

# Digital Photography – Level 2

## ISO, Aperture, Shutter Speed

### The basics of Photography

Ok you now know the basic parts of a camera but you still you still may not understand how it works. We will start to go into the how it works in this level as we dive into these three key elements of photography.

### ISOP

ISO is the digital equivalent (or approximation) of film speed. If you remember buying film for a regular camera, you'd get 100 or 200 for outdoors and 400 or 800 for indoors. The faster the film speed the more sensitive it is to light. All of this still applies to digital photography, but it's called an ISO rating instead.

The advantage of a low ISO is that the light in a given exposure is more accurately represented. If you've seen photos at night, the lights often look like they're much brighter and bleeding into other areas of the photo. This is the result of a high ISO—a greater sensitivity to light. High ISOs are particularly useful for picking up more detail in a dark photograph without reducing the shutter speed or widening the aperture more than you want to, but it comes at a cost. In addition to lights being overly and unrealistically bright in your photos, high ISO settings are the biggest contributors to photographic noise. High-end cameras will pick up less noise at higher ISOs than low-end cameras, but the rule is always the same: the higher you increase your ISO, the more noise you get.

Most cameras will set the ISO automatically, even in manual mode. Generally you can stick with the same ISO setting if your lighting situation doesn't change, so it's good to get used to setting it yourself. That said, sometimes lighting changes enough in dark, indoor settings that letting the camera set it for you automatically can be helpful—even when shooting manually.

### Aperture

Aperture is often the most difficult concept for people to grasp when they're learning how their camera works, but it's pretty simple once you understand it. If you look at your lens, you can see the opening where light comes through. When you adjust your aperture settings, you'll see that opening get bigger and smaller. The larger the opening, or wider the aperture, the more light you let in with each exposure. The smaller the opening, or narrower the aperture, the less light you let in. Why would you ever want a narrow aperture if a wider one lets in more light? Aside from those situations where you have too much light and want to let less of it in, narrowing the

aperture means more of the photograph will appear to be in focus. For example, a narrow aperture is great for landscapes. A wider aperture means less of the photograph will be in focus, which is something that's generally visually pleasing and isn't seen as a downside. If you've seen photographs with a subject in focus and beautiful blurred backgrounds, this is often the effect of a wide aperture. Using a wide aperture is generally considered the best method for taking in more light because the downside—less of the photograph being in focus—is often a desired result.



Aperture is represented in f-stops. A lower number, like  $f/1.8$ , denotes a wider aperture, and a higher number, like  $f/22$ , denotes a narrower aperture. Lenses are often marked with their widest possible aperture. If you see a lens that is a 50mm  $f/1.8$ , this means its widest aperture is  $f/1.8$ . The aperture can always be set to be more narrow, but it won't be able to go wider than  $f/1.8$ . Some lenses will have a range, such as  $f/3.5-5.6$ . You'll see this on zoom lenses, and it means that when the lens is zoomed out to the widest position it will be at  $f/3.5$ , but when it's zoomed in all the way it can only have an aperture as wide as  $f/5.6$ . The middle changes as well, so halfway through the zoom range you'll end up with a widest aperture of about  $f/4.5$ . An aperture range is common with less-expensive zoom lenses, but if you pay more you can get a standard aperture throughout the range.

That's pretty much all you need to know about aperture. The important thing to remember is that a wide aperture, like  $f/1.8$ , lets in more light and provides a shallow depth of field (meaning less of the photo appears in focus). A narrow aperture, like  $f/22$ , provides deeper focus but lets in less light. What aperture you should use depends on the situation and the type of lens you're using, so experiment to see what affects you get and you'll have a better idea of how your aperture setting affects your photographs.

## Shutter Speed



When you press the shutter button on your camera and take a picture, the aperture blades take a specific amount of time to close. This amount of time is known as your shutter speed. Generally it is a fraction of a second, and if you're capturing fast motion it needs to be at most 1/300th of a second. If you're not capturing any motion, you can sometimes get away with as long of an exposure as 1/30th of a second. When you increase your shutter speed—the length of time where the sensor is exposed to light—two important things happen.

1 - The sensor is exposed to more light because it's been given more time. This is useful in low light situations.

2 - The sensor is subject to more motion which causes motion blur. This can happen either because your subject is in motion or because you cannot hold the camera still.

This is fine if you're photographing a landscape at night and the camera is placed on a tripod, as neither the camera nor your subject is going to move. On the other hand, slow shutter speeds pose a problem when you're shooting handheld and/or your subject is moving. This is why you wouldn't want a shutter speed any slower than 1/30th of a second when photographing handheld (unless you're known for your remarkably still hands).

In general, you want to use the fastest shutter speed you can but there are plenty of circumstances where you'd choose a slower shutter speed.

The important thing to remember is a slow shutter speed means more light at the risk of motion blur. A fast shutter speed means low risk of motion blur while sacrificing light.

## **Digital Photography Level 2 Requirements**

- 1 – What is ISO?
- 2 – What is as aperture setting and what is it used for?
- 3 – Why is shutter speed important?