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Exposure

Exposure is the most basic of photographic concepts, and one you'll be working with throughout your photography career. Exposure is about how much light gets to your sensor, and therefore how bright or dark your image is.

People get all boggled up about this concept, but it's really quite straightforward. There are three things in your camera that you can control to change exposure; Aperture, Shutter Speed, and ISO.

The aperture is an adjustable device which operates like the iris of your eye, opening or closing to let in more or less light. One confusing thing about aperture is that the numbers we use to talk about it, "f-stops" work opposite the way we might expect. Large numbers mean small openings and vice-versa. We just need to know that, I'm afraid.



Your camera's shutter opens and closes to let light in, sometimes very quickly. You might think of it like a curtain. The shutter speed is expressed in seconds (or fractions of seconds). As you'd expect, the longer the shutter is open, the more light reaches your sensor.

Finally, ISO is an expression of how sensitive your sensor is to light. Higher ISOs allow you to shoot in darker environments. The trade-off is that higher ISOs will create more unattractive "noise" in your image. One of the greatest advantages of newer cameras is that sensors have rapidly gotten better, allowing photographers to capture lower light scenes with much less noise.

You'll see something called the "Exposure Triangle" talked about by some teachers. In my experience this concept is not helpful. I'd suggest you ignore it.

In practice, there are many combinations of the three which give identical exposure. For example, each combination of aperture and shutter speed in the figure below results in the same exposure.

Shutter Speed	1/500	1/250	1/125	1/60	1/30
Aperture	f/4	f/5.6	f/8	f/11	f/16

The decision about what combination to use has to do with your intention in creating an image. For example, you'd use a fast shutter speed if you want a moving subject to appear sharp (some people refer to "stop action"). Sports and moving wildlife are often shot this way. A slow shutter speed might be used to make falling water look "soft," or to show the apparent motion of stars in the night sky. If one of these was your goal, you'd likely choose a shutter speed and work your f-stop and ISO setting around it, in order to create the desired exposure.

Your choice of aperture depends on how much of your image you'd like in focus. You might choose large aperture (e.g. f/2.8), for example, if you were making a portrait and would like the background to be soft and blurry. This would draw the viewer's attention to the subject. Landscapes are often photographed with small apertures (e.g. f/16) in order to render a scene in focus from front to back.

The best way to think about ISO choices is that you'd like your ISO to be as low as possible. High noise is almost never desirable; rather it is sometimes an unpleasant side-effect of other choices.

Exercise

Take a series of images of the same subject (mounting your camera on a tripod will help here), and manipulate each of the three components of exposure one at a time. Notice the lightening and darkening of the image.

Then, manipulate two parameters at a time, one to increase light and the other to decrease it. For example, increase the shutter speed (less light) and increase the aperture (more light; smaller f-stop number). Try all six combinations and watch your exposure meter as you make the changes.