

Basic Photo Technique

A photograph begins w/ a vision and is made a reality by the strong understanding of the principles and techniques of photography. This strong understanding starts with the knowledge of light, composition and the triangle of exposure. The basics of photography start with the triangle of exposure, this triangle is made up of the three key elements that go into making a proper exposure, they are ISO, aperture and shutter speed. A good exposure is your best starting point, in order to obtain the most information possible in your image and allow for the best processing start with either a Raw file format on a digital camera (most common these days) or if you are feeling hands on and retro use a film based camera. Trying to print a lousy exposure is torture and will usually not give you the final image you desired. It is much easier to reshoot. In this day and age there are so many ways to ensure that your image is captured correctly, why struggle, instead inform yourself about the photographic process, everything will fall into place after that.

In photography stops are used to measure light. A stop is a universal measurement of the amount of light that is being let into your camera; the concept is similar to traveling a mile. Whether you travel a mile on foot, by car or on a bike it is still a mile you just got there at different speeds and saw things differently on the way. So in the end you traveled a mile but your visual memory of it will be different.

The same holds true for a stop of light. You can travel a stop of light using your aperture (f-stop) or your shutter speed. Your aperture (f-stop) will get you there but affect your depth of field and your shutter speed will get you there but affect your rendering of motion. So you see whether a stop is measured by your aperture (f-stop) or your shutter speed, it is the same, the only difference is the way it captures the light. Don't let the term f-stop get in your way, it is simply a way to measure the opening in the lens, the aperture, since the shutter is measured in time the aperture is measured by numbers referred to as f-stops.

Exposure

Exposure -the tonality of the image- is controlled by two functions of the camera: the aperture and the shutter speed. A correct exposure will capture detail in both the bright and dark areas of the image. In an overexposed image the brighter areas loose detail, which makes the overall photo look washed out or too light (like looking through a dirty window at a bright scene). In an underexposed image the shadows loose detail because they are too dark. In digital photography, which is what we are focusing on, it is often better to slightly overexpose (about a stop) than to underexpose but this is really on a case-by-case basis. It is best to try and capture your lights and darks on in your RAW format image and then process that image in Adobe Camera Raw via the Bridge or in Lightroom in order to make the image look the way you want it to.



Most RAW images look a little flat when they are first seen on the computer, but after a little processing they look amazing. The difference between shooting in RAW format as opposed to jpeg is that in RAW format you make all the processing choices. A jpeg is actually processed by

For example:

We'll use **f 8** as our starting f-stop for this example;

f 5.6 is the number below f 8 and **f 11** is the number above.

f 5.6 lets in twice as much light or one stop more than **f 8** (even though f 8 is a larger number than f 5.6 it's aperture opening is actually smaller than f5.6) Remember the chart above.

f 11 lets in half as much light or one stop less than **f 8** (even though f 8 is a smaller number than f 11 it's aperture opening is larger than that of f11). Remember the chart above.

The aperture controls the Depth of Field in your image. The Depth of Field is a measurement of the amount of space that will be rendered sharp in your image. A large f-stop number/small aperture opening produces a great depth of field. Therefore more of your image will be sharp. A small f-stop number / large aperture opening produces a shallow depth of field. Therefore less of your picture plane will be sharp. For example you want to take a shot of a large wildflower patch set against the rolling hills behind them to show their environment. The wildflowers become your foreground and middle ground and the hills become you background. To render everything in breathtaking detail, sharp focus, you would need a small aperture w/ a large f-stop number such as f 16 or 22. To put the attention just on the flowers in the front making them the only subject you would choose a large aperture w/ an f-stop number such as f 1.4 or 2 to blur the rest of the field and the hills in the background.



Lens set at f 2.



Same subject, lens set at f 16 for more depth of field.

Some other issues that affect depth of field are your distance to your subject and your subject's distance from its background/ other elements in the frame. The closer you are to your subject the shorter the depth of field, keep in mind depending on your lens you can only get so close and still be able to focus sharply on your subject. The farther away your subject is from the background or other elements in the frame that you do not want to be in sharp focus the easier is it to achieve a shallow depth of field. If you shoot a person leaning against a wall even with a wide aperture chosen they both may be equally sharp. But if your model is 10 feet from the wall and you are close to your subject the background will be blurred. So the further you are away from your subject the shorter the depth of field becomes and the farther away your subject is from other elements the more shallow depth of field you will achieve. Also quality lenses with the proper mm for your subject have a lot to do with shallow depth of field.

Here is a good tutorial <http://www.tutorial9.net/tutorials/photography-tutorials/depth-of-field-in-photography/>

Shutter Speed (responsible for time/motion or how long the light hits the sensor)

Shutter speeds are measured in seconds and are most often represented in fractions of a second such as 1/60 (a sixtieth of a second). If you do not see a fraction and instead see something like 1" (one second) that means your camera is shooting in actual seconds. Shutter speeds are responsible

for how motion is rendered in your image, it does this by controlling how much time the aperture stays open. Fast shutter speeds freeze motion and slow shutter speeds blur it, each have their aesthetic applications, a good photo isn't always sharp. Sometimes blur gets a point across.

The shutter speed controls the time the digital sensor or film is exposed to the light that travels through the lens when the aperture is open. The higher shutter speed numbers 1/125-1/1000+ are considered fast shutter speeds. They produce short exposure times allowing you to freeze motion and let less light into the camera. For example a shutter speed of 1/125 captures slow movement like a leisurely bike rider but not a car passing by at a normal speed limit. A shutter speed of 500+ would freeze the car's motion and any motion slower than that of the car.

The smaller shutter speed numbers of 1/60 and below are considered slow shutter speeds. They produce longer exposure times causing all motion to blur and let more light into the camera. The handheld rule is 1/60, any shutter speed slower than 1/60 will cause blurring of even a still life because the camera will pick up your movement (i.e. camera shake). **Any shutter speed slower than 1/60 requires a tripod!!!!** This means 1/30 as well !!! Don't be tempted to try and handhold at 1/30 you will not be pleased w/ the outcome if you were trying to capture a sharp image.

F-stops and shutter speeds have a very important factor in common. Each doubles or halves the amount of light of its neighbor. Each shutter speed lets in twice as much light or half as much light as the number above or below it. For example: We'll use 1/60 as our middle number, 1/30 is the number below 1/60 and 1/125 is the number above. **1/60 lets in half as much light or one stop less as 1/30** and twice as much light or one stop more than 1/125. The slower the time the more light is able to hit the sensor because the aperture is held open longer.

1second slow	1/2sec.	1/4	1/8	1/15	1/30	1/60 handhold	1/125	1/250	1/500+ fast
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ISO (responsible for how sensitive the sensor is to light)

Film speed was measured by and ISO/ASA number, this concept has translated to digital cameras. The higher the ISO/ASA number the more sensitive the digital camera's sensor is to light. The "higher" the ISO number the more sensitive the sensor is to light, allowing you to use faster shutter speeds or an aperture you would like to choose. But be aware that dialing up your ISO above 400 can often result in grain, making your image have a noisy texture making it look less sharp.

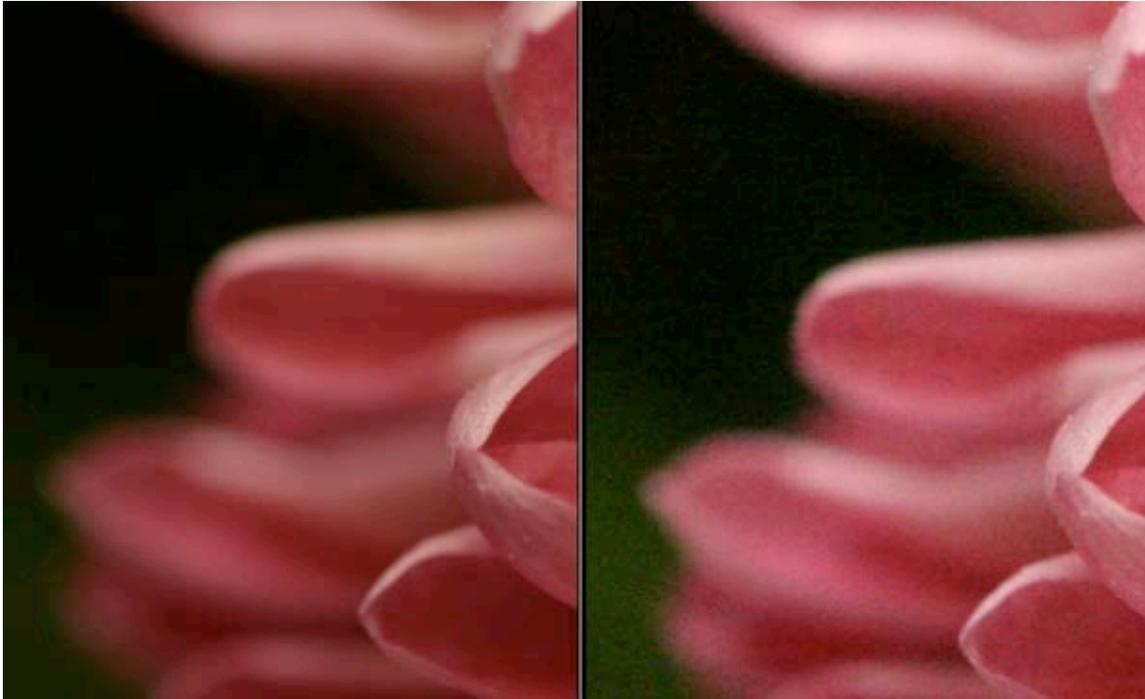
Digital Noise is like film grain and is often referred to as the grain or noise. It resembles small particles of sand or TV noise in your image. The faster the ISO the larger or coarser the grain will appear. So you sacrifice grain, which makes your image less sharp, for sensitivity, which allows you to have more choices for example at a concert in a club you might not be able to handhold or get a shutter speed fast enough to capture the motion of the band, so you might dial your ISO up to 800, you'll be able to get a faster shutter speed but your final image will have noise, especially in darker areas.

Here are some ISOs and their uses:

200 and below – Less sensitive sensor. Best for brightly lit subjects. In dim light it would require a lengthy exposure on a tripod. Produces very fine silky image with optimal sharpness.

400 – Average sensitivity. Best for general outdoor use when you might be shooting in the sun and then suddenly in the shady canopy of a forest. In dimmer light it would require a tripod. Produces some grain but very minimal and still produces sharp subjects.

800 +- Very sensitive. Best indoors or outdoors and in very dim light conditions. Produces noticeably grainy image that appears less sharp because of the grain but allows you more choices when it comes to shutter and aperture settings. Sometimes used for effect because the grain makes the image look older, it gives it a specific aesthetic.



ISO 100

ISO 800

Shooting Modes

<http://www.digital-photography-school.com/aperture-and-shutter-priority-modes>

You have several shooting modes you can use on a DSLR camera and some point and shoot cameras. DSLR cameras are digital single lens reflex cameras, they have many advantages over point and shoots such as better glass/lenses, high quality images, more choices, and RAW file format.

A pictorial icon does not indicate the shooting modes you can use with RAW file format, they are represented by a letter/s. They are:

P (program/automatic mode) this mode chooses your shutter and aperture based on the ISO you have set and the meter reading the camera is getting. If you don't want to make choices, you just want to shoot

S or TV (shutter priority mode, a semi-automatic mode) this mode chooses your aperture based on the shutter speed and ISO you choose as well as the meter reading. If you are shooting action like sports or birds (a personal favorite of mine) this mode is extremely helpful. You choose the shutter speed and ISO you need and the camera fills in the aperture, This makes less for you to think about so you can really focus on that crazy moving subject in front of you, oh wait its behind you, oh man now its over there...see how one less element can make life easier when you are shooting an action shot?

A or AV (aperture priority mode, a semi-automatic mode) this mode chooses your shutter speed based on the aperture and ISO you choose as well as the meter reading. This is helpful when shooting a subject where you know depth of field is the most important element. For example if you are shooting a portrait session with a child, again unpredictable, and you want a shallow depth of field so you choose an aperture of 4, in this mode the camera will fill in the shutter speed. Or if you are shooting a parade and you want a greater range of focus choose an aperture of 16 and let the camera pick your shutter.

Both shutter and aperture priority modes work best when you either:

- A) Can't concentrate on manually setting your exposure in the event of rapidly changing light, unpredictable subjects, or just can't multi-task well, but you know you want a particular shutter speed or aperture.
- B) Don't want the camera to make the choices in auto mode, you want control of one aspect of your exposure.
- C) All of the above

Advanced Applications For Using Manual Mode And Having Complete Control Over Your Subject.

There are some instances that auto or semi modes just won't cut it. This is when Manual shooting becomes important. Some examples are:

- A backlit subject (this makes the background bright and the subject dark, this can be used for effect with silhouettes but if that is not what you want to achieve a manual exposure is needed to expose your subject correctly)
- A subject that has super bright highlights and super dark shadows, sometimes shooting an exposure for the highlights and then another for the shadows and compositing the 2 files together can make a stronger exposure than just a single file, bracketing is helpful for this.
- A reflective surface can often throw your meter off, therefore manually exposing by metering correctly, see below, is important for getting the right exposure.
- When shooting with a light tent or in a studio often using manual mode to overexpose your image by 1 and 2 stops can achieve a better exposure than your meter reading. You can also use the bracketing mode for this.

The Problem w/ Reflected in Camera Light Meters

The problems w/ light meters are that they average whatever light they are aimed at. The meter exposes only for middle gray. Therefore it is important to be conscience about where the meter is pointed. For example, if the subject has dark hair, and the meter is pointed directly at the hair, the reading might be f 4 @ 1/60. If, however the meter were pointed at a highlight area of the same subject, it would indicate that there is a great deal more light since white reflects light and dark areas absorb it. So if the dark haired subject were wearing a white sweater and you pointed your meter at the white sweater it might read f 16 @ 1/60. As you can see it is possible to have more than one different reading depending where you point your light meter. A meter averages all the light, but it only reads the light that is reflected from the area it is pointed. Since the meter is like a computer it only wants to see what it is programmed to see and that is middle gray. Your white shirt will turn out gray and so will your dark hair. You can imagine using the zone system what this will do to the rest of your tones. If black turns to middle gray you won't have any highlight detail and vice a versa. Using a camera automatically gives the power of exposure to the camera. We are only using our cameras manually to learn how to get the pictures we want instead of the pictures the camera wants. You now have the control and will make better decisions than your camera.

Ways to Meter Exposure

Here are some ways to meter:

1. **Take a general reading.** This means you take a light reading of the entire scene, hoping that the light and dark area are balanced. If there are **very large light or dark areas** the reading will be **inaccurate**. If neither light nor dark areas dominate the scene, this system may give an

accurate reading. This method works best in evenly lit situations such as an overcast day. Bright sunny days are high contrast and cause this method to be inaccurate. This method doesn't give you power to choose and is the least desirable.

2. Use a gray card applying the zone system. A gray card is middle gray and is used to reflect the average amount light in the scene. To use a gray card, place it in front of the subject facing the card towards the camera. Take a meter reading off the card only by making sure it is the only thing you can see through your lens. Gray cards are inconvenient and awkward to carry at all times in the field. They become a crutch and don't allow you freedom since you are constantly setting them up and reading. They are best for studio situations.

******3. Using the Zone System More Effectively: Expose for your shadows and compensate!!!!!!!!!!!!!!!!!!!!!!** This is the most accurate system for exposing film. Read the darkest area w/ detail and then compensate. The general rule is:

Take the reading in the darkest area w/ detail and expose 2 stops less

For example, if the meter reading in the darkest area is f4 @ 1/60, then the compensated reading would be f8 @ 1/60. You let in less light for a dark scene and more light for a bright scene. If you have an all white scene and can't decide what is the darkest area take the reading in the lightest area w/ detail and expose 2 stops more.

If shooting a white scene read the white w/ detail and expose 2 stops more

4. Bracket. Bracketing exposures means taking exposures on either side of the meter's recommendations. Unlike equivalent exposures where you change both the shutter and the f-stop bracketing requires that you only change one or the other not both! If the meter reading is f 16 @ 1/250, shoot the exposure at that reading, but also take the underexposed and overexposed readings by either changing your f-stop a whole stop or your shutter speed a whole stop. To underexpose using your f-stops you'd change your reading to f 22 @ 1/250, and overexpose your reading to f 8 @ 1/25. To underexpose using your shutter speeds you'd change your reading to f 16 @ 1/500, and overexpose your reading to f 16 @ 1/125. You can also bracket two stops under and over if you want to be really careful.

This system should always provide you w/ a good exposure but doesn't lend itself to every situation. Action scenes and living beings pose a problem. You should take multiple shots of these scenes but not w/ different exposures because the under or overexposed scene might be your best shot but isn't good print quality. So reserve it for situations you can control.

How to Bracket:

- meter the scene using your camera meter
- set the meter reading
- shoot
- stop down 1 whole stop from the meter reading changing your f-stop or in a strange situation your shutter speed
- shoot
- stop up 1 whole stop from the meter reading changing your f-stop or in a strange situation your shutter speed

5. Incident Light Meters

An incident light meter (generally hand held with a spherical white ball as opposed to a reflective meter that is built into a camera) reads the amount of incident/ambient or available light. Since the incident meter does not read the light reflected from the subject, the subject's reflectance does not affect the exposure reading thus throwing off the exposure. Therefore incident meters are more accurate than an in camera reflected meter. Incident light meters are equipped with two types of light receptor diffusion cover - a round diffuser screwed out the ball is higher than the casing for three-dimensional subjects and the option to screw the ball back w/in a mount or use a flat no ball option for two-dimensional, flat subjects, such as a map or painting.

More Advanced Combining the Controls

Aperture and Shutter Speed Equivalent Exposures

The relationship between the aperture and the shutter speed is one of **sacrifice** and is the key to good exposure. When you choose your depth of field your ability to render motion will be affected and vice versa. This brings us to equivalent exposures. Knowing the power of equivalent exposures gives you **the freedom** to choose how you want your subjects to look and is the first step in finding your photographic vision. Equivalent exposures let in the same amount of light and will produce the same tones but produce differences in depth of field and motion rendering. Say your meter reads 1/30 @ f 16 but you don't have a tripod and are shooting a subject where motion freezing is more important than having the entire scene sharp you can choose to shoot the scene at 1/500 @ f4. Remember the larger the f-stop number the smaller the shutter speed number. Since 1/30 is 4 stops more light than 1/500 and f 16 is four stops less light than f 4 they are equivalent because each lets in the same amount of light. Use your key to illustrate this if you get confused.

Here is an example of some equivalent exposures: 1/30 @ f 16 *great depth of field motion blurred*
1/60 @ f 11
1/125 @ f 8
1/250 @ f 5.6
1/500 @ f 4 *shallow depth of field motion frozen*



small aperture, slow shutter
f 16 @ 1/8



medium aperture, medium shutter
f 4 @ 1/125



large aperture, fast shutter
f 2 @ 1/500

Notice the tones are consistent in the photos above due to equivalent exposure.

Sources Jen Stoker, Henry Hornstein Black and White Photography, A Basic Manual and London and Upton Photography 6th Edition.