

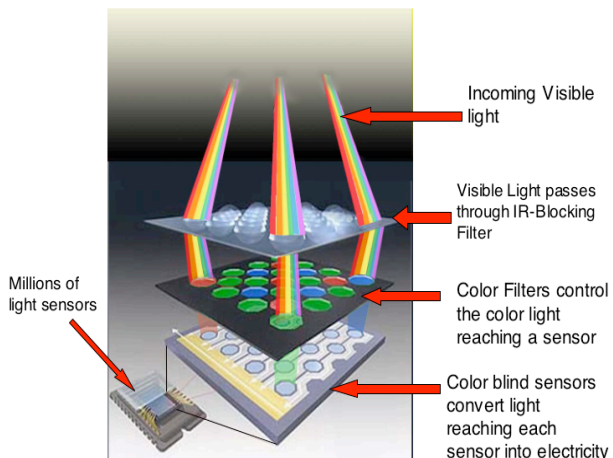
EXPOSURE QUICK GUIDE

A digital camera has a built-in sensor made up of light-sensitive material capable of capturing light in three color channels: red, green and blue – RGB. The entire visible spectrum can be reproduced by mixing these three colors (along with black/white). When you take a photograph the sensor is exposed to light, allowing it to make an image. If too much light strikes the sensor, the image will be over exposed. The whole image or portions of it will look white and “blown out.” If not enough light strikes the sensor it will be too dark.

In photography light is measured, controlled and talked about in units. Each unit of light is referred to as an F/stop (often “stop” for short). The system is universal. Every F/stop up (more light) doubles the amount of light and every F/stop down (Less light) halves the amount of light. More on F/stops below.

Three things control the amount of light that strikes the sensor: The ISO, shutter and aperture:

RGB Inside the Camera

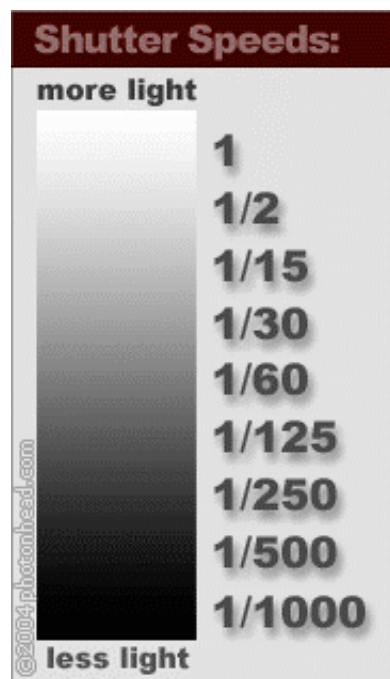


ISO: ISO stands for International Standard Organization (but no one ever says that). The photographer can control the sensor’s sensitivity to light – less sensitive for outdoor/daytime shooting and more sensitive for indoor or low-light shooting. As with everything else related to measuring and controlling light in photography, the ISO sensitivity is measured in F/stops. NOTE: at higher apertures – more sensitive – image quality may deteriorate, meaning you see graininess and color shift. Cameras have a menu option or dial that allow you to set the ISO either in AUTO or at one of the numbered values shown below. The typical range for ISO in most cameras is as follows:

ISO GUIDE

100 200 400 800 1600 (H-1) 3200 (H-2)
 Less light sensitive More light sensitive

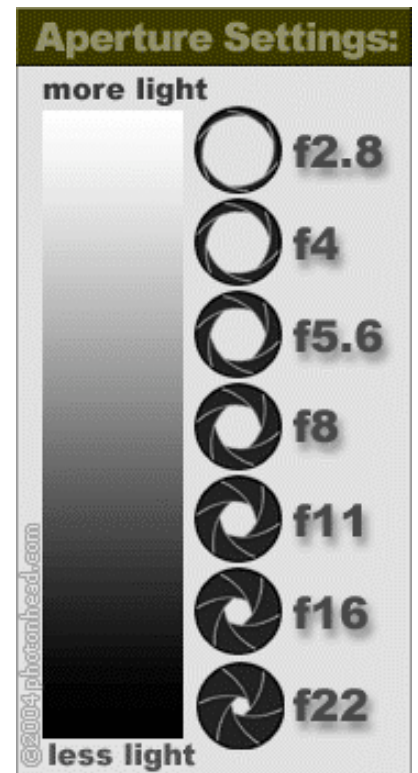
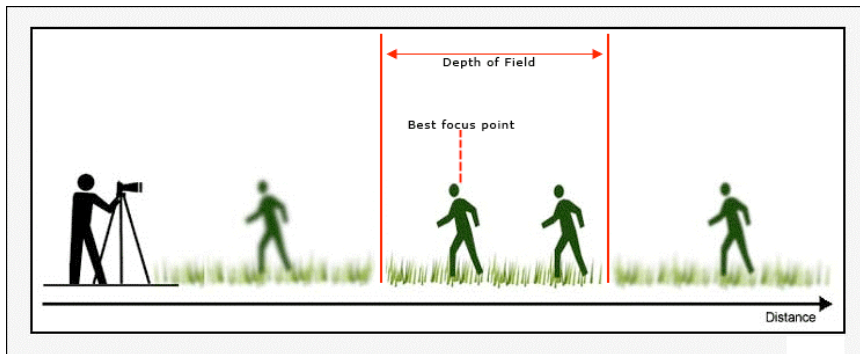
SHUTTER: The shutter is a small, metal curtain housed in the camera body and in front of the sensor that rises and falls when you push the shutter button. The shutter speed – the length of time the shutter is open – controls the length of the time that light strikes the sensor. In photography this usually measured in fractions of a second. It is the shutter that allows the photographer to freeze action. If the shutter is too slow, the subject’s movement might be recorded by the sensor, making it appear blurry as is illustrated below.



APERTURE: The aperture is a small iris valve housed in the lens of a camera. It controls the volume of light striking the sensor. The larger the valve opening, the more light that will strike the sensor. The smaller the iris valve, the less the light striking the sensor.

The aperture controls depth-of-field – the area in front of and behind the subject that is in focus. The larger the aperture, the shallower the depth of field.

More expensive lenses often are capable of much larger aperture settings. Less expensive lenses may have a smaller maximum aperture or an aperture size that changes depending on where the lens is in its zoom range.



So how exactly does this three-part system work? Proper exposure is very much a game of playing ISO, aperture and shutter off of one another to achieve the desired effect. For news photographers the primary concern is usually the shutter speed because this will control the ability to freeze motion.

Think about it this way: If you 'buy' from one of the three and wish to maintain the same exposure value, you will need to 'pay' for it with one – or perhaps both of the other two. For example, if you wish to increase the shutter speed from 1/60 sec. to 1/125th sec. – one f/stop – and maintain the same exposure value you will need to open the aperture one f/stop or increase the ISO by one F/stop to compensate. You can change the exposure value – make my image lighter or darker – by adjusting any of the three or a combination of the three. Which you choose to adjust will depend of a variety of circumstantial factors. However, as mentioned above, the shutter is usually the primary concern.

Your camera can be set to AUTO to make many of the choices for you, but good photographers understand the relationship between these three things and control them manually or semi-manually.

A final note on F/stops. The 'F' in F/stop stands for the German word for fraction. The entire system is a fractional system but often the numerator is not shown. This can be confusing because it means that smaller numbers represent more light. For example, a 60th of second is slower – more light strikes the sensor -- than 250th of a second. An aperture of F/4 is four times as big an aperture of F/16.