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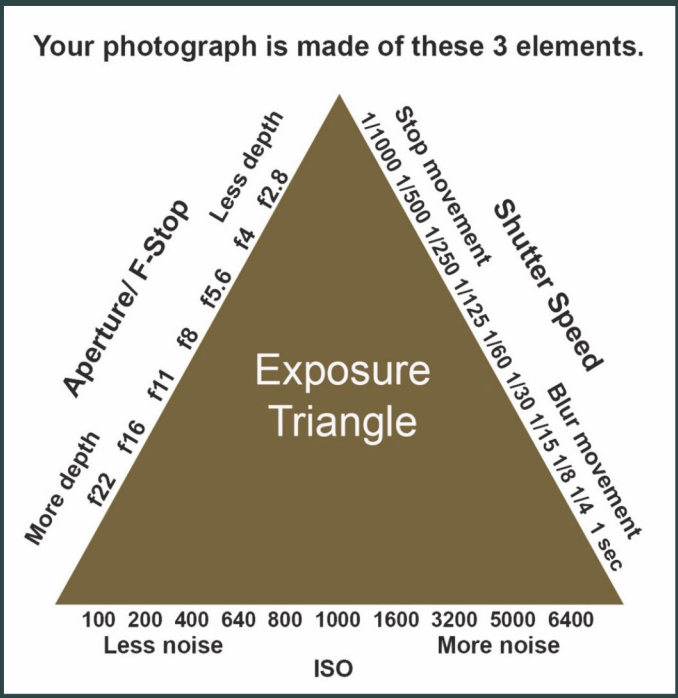

A Practical Photography Help Guide

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The Exposure Elements

Shutter Speed: Controls how long light hits your sensor. Beyond just exposure, it's your primary tool for capturing or freezing motion. A faster shutter speed (like 1/1000th of a second) freezes action, while a slower speed (like 1/15th) can create intentional motion blur, allowing you to convey movement in still images.

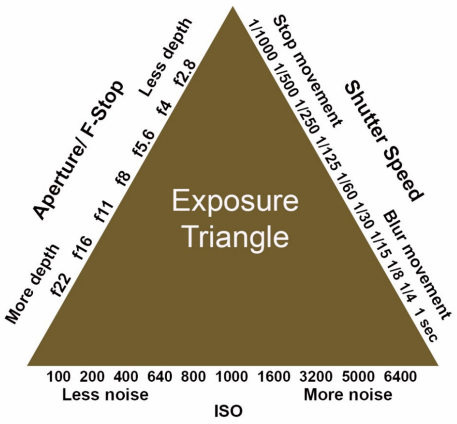
Aperture (f-stop): Determines how wide your lens opens to let in light. But it's also the master of depth of field. Large apertures (small f-numbers like f/2.8) create that coveted background blur, while small apertures (large f-numbers like f/16) keep more of your scene in focus.

ISO: Your camera sensor's light sensitivity setting. While it seems the simplest of the three, modern digital photography has transformed ISO from a fixed film property into a dynamic tool.

These elements ALL work together to create the proper exposure for an image. These elements also control Motion, Depth of Field, and Light Sensitivity of the sensor.

You must learn to use them together and in relationship with one another. These are the KEY to controlling and creating the BEST images

Your photograph is made of these 3 elements.



Camera Modes

The Mode Dial

M = Manual Mode
The photographer sets the Shutter Speed, Aperture and ISO.

S/Tv = Shutter Priority Mode
The photographer sets the Shutter Speed, and the camera sets the proper Aperture. The ISO is set manually, but if Auto ISO is set, the camera will set the needed ISO to create the proper exposure.

A/Av= Aperture Priority Mode
The photographer sets the Aperture, and the camera sets the proper Shutter Speed. The ISO is set manually, but if Auto ISO is set, the camera will set the needed ISO to create the proper exposure.

Auto or Scene Modes are NOT recommended.

Helpful Hint

If you struggle with full manual and using the light meter, use AUTO ISO when creating an exposure. Learn to use your Shutter Speed for the movement you want to control and the Aperture/F-Stop for the Depth of Field. Place your ISO on AUTO and it will set automatically to give you the correct exposure.

RAW vs Jpeg

RAW files are uncompressed and retain more image data than JPEG files, which are compressed. This makes RAW files larger and higher quality, but JPEG files are smaller and easier to share. Due to this, you want to think carefully about your image quality settings to use.

RAW images are larger than JPEGs, and they require work to edit. However, they offer more control over image quality.

To edit a RAW image, you need to learn to edit in software like Adobe Lightroom as an example. However, you will have MUCH greater control over your images and what you can do with them.

RAW -These are some of the reasons you should learn to work with RAW images.

- File Size - Larger and Uncompressed
- Image Quality - Higher Dynamic Range and More Data
- Editing Options - Options for Exposure, Color Balance, and Noise Reduction

TIPS:

If your camera has a single memory card slot, recording both RAW and JPEG files offers an extra layer of security. Should your memory card become corrupted, JPEG files are generally easier to recover using data recovery software, ensuring you don't lose your precious images completely.

For cameras with dual memory card slots, advanced photographers often opt to record RAW files to both cards. This creates an instant backup of your highest-quality images. However, this approach is most beneficial if you're comfortable with
post-processing RAW files.

Regardless of which format you choose, always set your camera to capture images at the highest quality setting available. For JPEG shooters, this means selecting the largest file size and finest compression option. Using lower quality settings might save space, but it will significantly compromise your image quality and limit your editing capabilities.

Remember to consult your camera's manual for specific instructions on adjusting these settings, as the exact process varies between different camera models and manufacturers.

Focus Modes

Autofocus modes on a camera refer to different settings that control how the camera automatically focuses on a subject, allowing you to choose whether the focus locks on a stationary subject with a single action, or continuously adjusts to track a moving subject depending on the situation.

AF-S (One Shot Canon) - Single AF Mode

Focus locks on the subject when the shutter button is half-pressed, ideal for stationary subjects like portraits or landscapes.

AF- C (AI Servo Canon) - Continuous AF Mode

Camera continuously adjusts focus while the shutter button is held half-pressed, perfect for capturing moving subjects like sports or wildlife.

AF-A - Auto Servo AF Mode

You give the camera the choice based on what it senses of the subject. We do not recommend this mode.

Subject Detection Modes

In the latest models of mirrorless cameras, many have the ability to detect subjects such as people, animals or automobiles.

Many newer cameras can also detect eyes as an example. These modes combined with high-speed shutter burst, allow for a much greater ability to capture fast objects such as birds and wildlife!

TIP: Traditional vs. Back-Button Focus

Traditionally, you half-press the shutter button to focus, and then fully press it to take the photo. With back-button focus, you press a dedicated button (often the AF-ON button) to activate autofocus, and then use the shutter button solely for taking the picture.

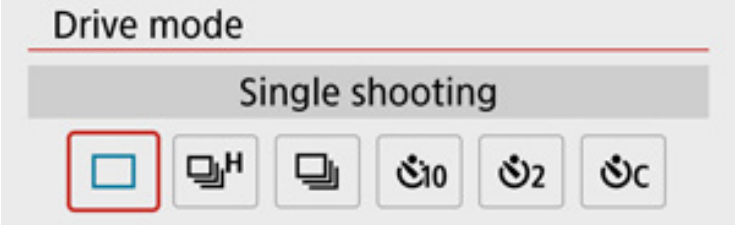
This can help with the following:

Faster Focusing: You can quickly focus on a subject and then keep shooting without having to refocus for each shot.

Improved Tracking: Back-button focus is particularly useful for tracking moving subjects, as you can lock focus on the subject and then follow it as it moves across the frame.

Drive Modes

Drive modes are a camera setting that controls how many pictures are taken when you press the shutter button. Different drive modes include single shot, continuous, self-timer, and remote.



Single Shot
Takes one picture when the shutter button is pressed.

Continuous Burst Mode
Takes pictures continuously while the shutter button is pressed and held down.

Most cameras have various speeds of capabilities.
L= Low Burst Mode
H = High Burst Mode
H+ = Very High Burst Mode

Self - Timer
Takes a picture after a set amount of time has passed since the shutter button was pressed. Usually, you can set a 2 second or a 10 second delay.

TIP: This is useful if you do not have a cable release for long exposure photography. Use this to allow the camera to "settle" before the shutter fires so that there is no camera shake in your photograph.

Shutter Speed

Function

Light Control

Movement

Education

The shutter speed allows light to hit the sensor through the process of time.

The character of movement is either stopped or blurred based on the shutter speed used in any given situation.

To STOP action, use a faster shutter speed.
To BLUR action , use a slower shutter speed.

Skills

- Stop Fast Action Subject - Ex. Car Moving
- Blur Motion - Ex. Waterfalls or River
- Panning - Ex. Move the camera with a subject to create a sense of motion.

Tips

- Use Manual with Auto ISO
- Set your F-Stop at 5.6 - 8 for practice
- Adjust the shutter speed ONLY and try various subjects.

Fast Action Settings

1/4000th - 1/8000th Stopping EXTREME Fast Action

1/1000th - 1/4000th Stopping VERY Fast Action

1/500th - 1/1000th Stopping BASIC Fast Action

Basic Action Settings

1/125th - 1/500th General Movement

Lowest Hand Holdable Settings

1/60th - Smaller Lens Ex. 18 - 55mm

1/400th - Medium Telephoto Lens Ex. 70 - 200mm

1/800th - Long Telephoto Lens Ex. 100 - 400mm

General Rule - Take the focal lens length and double it for a minimum Shutter Speed Setting.

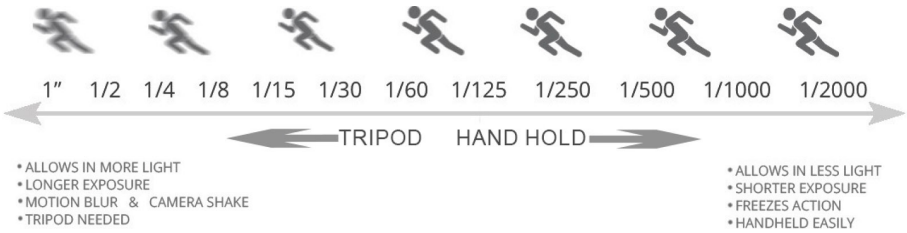
Ex. If you have a 70 -200mm lens, 1/400th is a safe hand holdable shutter speed to avoid shake.

Motion Blur

1/5th - 1/30th Creating Motion Blur or Panning

2" Seconds or more - 1/5th Heavy Motion Blur

General Rule - Use a tripod to avoid camera shake.



Shutter Speed Recommendations

	Subject	Shutter Speed	Helpful Advice
Tripod Required (Image Stabilization OFF)	**Star Trails**	30" to 2:00+'	30 second shutter speed repeated 40 times (a minimum of 20 minutes, longer creates longer trails). If you have a camera that allows for longer than 30 seconds or an intervalometer I suggest 2 minute shots(again a minimum of 20 minutes). These are stacked together in software.
	Stars/Milkway	10" - 15"	OK - Use the "500 Rule" as a guide. Divide 500 by the focal length you are using - the result is your max shutter speed. BETTER - Use the NPF rule that takes into account your sensor size and pixel density. The app PhotoPills offers an easy calculator. Typically we find that a shutter speed around 10-15 seconds is just fine. You can go longer if you don't plan to print large.
	Light painting	5" - 15"	
	Busy tourist location	2" - 8"	2-8 seconds shows movement with subjects and provides sense of motion and congestion. Longer shutter speeds can make anyone moving disappear. You can try this to get an empty view but in my experience there is always a soul or two that stands still.
	Moving water & waterfalls	1/4 - 4"	You can go longer but I find that the water begins to lose all detail and rarely do I see reasons to go longer than 2 or 4 seconds. Pro Tip: use a circular polarizer to cut the reflections on the water and rocks.
Handheld (Turn Image Stabilization ON)	**Panning shots**	1/6 - 1/100	(Switch Image Stabilization to Sports/Panning if offered with your lens) Shutter speed should approximately match subjects speed in mph Walking/Jogging/Runners: 1/6 - 1/15 Bicyclist: 1/15-1/30 Moped/Slow Car: 1/30 - 1/50 Pro Tip: shoot a burst when panning, especially when shooting below the minimum shutter speed rule. You will likely to get some blur from handshake and/or you won't track the subject perfectly. Shooting a burst makes it more likely to get a good shot among several throw aways.
	General Landscape Photography	1/125	Freeze windblown grass and leaves
	Street Photography & Portraiture	1/250	Freeze subjects
	Sports	1/500 - 1/1500	1/500 is usually enough to stop human motion but faster speeds are needed to stop swinging bats, baseballs, tennis balls etc. Remember that some motion blur can be useful to show movement, don't always freeze all action.
	Wildlife	1/250 - 1/4000	You will often use longer telephoto lenses so be sure you are still following the focal length/shutter speed rule as discussed in the previous article.

Motionless animals 1/250

Walking animals 1/400 - 1/800

Running animals 1/1000 - 1/1600

Birds in flight 1/1600

Small birds in flight 1/2500 - 1/4000

Aperture/ F-Stop

Function

Light Control

Depth of Field

Education

The aperture/f-stop allows light to hit the sensor through the opening in the lens.

The character of depth of field is produced based on the f stop used. A big number (small opening) creates more depth. A small number (large opening) creates shallow depth.

Skills

- Create shallow depth in an image.
- Create more depth in an image.

Tips

- Use Manual with Auto ISO
- Rarely do you need larger than f8 or f11 for lots of depth
- Big number = Big depth
- Little number = Little depth
- Create depth naturally by bringing your subject further from the background.

Depth of Field Basics

A small aperture lets in MORE light and helps create a shallow depth of field, while a large number lets in LESS light and creates more depth of field.

The distance of the photographer to the subject either in person or by using a zoom lens, changes how the depth of field looks as depth is relative to distance to a subject and background.

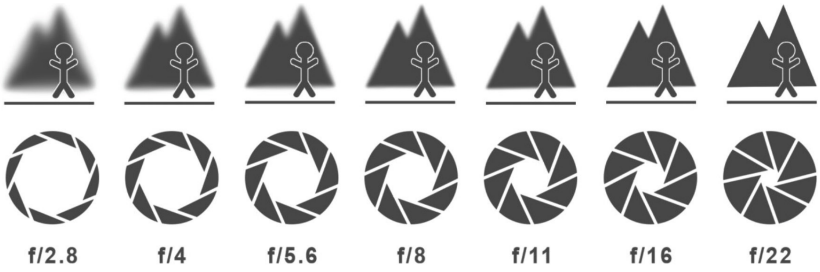
Basic Aperture Settings

- Portraits - Sing le subject - f2.8 - f4
- Portraits - Group - f8 or f 11 depending on how big
- the group is.
- Landscape - f8 (General Landscape)
- The closer a subject is to you, use a small number for shallow depth and a large number for more depth.

General Rule - f8 is great. It will work well for most landscape images!

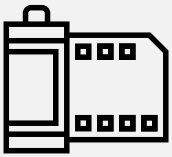
Long Exposures

Use a large number such as f22 to help take away light to allow you to take the shutter longer to help blur movement during the day time. You may also need a dark filter to help.



Small number = More light / Less depth. Large number = Less light / More depth.

ISO



In photography, ISO refers to the camera sensor's sensitivity to light, with higher ISO numbers indicating greater sensitivity, allowing for faster shutter speeds and better performance in low-light situations, though at the cost of potentially increased image noise or grain.

LIGHT SENSITIVITY OF CAMERA SENSOR	ISO SETTING	WHEN TO USE THIS SETTING
VERY LOW	50-100	IN DIRECT SUN
LOW	100-200	VERY BRIGHT
MEDIUM	200-400	MODERATELY BRIGHT
HIGH	400-1600	SOMEWHAT DARK
EXTREMELY HIGH	1600-6400	DIMLY LIT

One of digital photography's biggest advantages is its flexible ISO settings. In the past, photographers had to commit to a single film sensitivity (ISO) for an entire roll of film. Today, digital cameras let you adjust ISO sensitivity for each individual shot.

When you increase the ISO number, your camera becomes more sensitive to light, which helps you take photos in darker conditions.

However, there's a trade-off: higher ISO settings introduce digital noise. This is similar to the grainy effect photographers used to get with high-speed film, but in digital form.

TIP - Do not get to concerned if you need a higher ISO to get the image and that results in digital noise. It is very easy to clean up now in software during editing.

As an example, if you need a fast shutter in very low light, you will need a high ISO. This is because the fast shutter is not open very long to let much light in. Therefore, by having a higher sensitive ISO that does not need as much light, you can still capture the action with a fast shutter speed in low light. Sporting events in a gym are a good example.

It is better to have a sharp vs blurry photograph than to be worried about noise!

Exposure Compensation

Exposure compensation is a camera setting that adjusts the brightness of an image. It's used to override a camera's automatic exposure settings.

Most cameras have a button that looks like this on it.

Some cameras use a dial that rest on top that will have plus and minus numbers.

Want to make your photos brighter or darker? Just use exposure compensation. It's simpler than switching to FULL manual mode.

When your camera is on priority settings such as Shutter or Aperture, settings, it tries to balance the brightness perfectly if you also are using Auto ISO.

With exposure compensation, you can override this to make your images exactly how you want (lighter or darker) all while keeping the convenience of not having to spend time worried about the light meter.

TIP- Place your Mode dial in Shutter or Aperture Priority and your ISO to Auto. Take a photo.

Press the+/- button to adjust brightness. Move left(-) to darken or right (+) to brighten. Its that simple!

Newer model cameras will allow you to do this in manual mode as well if the ISO is set to Auto ISO.

Always reset exposure compensation to 0 before shooting in manual mode. *Even in manual mode, some cameras keep your previous compensation settings.* This means your photos might come out too bright or dark, even when the light meter looks correct.

Manual Settings the Easy Way!

Step 1 - Set your Mode Dial to M for Manual.

Step 2 - Set your ISO to Auto ISO. (refer to your specific camera manual)

Step 3-If action is your priority, set your shutter speed for the subject.

Step 4-If depth is your priority, set the aperture/f-stop for your subject.

Step 5-Take your photo.

Step 6 -If the image is too light or dark, use exposure compensation and take another photograph until you find the desired results.

Want to make your photos brighter or darker? Just use exposure compensation. It's simpler than switching to FULL manual mode.

Press the+/-button to adjust brightness. Move left{-) to darken or right(+) to brighten. Its that simple!

Action Photography

- ISO -Set to AUTO (NIkon users- Set your ISO to 100 FIRST, this allows for full range of the ISO spectrum)
- Shutter Speed -Set for Subject Movement
- Aperture/F-Stop -Set to smallest number your lens allows.
- Drive Mode -Set to Continuous Burst
- Focus Mode-Moving Subject?-Use Continuous Focus (Al Servo Canon)

Landscape Photography

- ISO -Set to AUTO (NIkon users- Set your ISO to 100 FIRST, this allows for full range of the ISO spectrum)
- Aperture/F-Stop -Set to f8 for most scenes.
- Shutter Speed -Set no slower than 1/60th if hand holding. (dependent on lens size)
- Drive Mode -Set to Single Shot
- Focus Mode-Use Single Focus

Helpful Hints

- Basic Action -Start at 1/250th of a second and see the results then increase as needed.
- Fast Action -Start at 1/1000th of a second and see the results then increase as needed.
- Do NOT hand hold slower than 1/60th of a second. (dependent on lens size)
- With a longer lens, double the focal length for your shutter speed to avoid camera shake (Ex. A 200mm lens, should be handheld no lower than 1/400th of a second.
- Do not worry if your ISO becomes too high, noise reduction software can help.

Full Manual Settings

Step 1 - Set your Mode Dial to M for Manual.

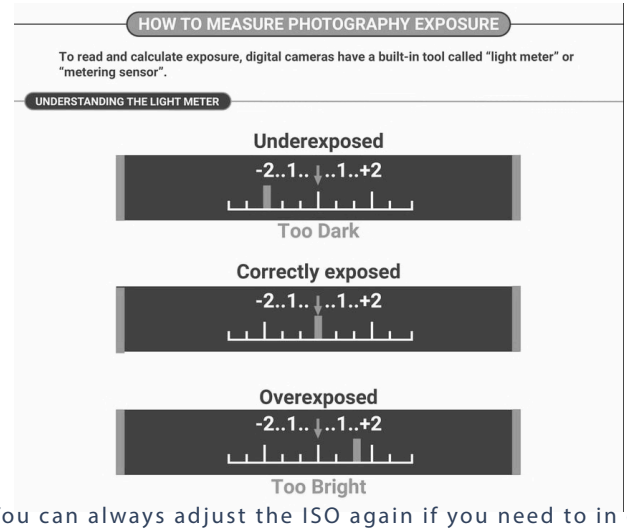
Step 2 - Set your ISO for the light you are in. You can always change again.

LIGHT SENSITIVITY OF CAMERA SENSOR	ISO SETTING	WHEN TO USE THIS SETTING
VERY LOW	50-100	IN DIRECT SUN
LOW	100-200	VERY BRIGHT
MEDIUM	200-400	MODERATELY BRIGHT
HIGH	400-1600	SOMEWHAT DARK
EXTREMELY HIGH	1600-6400	DIMLY LIT

Step 3 - Ask yourself if action or depth is your priority for the image.

Step 4 - Based on the answer, start with either your shutter or your aperture.

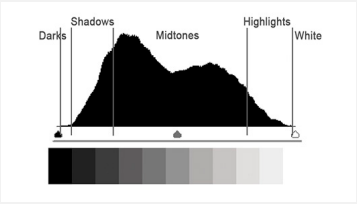
Step 5 - Now adjust either the shutter or aperture (whatever one you did not start with) and work to line up the light meter.



TIP - You can always adjust the ISO again if you need to in order to help get the other settings to where you desire.

Remember, it TAKES PRACTICE!

HISTOGRAM



A histogram in photography is a graphical representation of the brightness levels in an image, showing how many pixels fall into each tonal range from pure black (left side) to pure white (right side), essentially acting as a tool to assess if a photo is properly exposed or not by analyzing the distribution of light across the image.

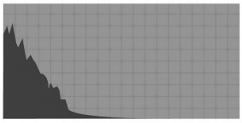
If you cannot seem to locate a screen that looks like this, use your camera manual and look under "histogram".

The biggest rule, is to stay away from the wall! Too far to the left is extremely under-exposed areas. Too far to the right and on the wall is extremely over-exposed areas.

READING A HISTOGRAM

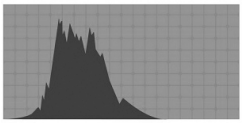
A histogram pushed to the far left indicates underexposure (dark image, potential loss of shadow detail). STAY OFF THE WALL.

UNDEREXPOSED



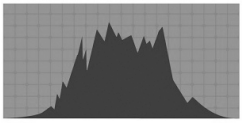
Here the histogram is slighly under-exposed but still has plenty of information to work with. This is totally acceptable.

EXPOSED TO THE LEFT



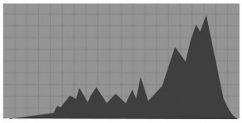
A properly exposed histogram has all of the details of tonal range in it from the darks to the lights. Although this is a good histogram, always remember a "perfect" histogram represents all tones from dark to light. An image with more brights in it, will naturally shift right as an example, while an image with more darks, such as at night, will naturally shift left. .

NEUTRAL EXPOSURE



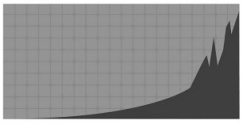
Here the histogram is slightly over-exposed but still has plenty of information to work with. This is totally acceptable.

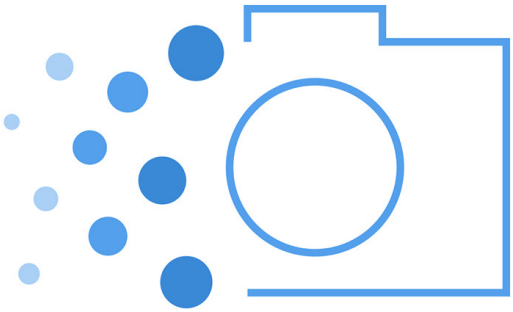
EXPOSED TO THE RIGHT



A histogram pushed to the far left indicates over exposure and will burn out the brightest areas of the image. STAY OFF THE WALL.

OVEREXPOSED





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- Jill B - Trip Advisor Review

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