

Action/Motion- Controlling the Exposure via the Shutter Speed

- Nothing epitomizes writing with light (photography), than working with the shutter speed.

❖ Camera Models and Modes

- Many P&S digital cameras have the ability to control shutter speed and aperture. Although depth of field is more difficult to affect because of generally small aperture lenses, most of this lesson on controlling the shutter speed **does** apply to digital cameras.
- Aperture Priority (Nikon – A, Canon – Av): You control the aperture, the camera sets the shutter speed. This is my preferred mode, allowing the most emphasis on depth of field, but still knowing the resulting shutter speed.
- Shutter Priority (Nikon – S, Canon – Tv): User controls the shutter speed, the camera sets the aperture.

❖ Equivalent Exposure: So many variables, Aperture and Shutter Speed, shallow or deep Depth of Field, stopping or showing motion, to keep in mind. An understanding of Equivalent Exposure is essential to understand as you control one and its effect on the other.

- **EE works like a See Saw...if you take away light on one side, you have to add it on the other to keep the balance.** The exposure dials are made up of stops (actually most cameras these days have ½ and/or 1/3 stops for even more exposure control). A full stop represents either a decrease in light by 50% or a 100% increase; you are either doubling or halving your light. So, if you have a given exposure that the meter says is correct for a scene, you can adjust the exposure by increasing on the shutter speed and then decreasing with the aperture to keep the same total exposure.
- **EXAMPLE:** Using a 200mm lens, at ISO 200, the base exposure outdoors on a sunny day is f/11 @ 1/500th. You are taking a picture of a bird on a post about 25 yards away. If your camera's top Shutter Speed is 1/2000th of a sec, then what are your options for a faster shutter speed to stop the bird in flight when it takes off?
- **EXAMPLE:** The **Sunny 16 Rule** states that you can just put your camera on f/16, then put the shutter speed on what ever your film speed is. So, if you are using ISO 100. Your exposure is simply 1/125th @ f/16, and you will get a good exposure with out metering the scene. And because of the f/16, the depth of field will be deep. BUT, 1/125 a swinging bat. So, given this information, using EE, what will your exposure be shooting for the fastest shutter speed possible?

❖ Minimum shutter speed.

- General rule to keep in mind for hand held photos is to shoot faster than the length of your lens. Ex. We normally think of 1/30th-1/60th of a sec. as the minimum shutter speed. But this is based on a NORMAL 50mm lens. If you are shooting at 120mm, you should try for a 1/125 of a sec min shutter speed
- **NOTE:** Most of all this goes OUT the window for Paula and her new camera! ☺ However, even with Anti Shake, Vibration Reduction, and Image Stabilization technologies, minimum shutter speeds still need to be observed based on our subject, such as stopping (or blurring) waving hands, a swinging bat, a flying gymnast. (see chart for examples).

❖ 2 Main Strategies:

- Stopping Motion -> Fast shutter speed or flash photography. 1/1,000th of a sec. will stop just about anything we would normally need to stop. Many SLR cameras will shoot at much higher speeds, such as 1/4,000th and 1/8,000th. And a flash can fire at 1/10,000th of sec stopping speeding bullets, balloons pooping, drops of water splashing, etc.
- Blurring Motion -> Panning...to give a sense of motion...involves tracking the subject and pressing the shutter release as you continue to move with the subject. This is frequently seen in car advertising for brochures and magazines.

❖ **General Tips:**

- Plan to take lots of pictures when you are experimenting with the effects of shutter speed, especially if you are using film.
- Bracket your exposures for both density in your exposure as well as variation in your Equivalent Exposure (i.e. Aperture and Shutter Speed combinations)
- Remember to have the correct posture. Support lenses from underneath, particularly for longer lenses and/or slower shutter speeds. One of the more frequent handling errors I see is for photographers to hold a lens from the top. Check out the difference...notice how easy it is to tip the camera down when holding a lens from the top.

❖ **Nature & Sports Photography**

- Waterfalls can be stopped or blurred. It generally depends on how much of the water fall shows, the context in which the falls appear, and the mood you are trying to convey. Tip: Use of a Polarizer or a Neutral Density Filter will allow you to lower the shutter speed 1, 2 or 3 stops slower than you would be able to go once you have closed your aperture all the way down.
- Wildlife (that includes sports) is usually in low light. Shooting children's games are usually in the worst of conditions.
 - Anticipate the action. Move with the action and release at the height of the action.
 - Shoot with a shorter focal length (or less zoom) that is a faster (larger lens aperture opening, i.e. f/2.8 or 4), or rather than a longer but slower focal length (f/5.6). It may seem to be advantageous to have a 300mm lens, but remember, 300mm calls for a shutter speed FASTER than the length of the lens, which is the worst time to have a slower lens.
 - Hint: Many zoom lenses are variable aperture, which means as you zoom in, your effective lens aperture closes down. If your images are turning out blurry, try backing off. The idea is that it is better to enlarge a sharp print, than it is to have a blurry image.
 - Use a faster film, just realize the trade off. Higher ISO is more sensitive to light, and will allow for faster shutter speeds, but with more grain/noise.
 - Use a tripod or monopod. It should be sturdy enough, but not too heavy. Sometimes it makes sense to have two tripods...one for hiking, one for the side of the road or near by locations.

❖ **Bonus: Night Time Exposure Calculator.** Although a topic for another lesson, we would be remiss to talk all about all this controlling the shutter speed and skip the photographic opportunities provided with Night Time Long Exposures. See included chart. ****Remember to use a sturdy tripod.****

- **Flash photography with slow curtain sync.** A WHOLE new dimension opens up with capturing/stopping motion with the use of flashes at night and a slow curtain.

❖ **Camera Simulator:** For an excellent simulator to show the effects of minimum shutter, as well as many other settings and photographic lessons, visit: <http://www.photonhead.com/> and click on the **SimCam**.

❖ **Lens Realities:** Having said all this, there is one more consideration (at least one). Just because you can open your lens all the way, doesn't mean you should. Lenses do not LIKE to be closed all the way down, or opened up all the way. IOW, the best place to shoot a lens is in the middle apertures. The reason is because of lens quality at the edges, such as corner sharpness and light fall, barrel and pincushion distortion, chromatic aberration, and other lens flare issues become more pronounced at wide or small apertures. *Even the most expensive lenses like to be closed down a stop for best sharpness.* Just something to keep in mind. (Although, for those shooting digital SLRS with a sensor size crop factor of 1.5, many of a lenses imperfections are minimized as only the center of a lens is used, which is generally the best part of a lens, aka, the sweet spot.)