

Low light photography

ISO

and the double triangle



AIM

To provide an understanding of ISO and potential use in low light

Potential problems and benefits

What other options are available?

How to adjust ISO



Exposure is about capturing the
light



What makes up an exposure?

Shutter speed

How long the sensor is exposed to light

Aperture

The size of the opening to let in the light

ISO

How much the available light is amplified

Shutter speed

Shutter speed

How long the sensor is exposed to light

Depending on if you want to freeze or blur action is a key factor in selecting a shutter speed



30 = 1/30 of a second while **30''** = 30 seconds

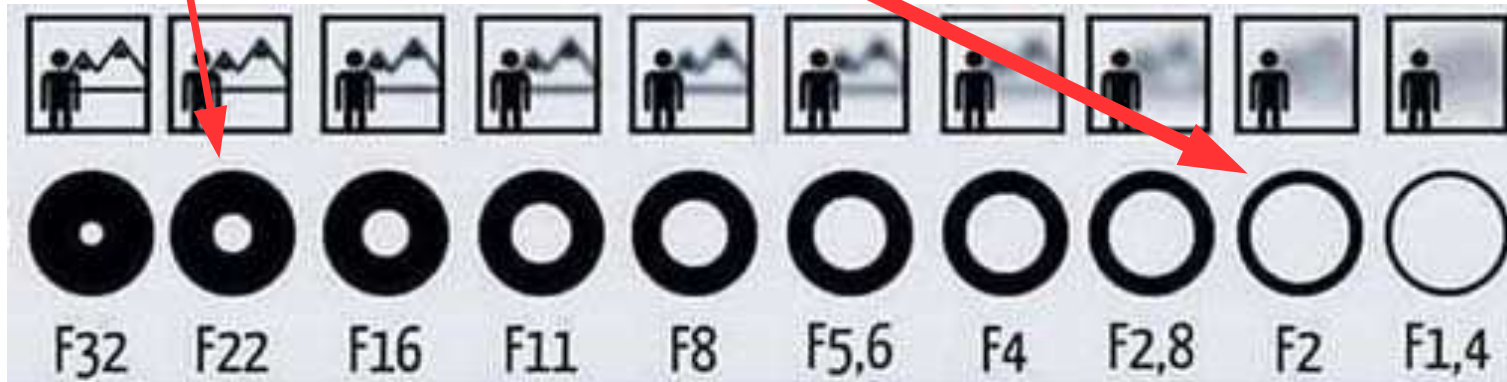
Aperture or F stop

Aperture or F Stop

The size of the opening to allow light to strike the sensor or film

The LARGER the opening the quicker light enters the camera

The smaller the opening, the longer it will take for a correct exposure, this allows for more detail and depth of field



ISO or light amplification

ISO not iSO

Is an **International Standards Organization** value that measures the sensitivity of the image sensor

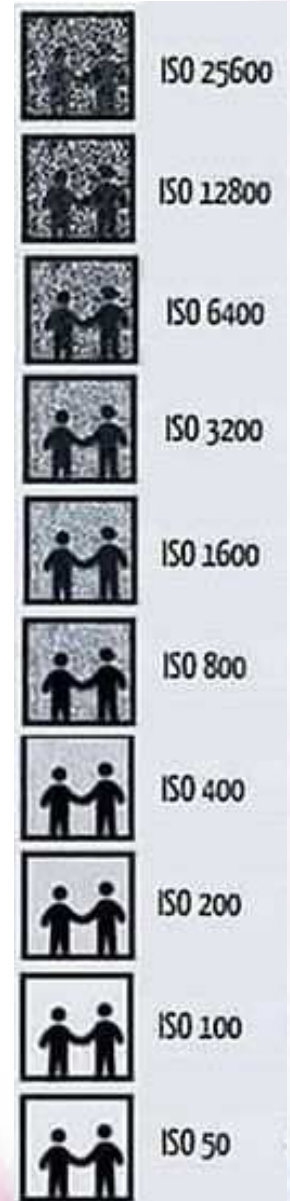
The higher the number the more sensitivity

Increasing the sensitivity increases digital noise

Current DSLR's have less noise at higher ISO

What is the best ISO?

- **The one that allows you to get the image you are trying to achieve**



640 ISO, F8, 25 seconds



With increased ISO, digital noise is visible above the Mountains on the left

3200 ISO, F5.6, 1/500 second



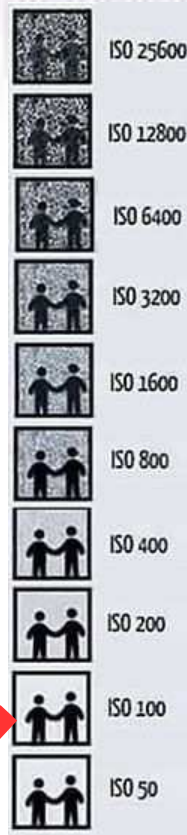
High ISO was used for stop action in low light and this is **as shot**

3200 ISO, F5.6, 1/500 second

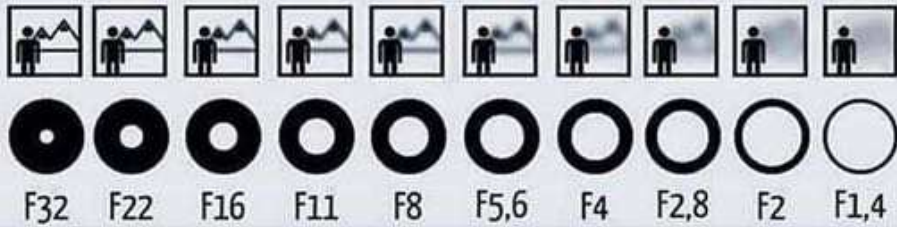


High ISO was used for stop action in low light and this has had **noise reduced**

Understanding the Exposure Triangle

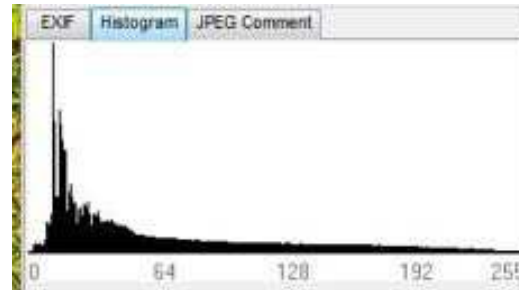


When more light is required the triangle can be changed

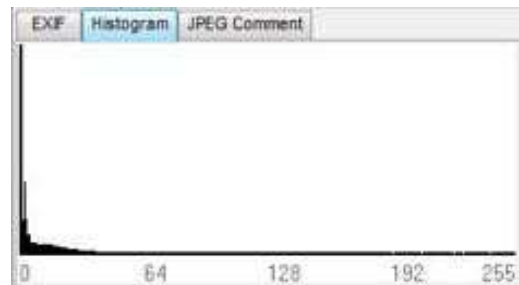


Available light, and your artistic vision will shape your Exposure Triangle

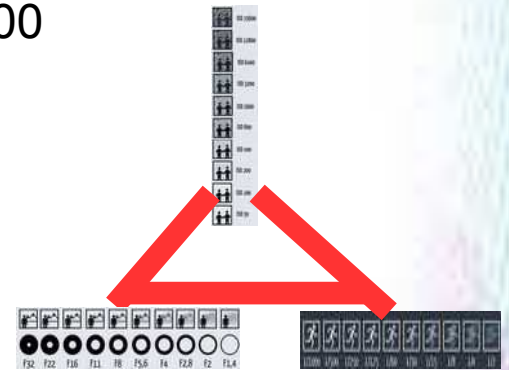
Using the Exposure triangle



Exposure time 30 Sec (30")
Program Mode Manual
F number F8
ISO 200



Exposure time 4 Sec (4")
Program Mode Manual
F number F8
ISO 200



Same subject, same light, different amount of light capture time

The light meter your friend



Understanding your settings



What is this reading telling you?

Can you hand hold this long?

What will DOF look like?

Avoiding shake

Adjust the exposure triangle to deal with hand held shake, or add a tripod (**the other triangle**) to expand possibilities, while controlling the use of HIGH ISO



Can you adjust your camera in this light?



Adjusting ISO

External controls



Internal menus



Custom quick access menu



Planning shots with low ISO



ISO 200, F25, 6 seconds



ISO 200, F25, 15 seconds



ISO 200, F25, 30 seconds

Setting up a practical exercise

- To demonstrate how ISO can be used in different situations.
- Set your **camera on a tripod for stability** hand hold if no tripod is available.
- **Focus on subject. If camera does not focus**, turn off auto focus and manually focus.
- Set your **camera to Manual (M) mode**. This allows controlling the camera settings.
- **Select F8 or higher**, we want good depth of field
- Set **Shutter speed to highest** (over 1/500th) **value** – we want to set up for stop action.
- Set **ISO at lowest value** (100 – 200 ISO) – this produces no or low noise images.
- **Look at your light meter** (is it visible if so what does it tell you) or **take a picture**
- Was there any indication that exposure (Shutter speed, F stop or ISO) should be changed?

Look at your image

Was the image under exposed?

- If yes, what might we do if we need $F8$ (**Good LARGE DOF**) and
- the high shutter speed? (**Stop action**)

OPTIONS - Now it is time to look at the exposure triangle

- You could use a **slower shutter speed**
- You could use a **smaller F stop number**
- You could increase ISO to amplify the available light, while retaining your other settings

Let's increase ISO to see if a correct exposure is possible.

Is the quality of the image acceptable to you?

Was the image over exposed?

What might you change to achieve the result you were looking for?

The options

- Adding **ISO amplifies light** but also **increased digital noise** this should be the last option.
- Using a **different shutter speed** that may or not introduce **blur or unwanted signs of motion**.
- Using a smaller or LARGER number **F Stop** that may or not affect the **amount of depth of field**
- ***Are you limited by hand holding the shot?*** Shutter speed should 1.5 times the focal length, to eliminate hand held shake.
- ***Use a tripod***, explore the Exposure Triangle ***take amazing images in low light with low ISO***

Thank you for your attention

Any questions