

Exposure

Two elements work together to determine the amount of light which hits your film to take the picture – the length of time the film is exposed (the shutter speed) and the size of the lens opening (the f/stop).

Think of light as though it were water going through a pipe. The bigger the diameter of the pipe, the more water that moves through it; the smaller the pipe, the less water moves through in a specified time. To fill a drinking glass, you can either turn the faucet on full force for a short time, or you can adjust the faucet to a trickle and let it run longer. You'll have the same amount of water in the end.

To take a photograph, you need a certain amount of light hitting the film. You can get that light by letting in a lot very quickly (by using a big lens opening and a short shutter speed) or by letting it trickle in slowly (by using a small lens opening and a long shutter speed). The two combinations will allow the same amount of light to hit the film, but circumstances will determine which is better for any particular situation.

Shutter speed

The *shutter speed* of your camera may be fixed (if it's a box-type or disposable). It may be automatically set by the camera depending on conditions (if it's a point-and-shoot) or it may be completely adjustable.

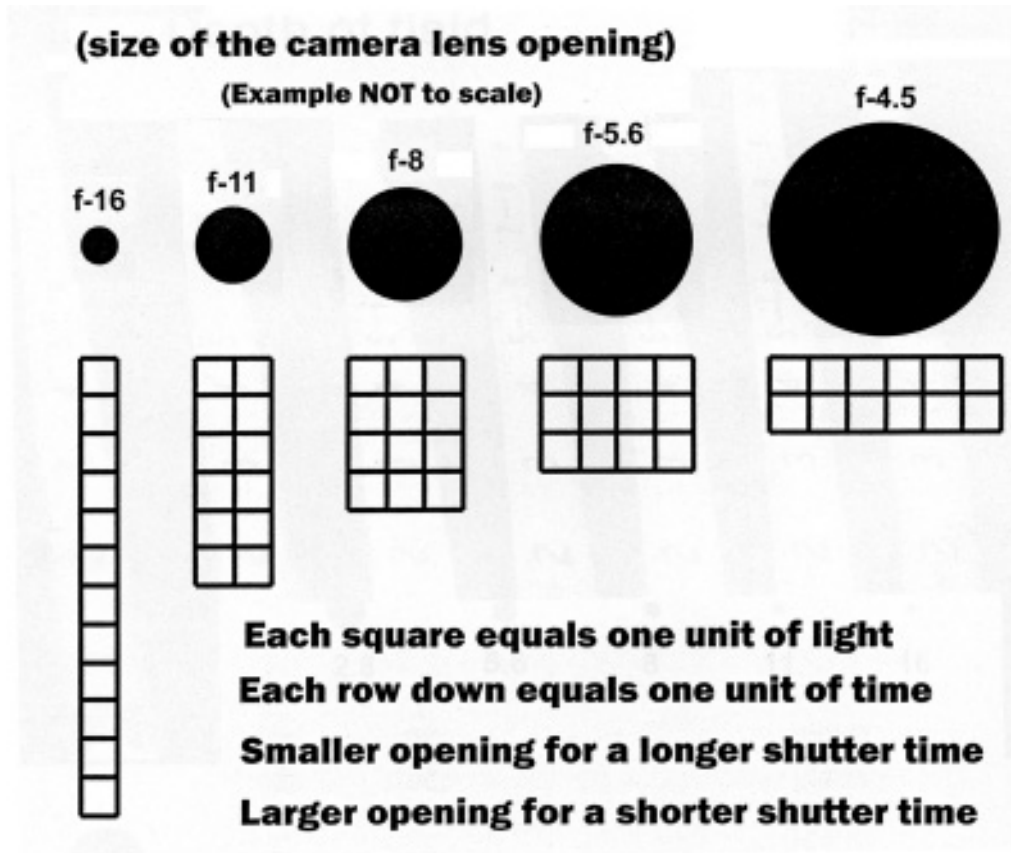
Shutter speeds are generally shown in fractions of a second. Available speeds will vary by camera, with different cameras offering slightly different options. If your camera has a "T" setting, it stands for time and allows you to take a time exposure. When you click the shutter in T it will stay open until you click it a second time. A "B" setting means bulb. When you click the shutter it will stay open as long as you hold the button down, but as soon as you let go, it will close the shutter.

Very fast shutter speeds give you the ability to stop action for one tiny moment. You can actually see what the human eye will miss – like a bullet coming out of a gun, or the wings of a hummingbird in flight.

Slow shutter speeds can give you the ability to take pictures under very difficult conditions, such as when you have very little light.

A fast-running stream in the mountains offers some beautiful photo opportunities. A fast shutter speed can freeze the water as it splashes against the rocks. A slow shutter speed with the camera on a tripod can give an entirely different look – the water will appear blurred and give a flowing effect.

FOCUS ON PHOTOS



f/stop

The *f/stop* is the size of the hole in your lens that the light comes into. The smaller the number, the larger the lens opening. Not all lenses have the same flexibility in lens openings; lenses which open up wider are often more expensive. A lens is usually identified by both the focal length and the largest *f/stop* opening it allows -- for instance, a 35 millimeter *f/2.8* lens.

Each time you make the *f/stop* smaller, you must increase the amount of time in which light can enter in order to get the same exposure. Some cameras compensate automatically, so if you change one setting, the camera sets the other. Some cameras allow the photographer to adjust only one of the settings. Point and shoot and disposables usually come preset and allow the photographer to make few if any adjustments.

The examples shown in this illustration and in the graph on the next page would all give the same exposure – the same amount of light on the film.

| Lens opening | Shutter speed |
|---------------------|----------------------|
| f /2.8 | 1/1000 sec |
| f/ 4 | 1/500 sec |
| f/5.6 | 1/250 sec |
| f/8 | 1/125 sec |
| f/ 11 | 1/60 sec |
| f/16 | 1/30 sec |
| f/ 22 | 1/15 sec |
| f/32 | 1/8 sec |

Which setting is right? Any one of them, depending on the subject and the circumstances.

If your subject is moving quickly, you'll need a short shutter speed to avoid blur, so you'll need to use a bigger f/stop opening. If your subject is stationary, you may want to use a longer shutter speed and a smaller f/stop opening to increase your depth of field and keep more of your subject in focus.

Depth of field

Depth of field is the area in your photograph that is in sharp focus. As a general rule, one third of the depth of field is in front of the point where you've focused the lens to produce a sharp image, and two thirds is behind it.

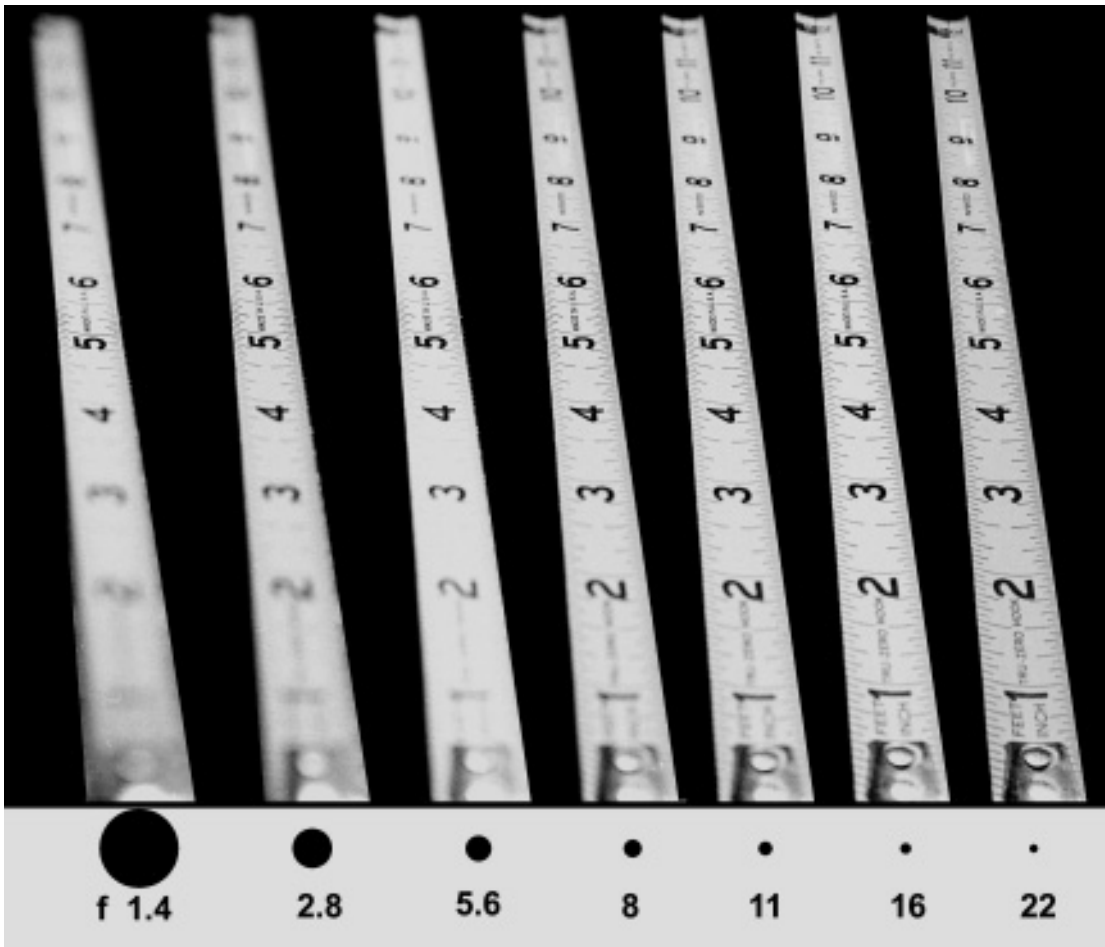
Depth of field is influenced largely by the f/stop, the size of the lens opening. The larger the lens opening or f/stop, the smaller the depth of field in the photograph. The smaller the opening, the greater the depth of field or area that is in focus.

If you're shooting a flower with a large f/stop opening, the petals closest to you may be in focus while the ones at the far side of the flower will be fuzzy. By using a smaller f/stop and a longer shutter speed, you can keep the entire flower sharp.

You'll have more depth of field when using a wide angle lens but far less with a telephoto lens.

Taking a photo with a telephoto lens wide open (at the smallest f/stop number) will produce a very shallow depth of field. This can be used to your advantage to make something stand out, because everything at a different distance from the camera will be out of focus. For example, if there is a line of people and you are near one end of the line, if you focus on a person in the middle of the line with a telephoto lens, most of the rest of the people would be out of focus but the one person would stand out. If

FOCUS ON PHOTOS



you were to close the f/stop down, more people would come into focus. With a wide angle lens and a small lens opening, the entire line of people could be in focus.

If you are photographing mountains, then you don't need to worry much about depth of field. If, however, you want to show the mountains with a person in the foreground, then you will need more depth of field to keep both person and landscape in focus.

Every time you adjust the lens to a smaller opening, then the shutter speed has to be slowed to allow more light to pass through. If you have the shutter speed too slow, you won't be able to stop movement in your photo. If you need a faster shutter speed, then you have to lose some depth of field by opening your lens. When you change either f/stop or shutter speed, the other has to change in order to maintain the same exposure.