

DIGITAL PHOTOGRAPHY BASICS FOR BEGINNERS

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These notes are free to use by anyone learning or teaching photography.

1. Choosing a camera - there are 2 main types of compact cameras

A) **Point and Shoot Camera** (some have interchangeable lenses most don't) - you view the scene on a liquid crystal display (LCD) screen, some cameras also offer viewfinders.



B) **Single Lens Reflex (SLR)** - cameras with interchangeable lenses let you see the image through the lens that is attached to the camera. What you see is what you get - this feature is particularly valuable when you want to use different types of lenses.



Digital SLR Camera with Interchangeable zoom lens

Point and shoot cameras are small, light weight and can be carried in a pocket. These cameras tend to be cheaper than SLR cameras. Many of these cameras offer a built in macro mode allowing extreme close-up pictures. Generally the quality of the images on compact cameras is not as good as that from SLR cameras, but they are capable of taking professional quality images.

SLR cameras are bigger and usually more expensive. SLRs can be used with a wide variety of interchangeable lenses such as telephoto lenses and macro lenses. SLR cameras offer excellent image quality, lots of features and accessories (some might argue too many features). SLR cameras also shoot a higher frame rates than compact cameras making them better for action photography. Their disadvantages include: higher cost, larger size and weight. They are called Single Lens Reflex, because you see through the lens attached to the camera, the light is reflected by a mirror through a prism and then the viewfinder. The mirror is pulled away (reflex) when the user pushes the button to take a picture and allows light to hit the sensor behind the mirror.

Important Camera controls:

1. ISO Speed - determines the digital sensors sensitivity to light and the amount of "grain" in your pictures. When there is lots of light e.g. sunny day, set your camera ISO speed to 100-200. If you want to shoot inside without using a flash, then set your camera to ISO 400, 800, 1600 or higher. The higher the ISO speed the grainier your image will be. Always try use the lowest ISO speed that allows you to shoot with a shutter speed of 1\30 or faster if you are not using a tripod. Doubling the ISO speed e.g. from 100 to 200 doubles the camera's sensitivity to light (equal to one F-stop or one shutter speed). Advances in noise reduction allow digital cameras to achieve low grain images even at high ISO speeds around 1600 or more. Some cameras change the ISO speed automatically depending on the ambient light - I recommend you control the ISO speed.

Digital Camera Simulated ISO Speed



ISO 200

Daylight, sunny, light overcast



ISO 1600

Low Light - Morning, Dusk, Heavy Cloud, whenever you need faster shutter speed



ISO 25000

Very Low Light, before sunrise after sunset

Note: actual amount of Noise varies with digital camera chip size, camera model, and noise reduction settings, always try to use the lowest ISO speed possible as it is difficult to reduce noise in existing images.

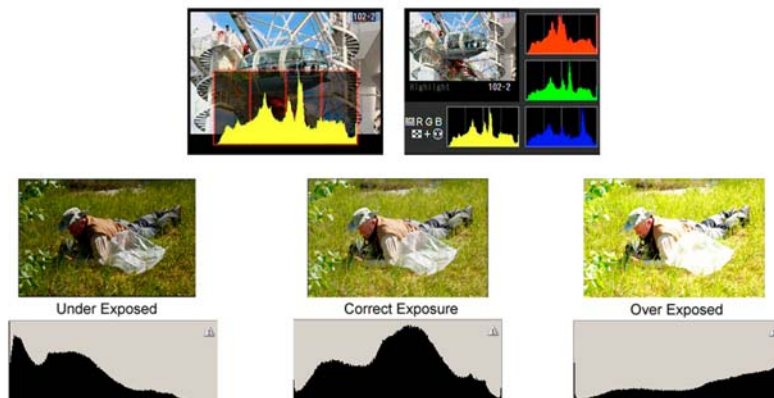
2. Camera Shooting Modes: A, S, M, P, B -some cameras also include additional automated modes. Use **P** Program or "party" mode when you don't want to think, use **A** or aperture priority mode most of the time to control depth of field. In **A** mode you control the lens F-stop and hence the depth of field - just keep an eye on the shutter speed which should always be 1\30 of a second or faster if the camera is being hand held. Other modes are used less often, e.g. **S** shutter speed might be used in sports to lock in a fast shutter speed. **M** or manual might be used to lock exposure for taking panoramas. **B** or bulb keeps the shutter open as long the shutter button is held down. B mode is useful for long exposures at night time e.g. fireworks, and lightening but requires a tripod. Sometimes **B** setting falls under the **M** or manual control mode. I recommend using **A** or **Aperture priority** mode most of the time if you want to control the camera and the depth of field in the picture.



3. Exposure meter - most new cameras have several types of metering systems - they all measure light reaching your digital sensor. The choices include: 1) multisegment also called Matrix, evaluative, or honeycomb 2) Center weighted and 3) spot meter. Spot metering is used in difficult lighting or backlit situations and requires the most skill to use properly. I recommend you set your camera to use Matrix metering most of the time (i.e. 99% of the time).

4. The Histogram feature is used to evaluate exposure particularly in bright light outdoors. The graph simply indicates how many pixels in a picture are light in tone, medium or dark. The left side of the histogram represents total black, the right side total white with intermediate tones in between. The height of the histogram represents the number of pixels in your picture with a particular tone. If the histogram is too far left - the picture may be underexposed; if it is too far to the right the picture is overexposed. Overexposure is the worst thing you can do because it can not be fixed afterwards. A good histogram is centered as much as possible - see images below.

Use the Histogram Function to Determine Exposure with Digital Cameras



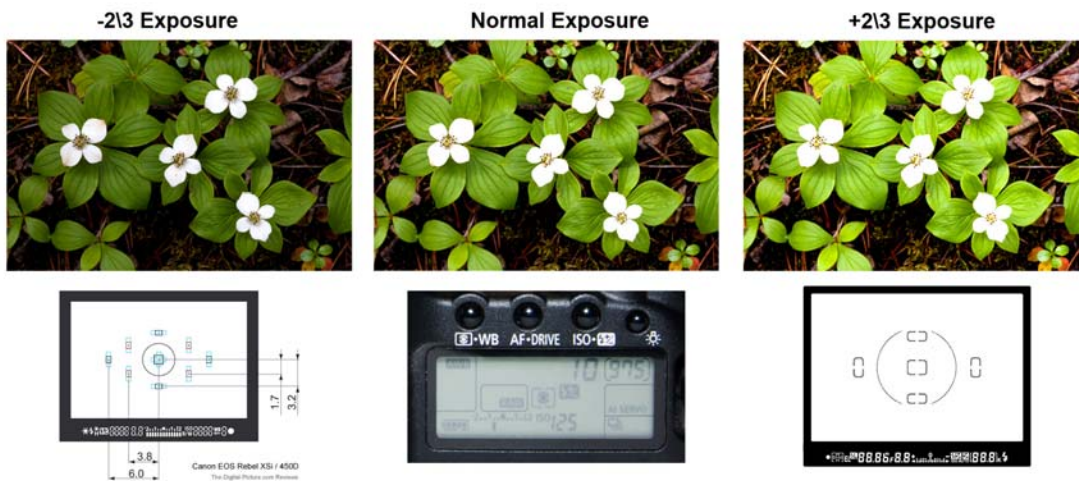
Left picture shows histogram from underexposed image, middle - proper exposure, right - over exposed image. See your manual how to call up your histogram and evaluate exposure. Some cameras show overexposed regions by flashing on screen - use exposure compensation to reduce the exposure and flashing areas.

5. Exposure Compensation

Sometimes even the best light meters can be fooled if the background is really bright or really dark. Many digital cameras offer the ability to alter the exposure by making the picture lighter or darker using an exposure compensation button. **The exposure compensation button** often has a +/- sign beside it, if not check your camera manual. Sometimes this feature is buried in a menu. When you press this button you may have to press another button to change the exposure so it is lighter + lighter or - darker. When you are finished taking the shot don't forget to reset the button back to zero! See example photos below where the exposure was made darker or lighter - this is an important camera control you will want to master.



Exposure Compensation



5. File type to store your images: JPG is the most common file type and usually comes in S, M, L sizes - always choose **L** the Largest file for best quality (Some cameras call this size FINE - bigger files are better). If your camera offers different quality settings always pick the maximum quality - you can easily reduce an image in size, but we can't always enlarge a JPG file without degrading the image.

All digital SLR cameras offer the ability to shoot a **RAW** file format, unfortunately only a few compact cameras offer this feature. RAW files are bigger than JPG files and the quality of the images after processing is better (more data and colours). RAW files, however must be processed in software before you can print the files. RAW files permit you to enlarge your images 200% or more and it is possible to modify exposure and white balance afterwards - you get a second chance to improve the exposure! Most cameras will also permit you to shoot both RAW and JPG files simultaneously. **RAW is best if you want high quality and flexibility.** JPG files are easier to work with, smaller and can be taken to be printed as is. Currently the file extension for RAW files varies between camera manufacturers and at this time there is no one accepted Standard (Adobe is trying to set .DNG as the standard). RAW files must also be processed in software before they are placed within a web page, printed or sent by email.

6. Storage Cards - come in a variety of shapes and sizes, writing speeds and total memory size. The number of photos you can take with a particular card is usually indicated on your camera. I recommend having at least one extra card. If you are planning to shoot a lot e.g. on a vacation or at a wedding get more. A question I often get is "Should I spend more money on getting a faster card"? Generally no as your camera has a built-in memory buffer. Faster cards are better for those shooting HD video or those shooting many photos in bursts of 10-20 images.