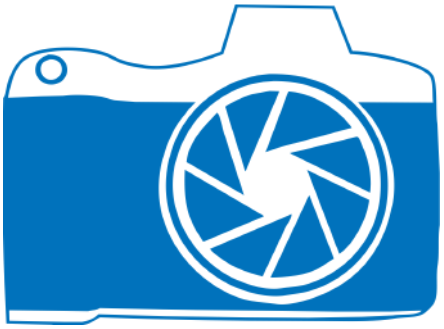
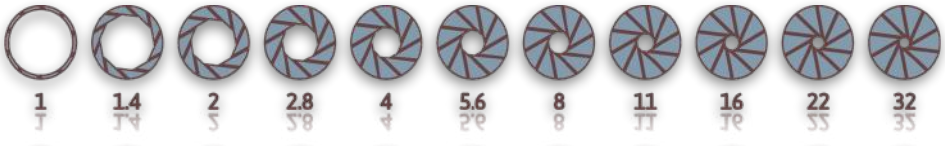
Photography made easy

Aperture



Aperture controls the amount of light exposure on the camera's sensor. It also controls the Depth of Field.



Depth of Field (DOF) is the distance between the nearest & the furthest objects that are in sharp focus in an image. The aperture measured in units called f/stop numbers. The smaller the f/stop number, the shallower the DOF and less light needed. The larger the f/stop number, the wider the DOF and more light needed.

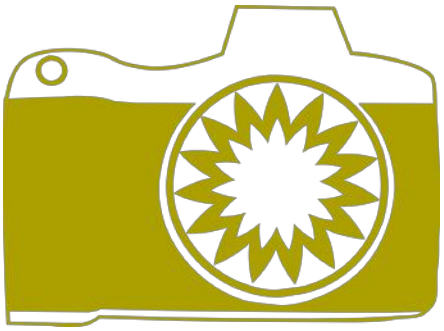
Shutter

The shutter controls the length of light exposure on the camera's sensor. It also controls the motion blur.

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

Motion blur is the effect of the subject moving during a single exposure. The faster the shutter opens and closes, the more stopped the motion appears. The slower the shutter opens and closes, the more blurring the motion appears in the image.

ISO



ISO manages the image sensor's sensitivity to light. It also manages noise.

Use during day time or bright lighting the lower settings. Use during the night time or low light shooting the higher settings. However, higher settings can result in lower image quality with an increase in image noise.

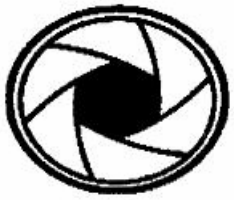
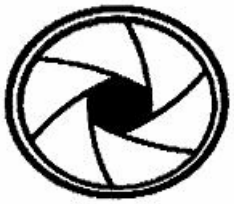
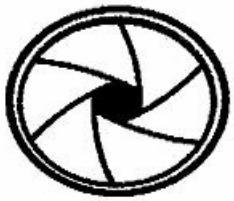
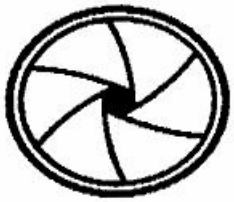
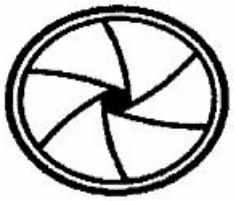
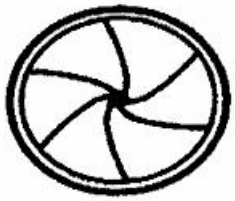
941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

A. Brightness of Scene

Shooting in manual - On sunny days, lower the ISO to make an image stopped action with a wide depth of field. Increase the ISO for cloudy days or under shadows, if you want the most stopped action.

B. Aperture and Shutter Speed Combination

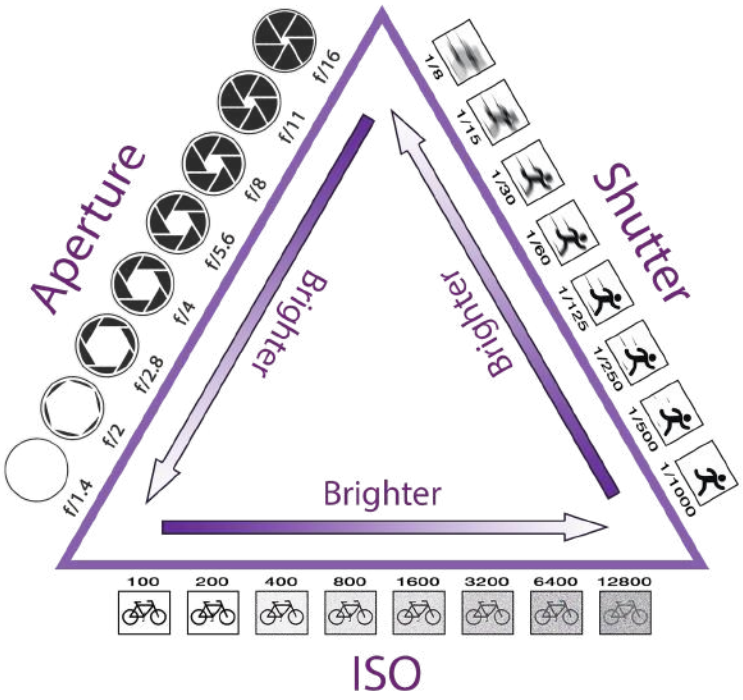
C. Sensitivity

	**f-stop**	**Shutter Speed**	**ISO**
	Depth of Field NARROW	Stopped Motion	Minimal Grain
	f/2.8	1/4000	100
		1/2000	200
	f/4	1/1000	
		1/500	400
	f/5.6	1/250	
		1/125	800
	f/8	1/60	
		1/30	1600
	f/11	1/15	
		1/8	3200
	f/16	1/4	
		1/2	6400
	f/22	1”	
	Depth of Field Wide	2”	12800
			25600
		Blurred Motion	A lot of Grain

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

EXPOSURE

The Exposure Triangle



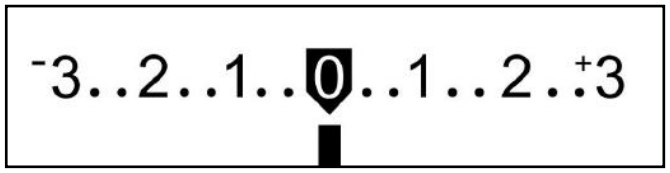
In photography ISO, aperture and shutter speed are the Exposure Triangle. It's a way to visualize how the three elements react with each other. Notice at the top of the triangle. The shutter speed lets in most of the amount of light and aperture lets in the least amount of light. With most exposures, there is a reciprocal given and take between the three. If the shutter speed is slower, the aperture is smaller. If the scene is too dark or bright, then the ISO is modified. For example - In sports, the action is fast, so use fast shutter speed, say 1/2000. The widest aperture in the lens is f/5.6. The light meter indicates the exposure is at least three stops too dark. The ISO is modified by three stops to be more sensitive in lower light.

Shooting in manual isn't complicated, hard or weird. It's like learning to drive a car with an automatic shifter and 30 years later learning how to drive with a stick shift. It's just a skill set that gets better with practice. The critical point to remember is to think before you click. Pay attention to the light meter and master the controls for f/stop, shutter speed, and ISO. Concentrate on composition and be aware of the direction of light. When possible, keep the Sun behind you. Learning the camera controls is 10% of the photography. The rest is up to the photographer.

Using the Light Meter

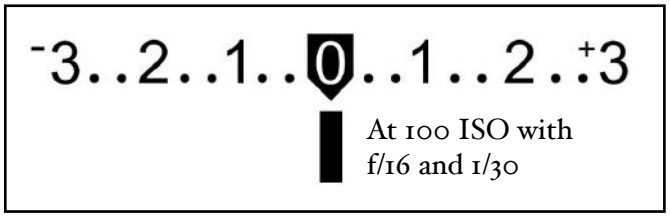
Exposure is going to darker than recommended

Exposure is going to lighter than recommended



When the indicator is at "0," the exposure is considered excellent. Each whole number is a stop. The dots in between are a 1/3 of a stop.

The light meter indicates the image will be too dark and suggests at least adding two more stops of light.



Half of 1/125 is 1/60 and half of that is 1/30 of a second. The slower shutter speed lets in more light for the camera by two stops.

Other options would be to increase the ISO by two stops, 400 ISO or open the aperture to f/4. In automatic, the camera uses whichever combination it thinks is best. That's why the scene modes are, mostly, modifiers for the depth of field and stopping motion.

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

Working with Manual Settings

Digital cameras, regardless of kind or shape, can create images from a wide range of lighting conditions. The camera choices in auto mode work well for most camera owners and create a good exposure for the photographer. However, the auto mode does have its limits. With every exposure, the camera's auto settings can choose a completely different exposure. The auto mode can frustrate photographers looking for a specific look in an image. Using the scene modes help guide the camera's choices for creating an image closer to what the photographer desires.

Choosing to work in manual mode means the photographer controls the camera. The photographer creates consistent exposures for a unique look. A camera's light meter is used to measure the brightness of the scene. It indicates if the current settings will overexpose or underexpose the image. The exposure is modified depending on how bright or dark the scene is and what the photographer intends. In the beginning, the photographer uses the meter to pick appropriate settings.

However, a photographer soon learns the light meter works best as a guide and not as an absolute. Think of it as a useful tool like a saw. A saw is excellent for cutting wood. However, the woodworker's skill shapes it and not the saw. Photographers gain knowledge by shooting thousands of deferent lighting conditions to properly evaluate exposure.

For instance, on a sunny day, a photographer could set the aperture to f/16 with the shutter speed of 1/125. Since there is enough light, set the ISO to 100. This exposure referred to as the Sunny 16 Rule. The rule will yield a wide enough depth of field and stop most motion. On an overcast day, the photographer can modify Sunny 16 by changing the aperture to f/8 to let in more light.

Changing any exposure setting by half or doubling it is called a stop. A stop is a doubling or halving of the amount of light let in. When a photographer says that they increased the exposure by one stop, it means they captured twice as much light. For example - changing the shutter speed from 1/125 to 1/30 of second gains two stops of light.

The Sunny 16 Rule is a method to set exposure without referring to the light meter. However, if the lighting conditions are different, like the clouds blocking the Sun, the Rule is modified by changing the aperture by stops.

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

Shooting in Shutter Priority

Shutter Priority is where the photographer sets the shutter speed. According to the brightness of the scene, the camera then sets the f/stop and sometimes the ISO. In the train photo, the photographer wanted to add motion blur to create a sense of speed in a static image. Setting the shutter to 1/125 and the ISO to 100 by using the light meter. The camera chose the f/stop. With the bird in flight, with the shutter set at 1/2000 to stop motion, the camera picks the f/stop and ISO according to the light meter.

1/125

100

f/7.1 - Auto

Panning – A technique to capture action images. The camera will need to follow the subject while capturing the image.

Image by Robert-Owen-Wahl from Pixabay

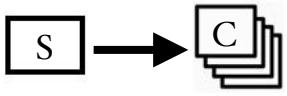
1/2000

400 - Auto

f/5.6 - Auto

Select shutter priority on the shooting dial and pick the speed preferred. The result improves if you follow the subject while shooting.

Image by Foto Dono



When shooting shutter priority and the subject is moving, switch from single shot mode to continuous shooting. The camera will keep taking photos while pressing the shutter button.

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

Shooting in Aperture Priority

Aperture Priority is where the photographer sets the f/stop. According to the brightness of the scene, the camera then sets the shutter speed and sometimes the ISO. Bokeh, pronounce BOH-kay, occurs in parts of an image that lie outside the DOF, a unique property of a small f/stop number. Photographers sometimes deliberately use a shallow DOF to create images with prominent out-of-focus regions to create a bokeh. Lenses with apertures that can open very wide are also called "fast" lenses because they can achieve the same exposure with faster shutter speed.

f/1.4

640 - Auto

1/100 -Auto

Your eye is drawn to the sharpest point of an image. By using bokeh creatively you can control the image narrative.

Image by Mihai Paraschiv from Pixabay

f/2.8

100

1/320 - Auto

Bokeh isn't just for background. It can be created in the foreground outside the DOF.

Image by Foto Dono

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

Shooting in Manual

In the following examples, the beach photo has more than enough light. The rule of thumb for here - set the ISO to 100. Set the aperture to f/8 for a moderate depth of field. With the light meter as a guide set the shutter speed to 1/320 of a second. In the city photo, a storm was approaching, and the sky was overcast. The lens aperture couldn't open wider than f5.6. According to the light meter, a 3200 ISO was needed to achieve a shutter speed of 1/60. 1/60 of a second is the slowest shutter speed for most handheld shots.

1/320s

100

f/8

On sunny days, lowering the ISO can create an image with stopped action and a wide depth of field.

Image by pasja1000 from Pixabay

1/60

3200

f/5.6

Increase the ISO for cloudy days or under shadows, if you want the most stopped action.

Image by Foto Dono

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

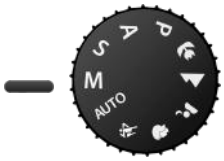
How do you choose?

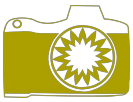
There are guidelines for shooting in certain situations, like the Sunny 16 rule. The following photos are some examples of shooting in full manual without the benefit of a light meter. To expose these moments, you have to rely on an understanding of how exposure works. Remember these are only guides and not standards set in stone - a jumping point for the photographer to manipulate the image. Don't be afraid to choose differently and see what happens. There is more value in the mistakes made than in getting it right.

Photographing Fireworks

You'll need a tripod and a remote switch to keep the camera steady. Pick a spot where the wind is blowing the firework's smoke away from you. A 100 ISO will provide enough light sensitivity. Set the shutter speed between 1 to 5 seconds. The amount of time controls the light trails from the fireworks. The f/stop controls how dark the background is. Also, turn off the lens autofocus system and focus manually. Set the focus once, and you won't have to change it again unless you move the camera.

f/5.6





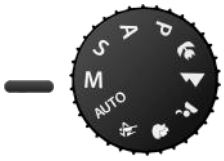
100

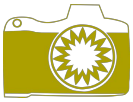
1.6 seconds

The shorter time creates a small burst of trails. The trick is to time the shot right before the burst starts.

Image by Foto Dono

f/16





100

3 seconds

Remember, when using longer shutter speed, you need to reduce the size of the aperture.

Image by Foto Dono

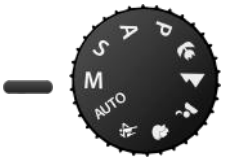
941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203

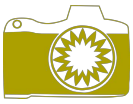
Photographing the Moon

You'll need a tripod and a remote switch to keep the camera steady for moon shots. Clear skies work the best when photographing the night sky. Most moon shots are blurry and overexposed in auto and program modes. The light meter registers a tiny bright spot surrounded by darkness and can't determine what is what. Don't rely on autofocus. It wants to reacquire the focus each time. Once the moon is in sharp focus, turn off the autofocus.

Not Cropped

f/5.6





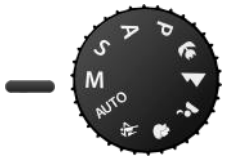
320

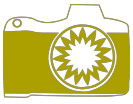
1/320

Cropped

When the moon is full or half a moon, fast shutter speed is needed to stop the motion of the moon. The moon reflects plenty of light, so there is no need for a higher ISO setting than 400. The aperture is then used to reduce the glare of the moon. The longer the focal length, the better. The moon at the top was shot at 200mm and then cropped later on. Also, the white balance was set to "Daylight" to correct the color temperature.

f/4.5





3200

1/20

A lunar eclipse is where the Earth's shadow falls over the moon. Compensate by increasing the ISO, and lengthen the shutter speed. The aperture still controls the glare. The image here is cropped.

Images by Foto Dono

941-896-9921 * jpiphoto.com * 6709 53rd Ave East, Bradenton, FL 34203