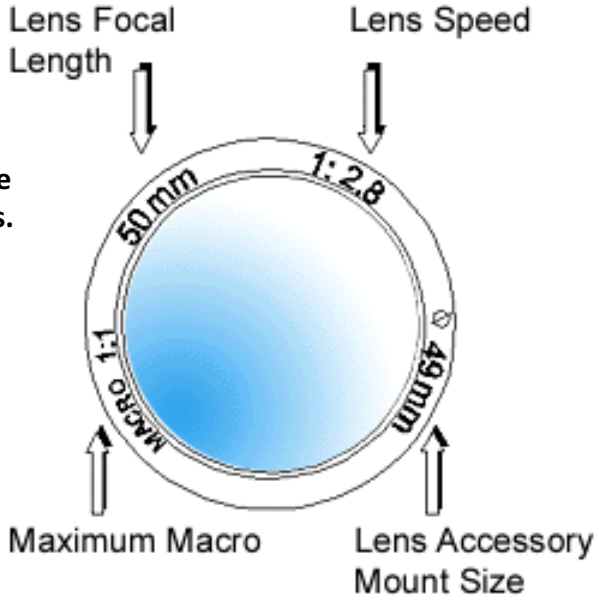
Camera Aperture Opening

Focal Length = 28-135 mm Zoom Lens

Camera Diaphragm

The plates in the iris diaphragm fold in on each other to shrink the aperture and expand out to make it wider.

The Numbers on a Lens



Focal Lengths determines the angle of view and magnification of a lens. Typically, lenses are described by their focal length or for their viewing angle (wide, normal and telephoto)

Lens Speed involves how much light passes through the lens and strikes the film

Accessory size is the diameter of the front threaded bezel that filters and other lens accessories can be attached.

Sometimes lenses are noted for their macro capabilities. Macro lenses are able to record an image on film in life-size or near life-size ranges of 1:1 - 1:3

Camera Lenses

Examples of Focal Length

24mm

35mm

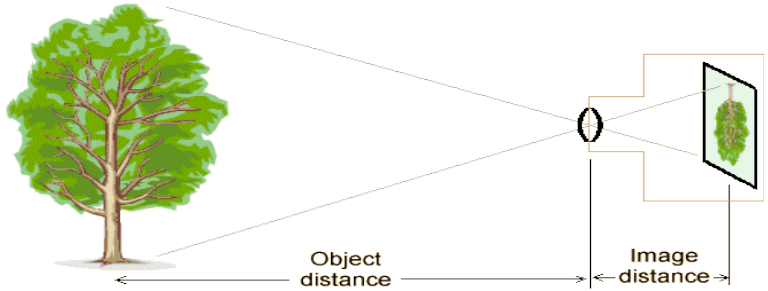
50mm

100mm

200mm

400mm

Focal Length

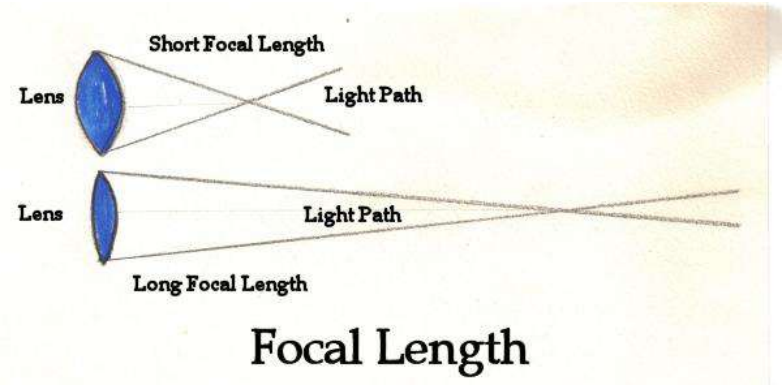


What is Focal Length?

Focal length is the distance from the lens to the image sensor, when focused on a subject at infinity. In other words, focal length equals image distance for a far subject. To focus on something closer than infinity, the lens is moved farther away from the sensor. This is why most lenses get longer when you turn the focusing ring. The distances follow this formula:

This means a 400mm lens should be 400mm long. If you get out your ruler and measure it, you will find it is less than 400mm. That is because a camera lens really has many individual glass lenses inside, and this makes it behave as if it is longer than it really is. This is called "telephoto."

Focal Length



The focal length of a lens determines its angle of view, and thus also how much the subject will be magnified for a given photographic position. Wide angle lenses have small focal lengths, while telephoto lenses have larger corresponding focal lengths.

Shutter

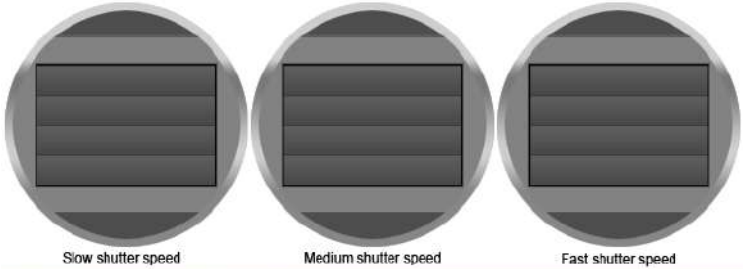
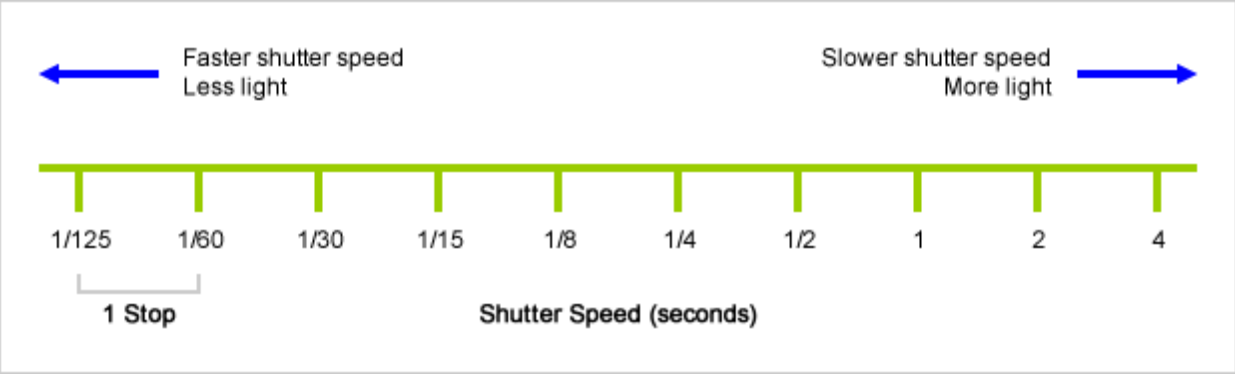


Fig 1.6.2 The appearance of the shutter at various speeds.

The shutter blocks all light from exposing the image sensor UNTIL you press the button. Then it quickly opens and closes, giving the sensor a certain amount of light. You can control the length of time the shutter remains open by setting the SHUTTER SPEED.

Longer shutter speeds = more light **Shorter shutter speeds = less light**

SHUTTER SPEED



- **4000 = 1/4000 of a sec**
- **½ = ½ second**
- **1” = 1 second**
- **2” = 2 seconds**
- **B = Bulb**

- **1/30 and slower require tripod**
- **1/60 portrait**
- **1/125 running**

Shutter Speed:

Determines HOW LONG the shutter stays open.

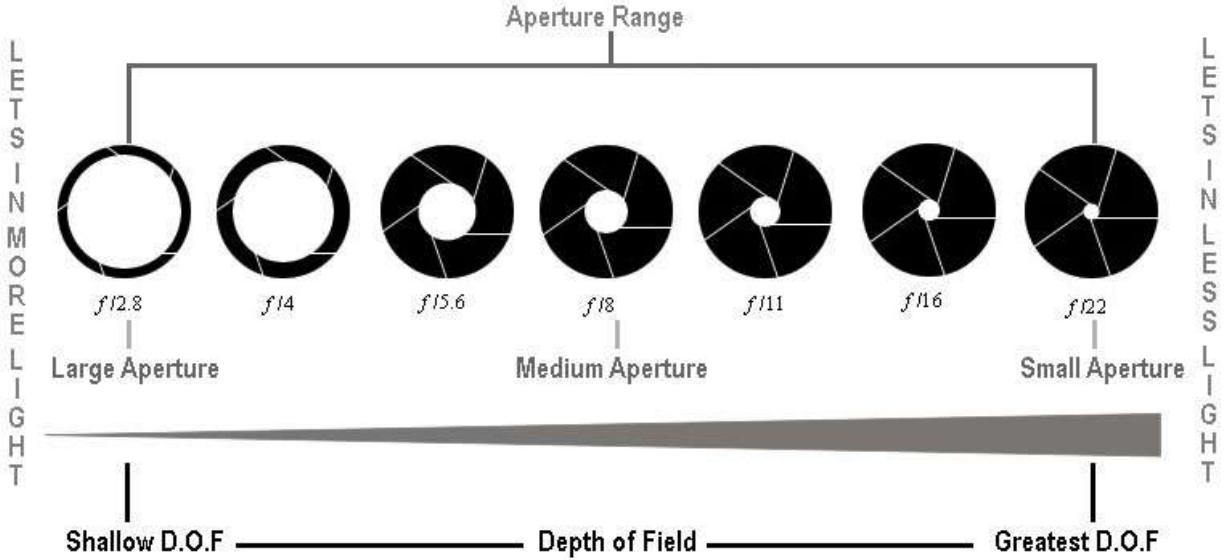
Examples:

- A half second exposure is ONE STOP darker than a one second exposure.
- A 1/125 exposure is TWO STOPS brighter than a 1/500 exposure.
- A 1/1000 exposure is THREE STOPS darker than a 1/125 exposure.

Every step in this table represents a ONE STOP change in light.

Shutter Speed:

Aperture



- Aperture
  - **The higher the f-stop # the smaller the aperture**
  - **F22 allows in half the amount of light as f16**
  - **The larger the aperture (small #) the less depth of field**

Aperture

Aperture is represented in f-stops. A lower number, like f/1.8 is a wider aperture, and a higher number, like f/22, is a smaller aperture.

Aperture Settings (F-Stops):

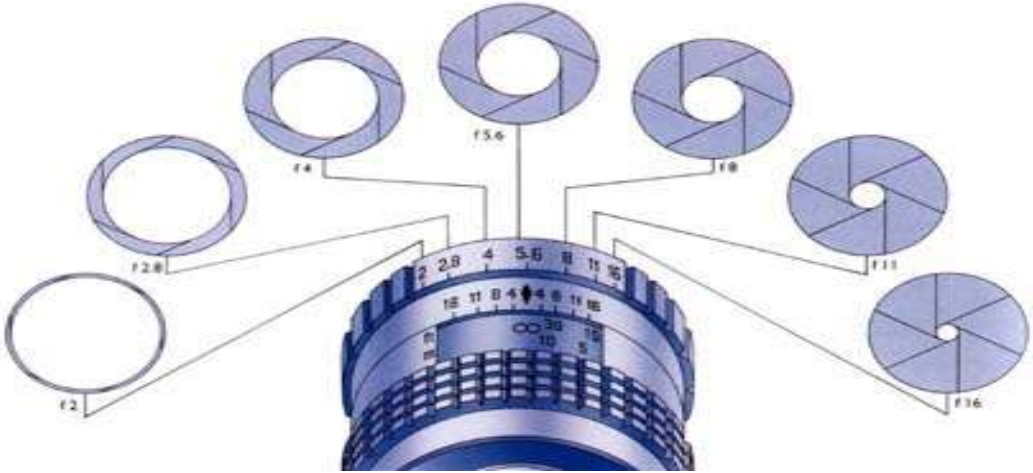
Like the pupil in a human eye, the aperture on a camera controls light.
It does so by closing up to restrict light, and opening up to let it through.

Examples:

moving from f16 to f8 is:
TWO STOPS brighter.

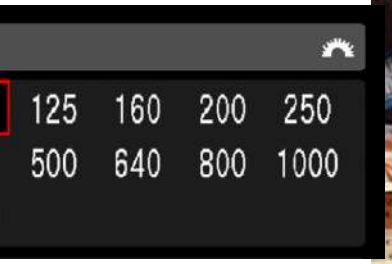
moving from f5.6 to f8 is:
ONE STOP darker

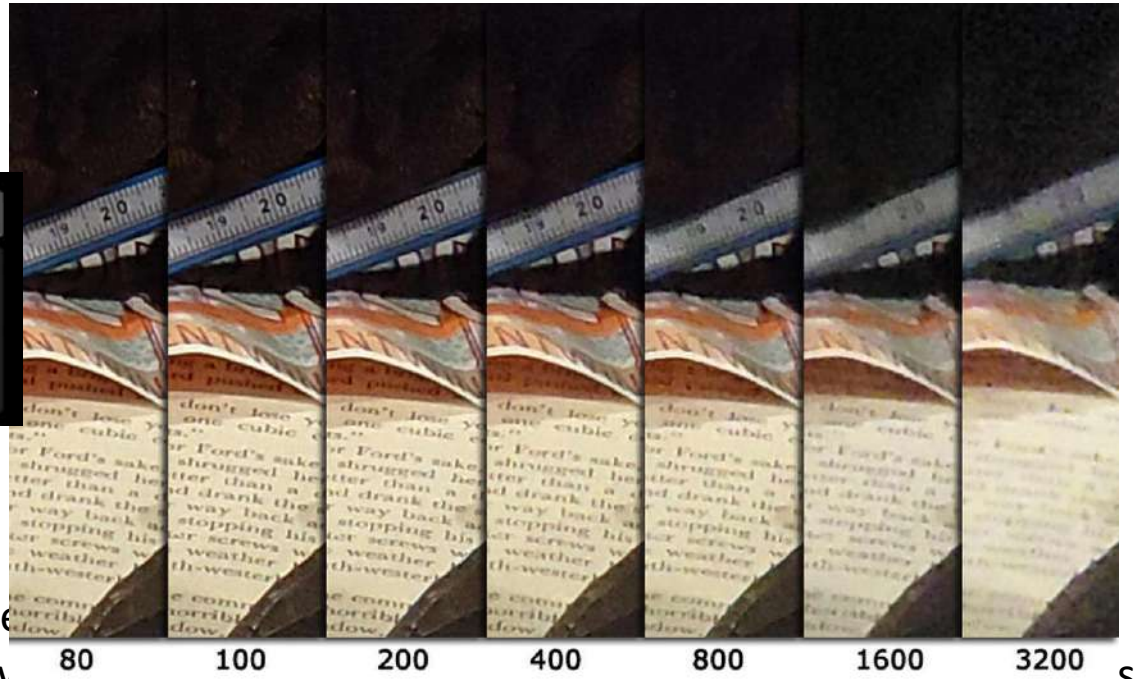
moving from f4 to f2.8 is:
ONE STOP brighter



ISO

The ISO rating describes how quickly the memory card's sensor reacts to light.

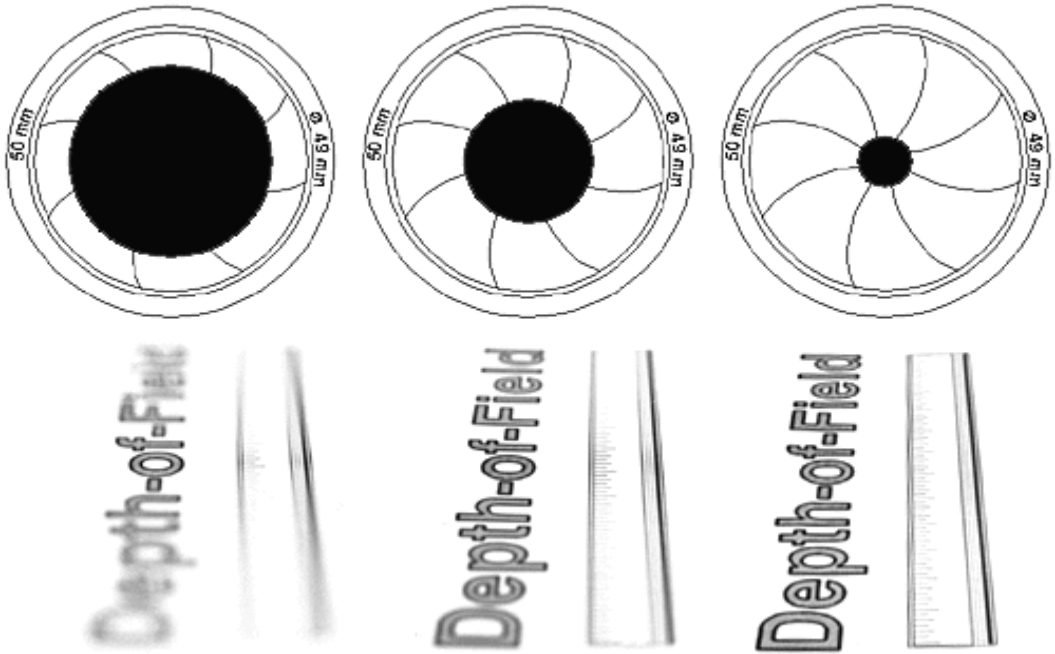




The

Lower ISOs generally produce sharper, more detailed images, while higher ISOs often have digital noise.

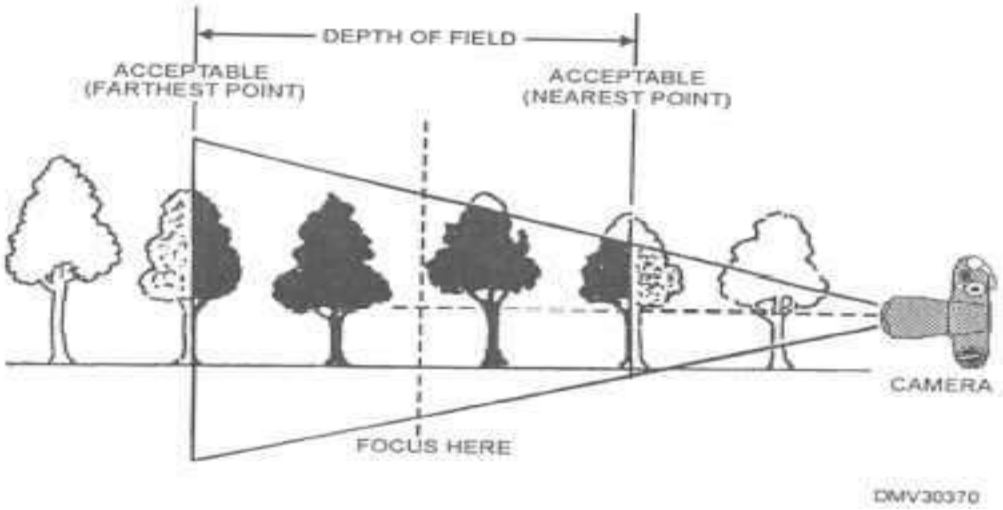
Aperture & D.O.F.



D.O.F.

The depth of field varies depending on camera type, aperture and focusing distance.

Depth of Field



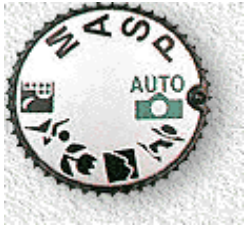
Night Exposure

A demonstration of the effect of exposure in night photography. Longer shutter speeds result in increased exposure.

Camera Modes

Auto The camera will completely control flash and exposure. On most cameras this is labeled "auto", on others simply "A". Some cameras only have (Program.

Program automatic-assist, just point and shoot. Unlike full auto mode, you can usually control flash and a few other camera settings.



Aperture Priority- Photographer sets the aperture (f-stop) and the camera will attempt to deliver a good exposure. Some cameras use an "A" icon instead of "Av"

Shutter Priority- Photographer sets the shutter, and the camera will attempt to deliver a good exposure. Some cameras use an "S" icon instead of "Tv"

Manual- The photographer must set both the shutter and the aperture.

LCD Readout on Electronic SLRs

F 2.8

@ 1/8000 of a sec.

F 3.5

@ 1/125 of a sec.

Camera Accessories