

Digital Photography

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Standard Compact & Compact Zoom

- ▶ Great for light use & Travel
- ▶ Small in Size
- ▶ Compact Zoom has adjustable lens
- ▶ Advanced Compacts offer Shock Resistance and Waterproofing



Compact Systems (Mirrorless)

- ▶ Middle ground between Compact Cameras and Standard DSLR
- ▶ Good for most use cases – Interchangeable Lenses
- ▶ Lightweight and still able to take quality photos
- ▶ Cost vs Quality – High



DSLR

- ▶ What most people think of when they think Enthusiast Photography
- ▶ Takes High Quality Photos
- ▶ Interchangeable Lenses
- ▶ Customization of settings (ISO, Aperture, Shutter Speed)
- ▶ Cost High, but Quality Photos makes up for the cost
- ▶ Can range from \$400-\$3000.
- ▶ Technically just the body, but most come with a standard lens (18/55mm)



Choosing the Right Lens

- ▶ Lenses are limited to Brand of Camera (i.e. Nikon cannot use Cannon Lenses and vice versa)
- ▶ Defined by their Focal Length (standard 18/55mm)
- ▶ A smaller focal length will capture more of the scene, while a larger focal length will bring the subject in close

Standard Lens

- ▶ 50mm give or take is the standard focal length for lenses
- ▶ Good for most use cases
- ▶ Most come in a kit with the DSLR camera body

Fish Eye Lens

- ▶ Used for action sports and for taking photos of things close up while keeping peripherals in view.
- ▶ Distorts the image to look like your viewing the world through a fish bowl.
- ▶ Any lens that has a less than 14mm focal length can be considered a Fish Eye.



Wide Angle Lens

- ▶ Ranging from 14-35mm focal length
- ▶ Ability to take in everything at detail within a shot
- ▶ Used mostly for Landscapes (Perfect for getting the right shot at the Look Out Point on your next vacation).
- ▶ don't offer much by the way of zoom

Telephoto Lens

- ▶ The range on these lenses varies from about 70-200mm, but can go to as much as 300mm or more!
- ▶ Allow you to take super close detailed pictures while being very far away.
- ▶ Want to snap a photo of a pride of lions without being mauled, grab a telephoto.
- ▶ Some will even zoom on an object more than a mile away!
- ▶ Portraits are generally taken with shorter telephoto lenses typically ranging from 50-105mm (Ideal for Weddings)
- ▶ https://www.youtube.com/watch?v=2pHcy_hk6FY



Crop Factor (Full Frame Equivalent)

- ▶ Although a lenses focal length may say that it is, for example, 18-55mm, these numbers cannot be directly compared across different formats as the actual angle of view you capture is determined by the imaging sensor.
- ▶ The most common of these imaging sensors are Full-Frame, APS-C, and Micro Four Thirds (MFT).
- ▶ In order to know what one format compared to the other we have to convert these focal lengths into a standard
- ▶ The Industry Standard is called the Full Frame Equivalent, which we calculate using a formats crop factor (the ratio of a cameras sensor size to 35mm film frame).

Crop Factor (continued)

- ▶ Most APS-C sensors have a crop factor of 1.5x, which means if you multiply a lens' focal length by 1.5, you will get the full frame equivalent focal length of that lens. (Canon is an oddball here, with a crop factor of 1.6x on its APS-C cameras.) For example, an 18-55mm kit lens on a Nikon D5600 will have a full-frame equivalent focal length of 27-82.5mm. The Micro Four Thirds format is a bit smaller than APS-C and has a 2x crop factor, so a 14-42mm MFT lens will have an equivalent focal length of 28-84mm. Notice anything about those numbers? Exactly: An 18-55mm APS-C lens provides just about the same field of view as a 14-42mm MFT lens.
- ▶ Across manufacturers and formats, **basic kit lenses cover roughly equal zoom ranges and fields of view**

Filters

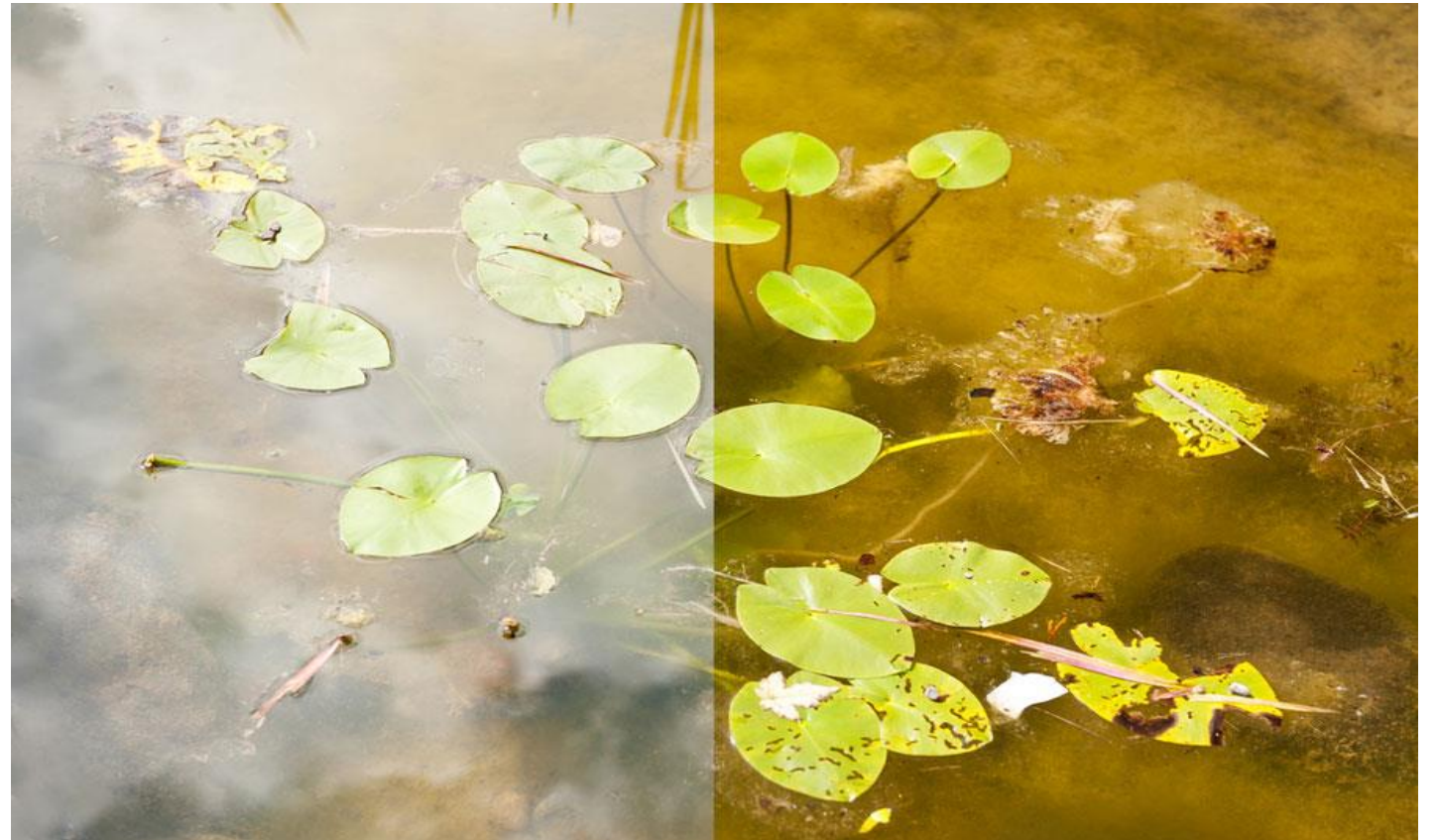
- ▶ Filters are used for many different things, from correcting or enhancing colors, ensuring accurate exposures, and simply protecting the lens from scratches and other harms.
- ▶ Are generally rather cheap.
- ▶ Common Filter Types: UV/Skylight | Polarizing | Neutral Density | Color Correcting

UV / Skylight Filters

- ▶ Protective UV and skylight filters are often used to protect the front element of a lens against moisture, dirt, and scratches, which makes them ideal for shooting in wet, dusty, or muddy environments
- ▶ Skylight filters are every photographer's best friend when shooting under a clear blue sky. They can reduce the excessive blue cast that often appears in photographs taken outdoors. They can also keep skin tones free of color reflections from objects that are around the subject.
- ▶ Keep in mind, however, that with a skylight filter as your lens' protection, the image quality of your photos may be compromised as it can intensify lens flares that tend to add a color tint and reduce image contrast.

Polarizing Filters

- ▶ Polarizing filters, pretty much like sunglasses, add depth to an image by saturating its color and reducing reflections.
- ▶ Polarizers are best for shooting landscapes. They darken skies and make colors pop, as well as eliminate glare and reduce reflections on glassy or water surfaces.



Neutral Density Filters

- ▶ Neutral density (ND) filters are sheets of dark-colored glasses that reduce the amount of light that enters your lens and hits to the sensor, but without affecting the color of the resulting image. This includes excess sunlight and powerful light from studio flashes.
- ▶ By reducing the intensity of incoming light, this filter allows you to shoot with slower shutter speeds without overexposing your image.



Color Correcting Filters

- ▶ Color correcting filters, also known as cooling and warming, color conversion, or color compensating filters, are used to correct and/or enhance the color of your scene.
- ▶ Warming and cooling filters are great for correcting indoor lighting and making your scene look gloomier or sunnier.
- ▶ other colored filters are great for bringing out certain hues in a scene.

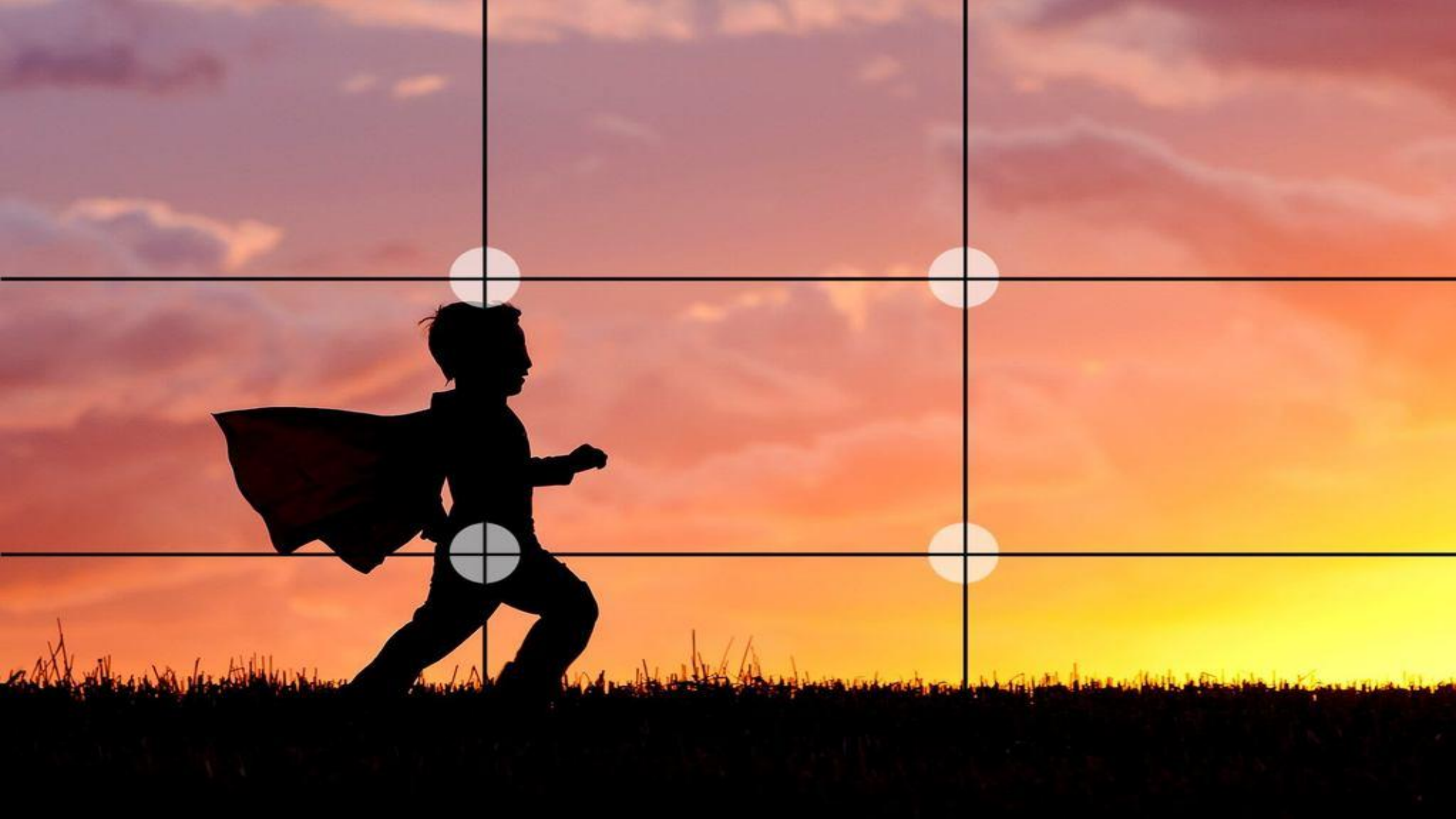


Framing the Perfect Picture

- ▶ A good photograph creates depth, and there are many ways to achieve that including: light and contrast, colors, movement, a solid composition, and depth of field.
- ▶ Try and include one of these aspect, at least, in every photo that you take.
- ▶ One of the most important things you can do to take a great photo is to avoid flat lighting.
- ▶ Some areas should be lighter and some should be darker, much like a painting has negative space to bring out the portions that have positive aspects to them.
- ▶ If you like taking landscape pictures then you look for what is called the magic hour, at dusk at dawn.

Framing the Perfect Picture (Rule of Thirds)

- ▶ The most important thing is composition, using a foreground, middle ground and background in an image.
- ▶ Try adhering to the Rule of Thirds to get that perfect picture in frame
- ▶ The rule of thirds breaks the image up into nine equal squares. Where the lines intersect we call these Points of Interest. The rule works by placing your subject, and other elements, along the lines and at the points of interest. Most cameras will have the option to overlay this grid on the viewing screen, so turn it on if that helps. The human eye is naturally drawn to these points of interest.





Three Kings of Exposure (Exposure Triangle)

- ▶ ISO, Shutter Speed, and Aperture, the Three Kings of Photography are the keys to taking your photographing skills to the next level.
- ▶ Most new DSLRs will come with an auto mode that will calculate all this for you
- ▶ To take professional quality photos these are things that you will learn to change and manipulate on the fly

Shutter Speed

The length of time a camera shutter is open to expose light into the camera sensor. Shutter speeds are typically measured in fractions of a second, when they are under a second. Slow shutter speeds allow more light into the camera sensor and are used for low-light and night photography, while fast shutter speeds help to freeze motion. Examples of shutter speeds: 1/15 (1/15th of a second), 1/30, 1/60, 1/125.

Aperture

A hole within a lens, through which light travels into the camera body. The larger the hole, the more light passes to the camera sensor. Aperture also controls the depth of field, which is the portion of a scene that appears to be sharp. If the aperture is very small, the depth of field is large, while if the aperture is large, the depth of field is small. In photography, aperture is typically expressed in “f” numbers (also known as “focal ratio”, since the f-number is the ratio of the diameter of the lens aperture to the length of the lens). Examples of f-numbers are: f/1.4, f/2.0, f/2.8, f/4.0, f/5.6, f/8.0.

ISO

A way to brighten your photos if you can't use a longer shutter speed or a wider aperture. It is typically measured in numbers, a lower number representing a darker image, while higher numbers mean a brighter image. However, raising your ISO comes at a cost. As the ISO rises, so does the visibility of graininess/noise in your images. Examples of ISO: 100, 200, 400, 800, 1600.

Working Together to Create an Exposure

When we point our camera at a subject and hit the shutter button, the subject gets into the lens as a form of light. If the subject is well lit plenty of light then travels into the lens, and vice versa.

When the light enters the lens, it passes through glass elements and then passes through the Aperture.

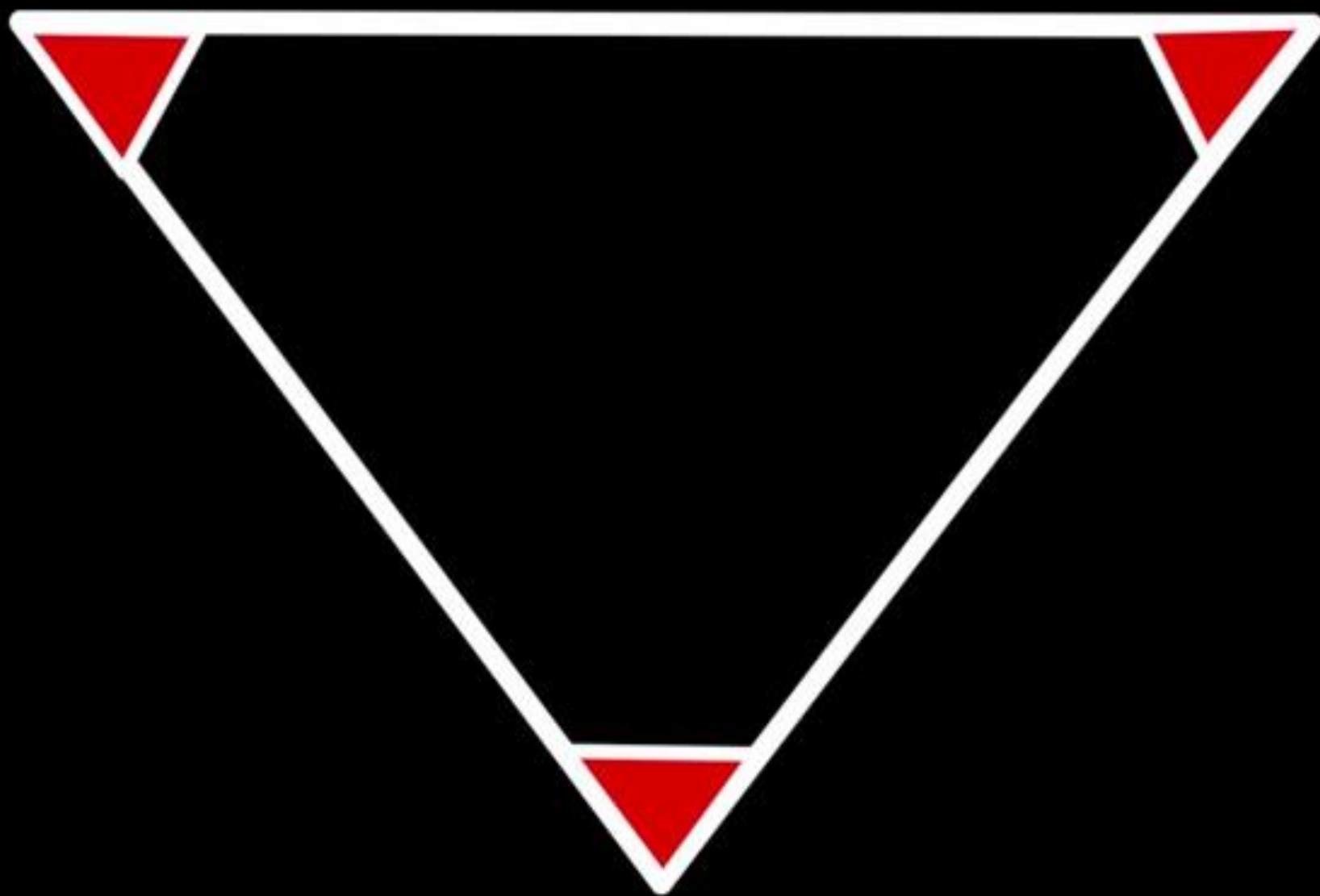
Next it hits the shutter curtain, which is like a window that opens when needed and can open within a matter of milliseconds. This time is called the Shutter Speed.

The sensor then gathers light and your ISO brightens the image if necessary, the shutter is then closed and light is blocked from reaching the camera sensor.

To get the image properly exposed, so that it is not too bright or too dark, Shutter Speed, Aperture and ISO need to play together.

Shutter

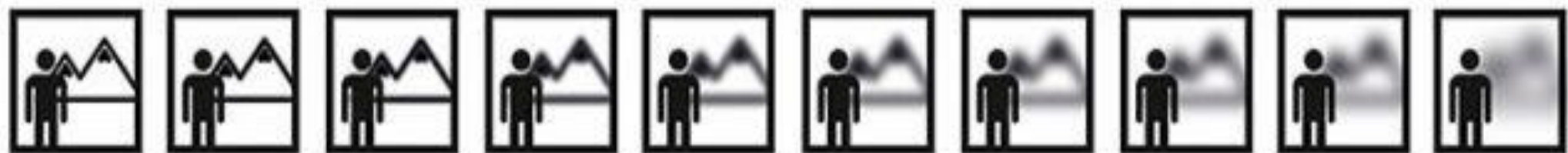
Aperture



ISO

Aperture

small aperture



F32 F22 F16 F11 F8 F5,6 F4 F2,8 F2 F1,4

large aperture

Shutter

fast shutter speed



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

slow shutter speed

ISO

low sensitivity



ISO 50 ISO 100 ISO 200 ISO 400 ISO 800 ISO 1600 ISO 3200 ISO 6400 ISO 12800 ISO 25600

high sensitivity

Getting Your Photos off Your Computer

- ▶ Most cameras use SD cards to store all of the photos on
- ▶ Some computers come with a reader preinstalled, but you can pick them up at your local stores for \$20 or so
- ▶ If your camera doesn't use a Micro SD then it uses internal storage which can be accessed with the micro-USB that came with the camera for charging. Simply plug the regular USB end into a computer to easily access your photos.

Getting Your Photos off Your Computer (Cont)

- ▶ Photos are stored as either .PNG or .JPEG.
- ▶ JPEG files have different compression types so it can be lower quality than a PNG (PNG is lossless compression)
- ▶ Sometimes you can change your file type to a .TIF file but this requires a high end camera and a large storage space as these are raw uncompressed files offering the highest fidelity.

Getting Your Photos off Your Computer (Cont)

- ▶ When you plug in your SD card or camera the file explorer (windows) or finder (mac) will open and you will be presented with the file tree of your storage space.
- ▶ All your photos live in the DCIM (Digital Camera Images) folder, which is the standardized directory name for a cameras file system.
- ▶ From here it is a simple drag and drop process to get the images off your camera and onto your computer.
- ▶ After you are done feel free to delete the photos from your cameras storage as you will need it to take more pictures.

Post Processing

- ▶ Post-Processing includes anything you do to the photo after you take it.
- ▶ Usually this is done on a computer program such as Adobe Light Room or Photoshop
- ▶ A free alternative is GIMP (steep learning curve).
- ▶ These will allow you to crop, change dimension sizes, change color washout, and remove red-eye as well as many other things.