

CAMERA BASICS

Shutter Speed.

Shutter speed is the length of time that your camera remains open to allow light to reach the film. The shutter can be set for a variety of speeds, ranging usually from 1 second to 1/2000 of a second. Most cameras have a B (Bulb) setting which allows the shutter to be held open for an extended amount of time.

A standard sequence of shutter speeds on a 35mm SLR camera is:

B, 1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000

Apart from the B setting, reading from left to right and starting at 1 second, each value is HALF that of it's predecessor.

A fast shutter speed can freeze action (see photo below left), whilst a slow shutter speed can show movement (see photo below right). As a general rule of thumb, for shutter speeds slower than 1/60 a tripod or similar support is recommended.



Aperture

Aperture is the hole in the camera lens through which light can enter the camera. On simple cameras this is usually a fixed size, or at best has only two or three options. On more advanced cameras however there are a number of different settings. These settings are designated by different numbers called f numbers. The difference between each number is referred to as an f-stop.

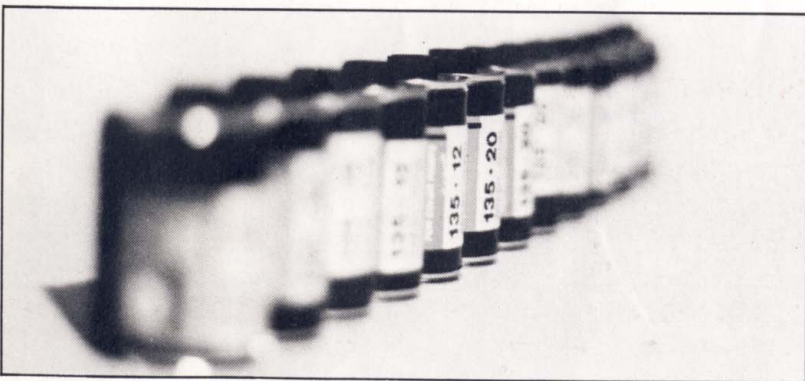
The standard sequence of f-numbers on a standard lens is as follows:

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

Reading from left to right starting at 2, each number lets in half the light of its predecessor. Many people get confused with larger numbers meaning less light, but what most people forget is these f numbers are really fractions, so f22 is really f 1/22.

Aperture not only controls the amount of light entering the camera, it also controls the zone of acceptable focus within a photograph, or **Depth Of Field**.

When we focus our camera on a specific point the image is only in perfect focus at that particular point, and gradually goes out of focus as we move forward, or backward from that point. Exactly how quickly the focus changes is determined by the aperture. The effect is similar to squinting to make distant objects appear clearer. When you squint you are reducing the amount of light entering your eye, or in camera terms, using a smaller aperture. Therefore a large aperture gives a narrow depth of field, whilst a small aperture will give a wider depth of field. Examine the image below. In all images the camera is focussed on the sixth film cartridge from the front. The top photo uses a small aperture, f22, the middle used f8 and the bottom uses a large aperture f2. The effect of this can be clearly seen.



ISO

ISO stands for International Standards Organisation, and in the case of Photography it is a number which reflects a CCD's/film's sensitivity to light. Many older photographers will also refer to ASA, (American Standards Association) which is essentially the same numerical value.

A low ISO number, say 50 has a low sensitivity to light, whilst 400 ISO has a much higher sensitivity to light, and 1600 ISO being extremely sensitive to light. Using a high sensitivity allows a photographer to use a faster shutter speed, or smaller aperture in low light situations, at the loss of some image quality (greater grain/noise and contrast).

With a digital camera ISO refers to the sensitivity being applied to the CCD. This is sometimes referred to as the gain. This can be changed from shot to shot to accommodate different shooting situations

With film it is the film's rated sensitivity to light. This generally cannot be changed mid roll. (Ilford XP2 is an exception to this rule) A slow ISO film has very fine grain and a greater contrast range so it is suitable for big enlargements, but the photographer may sacrifice shutter speed or aperture to use this film. A great all round film is 400 ISO film, with newer technologies allowing this film to have a much finer grain than earlier versions.

Some common ISO values of film are 50, 100, 200 and 400, as well as 1600 and 3200.

If you double the ISO value you increase the sensitivity by ONE F-STOP.

In understanding the relationship between the different factors in correctly exposing a film/image we look at the one common factor, that it that the difference between consecutive numbers in a sequence is the same for aperture, shutter speed and ISO, that is ONE F-STOP.

CHECK YOUR UNDERSTANDING DY DOING THE QUICK QUIZ BELOW

1. Which of the following apertures would give you the maximum depth of field?

- a) f 5.6
- b) f 2.8
- c) f 11
- d) f 8

2. Which of the following apertures would give you the minimum depth of field?

- a) f 16
- b) f 4
- c) f 5.6
- d) f 8

3. Which of the following shutter speeds will freeze action the best?

- a) 1/250
- b) 1/500
- c) 1/125
- d) 1/60

4. Which of the following shutter speeds would I use if I wanted to show movement by panning the camera, following a moving object?

- a) 1/30
- b) 1/125
- c) 1/250
- d) 1/1000

5. Which of the following apertures will let in the most light?

- a) f 11
- b) f 16
- c) f 8
- d) f 5.6

6. Which of the following apertures will let in the smallest amount of light?

- a) f 11
- b) f 22
- c) f 5.6
- d) f 8

7. Which of the following ISO ratings is the most sensitive to light?

- a) 200 ISO
- b) 125 ISO
- c) 100 ISO
- d) 400 ISO

8. Which of the following ISO ratings would produce the finest image quality?

- a) 1600 ISO
- b) 3200 ISO
- c) 400 ISO
- d) 100 ISO

9. Which of the following apertures would you select if you were taking a portrait photo and you wanted the background to be out of focus

- a) f 22
- b) f 16
- c) f 5.6
- d) f 11

10. You are taking action photos of a sporting event and are concerned that the rapid movement will make it difficult to maintain the correct focus. Which combination of aperture and shutter speed would you select to maximize your chances of success.

- a) 1/60th at f 16
- b) 1/250th at f 8
- c) 1/500th at f 5.6
- d) 1/1000th at f 4