

Cinematography Theory

Aperture and shutter speed control the amount of light that fall on a light sensor in a DSLR camera. (Old technology is film.)

Aperture

Aperture controls the amount of light entering a camera.

A wide open aperture lets in a lot of light.

A small aperture lets in a little amount of light.

Measured in f-stops:

Wide open Closed down
f1.4 f1.8 f2.0 f2.8 f4 f5.6 f8 f16 f22

Shutter speed

Shutter speed is the time that light hits a light sensor in a DSLR

It is measured in seconds (most common use is fractions of a second)

Short amount of time

1/1000

1/500

1/250

1/125

1/60

1/30

1/15

$\frac{1}{8}$

$\frac{1}{4}$

$\frac{1}{2}$

1 second

Long amount of time

Exposure

Exposure is the amount of light needed to create an image on a light sensor.

Focus

Image is detailed, not blurry. You notice it when you see it.

Focus is solely determined by the distance from the subject.

Trick question: Without looking through a viewfinder, how do you focus on the subject?

Answer: Measure the distance between the camera and the subject.

Turn the focus ring on the camera to that distance

Focal length of a lens

It is measured in mm

Wide angle: 24mm, 28mm, 35mm

Normal: 50mm

Telephoto: 85mm, 105mm, 200mm

Depth of Field

The distance within which images are in focus.

Large depth of field: Everything is in focus.

Shallow depth of field. The subject is in focus. Objects in front of it and objects behind it are blurry.

What controls the depth of field? The aperture, distance and focal length of a lens

Aperture - wide open is shallow depth of field, closed is a large depth of field

Distance - closer makes a shallow depth of field, further makes a large depth of field

Focal length - telephoto lens makes for a shallow depth of field, wide angle makes a large depth of field.

Limitations of a camera

Exposure

Measured as ISO

A high ISO requires a little amount of light to make an image. 200, 400, 800, 1600

A low ISO requires a lot of light to create an image. 100, 50, 25

Low ISO has sharper pictures.

High ISO have grainy pictures.

Low is better. It's a sharper detailed picture.

A low ISO also requires a ton of light which is not always available. Therefore you have to adjust the ISO to get an image.

Shutter Speed and Movement

Either a subject moves or the camera moves.

The camera can move by a shaky hand.

The camera movement becomes exaggerated when you use a telephoto lens as opposed to a wide angle.

A fast shutter speed can freeze a subject

If the shutter speed is too slow, the image will appear blurry. If your camera is on a tripod and it doesn't move, but your subject moves too fast, the subject will look blurry.

If you hand hold a telephoto lens and take a picture, the movement of the camera is exaggerated by the telephoto lens. Your picture may turn out blurry.

The more light you have, the faster you can have your shutter speed.

The lower the light, the slower you set your shutter speed.

Shallow depth of field caused by a wide open aperture.

If your subject is not within the depth of field it will be out of focus.