

The Second Pillar of Photography

"Oh, look at that high-powered dolphin flipping up and down in the sea! Or, how delightful are those skies as the sun sets into the horizon? Wish I can freeze them in my frames." Have you pondered about these as a photographer? How do you get your cameras to do these? You need to be fast at one instance and slow-down in the other to catch the colours of the fading light. Can you manipulate the timing on your camera?

Yes, you can and it is done using 'Shutter Speed' - the second of the three parameters of the exposure triangle - the quintessential pillar of photography.

The Second Pillar: Shutter Speed

"Eyes like a shutter, Mind like a lens" – a quote I had read long ago that stayed with me until I became a photographer. This is when I understood the relationship between the shutter and the lens, just like the one between the eye and the mind. Every camera body has a shutter. They have blades or curtains that open and close upon pressing the shutter release button to expose the image. Remember, inside one's camera, it's dark. It needs light to capture an image and light does not automatically enter inside the camera, right?

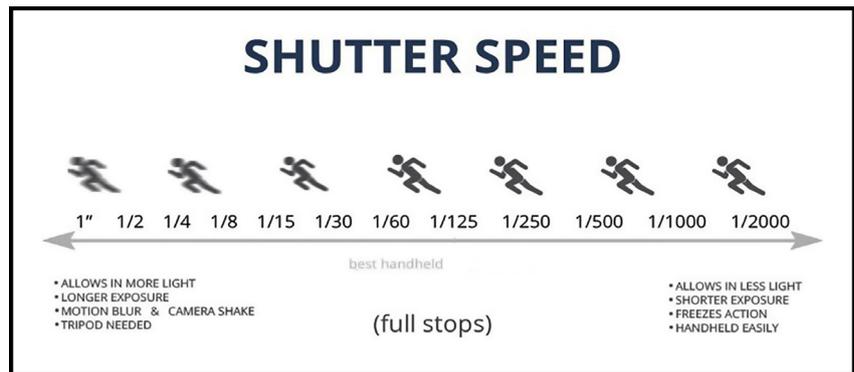
So, 'shutter speed' in simple terms, is the length of time the camera shutter is open, exposing light onto the camera sensor. In other words, it's how long the camera spends in taking a photo. That 'duration' can be adjusted and changed by the photographer, which in turn effects the way the images appear.

The Math of Shutter Speed

Most cameras allow shutter speed to be set in one of the following modes:

- 1) In the 'Shutter Priority' (Tv, S) mode - where you choose the shutter speed, and the camera automatically selects the aperture.
- 2) In the 'Manual' mode (M) - where you choose both shutter speed and aperture manually.
- 3) Set the shutter speed in 'Program (P)

Shutter speed is measured in 'seconds' or in 'fraction of a second' when they are under a second. Speeds are commonly written as: 30", 15", 10", 8", 4", 2, 1", 1/2, 1/4,



The Shutter scale

1/8, 1/15, 1/30, 1/60 1/250 1/800, 1/1600, 1/2000, 1/4000 and so on.

Let's clear the air of confusion first: A shutter speed written like 30, implies that the camera takes 1/30th of a second to take a photo. Tad bit confusing? Well, in many DSLRs, the markings are seen as 15, 60, 400 and so on, instead of 1/15, 1/60 or 1/400. In order to read this correctly as a photographer, it is best to remember that, any marked number which is not suffixed with a double apostrophe (") for seconds is considered as a fraction (1/X) of a second. Millisecond starts from 1/1000th of a second and hence it is wrong to call 1/15, 1/60 etc as milliseconds. Thus 15, 60 and 400 should be read as 1/15, 1/60 or 1/400. Anything with X" is measured in seconds.

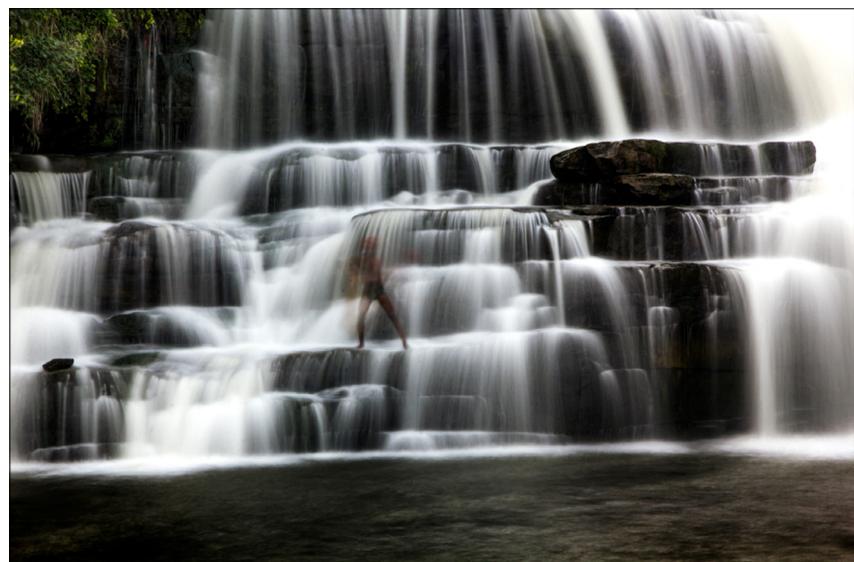
Given this as a premise, let's look at the shutter scale:

- The bigger the denominator, the faster the shutter speed → lesser time it takes for the light to enter in. For example, 1/250, 1/500 and faster

- The smaller the denominator, the slower the shutter speed → more time the shutter stays open and more light enters in, For example, 1/4, 1/2, and 2".

Typically,

- Fastest shutter speed is 1/4000sec (and even faster in some models)
- Slowest speed on most cameras is 30 seconds. It can be made longer, using external remote triggers, using the 'bulb mode'
- The slowest speed at which one can shoot images handheld, is generally equal to the focal length of the lens. That is, if you are shooting with a 400 mm lens, 1/400th of a second is the least speed for handheld shooting. Some cameras or lenses offer image stabilization, which can help in reducing the minimum handheld shutter speed to as slow as 1/4th of the focal length.



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Exposure time 5 Sec,



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Exposure time 1/200 sec

Shutter Speed and its Effects

When we change the shutter speed, there has to be a definite effect or impact on the outcome of the picture, is it not? Let us see how:

1) Motion Blur: For 'long' duration (called slow shutter speed) the sensor is exposed for a significant period of time resulting in 'Motion Blur'. Moving subjects will appear blurred along the direction of motion. What speed would cause motion blur depends on how fast the subject is moving, in this case the water droplets in the river. To shoot such pictures of moving water one can experiment speeds slower than 1/15th of a second.

- Angel Hair Effect: Landscape photographers use slow shutter to create an angel hair effect - a sense of motion on rivers or waterfalls, keeping everything else completely sharp

- Milky way: Night and Astro photographers use slow shutter to shoot at night, dim environments or the Milky Way with zillion stars

2) Freeze Action: for 'short' duration (called fast shutter speed), the sensor is exposed to lesser period of time resulting in 'freezing of motion or action.' Fast shutter can start from 1/250, 1/400sec, 1/800 sec onwards...

- Eliminate Motion: Fast shutter speed can remove motion even from fast-moving objects, like birds in flight or cars driving past.
- Water Diamonds: taking photos of water using fast shutter can give sharp frozen droplets hanging in the air. I call them, 'The Water Diamonds!'

All of the above are achieved by simply controlling the shutter speed. In summary, quick shutter speeds freeze action, while long ones create an effect of motion when you photograph moving objects. There is no such thing as the 'best shutter speed' as it really depends on what you are trying to achieve.

That is Shutter Speed, the power pillar that helps us capture both the dolphin in action and the magical sunset at night. My mantra is 'when in doubt, go to 1/60th and traverse either side of the shutter scale' because one side of the scale makes it faster and the other side makes the shutter speed slower.

Experiment with this parameter and with time you will realize that shutter speed can be used for a plethora of situations. Do you know what some of these could be? Think about it.



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Backlit Katydid © Anagha Mohan (JA-0003), 1st Award: Macro Section, YPS Wildlife Week 2020 Photography Contest for Members



Green Lynx eating Termite © Arjun Haarith AFIP (IM-0127), 2nd Award: Macro Section, YPS Wildlife Week 2020 Photography Contest for Members