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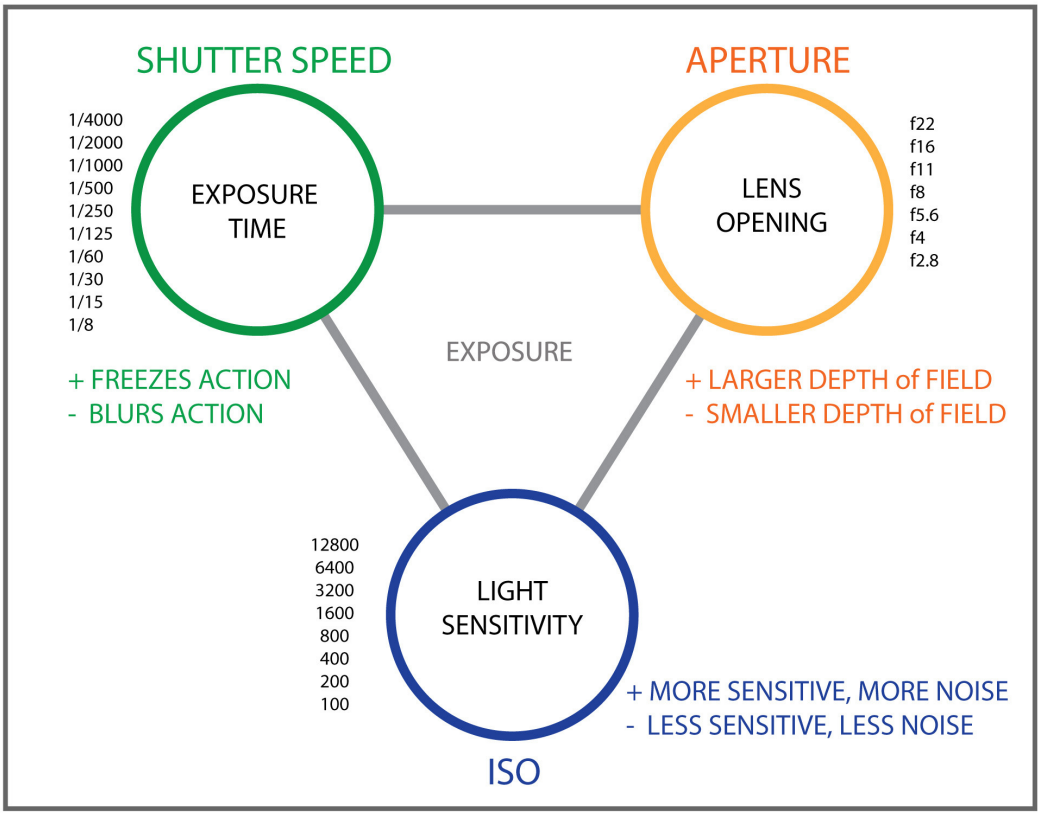
Master the Exposure Triangle

to improve your cat photography

When I first started taking photographs years ago, I quickly stumbled upon my limited knowledge I had about the relationship between the technical side (and variables) of a camera and the aesthetic results of a photograph.

I believe that every photographer should understand this relationship and realize that every technical decision he or she makes about camera settings also has an important aesthetic result and thus that those results can be controlled.
The choices you have to make as a cat photographer will get easier when you master the exposure triangle, because you'll understand exactly what setting you're choosing—and also what you're giving up with that choice—with respect to the aesthetic of the image.

The exposure triangle is the relationship between the three elements that influence the exposure of a photograph: **the ISO, the shutter speed and the aperture**. These three components work together to create a specific exposure for every photograph:



When you change one element of the exposure triangle, the exposure of the picture will change.
This also means that if you want to keep the same exposure of a picture, and when you adjust one element of the exposure triangle, another element has to change also to compensate for this change.

When you want to understand the exposure triangle it is paramount to always remember this cause and effect relationship.

For example, if you increase the ISO with one stop (doubling the sensitivity), and you increase the shutter speed with one stop (halving the exposure time), then the total exposure of the picture stays the same.

Before we get into the details and specific technical examples about understanding the exposure triangle, let's first make sure we understand each of the three elements – ISO, shutter speed and aperture.

This is what happens when we take a picture: When we push the shutter button, the shutter of the camera opens, light enters the camera and hits the camera sensor for a certain amount of time.

This exposure of the sensor to this light creates an image.

If there is too much light hitting the sensor, the image will get overexposed (resulting in white spots or even a complete white image). And if there is not enough light, entering the camera and hitting the sensor, the photograph will be underexposed, or even in worst case completely black.

There are three basic parameters we can adjust on our camera to control how much light gets in the camera: the ISO, the shutter speed and the aperture.

It is essential to realize that each of these parameters have an influence on a specific **aesthetic characteristic** of the photograph.

ISO

The first parameter is the ISO, a term from the film photography days which refers to **film sensitivity** to light.

A camera setting of ISO 100 is low, which means a low sensitive to light, while a camera setting of ISO 3200 is rather a high ISO, meaning a high sensitivity to light.
The lower the ISO, the lower the sensitivity of the sensor, and thus the more light you'll need to let in through the lens and shutter to get a correct exposure.

The higher the ISO, the less light you'll need to let into the camera to get a correct exposure.

But there's **a "little" give and take here**: the higher the ISO, the **grainier** (noisier) the picture will look, which is in general to be considered as a bad thing.

Just remember that a lower ISO number gives a cleaner looking photo, so I prefer to set the ISO as low as possible. This means there will be less grain or noise. However, also know that high grain or noise is sometimes used as an artistic effect too.

APERTURE

The second way to control the light is via the aperture in the lens.

When we change the aperture setting of the lens on the camera, we adjust the opening of a diaphragm inside the lens and this way we control the **quantity of light** that can enter the camera en hit the sensor.

The aperture is measured by a number, which is also called the f-stop.
F/1.8 is a very large opening despite it's small number.
F/22 is a very small opening despite it's large number.

A large opening lets in more light, and a small opening lets in less.

There is also **a little give and take here**:

without explaining the optical theory behind this effect, it is important to remember that when we have a smaller opening, the tighter hole will focus the light much more than when we have a larger hole.
This lower opening results in a larger depth of field.

The **depth of field (DoF)** is the distance between the nearest and the farthest point at which the image appears to be sharp and in focus.
With a large aperture, and a large opening, the depth of field will be less, meaning that there will be less focus in the picture.

This means that controlling the light with the aperture also means controlling the quality of focus.

This effect of being in focus or not (bokeh) has a serious aesthetic consequence, that we can control by setting the aperture.

SHUTTER SPEED

The third way we can control light is with the shutter itself.

The shutter is like a curtain, between the sensor and the lens, hiding the sensor from light until we press the shutter button.
When we push the shutter button, the shutter opens across the sensor for a specified amount of time, exposing the sensor to the light coming through the aperture in the lens, which is more or less sensitive to light depending on the ISO we've set.
It is clear that the longer the shutter is open, the more the sensor is exposed to light.

There is also a give and take here!
Fast shutter speeds will freeze action because the sensor sees that action for such a brief fraction of time. 1/1000 of a second is pretty quick.
Slower shutter speeds, like 1/15 of a second can blur action because the shutter is open longer and sees more movement in that time, recording it as a blur.

If we understand this effect, we can select a high enough shutter speed to freeze action if we want to or choose a low shutter speed if we deliberately aim for a blurry effect.

CAMERA MODES

On a DSLR camera, we can select the sensitivity of the sensor (ISO) and also different automatic photographing modes that will determine which parameter we willing to control.

On a NIKON camera these modes are:

Aperture Mode (A): we set the aperture to the f-stop that we want, depending on the aesthetic effect we are looking for (small or large depth of field) and the camera will automatically calculate, taking into account the set ISO, the required shutter speed in order to get a correct (average) exposure.

Shutter Speed Mode (S): we set the shutter speed to our liking, depending on the aesthetic effect we are looking for (blurry or freezing action) and the camera will automatically calculate, taking into account the set ISO, the required aperture in order to get a correct (average) exposure.

So these are the basics you need to understand about the exposure triangle. The three parameters work together and where you push the camera in one way, it will demand a little pull in another.

In choosing what you want the photograph to look like, if your first priority is a fast shutter speed (1/1000), then you will have to use either a much larger aperture (f/1.8) or, if you also need some depth of filed (more focus) and need, say, f/8 to do this, then you'll also need a higher ISO.

Remember when you change the control of a parameter, this always mean halving or doubling the amount of light.

So try and experiment : practice makes perfect!