

The Shutter

Letting the Light In

Some of the first cameras were simply a sturdy box with a lens at one end and some form of photosensitive material at the other. To control the amount of light allowed to enter the camera the photographer would remove a cap in front of the lens and then replace it again when they'd judged that the plate had been exposed for long enough. In this example, the lens cap is the shutter. It blocks light from entering the camera, and when it is open, it enables the photographer to control just how much light is allowed to enter.

Modern cameras contain much more sensitive materials than those original boxes with their glass plates. To record an image on a modern digital camera light needs to be admitted for only a few hundredths of a second and so an automatic shutter is used to control the exposure time.

Shutter Priority Mode

When you are Automatic Mode your camera takes measurements of the scene in front of it and calculates the most effective shutter speed for you. In many cases this is fine but you may want to change these automatic settings for yourself. The easiest way to do this is to change from full Automatic Mode to Shutter Priority mode. On Canon cameras this is done by moving the mode dial to **Tv**; on Nikon and Sony cameras the Shutter Priority mode is more sensibly labelled **S**.



There should be a dial somewhere on your camera (often near where the tip of your right forefinger is) which you can move forward and backward. In Shutter Priority mode this will allow you to control the amount of time that the shutter stays open.

The Stop

The amount of exposure that the sensor is given is measured in **stops**. By doubling or halving the shutter speed you can change the exposure of an image by a whole stop. You can have half and quarter stops as well if the shutter speed isn't changed by quite as much.

The table shown here gives some of the shutter values for my own camera:

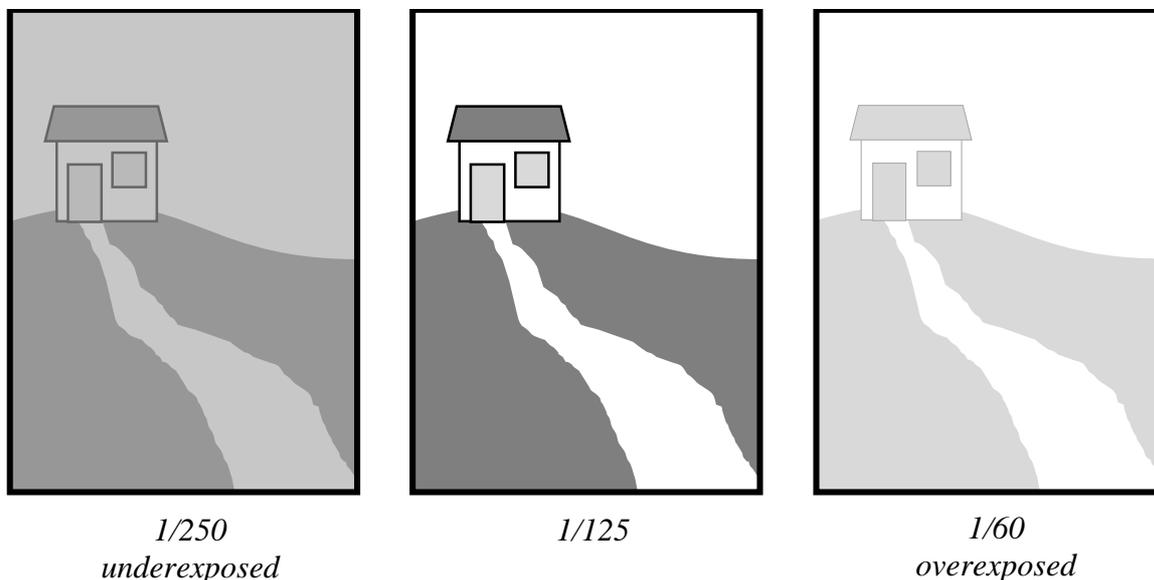
30	15	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500	1/1000	1/2000	1/4000	1/8000
30"	15"	8"	4"	2"	1"	0.5	4	8	16	30	60	125	250	500	1000	2000	4000	8000

The top row is the number of seconds (or fractions of a second) that the shutter stays open. The bottom row is what is displayed in the viewfinder. Each column in the table differs by *one whole exposure stop* ... from 30 seconds to one eight thousandth of a second.

My camera is set up so that there are actually two more values for shutter speed between each exposure stop. But I haven't included them in the above table.

Light Levels

If you take a picture of the same scene at different shutter speeds what happens to the picture? If you were in full Manual Mode then the camera would simply let in different amounts of light each time ...



Shutter Priority mode is a little more forgiving. The camera compensates in other ways to ensure that the picture is correctly exposed when you change the shutter speed.

Camera Shake

Everybody has some form of tremor in their hands, it's how muscles work in the body. Some people have a more noticeable shake than others, but we all have it.

At longer shutter speeds the effects of camera shake can become noticeable. And this is particularly so if you are using a long lens. In fact, the guideline on how slow a shutter speed you can use is $1/f$ (where f is the focal length of your lens).

In theory then, if you have a 200mm lens you shouldn't shoot slower than $1/200$ second.

In practice this may not be strictly true. It depends on how comfortable you feel, how heavy your camera and lens is, and what you're shooting. But it does give you a rough estimate of the bottom limit of your shutter speed.

Of course, if you want to take pictures using slower shutter speeds then you can use a tripod or some other way of bracing your camera. Some modern lenses also have **image stabilisation** built into them which helps the camera to compensate for any shakiness.

Implied Movement

Of course, unless you are shooting a video, your photographs don't move. However it is possible, by manipulating shutter speed, to imply movement in the subject of your photograph. Look at these two pictures of cherry tree branches taken within seconds of each other on a windy day ...



1/1000 second

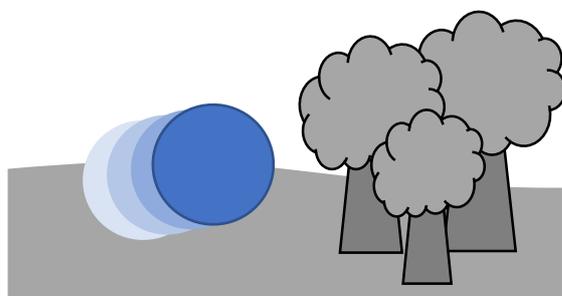


1/60 second

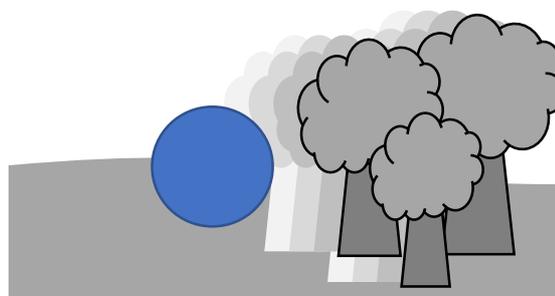
... it is obvious in the picture taken at the slower speed that the branch is moving. It's not obvious in the other picture at all.

You might choose a slower shutter speed because you want to emphasise the fact that the subject is moving. It's a technique that implies what the subject is doing without any explanation.

Panning



Camera held stationary



Camera follows ball

This technique only works at slow exposures, at a fast exposure all motion is frozen.

In the photographs of the branches at the top of the page the camera was held steady so the movement of the leaves was implied by the blurring. However if the subject is moving in a uniform direction at a steady speed it is possible (with practice!) to move the camera in the same direction and at the same speed ... following the subject with the camera. This is called panning.

When this is done successfully the subject appears to be static and the background is blurred. You often see this technique used in sports photography.