

Notes/Vocabulary for Introduction to Photo

Digital Photography vs. Traditional Photography

In capturing an image, digital photography has made photographic processes more instant in readability and also faster in output. What previously would take several rolls of film and hours of trial and error is now instant. Color prints that would take up to four hours in the darkroom, now take one. In many aspects costs for digital photography are also lower than traditional. But not everything with digital is better – at least not on the average person's budget.

Most principles remain the same for both digital and traditional. And, in order to better capture and control the kinds of imagery you make, basic photographic skills and principles should be studied.

Basic camera controls – Vocabulary

aperture: size of the lens opening; smaller the number = larger the opening
- small aperture = greater depth of field

f-stop: aperture setting of a lens; standard stops for most cameras are 2.8, 4, 5.6, 8, 11, 16, 22; each lets in twice as much light as the next smaller opening; can be found on outer ring of SLR cameras

Both aperture and shutter control the amount of light let into the camera

shutter: a mechanism that opens and closes to admit light into a camera for a measured length of time; some digital use shutter, but some control exposure by turning on/off sensor chip for same amount of time as trad. shutter

leaf shutter - “between the lens” located inside the lens itself
focal plane shutter – built into the camera body & located directly in front of film

shutter speed: each stop or shutter setting is half (or double) the time of the next one and is marked using the denominator, ex: $1/1$ (one second) = 1, $1/2$ (one half second) = 2, $1/4$ (one fourth second) = 4, etc.
Standard shutter speeds for most cameras are: 1, 2, 4, 8, 15, 30, 60, 125, 250, 500
- some cameras go up to 8,000
- T = timed, B = bulb; to be used with flash
- faster action demands fast shutter speeds to prevent blurring

panning: moving camera with the movement of an object in motion; lessens the probability of subject being blurred with background being blurred

focal length: the distance from the lens to the focal plane when the lens is focused on infinity; longer the focal length, the greater the magnification

focal plane: plane or surface on which a focused lens forms a sharp image

depth of field: area from near to far in a scene that is acceptably sharp in a photograph
- some lenses have a depth of field scale printed on the ring also
- view cameras and single-lens reflex (SLR) cameras allow you to see depth of field

viewfinder: small window on a camera through which subject is viewed & framed; also, a camera that has a viewfinder but not a rangefinder

light meter: separate instrument or built in mechanism that measures light; can measure reflected (amt. of light emitted/reflected by subject) or incident (amount of light falling on the subject) light

ISO: numerical rating that describes the sensitivity to light of film or of a digital camera's CCD. The ISO doubles as the sensitivity to light doubles.

Digital Photography Basics

When your camera captures an image, it is in analog form, similar to the continuous tones captured on film by a traditional camera. But with digital, this analog information is converted to digital information or digitized. This is done through CCDs (charge-coupled devices) or CMOS devices that are arranged in a grid pattern on a digital camera's recording chip. Each point on the grid is a pixel. Once the image is captured, it is digitized and stored in the camera. Next, it can be downloaded to a computer.

Bit depth: the number of bits used to represent each pixel in an image, determining its color and tonal range

- 1 bit per pixel = 2 colors, B + W
- 8 bits per pixel = 256 tones from 0 – 255
- 24 bits per pixel = 16,777,216 tones

Image size: actual measurement of the image

Resolution: the fineness of detail or the amount of data available to represent detail in a given area; on the computer or in a digital file = pixels per inch (ppi), output on printer = dots per inch (dpi)

White Balance: the setting on a digital camera that adjusts the camera for the color temperature of a particular light source; white object will be white and not tinted by light source

Histogram: a graph that shows the distribution of tones in a digital image (B & W) or of colors

Gamut: the range of colors that can be seen or that a particular device can capture and reproduce

Digital Capture and File Formats

Digital cameras can capture images using two devices: CCD image sensor device or CMOS sensor device. All images are captured in terms of tones created by luminosity and while they appear in color, they are actually gray tones with 256 levels of distinction. In color digital images, each of the areas of the RGB spectrum are separated through a filtering system.

There are 3 ways the spectrum is separated and recombined:

Individually filtered and separate imaging sensor device can be used to capture the RGB light separately. Individual exposures can be captured, where each exposure uses a red, green or blue filter – captured on one sensor

The photo-sites of a particular sensor can be individual. Filtered in order to capture. RGB separately

CMOS – (Complimentary Metal Oxide Semiconductor, pronounced “see-moss”) sensors comprise both ends of the digital capture spectrum. Both low-end and high-end cameras use this technology.

CCD –(Charge-coupled device) imaging sensors are the most widely used forms of capture sensors. They produce a high-quality image with little digital noise. Require more power to charge. Can use one or three CCD chips.

Definitions/notes taken from:

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