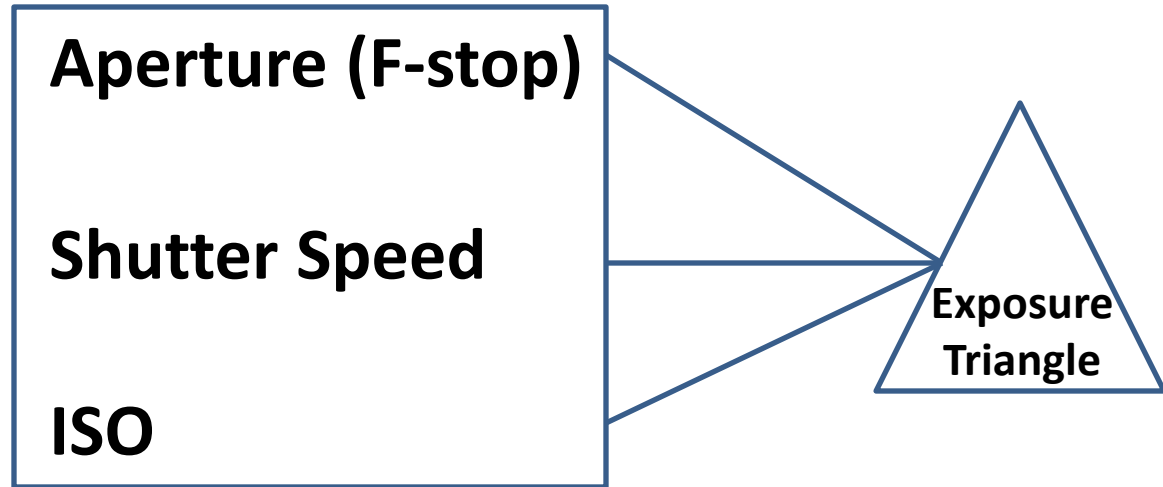


# Understanding Camera Settings



**White Balance**

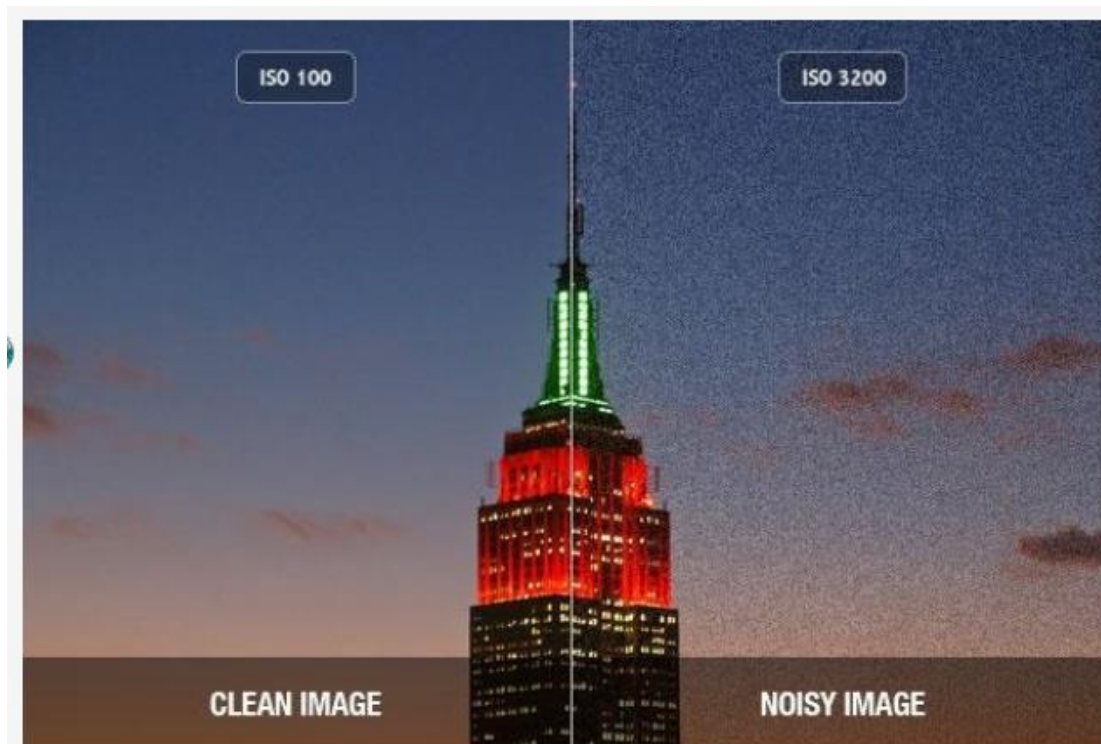


# ISO

ISO is the acronym for International Standards Organization

**When changing your ISO setting, you're adjusting your camera's sensitivity to light.** ISO settings can be anywhere from 100 to 6,400 (or higher), and these numbers have a direct relationship with the camera's sensitivity, so a lower setting makes it less sensitive and a high setting makes it more so.

Along with shutter speed and aperture, ISO is one of the three factors that determine your picture's exposure. Finding the right balance between these three settings is key to getting the perfect shot.



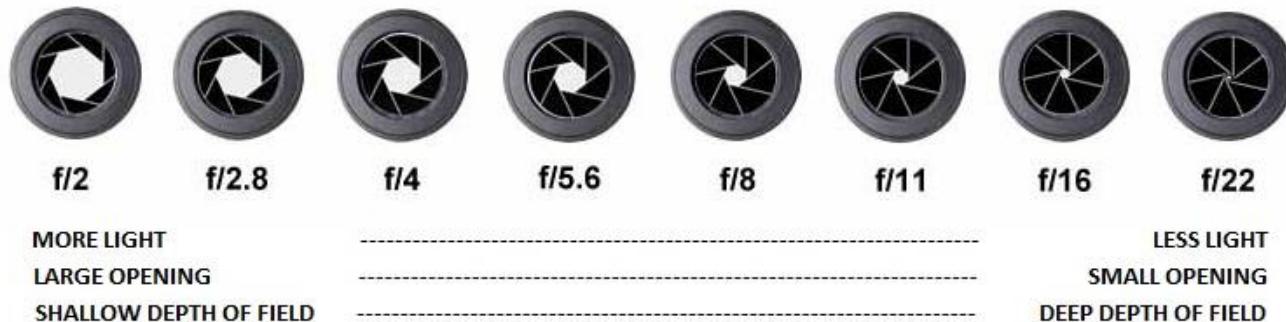
# F-stop

F-stop is the **opening that lets light into your camera**. And so the numbers on the f-stop relate to the size of the opening that is letting light into your camera. F-stops are measured by a scale, and this is known as the f-stop scale (amount of light reaching the sensor).

Aperture openings are measured as fractions of the focal length of a lens. That is what the 'f' stands for in the aperture rating, '**focal length**'.

The f-stop numbers can be very confusing as they do not seem to make any sense. The f-stops are actually a **measurement of the diameter of the aperture**. Logically, they should be expressed as a fraction and this number would tell you the diameter in millimeters as a fraction of the actual focal length of the lens.

Adding to this confusion, the numbers that correspond to different f-stops seem backwards, because an aperture of F8 is actually smaller than an aperture of F4. So, the larger the number the smaller the opening. And the smaller the number the larger the opening.



# Shutter Speed

**Shutter speed is ‘the amount of time that the shutter is open’.**

In digital photography, shutter speed is the length of time that your image sensor ‘sees’ the scene you’re attempting to capture.



## SHUTTER SPEED SCALE

1/8000 1/4000 1/2000 1/1000 1/500 1/250 1/125 1/60 1/30 1/15 1/8 ¼ ½ 1 2 4 8 15 30

Shorter the shutter stays open ← → Longer the shutter stays open

Less light strikes image sensor ← → More light strikes image sensor

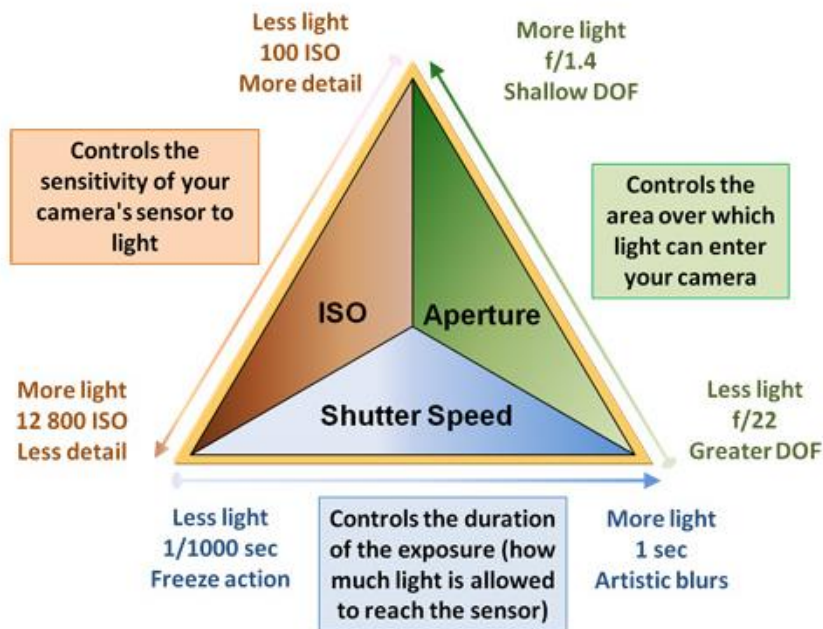
Freezes Motion ← → Shows motion

Less image noise/grain ← → More image noise/grain

# Exposure Triangle

Remember that thinking about Shutter Speed in isolation from the other two elements of the [Exposure Triangle](#) (aperture and ISO) is not really a good idea. **As you change shutter speed you'll need to change one or both of the other elements to compensate for it.**

For example if you speed up your shutter speed one stop (for example from 1/125th to 1/250th) you're effectively letting half as much light into your camera. To compensate for this you'll probably need to increase your aperture one stop (for example from f16 to f11). The other alternative would be to choose a faster ISO rating (you might want to move from ISO 100 to ISO 400 for example).



[Aperture](#) is the amount of light, which provides either shallow or large DOF (depth of field)

[Shutter Speed](#) is the amount of time light enters the camera to either freeze or blur motion

[ISO](#) is the light sensitivity of the sensor, which affects detail and sharpness (by adding more or less noise and grain)

***Exposure is the balance between these three elements***

# White Balance

**At its simplest – the reason we adjust white balance is to get the colors in your images as accurate as possible.**

Why would you need to get the color right in your shots?

You might have noticed when examining shots after taking them that at times images can come out with an orange, blue, yellow etc look to them – despite the fact that to the naked eye the scene looked quite normal.

The reason for this is **different sources of light have a different ‘color’** (or temperature) to them.

Fluorescent lighting adds a bluish cast to photos whereas tungsten (incandescent/bulbs) lights add a yellowish tinge to photos.





# Depth of Field – zone of sharpness

This zone of sharpness is called the depth-of-field, and it extends in front of and behind the point that you actually focused on.

The size of the zone is determined by three key factors –

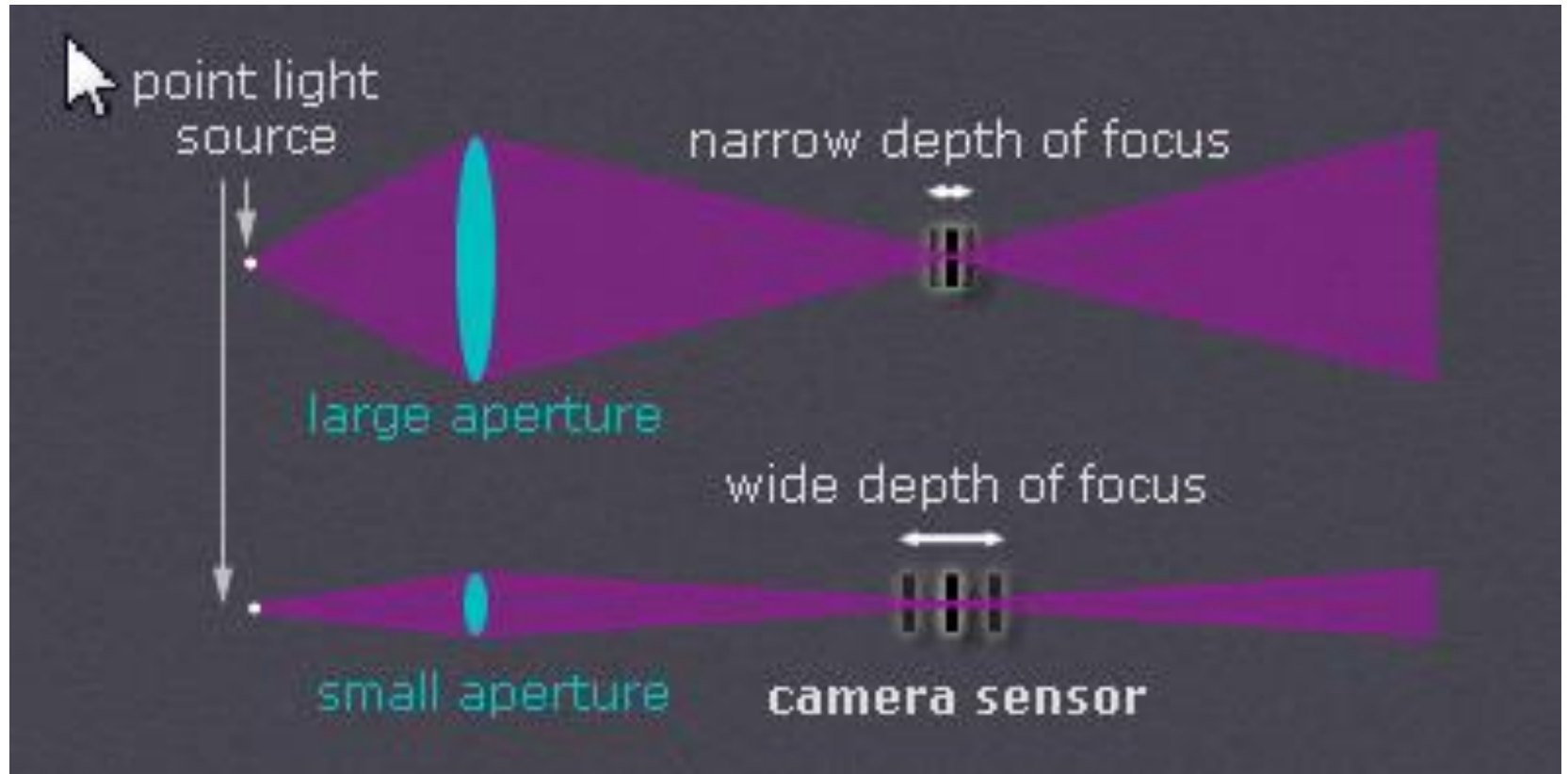
- the aperture of the lens
- the focal length of the lens used
- the distance you are from the subject

Varying these three elements allows you almost complete control over the depth-of-field in a picture.

When most of the picture is sharp, we say there's lots of depth-of-field. When only part is sharp, we say depth-of-field is shallow



# Depth of Field



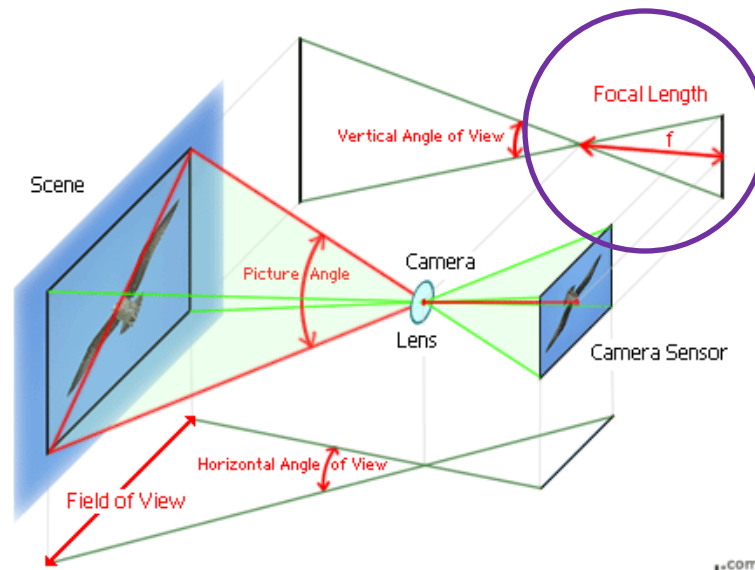


# Focal Length

The **focal length of a lens** is defined as the distance in millimeters from the optical center of the lens to the focal point, which is located on the sensor if the subject (at infinity) is "in focus".

The camera lens projects part of the scene onto the film or sensor. The field of view (FOV) is determined by the angle of view from the lens out to the scene and can be measured horizontally or vertically.

Larger sensors or films have wider FOVs and can capture more of the scene. The FOV associated with a focal length is usually based on the 35mm film photography, given the popularity of this format over other formats.



# Consider Your Lens

**Focal Length and Shutter Speed** - another thing to consider when choosing shutter speed is the **focal length of the lens** you're using.

Longer focal lengths will accentuate the amount of camera shake you have and so you'll need to choose a faster shutter speed (unless you have image stabilization in your lens or camera).

The 'rule' of thumb to use with focal length (in non image stabilized situations) is to choose a shutter speed *with a denominator that is larger than the focal length of the lens.*

For example if you have a lens that is 50mm 1/60th is probably ok but if you have a 200mm lens you'll probably want to shoot at around 1/250.

# Histogram

## How to read the Histogram

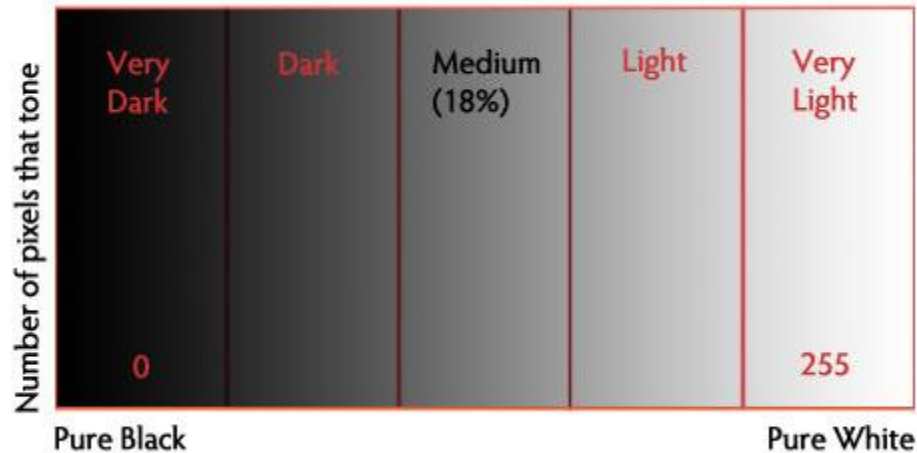
A histogram is a graphical representation of the pixels exposed in your image.

The left side of the graph represents the blacks or shadows, the right side represents the highlights or bright areas and the middle section is mid-tones (middle or 18% grey).

How high the peaks reach represent the number of pixels in that particular tone.

Each tone from 0-255 (0 being black and 255 being white) is one pixel wide on the graph, so imagine the histogram as a bar graph all squished together with no spaces between each bar.





## What can we learn from this histogram?

There are many things we can learn about an image just by looking at the histogram.

We can tell an image is well exposed if **it reaches fully from edge to edge without a space on one side of the graph, and isn't heavily going up one side or the other.**

In an ideal world, it should just touch the left and right edges, and not spill up the sides, with a nice arch up in the center. However that doesn't always apply in every situation, for every scene.