

DIGITAL CAPTURE TERMS

Digital Sensors: Light sensitive electronic chips used in digital cameras in place of film in regular cameras. There are two basic types of chips:

- **CMOS** (Complementary Metal Oxide Semiconductor) – Less expensive and less power consumption (i.e. longer battery life). CMOS chips stay cooler so there is less digital noise at higher ISO settings.
- **CCD** (Charged Coupled Device) - CCD will almost always have a greater dynamic range, but runs hotter and will have more digital noise.

Chip Size/Megapixels: This is roughly analogous to film size, but there are two factors to consider: the physical size of the chip and the number of megapixels. A megapixel is 1 million pixels and camera manufacturers use it to describe how many pixels are in an image captured by a digital camera. The chart below shows some common chip sizes and the image resolutions they produce.

Megapixels	Pixel Dimensions	Image Size at 300dpi	Image Size at 240dpi
1	1216 x 912	3" x 4"	3.75" x 5"
3.1	2048 x 1563	5" x 6.5"	6.5" x 8.5"
4	2240 x 1680	5.5" x 7.5"	7" x 9.25"
5	2560 x 1920	6.5" x 8.5"	8" x 10.5"
6	3032 x 2008	6.75" x 10"	8.25" x 12.5"
11.1	4064 x 2704	9" x 13.5"	11" x 17"
22	5440 x 4080	13.5" x 18"	17" x 22.5"

File types / compression: Most digital cameras give you the option to shoot in a few different file formats. This can be confusing because many manufacturers create proprietary formats that work only with their cameras and software. The three main formats you should know include:

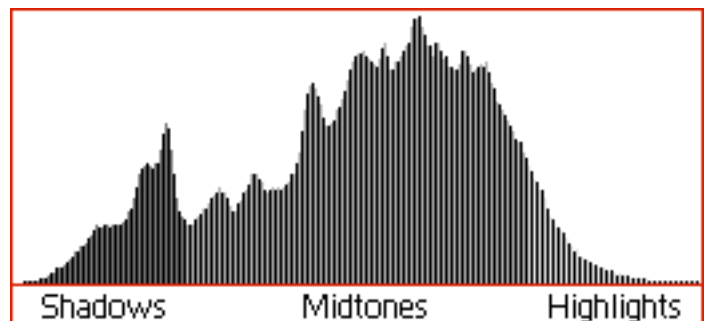
- **RAW** Professional and some high-end consumer cameras offer the option of using a proprietary RAW file format that delivers better image quality and post-capture options such as changing exposure and color balance settings. Raw files are not processed within the camera.
- **DNG** (Digital Negative) is a non proprietary RAW format developed by Adobe to unify all RAW formats.
- **JPG** This is the file format common to all consumer digital cameras. It is a compression format that effects the quality of your images in order to make them smaller and easier to store. Less compression, sometimes called Fine mode, gives you better images so you can make larger prints, but you can't store as many images. More compression, in modes such as Normal or Basic, lets you store more images, but they have a lower quality.

Digital Artifacts and Noise: Artifacts refer to a range of undesirable changes to a digital image caused by the sensor, optics, and internal image processing algorithms of the camera. Noise is roughly equivalent to film grain. These can be introduced by equipment errors, overheated chips, high ISO settings, file compression, etc.

Sensitivity (ISO): Digital cameras have an ISO rating roughly analogous to film speeds that indicate their level of sensitivity to light. ISO 100 is the "normal" setting for most cameras, although some go as low as ISO 50. The sensitivities can be increased to 200, 400, 800, or even 3,200 on high-end digital SLRs. When increasing the sensitivity, the output of the sensor is amplified, so less light is needed. Unfortunately that also amplifies the undesired noise, much like in conventional photography.

Dynamic Range: This is the number of f-stops of exposure the camera can handle – the more the better – which we will address later in the course when we discuss histograms. Dynamic range has to do with the quality of the electronic processing in the camera.

Histogram: A graphical display of all the values in a digital image. Histograms are extremely useful for indicating when highlight information or shadow detail are being 'clipped' out of our images.



1. Additive – Light mixes together in and *additive* process whereby, as colors are mixed, they get brighter – that is, the light is added as the colors are mixed. Additive colors eventually produce white. Red , green, and blue are the primary additive colors that can be used to create all other colors.
2. Aperture – An opening that is used to control the amount of light passing through the lens of a camera.
3. Aperture priority – A shooting mode on a camera. Aperture priority lets you define the camera’s aperture. The camera will then calculate a corresponding shutter speed based on the light metering.
4. Black and White – In the film world, “black and white” is used to refer to images that lack color – that is, images that are composed of only shades of gray. In the digital world, it’s usually better to refer to such images as “grayscale” as your computer is only capable of creating images composed of black and white pixels.
5. Compact Flash – A type of reusable, removable storage. The most common form of storage used in digital cameras.
6. Depth of field – A measure of the area of an image that is focus.
7. Digital zoom – A feature on many digital cameras that create a fake zoom by capturing the center of an image and blowing it up (interpolating) to full image size.
8. DPI – Dot per Inch, a measure of resolution.
9. Exposure compensation – A mechanism for adjusting the exposure on your camera that is independent of any particular exposure parameter. In other words, rather than specifically changing the aperture or shutter speed, you can simply use exposure compensation to over or underexpose an image. The camera will calculate the best way to achieve the compensation.
10. Fill flash – Allows you to force the flash to fire to provide a slight fill light.
11. Image buffering – The ability of a camera to temporarily store images in an internal memory buffer before writing them out to a memory card. A large image buffer facilitates the rapid shooting of multiple frames as the camera doesn’t have to stop shooting to offload images to storage.
12. ISO – A measure of a film’s “speed” or light sensitivity. The higher the ISO, the more sensitive the film. The sensitivity of digital camera sensors are also rated using the ISO scale.
13. LCD – Liquid Crystal Display
14. Megapixel – A million pixels. Usually used as a measure of the resolution of a digital camera’s sensor.
15. Memory Stick – A type of reusable, removable storage developed by Sony, not yet adopted by any other camera vendors.
16. NiMH – Nickel Metal Hydride. A type of rechargeable battery.
17. Photosite - A tiny electrode that sits on the surface of an image sensor. There is one photosite for each pixel on a sensor.
18. Red-eye reduction – A special flash mode that attempts to prevent red eye by firing a short initial flash to close down the iris in your subject’s eyes.
19. Shutter – A mechanism that sits in front of the focal plane in a camera and that can open and close to expose the image sensor or film to light. Many digital cameras do not have physical shutters, but instead mimic shutter functionality by simply activating and deactivating their image sensors to record an image. Cameras that do not have shutters typically use a two-curtain mechanism. The first curtain begins to slide across the focal plane to create a gap. It is followed – usually very quickly – by a second curtain that closes the gap. As the gap passes across, the entire CCD is exposed.
20. Single lens reflex – A camera whose viewfinder looks through the same lens that your camera uses to make its exposure. Also Known as SLR.
21. White Balance – A color calibration used by a camera. Once a camera knows how to accurately represent white it can represent all other colors. Because white can look different under different types of light, a camera needs to be told what white is, a process called *white balancing*.