
CAMERA
SHUTTER
SPEED
AUTO

Camera shutter speed

There are a few things that are commonly discussed about the use of the camera's shutter speed. They include:

· A fast shutter speed stops action

· A slow shutter speed creates motion blur

· If you have a slow shutter speed, and you are

unprepared for it, you can accidently blur your

photograph through camera shake.

Outside of these three commonly discussed

attributes, you'll find very little knowledge about how

the shutter speed works and why.

When you finish this guide you will have a better understanding of the following five attributes in the use of the camera's shutter speed:

· How the **focal length** of the lens affects the attributes of the chosen shutter speed

· How the **angle of movement**, relating to the subject and relative to the camera position, affects the attributes of the chosen shutter speed

· How to **judge your shutter speed** selection based on the speed and distance of the object being photographed

· **Panning** and how it relates to shutter speed

· **Reciprocity failure** and whether you need to be concerned with it

How the focal length affects the attributes of shutter speed

Two motorcycles are traveling at the same speed. The angle of movement relating to the subject and relative to the camera position are almost identical. Yet, the necessary shutter speed to “freeze the action” for these two photographs would be widely different. Why?

Two motorcycles are traveling at 100 kpm, the logical thought you must use the fastest shutter speed possible to freeze the action

In order to understand this concept, you have to understand how lenses work. with a 500mm telephoto lens. It brings things closer, but what it really does is “magnify” the image it is resolving.

Magnify is the key word because it not only magnifies the image, but it also magnifies movement.

This is why it is harder to handhold your camera with a telephoto lens and still get a sharp picture. The camera movement is being magnified. And it also magnifies the movement of the subject.

A (35mm lens) could freeze the action at a much slower shutter speed than the 500mm

What shutter speed would be necessary to freeze the action in these two scenarios?

It’s almost impossible as there are too many factors at work.

Key Lesson: you don’t always need the fastest shutter speed possible when something is moving. drive up your ISO or open up your aperture and lose depth of field. a shutter speed of 1/5000th of a second if you’re shooting with a 50mm lens, whereas you might if you were to switch lenses to a 300mm lens. always start an action (motion) photo shoot with a little experimentation to find the sweet spot (stopping action and correct depth of field) for the shutter speed.

the angle of movement,
As it Relates to the subject and relative to the camera position, affects the attributes of the shutter speed

When two subjects are moving at relatively the same speed. The appearance of movement is exaggerated in both subjects. Yet, you would need a much faster movement when the subject is in a perpendicular line to your is shutter speed to freeze the action for the photograph vision.

If a train is traveling at 100 kpm, and you’re standing off to the side of the tracks watching it go by, it will be moving so fast you can barely make out the cars.
If you’re standing on the tracks, and watching the train moving directly at you, at 100 kpm, it will look like it’s barely moving at all!

Key Lesson: When you’re out photographing take into consideration the direction of the activity relative to your position. If you’re photographing a horse race, and you want to see the strain on all the horses’ faces as they round the final turn, pick a camera position where the angle of movement, relative to your position, will be straight-on. Or, if you want to capture the faces sharply but also want to see the blur of the pounding hooves, pick a position where they will pass in a perpendicular position to the camera.

How to judge your shutter speed selection

based on the speed and distance of the object being photographed
Would a shutter speed of 1/125th of a second capture this shot sharply?

your initial reaction would be to say no, As It looks like it was shot with a telephoto lens. The subject is traveling perpendicular to the camera. It looks like the motorcycle is traveling at 100 Kph.

But what if it's not traveling that fast?
What if it's only going 40 kph and this was shot with a lens closer to a normal focal length, and then it was cropped? Could a shutter speed of 125th of a second freeze the action?

a motor scooter that probably maxes out at a speed of 40 kpm; could we be guaranteed a sharp image, at a shutter speed 125th of a second, as the scooter passed by? not necessarily.

Let's say that we have the same normal focal length lens, which we used for the previous shot of the racing motorcycle, only now we are mere feet away from the motor scooter as it passes by at 40 kph. We would have to have a faster shutter speed to stop the action.

Key Lesson: Movement is accentuated the closer your camera is to the subject that is moving. If you are using the same lens, and photographing the same moving subject, you will need a faster shutter speed to stop the action at 10 feet away from the subject than you would at 30 feet away from the subject. Take into account your distance from the subject when choosing a shutter speed.

Panning and how it relates to shutter speed

You are probably familiar with the term "panning" if you've been involved with photography for any length of time.

Most descriptions of panning describe picking a slower shutter speed and then moving the camera at a similar speed to the subject as it passes by perpendicular to your camera's POV.

Key Lesson: When using the panning technique, begin by evaluating the speed of the moving object. If the subject is your dog running by in the yard, then 1/60th of a second might be a perfect shutter speed for panning. If the subject is a pack of Formula One race cars going by at 230 kpm, you may need to pan at a shutter speed of 1/1000th of a second or faster.
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Reciprocity failure.
what is it and when might it concern you?

Here is a definition of reciprocity failure (courtesy of Oxford Dictionaries).
Definition: Reciprocity failure is the failure of an emulsion to follow the principle that the degree of darkening is constant for a given product of light intensity and exposure time, typically at very low or very high light intensities. That's a lot of fancy language that says this: "If you're photographing with film, and your exposure time (shutter speed) becomes longer than one second, the film will begin to experience a loss of sensitivity, and you can no longer rely on the square factor for exposure calculation." In other words, if you're shooting at 2 seconds and you determine that you need one more stop of exposure, doubling the exposure time to 4 seconds may not give you one more stop of exposure. It might actually take something like 5 seconds (this is just an example).

Film is always sold with a data sheet that would give an exposure factor for reciprocity failure. This allowed the photographer to calculate the exposure adjustment.

Digital photography does not suffer from reciprocity failure. As Reciprocity failure is a chemical issue, and in digital photography we don't use chemicals.

Why does the train track appear sharp?
The angle of movement (the zooming lens), relative to the subject (the train tracks) and relative to the camera position, is straight on versus perpendicular.
This is a fun technique. give it a try.
Why does a ride look like it is spinning at 1000 kpm?

A Short Story…
Years ago, during a photography workshop with a photographer who was known for his automotive work. He was a master at lighting and movement.
He used hot lights (continuous lighting, not electronic flash) to perfectly light up a Chevy Camaro that was sitting in his studio.
Behind the Camaro was a painted backdrop that looked like a mountain scene.
The car sat on rollers, and there was a driver inside the car. The engine was not on, but the rollers were motorized to spin the tires.
He used a shutter speed of around five seconds.
The painted backdrop was on wheels.
When he clicked the shutter, there were two photo assistants that rolled the backdrop back and forth (no more than 6 inches total) during the entire exposure. Now, bear this in mind: this was all before Photoshop. When he shared his film with us the next day, it was nothing short of mind-blowing.
It looked like a perfectly studio-lit car was screaming down a mountain road at breakneck speed.
This is the power of your shutter speed – when you have the right knowledge on how to use it!

Key Lesson: The reason that having the ability to evaluate a photographic situation and then choose an appropriate shutter speed is so important, is because (in a very distinct way) it's going to affect your DOF (depth of field). In a rodeo scenario, would the camera settings of 1/8000th of second at f/2.8 be better, worse, or as good as the camera settings of 1/500th of a second at f/11? If 1/500th of a second stops the action, then it would be a better choice because of the increased DOF. What if 1/500th of a second didn't quite freeze the action?
You could then employ the panning technique to squeeze additional sharpness out of that 1/500th of a second shutter speed.

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My name is David Wright.

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