

EXPOSURE CONTROLS

There are two ways a camera controls to the amount of light that will expose film: shutter and f-stop.

SHUTTER: A device built into lens or camera body which controls the amount of time film is exposed to the light entering through your lens.

- The numbers are fractions: the smaller the number, the faster the shutter speed. Common shutter speeds are:

1 • 2 • 4 • 8 • 15 • 30 • 60 • 125 • 250 • 500 • 1000 • 2000

By setting the shutter speed to 60, film will be exposed for 1/60th of a second. Each step to the right halves the amount of light that will expose the film, each step to the left doubles the amount of light.

Some cameras also have a B setting, which keeps the shutter open as long as the shutter button is depressed. X settings are used to sync the shutter to electronic flash units.

- Your choice of shutter speeds determines the amount of motion that will be shown in your photograph. The faster the shutter speed, the less motion in the photograph. Naturally, the faster the subject is moving the faster the shutter speed required to freeze motion.

- If the action is parallel to you, you need a faster shutter speed to freeze action (1/500 to 1/1000 of a second). If the action is coming straight at you, you can safely freeze action at 1/125 to 1/250 of a second

- Shutter speeds also control camera shake. A good rule of thumb: to ensure sharp images, use a shutter speed at least as fast as your lens is long (ie. 1/60th of a second for a standard 50 mm lens)

Aperture: Opening in lens that lets light through. Usually adjusted by thin blades in the lens.

The size of the hole is measured in f/stops. Full f/stops are:

f1 • 1.4 • 2 • 2.8 • 4 • 5.6 • 8 • 11 • 16 • 22 • 32 • 45

These numbers represent fractions and the ratio of the diameter of the aperture to the focal length of the lens.

The smaller the f/number, the larger the opening. The larger the f/number, the smaller the opening.

Moving from a larger to a smaller f/stop reduces the amount of light exposing the film in half and is called “stopping down” the lens/
Moving from a smaller to a larger f/stop doubles the amount of light and is called “opening up” the lens.

The f/stop controls the “depth of field,” the area of a photograph that will be in focus. The larger the aperture, the smaller the area of a photograph that will appear in focus. The larger the number, the greater the area that will be in focus.

- When you focus on your subject, the “depth of field” will extend 1/3 in front of the subject and 2/3 behind.
- The “hyperfocal point” of the lens uses this concept to help you get the most out of the depth of field available. Older prime lenses have the depth of field marked on the lens barrel, allowing you to manually determine the maximum area of focus. Some cameras have automatic programs to accomplish the same task.

f-factoids

- The “faster” your lens, the brighter the image in the viewfinder, the easier it is to focus and the faster shutter speed you can use. And, the faster the lens, the shallower the depth-of-field when the lens is used wide open.

- The fastest prime lenses in the world (and most expensive) are f1, f1.2, f1.4. Fast zooms are usually f2.8.

- Faster lenses let more light in, so their elements must be larger.
- Portraits are often shot with large apertures: the background goes out of focus to put emphasis on the subject.
- The wider the lens, (50 mm being a “normal” length) the greater the depth of field at a given f-stop. The longer the lens, the shallower the depth of field.
- The closer the camera is to the subject, the shallower the depth of field. The further the camera is from the subject, the greater the depth of field.
- The sharpness of lenses changes depending on the f-stop. At maximum aperture, light is entering through the entire area of the lens. The extreme edges of the glass are less precisely made, so the image is softer. At minimum apertures, all the light exposing the film is coming through a tiny central area of the lens, which is also less sharp.

Manual focusing tips:

- rock the focus back and forth, to ensure the image is in focus.
- split image circles are a great focusing aid. Use a line on a subject, lips, the edge of a tie, and turn the focus barrel until the lines match up.
- it is easier to focus on things that are contrasty.

ISO (aka. film speed): The number on film box (ie. 100, 400, 800, 1600 ISO) designates is the film’s sensitivity to light. The higher the number, the more silver in the emulsion of the film, the faster, grainier and more expensive the film.

On manual cameras, the ISO dial must be adjusted to the ISO of the film loaded in the camera.

**MOST IMPORTANT THING TO REMEMBER:
F-stop = shutter speed = ISO**

Each f-stop of an aperture = one unit of light

Each step on your shutter speed dial (halving or doubling the speed) = the same amount of light

Each doubling or halving of film speed (ISO speed) = the same amount of light.

If the light hasn't changed, and you wish to increase your depth of field by stopping down the lens, you must slow the shutter the same number of stops, or use faster film.

Analogy: Filling swimming pool with water using a fire hose or a garden hose. The result is the same, the size of the hose determines the time it takes to fill the pool.

REMEMBER:

When you "make" a photograph, you have to decide how you want your photograph to look.

The big decisions: What is the most important element of the photograph?

ie. 'Do I want a lot in focus or a little?' (DEPTH OF FIELD/F-STOP)

Or is it more important to freeze or blur action SHUTTER SPEED

Assignment: The primary difference between "snapshots" and photographs is that a photographer "makes" a picture. A snaphooter takes a picture. Using your knowledge of depth-of-field and shutter speed, pick a subject, experiment to give several different looks.

Try getting as close to your subject as possible. Use your biggest f/stop and smallest f/stop.

Bring the results to the next class.