## DIGITAL PHOTOGRAPHY WORKSHOP

DIGITAL SINGLE LENS REFLEX CAMERA (DSLR)

- Through-the-lens viewing and focusing. You see what the lens sees.
- When you look through the viewfinder, light passes through the lens and onto a mirror, which bounces the image to your eye.
- When you press the shutter release to take the picture, the camera body flips up the mirror and opens the SHUTTER (like curtains), exposing the light sensitive surface [image sensor].
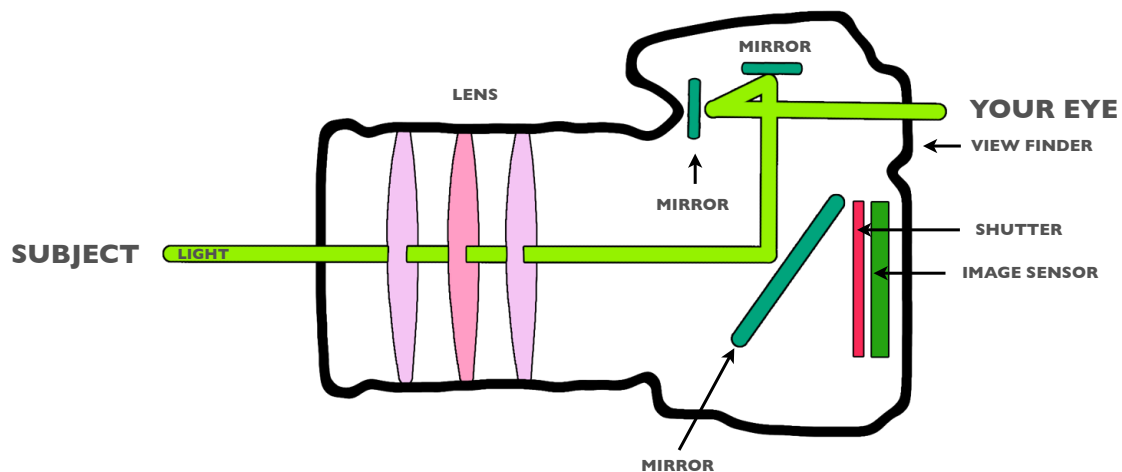
EXPOSURE

Exposure is the total amount of light allowed to register on the camera's image sensor during the process of taking a photograph.

You control how much light reaches the image sensor by adjusting the following 3 exposure settings:

1. APERTURE: the amount of light that is allowed into the camera by changing the diameter of the opening in the lens
2. SHUTTER SPEED: the length of time (duration) light is allowed to pass through the shutter and onto the image sensor
3. ISO: the sensitivity of the image sensor to light - how quickly the image sensor reacts to light

When these 3 factors are properly balanced one receives a 'normal' or 'correct' exposure. So how do you know when you have balanced the 3 settings…

LIGHT METER: HOW TO MEASURE EXPOSURE

When you look through the viewfinder of your camera, you will see a small illuminated indicator called a LIGHT METER.

UNDER EXPOSED   CORRECTLY EXPOSED   OVER EXPOSED

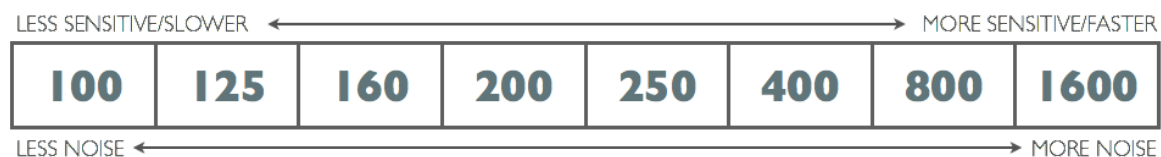-2 ●●1●● ▼ ●●1●●+2   -2 ●●1●● ▼ ●●1●●+2   -2 ●●1●● ▼ ●●1●●+2
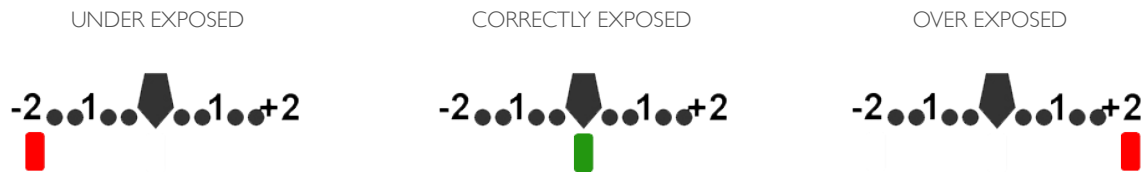
The LIGHT METER takes aperture, shutter speed, and ISO into consideration and creates a 'reading' of the lighting situation, telling you if the image sensor will receive too much, too little, or just the right amount of light to make a good image. An image that receives too much light is overexposed (light/white) and an image that receives too little light is underexposed (dark/black).

Tip: when you are out photographing, it will be easier to balance your light meter when there is a good amount of light around you: for instance, outside on a bright, sunny day.

ISO (International Standards Organization)

- ISO is a function of the image sensor located in the camera body.
- ISO is responsible for gathering light and transforming it into an image.
- ISO is the level of sensitivity of your camera's image sensor to available light.

LESS SENSITIVE/SLOWER ←————————————————→ MORE SENSITIVE/FASTER

100	125	160	200	250	400	800	1600

LESS NOISE ←————————————————→ MORE NOISE

ISO → IMAGE QUALITY

Higher ISO values allow you to capture images in low-light environments without having to use a flash, but higher sensitivity comes at an expense – it adds grain or "noise" to the pictures. Therefore, always try to keep your ISO setting as low as possible to get the best image quality.
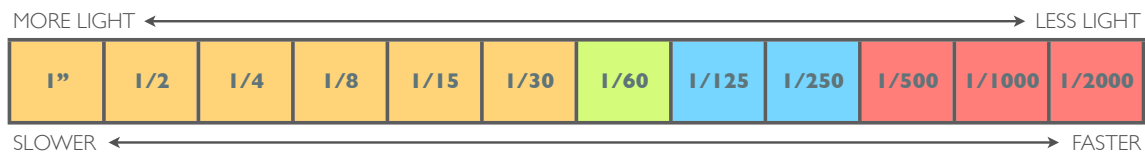
- The LOWER the value of the ISO, the LESS sensitive the sensor is to light
- The HIGHER the value of the ISO, the MORE sensitive the sensor is to light

SHUTTER

- The shutter is a function of the camera body.
- The shutter works as a shield to protect the image sensor from light until you press the shutter release button.

SHUTTER SPEED

- The duration of time that the shutter remains open is called SHUTTER SPEED.
- SHUTTER SPEED is measured in seconds and fractions of seconds.
- Generally, 1/60th of a second is the slowest shutter speed at which one can hold the camera in hand without causing camera shake/blur. Anything slower than 1/60th of a second should be shot with a tripod if blur is not desired.

MORE LIGHT ←————————————————————————→ LESS LIGHT

| 1" | 1/2 | 1/4 | 1/8 | 1/15 | 1/30 | 1/60 | 1/125 | 1/250 | 1/500 | 1/1000 | 1/2000 |

SLOWER ←————————————————————————→ FASTER

Note: a quotation mark next to shutter speed value indicates a whole second
(for example, 1" = 1 second).

SHUTTER SPEED → MOTION

The SHUTTER affects the amount of MOVEMENT rendered in an image.

- The **FASTER** the shutter speed, the better we are able to **FREEZE** motion (Frozen motion = photograph depicts a moving subject without any blur)
- The **SLOWER** the shutter speed, the better we are able to **CAPTURE** motion (Capture motion = photograph depicts a moving subject by showing blur)

Depending on your specific subject, you have to judge the most appropriate shutter speed for the occasion. Some guidelines for getting started:

- 1/500th of a second or faster, in most cases, will likely freeze motion
- 1/125th of a second or slower, in most cases, will produce motion blur

Say for instance you are photographing a car that is moving at 55 mph. In order to freeze its motion, you have to go very fast with your shutter speed. On the other hand, if you are photographing someone running at 5mph, you can get away with a much slower shutter speed yet still freeze the motion. Selecting speeds comes with practice; there is no specific rule that can apply to all situations.

APERTURE

- The APERTURE is the hole or opening inside the lens. Changing the aperture setting will either open the aperture wider to allow in more light or will close the aperture making the opening smaller so that less light is allowed in.

- The APERTURE functions similarly to the HUMAN EYE. When there is little light, our pupils dilate in order to allow the maximum amount of light to enter. When there is much light, our pupils shrink to accommodate the amount of light.

- Aperture is measured in F-STOPS, which correspond to the different sizes of the openings.
    - The LOWER the f-stop number, the BIGGER the APERTURE opening
    - The HIGHER the f-stop number, the SMALLER the APERTURE opening

MORE LIGHT ⟵————————————————⟶ LESS LIGHT

f2   f2.8   f4   f5.6   f8   f11   f16

LESS DEPTH ⟵————————————————⟶ MORE DEPTH
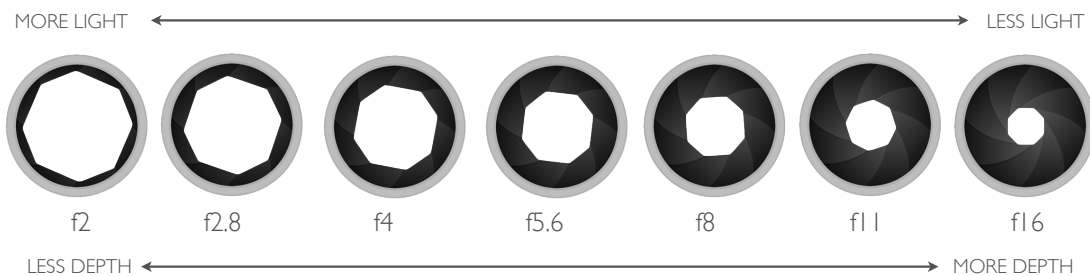
APERTURE → DEPTH OF FIELD

The APERTURE affects the DEPTH OF FIELD (DOF) in an image, meaning how much in front of and behind the subject appears in FOCUS.

- As we OPEN UP the aperture (lower f-stop values), we are reducing the amount of DOF in the image (known as shallow DOF or selective focus):
    - SHALLOW DOF can be recognized by the amount of blur that is in front of or behind the main subject
    - SHALLOW DOF can create focus on a subject, isolating it from a distracting or undesirable background

- As we CLOSE DOWN the aperture (higher f-stop values), we are increasing the amount of DOF in the image (known as deep or long DOF):
    - DEEP DOF can be recognized by the amount of sharpness that is throughout an image
    - DEEP DOF can aid in providing more detail and information in an image