

Study guide for Photography / Understanding the SLR Camera

The most important technical step to a good print is a good negative. The key to a good negative is correct film exposure.

Three variables control film exposure:

Lens Opening
Shutter Speed
Film Speed

Lens Opening:

1. The larger the opening, the greater amount of light that reaches the film.
2. The size of the lens opening is measured by f-stops.
(The larger the f-stop, the smaller the opening)
3. The f-stops are as follows:

f 1.4 (most light)
f 2
f 2.8
f 4
f 5.6
f 8
f 11
f 16
f 22 (least light)

Shutter Speed:

1. The time for which film is exposed to light is controlled by the shutter speed.
2. The faster the shutter speed, the shorter the duration of film exposure, and the less light reaches the film.
3. A dimly lit subject requires a slower shutter speed than a brightly lit subject.
4. The following are shutter speed settings: (fraction of seconds)

1 (most light)
2
4
8
15
30
60
125
250
500
1000 (least light)

5. Each setting represents a halving or doubling of light that reaches the film. For example, 1/8 allows light in for twice as much time as 1/15.

Film Speed:

1. The third film -exposure control is film speed, or the sensitivity of film to light.
2. Fast films receive and record light more readily than slow films.
(The terms “fast films” and “slow films” should not be confused with “fast “ or “slow” as it applies to shutter speeds or lens.)

Example: Imagine two strips of film, one with a fast speed and the other with a slow speed. If both strips are exposed to equal amounts of light, upon development the fast film will produce a greater density than the slow film.

3. A fast film is needed in a dimly lit room to capture the little light that exists.
4. A slow film is adequate for brightly lit subjects where light is plentiful.

Fast films have emulsions that consist of larger silver crystals than slow films. These crystals when exposed and developed, clump together to create the density that makes the image. These clumps are referred to as grain, and look like fine particles of sand. Grain can make the picture look fuzzy or coarse. The faster the film speed, the coarser the image.

5. The following is a chart to determine film speed and its use:

32 ISO - Slow film; best with brightly lit subjects; produces very fine grain negatives.

125 ISO - Medium speed film; best for general outdoor use; produces medium fine grain negatives.

400 ISO - A fast film; best for indoor or dimly lit subjects, though can be used outdoors; produces acceptable, but coarser grain than slower films.

Combining the Controls:

1. The relationship between f-stop and shutter speed is the key to understanding film exposure. (The combination of these two controls determines how much light actually reaches the film.)
2. As noted above, each designated f-stop or shutter speed doubles or halves the amount of light allowed in by the next designated f-stop or shutter speed. F11 lets in half as much light as f8, and twice as much as f16; a shutter speed of 1/60 lets in light for half as much time as 1/30, and twice as much time as 1/125. Therefore, f-stop and shutter speed have a reciprocal relationship. If the shutter speed is slowed down (to allow more light to reach the film), the f-stop must be closed down (to let less light strike the film) to make an equivalent exposure.
3. The following combinations of f-stop and shutter speed will produce the exact same film exposure:

f 16 at 1/30
f 11 at 1/60
f 8 at 1/125
f 5.6 at 1/250
f 4 at 1/500

The Light Meter (*through the lens*):

1. These meters are built into the camera and read the light that passes through the lens. The reading is then translated into an f-stop and shutter-speed combination.
2. Light meters average whatever light they read, whether from a dark, light, or gray subject. The average represents the gray.
3. Your built in light meter will work on average 8 out of 10 shots (depending on the lighting conditions).
4. A general light meter reading produces accurate exposure most of the time - when the dark, middle, and light values of the subject roughly average out.
5. Bracket. Bracketing means taking exposures on either side of recommendations of the meter. It is a safe way to guarantee a good exposure. However, this is not always a practical way of evaluating your exposure, especially if you are trying to capture motion.

Backlit Subjects. A good rule of thumb for a back lit subject is to add one to two more f-stops to your exposure beyond the recommended light reading, depending on how dark your subject matter is. Note: The draw back to this technique is that the background will lose detail and become bleached out. However, your subject matter will appear with more detail.

The Shutter (controlling movement)

1. The shutter has two functions: it sets the amount of time for which film is struck by light and it affects the amount of movement rendered in the image.
2. When the light is dim, a long or “slow” shutter speed is required; that is, the shutter must remain open long enough to allow a good amount of light to reach the film.
3. When the light is bright, a “fast” or short shutter speed is required so that little light reaches the film.
4. Aside from the number system that is used to identify shutter speeds, (located at the top of the page) you will also find the letter “B” on your shutter dial which stands for bulb. This setting will allow you to keep your shutter open indefinitely until you release your shutter control on your camera. This setting is most useful in extreme dark settings. A tripod is required for this setting since the image is subject to blur .
5. Shutter speeds are often used to control the sharpness (or blurriness) of a subject. For example: The motion of a dog walking can be stopped by a shutter speed set at 1/125, however a speeding car captured at this shutter speed will appear blurred.
6. The direction of the subject movement in relationship to the camera is also an important consideration when determining a shutter speed. If the movement of the subject is traveling across the viewfinder from left to right, the subject will appear faster than if the same subject at the same speed is traveling towards you or away from you. Therefore, use a faster shutter speed when the subject is moving across the viewfinder and a slower shutter speed when the subject is moving towards and away from you.

7. Windy days will cause grass and tree foliage to move. Use a faster shutter speed to capture a sharp still image. Or if your intention is to create a blurry effect, slow down the shutter and capture the weather on film!

8. **Panning.** Panning means moving the camera during the exposure in the same direction as your moving subject. A successful “pan” renders the subject in a sharp focus, and causes the background to blur. Use a medium shutter speed such as 1/30 or 1/60 and experiment.

(Panning can be tricky since the camera must move in time with the moving subject which traveling across the view finder.)

Procedure for panning:

1. Locate a center point where your moving subject will be crossing over your viewfinder.
2. Focus you lens, set your shutter at 1/60 or 1/30 depending on how fast your moving object is.
3. Adjust your aperture so your light reading is averaged out.
4. When your moving subject approaches (such as a car), follow your subject while looking through your view finder.
5. When your subject is at your midway target point (the point that you focused and adjusted your camera settings) shoot the picture while continuing to move your camera along with the subject.

The aperture (*Depth of Field*)

1. Depth of field refers to the zone of focus in a photograph or the distance between the closest and farthest parts of the picture that are reasonably sharp. For example; say your subject is a tree. The area in front of and behind the tree that is reasonably in focus is your depth of field for that picture.

Depth of field varies with each photograph, and is determined by three controllable factors:

Lens opening: Lens opening: The smaller the aperture used, the greater the depth of field. F 16 creates an area with far greater depth of field than f 2. **Focus Distance**

Focal Length of the Lens

Focus Distance: The greater the focus distance (from camera to subject) , the greater the depth of field.