

## SHUTTER SPEED

As I explained at the start of the aperture lesson, learning the exposure triangle is easier if you learn each point individually and then put them together. Today we will begin to work on the second point of the triangle – shutter speed.

Just like aperture can control how much light hits the camera sensor (which in turn affects depth of field), the shutter speed also controls the amount of light entering the camera. Aperture can be used for artistic and creative control, it determines how much of the image is in focus and thus whether the background is blurry or not. Shutter speed has its own set of artistic effects we can control!

If you need to review the aperture lesson and its effects on Depth of Field, do that before moving on: <https://focusedcamera.weebly.com/blog/depth-of-field> and [https://focusedcamera.weebly.com/uploads/1/2/7/7/127775132/aperture\\_lesson\\_copyright\\_2021.pdf](https://focusedcamera.weebly.com/uploads/1/2/7/7/127775132/aperture_lesson_copyright_2021.pdf)

### **What is Shutter Speed & What Effect Does it Have?**

Have you ever seen an image of a waterfall and the water is blurry and smooth? That effect is created by shutter speed and you are going to learn how!

Shutter speed is the speed of the opening and closing of the shutter. When it is fast, it can “freeze” motion. When it is slow, it allows blur or movement. The shutter is a piece inside the camera body that acts like a curtain – open and closed – and it is positioned in front of the sensor. When you press the button to take a picture you activate the shutter causing it to flip open. The amount of time it stays open is the shutter speed. This amount of time it stays open may be fractions of a second (fast = to freeze motion) or several seconds (slow = to blur / show movement). The amount of time that light hits the sensor while the shutter is up is called *exposure time*. The sensor is being exposed to light. When you hear people talk about *exposure time*, they are essentially talking about shutter speed (not to be confused with overall exposure which is a result of the exposure triangle – the combination of shutter speed, ISO, and aperture).

So as the camera user you have to decide if you want blur in your photos or not. In auto mode your camera will always pick an average shutter speed because the camera does not know what you want from a photo. If you want blur, or super crisp “frozen” action, you will need to learn shutter speed settings.

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The two images below were taken by a student on her first lesson for shutter speed and using it for artistic effect. On the left is her photo using a fast shutter speed and the water appears “frozen.” On the right is her photo using a much longer shutter speed and the water appears soft and blurry. Not bad for one lesson!



Images by Leanne Luttrell



## Blur vs. Camera Shake vs. Motion Blur for Artistic Effect

Both blur and camera shake are undesirable in an image. Motion blur is used for creative and artistic effect and can be desirable. So which is which?

Blur is caused by slower shutter speeds, a fast moving subject, or both. If a subject is moving fast and your shutter speed is too slow, it will show up as a blur in your image. Often, we cannot control a fast moving subject – think cars, bikes, kids, and dogs! However, we can control shutter speed to compensate. A fast shutter speed can “stop” or “freeze” motion. Have you seen images of water droplets caught in mid-air like the example image below on the left? That is fast shutter speed. Have you seen an image of a football player where the dirt or sweat is just hanging in the air (similar to the one of the dog below on the right)? That is fast shutter speed.



Image by [Janeke88 from Pixabay](#)



Image by [Herbert Aust from Pixabay](#)

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Neither one of the images above would have been a good image if the photographer had used a slower shutter speed. Both would have been blurry.

Below, on the left, is an image with an example of blur. The shutter speed was not fast enough to stop the motion of the female cardinal bird. On the right, I adjusted the shutter speed to be faster (4 times faster) and stop the motion on this sparrow. Birds move their bodies and heads very fast! If I wanted to capture a hummingbird, I would need an ever faster shutter speed!



*Images by FocusEd Camera*



Camera shake will also create a blur in your image, but instead of it just being a blurry subject, it will be the entire photo that is blurred. Camera shake is entirely caused by the user and/or camera itself. This can happen anytime you move the camera during a shot (and more likely to occur with slower shutter speeds). It can be a shake from unsteady hands, deep breathing, a vibration in the ground that travels through your tripod (think about being on a bridge and feeling it moving under your feet), or even the movement of the camera when you press and release the shutter button (that is why some photographers use a shutter remote). In the female cardinal bird image above on the left, there is also camera shake in addition to the blur of the bird moving. The camera shake can be seen as blur on the bird feeder which was not moving. The blur from camera shake happened because I was moving. My hands were not steady enough at that shutter speed, therefore everything is out of focus.

In the image of the sparrow above on the right, I adjusted was the shutter speed, but was still hand-holding the camera. Notice there is no blur, or very little at least. If I really wanted to make sure the image was crisp, I probably should have used  $1/125^{\text{th}}$  or even  $1/250^{\text{th}}$  of a second.

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So now let's talk about motion blur which is when we use blur in an intentional way for creative effect.

Look back at the waterfall images above. These were taken using a tripod (to reduce camera shake) and a longer shutter speed. The longer shutter speed allows the water to get that blurry, smooth look. In this case the camera remained still and the water moved and we captured that motion intentionally. To get the best effects of long exposure you may need to purchase an ND filter and a tripod. Contact us for assistance or take a [Try Before You Buy Class](#) with us!



Image by [Ronald Plett from Pixabay](#)

Here's another example of motion blur. In this case the camera person moved the camera at the same timing and speed as the motorbike to follow its motion (panning). It makes the motorbike stay in focus, but all the other things behind it become blurred as the camera panned from right to left. They used a longer shutter speed to accomplish this.

On the right is a street scene that is full of motion blur. In this case the camera remained still, the subject remained still (the man with the green jacket holding up a camera), but other things moved around them. The camera's shutter speed was slowed to allow this movement to be captured. So as you can see, motion blur can be used very creatively. It can be a lot of fun to experiment with using children, pets, bicycles, and more.



Image by [abdulla binmassam from Pixabay](#)

## Memorize These Basics

To recap, a fast shutter will open briefly and close quickly and “freeze” motion and prevent some unwanted blur. If the shutter opens and closes faster than the thing that is moving it “stops” action. A slow shutter speed opens and stays open longer. While the shutter is open if anything moves (you, camera, subject) it will show up as

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a blur. When you intentionally use slow shutter speed for artistic effect is it motion blur. Unintentional and unwanted blur is just blur, or camera shake.

The takeaway, if you notice an unwanted blur in any of your images, increase your shutter speed (make it faster). 😊

## Mode Settings

Let's look at shutter speed on your camera. You may need your camera manual to figure out how to get your camera into Shutter Priority Mode. If you need your manual go download it here (and follow directions to save it on your phone like an "app"): <https://focusedcamera.weebly.com/download-your-camera-manual.html>

Following the instructions in your camera manual, set it to Shutter Priority. This mode will allow you to set shutter speed and it will figure everything else out for you --- so don't worry about aperture or ISO right now.

Find the instructions for how to change and set the shutter speed. Shutter speeds are measured by either seconds or fractions of seconds. On one of my cameras 1/25 means one-twenty-fifth of a second (very fast – less than a second!) and 25" means twenty-five whole seconds (very slow, shutter open a long time). On a different camera, 25 is the fraction of one-twenty-fifth and 25" is twenty-five full seconds. Check your manual to see how to read the speeds for your camera.

## Your Homework Assignment

Take a series of several photos where you change the shutter speed. Use shutter priority mode as discussed above.

1. Moving car, bike, child or dog. A person or pet can run across the frame, or have your child wave their arms around. Choose a place with some good lighting (outdoors will probably work better) and don't worry about composition or the background. Set the shutter speed to be slow, like 1/5<sup>th</sup> of a second. Take the photo while the subject is in motion. Set the shutter speed to be much faster, near 1/2000<sup>th</sup>. Take the photo again while the subject is in motion. These images probably won't be "keepers" but you should be able to see a huge difference in the amount of blur between the two images. The first one should be blurry – the kind of unwanted, undesirable blur/camera shake we want to avoid. The second one should be much crisper (even if it isn't perfect).

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If your images are coming out bright white (overexposed) or too dark (underexposed), see the tips below. Don't give up!

2. Moving water. This can be a hose outside, faucet inside, or a waterfall at a park. Take two photos again – using fast shutter speed one time (water should look “frozen”) and slow shutter speed the second time (water should have that artistic blur). That blur is an artistic motion blur effect and that is how we use shutter speed to create it!

If your images are coming out bright white or too dark, see the tips below and don't give up!

3. Try another set of images or two where you change only shutter speed. It is only with practice that you will start to see and understand shutter speed.

## **It Isn't Working? Tips to Help...**

1. Image is grainy. Most likely the ISO is too high. Since we are letting the camera take control of the other settings it might raise the ISO especially if you are inside or in the shade when taking images with fast shutter speed. You don't need to do anything. We will cover ISO later. If it is bothersome, move to a brighter location.
2. I can't focus. Make sure Auto Focus is on. Since your subject is moving, especially for test #1 above, it will be harder to focus. Don't worry if the focus is a little off – as long as you can see the difference in the blur between your two test shots. If it is bothersome, use a tripod and consult your camera manual for instructions on how to set your focus points.
3. My camera refuses to take a picture. This may happen at fast shutter speeds or in dark areas. Your camera may be telling you that you don't have enough light. Go somewhere brighter, or adjust the shutter speed a little bit slower but not too much. You want the shutter speeds between the two images to be dramatic enough that you can visually see the point of the lesson!
4. Image is all white or way too bright. Your image is overexposing. You have too much light and the shutter is open too long. If you are outside in sun, move in the shade or indoors, or adjust shutter to be a little bit faster.
5. Image is black or too dark. Your image is underexposed. You do not have enough light or shutter is too fast. Go somewhere brighter, or adjust the shutter speed a little bit slower but not too much.

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6. None of this is working and these tips didn't help. You may be at the mechanical limits of your camera. Try troubleshooting again. The point is to see the difference shutter speeds have on blur and camera shake. As long as you can get two images where you can see these effects, they do not have to be in the drastic extremes. If all else fails, reach out to us on Twitter @focusedcamera or join our Facebook Group here: <https://www.facebook.com/groups/720515918561138>

Now that you know the basics of shutter speed, keep practicing. Use different shutter speeds all week. Think about your subject and whether you should adjust faster or slower based on the movement of the subject.

Coffee cup on the table – slow shutter speed is fine

Kids playing soccer – faster shutter speed is needed

Here is a Shutter Speed Cheat Sheet to keep in your camera bag (there is a pocket size version on my website in the mini-tutorials/extras section):

<https://drive.google.com/file/d/1CVa-A-r30KBAR6Wa7TnU-J-OObbEWRK1/view?usp=sharing>

As a general rule, never shoot handheld at speeds slower than the lens' length. For example if you are using an 85mm lens, the shutter speed needs to be faster than 1/250<sup>th</sup> (If your camera allows ½ or even 1/3 stops the settings would be closer to 1/90<sup>th</sup>). If you are using a 50mm, you should be able to use a setting near 1/60<sup>th</sup> of a second. This is just a starting point – a generalization – I have very shaky hands so I need faster shutter speeds than this “rule” for any lens or I need to use a tripod!

In general, a tripod will help in ALL scenarios. It helps prevent camera shake. A tripod is required to do long, intentional exposure times like blurry waterfalls. Repeat the practice above with and without a tripod and see the difference it can make!

Once you understand the basics of shutter speed and the other aspects of the exposure triangle (aperture and ISO), you can begin to learn other types of photography that make use of long exposures and slow shutter speeds. There are some fun ways to use these to photograph fireworks, the moon and stars, to do light painting, and to take pictures of “ghosts.” We offer [One-on-One instruction](#) for many specialty topics and can even meet via Zoom for a lesson of your choosing – times/length of class and rates will vary. [Visit our website](#) for more information.