



Camera Exposure

An Introduction:

Many people who take pictures for pleasure have a limited understanding of camera exposure when they are taking pictures. They often have 'point and shoot' cameras with little opportunity for any creative control. Even with more expensive cameras, people often place their settings on automatic and just take pictures. So, why bother learning about camera exposure?

Everyone knows that cameras, be they digital or film, require light to take pictures. The recording medium, film or digital sensor, receives light that has passed through the lens and registers an image. In automatic mode, the camera makes decisions for you and hopefully, registers a proper exposure. However, cameras are not as intelligent as you are. You may want to take a picture of a fast moving object and stop the motion. You might want to follow the motion of a runner and get a blurry background. You might want to take a portrait and blur distracting backgrounds. You might want to take a photograph under very low light. All of a sudden, knowledge of camera exposure becomes important.

Basically, when a picture is taken, the amount of light actually reaching your film or digital sensor is controlled two interdependent ways. The first of these ways is the actual amount of time you allow to record your exposure. This is called the shutter speed. The second control is the size of the opening in the lens that you allow light to pass through. This is called the lens opening, aperture, or *f*/#. Both apertures and shutters have numerical values to indicate just how much light is entering your camera. Generally, when you change either setting by one step, you double or half the light, depending on the direction you move the controls. Let's look at each in more detail.

Shutter Speeds:

Consider shutter speeds first as they tend to be the easiest to understand. Shutter speeds are expressed in fractions of a second. For example, at a setting of 60, light actually enters the camera for a time of 1/60th of a second. When you change the setting to the next higher number - ie. 125 - you are now letting in light for 1/125 of a second. This is half the time of 1/60 and of course, half as much light enters the camera. Conversely, if you moved the shutter from 60 to 30, you would be allowing the light to enter for 1/30th of a second. This would be letting in twice as much light as 1/60th of a second. Shutter speeds appear in the following numerical sequence on cameras:

1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, 1/1000

Some cameras go even slower and move into entire seconds like 1 second, 2 seconds, etc. At the faster end, some cameras go even higher to 1/2000, 1/4000, etc. Now don't worry about why we would use these various settings. More of this later. By the way, shutters can be located in one of two places in a camera - in the lens itself, or at the back of the camera just in front of the film or sensor. Shutters located in the lens are called leaf shutters and those located at the back of the camera are called focal plane shutters since they are just in front of the focal plane where the lens focuses the light. Cameras with leaf shutters tend to be more expensive if you have removable lenses since you are buying not only the lens, but a shutter as well. They are common with professional photographers.

Aperture Settings:

Aperture settings simply control the size of the lens opening through which light passes as it enters your camera. Apertures are located within the lens elements. Like shutters, they are denoted by a series of numbers as follows:

1.4, 2, 2.8, 4, 5.6, 8, 11, 16, 22, 32

Just like with shutters, when you move one setting you either half or double the amount of light entering. Like shutter speeds, the bigger the number, the less the light. For example, when you move from *f*/8 to *f*/11, half as much light is allowed in. If you moved from *f*/8 to *f*/5.6, twice as much light enters. Notice we tucked in the letter '*f*'. Often an aperture number like '8' is denoted as '*f*/8'. Nothing overly complex. In a graphic sense, you can visualize aperture numbers as shown below.



Now, it is important to realize that only a very exact amount of light gives proper exposure. Let in too much or too little light, and you pictures start to appear darker or lighter. Only the proper exposure will yield beautiful bright images with good colour.

When you point your camera at a subject, the camera will 'suggest' the proper combination of aperture and shutter speed settings. Often, amateur photographers don't even realize this is taking place. So, why all the fuss? Well, you are now about to start thinking like a professional photographer. Let's look at equivalent exposures.

Equivalent Exposures:

Let's assume your camera has suggested you use the following settings: a shutter of 1/60th of a second and an aperture setting of *f*/8. In this example, you would get a correct exposure. However, let's get creative. If someone was jumping into the air, the above settings would result in a blurry picture since the subject would be moving while the exposure is being made. Well, no problem. Let the exposure decrease in time. You could go to the next faster speed of 1/125. However, if you left the aperture at *f*/8, you would be letting in half as much light and have an underexposed image. To overcome this, you simply open up the lens opening to the next bigger opening, in this case *f*/5.6. The net result is a faster speed that better stops motion and yet overall, the same amount of light enters the camera. You can go to even faster shutter speeds remembering to open up your aperture with each change in settings. Equivalent exposures would be as follows:

1/60 - *f*/8
1/125 - *f*/5.6
1/250 - *f*/4
1/500 - *f*/2.8
1/1000 - *f*/2

All of these settings let in exactly as much light. Now, want to get even more creative? Learn about panning action photography, stopping the motion of a pole vaulter, taking a portrait with a blurry background by controlling what is called 'depth of field' For more information go to the 'classroom' at:

<http://www.cdnyearbookreview.com>