

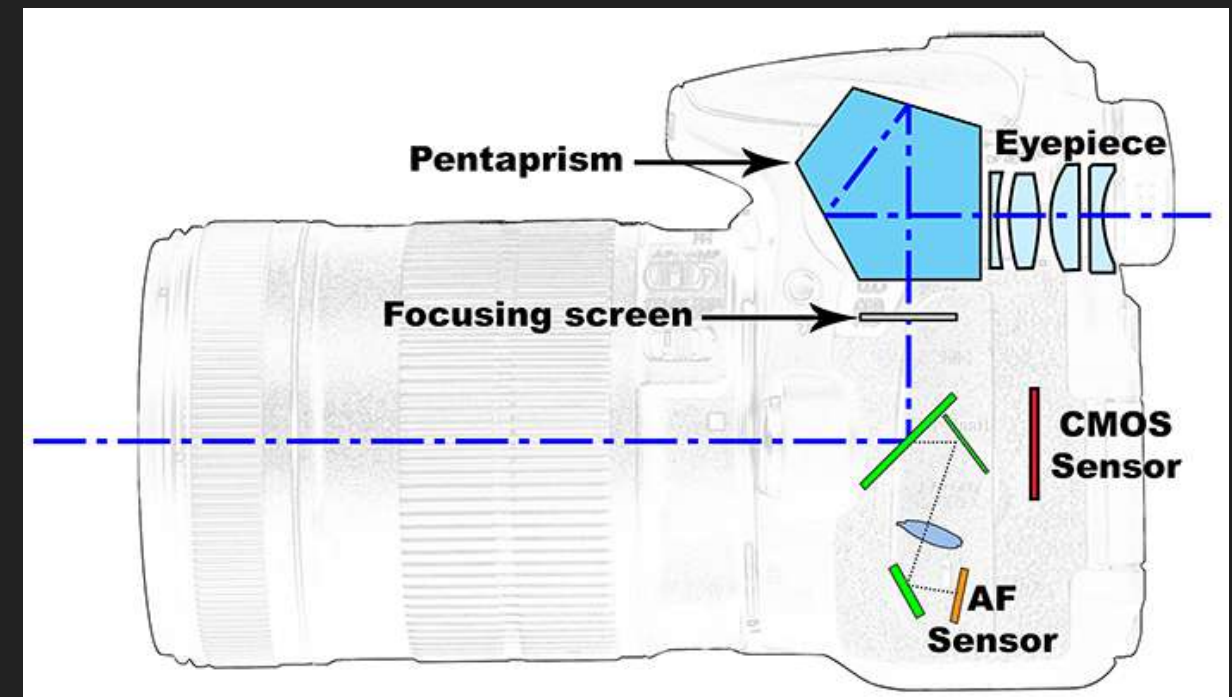
DIGITAL PHOTOGRAPHY

CAMERA BASICS

CAMERA BODY

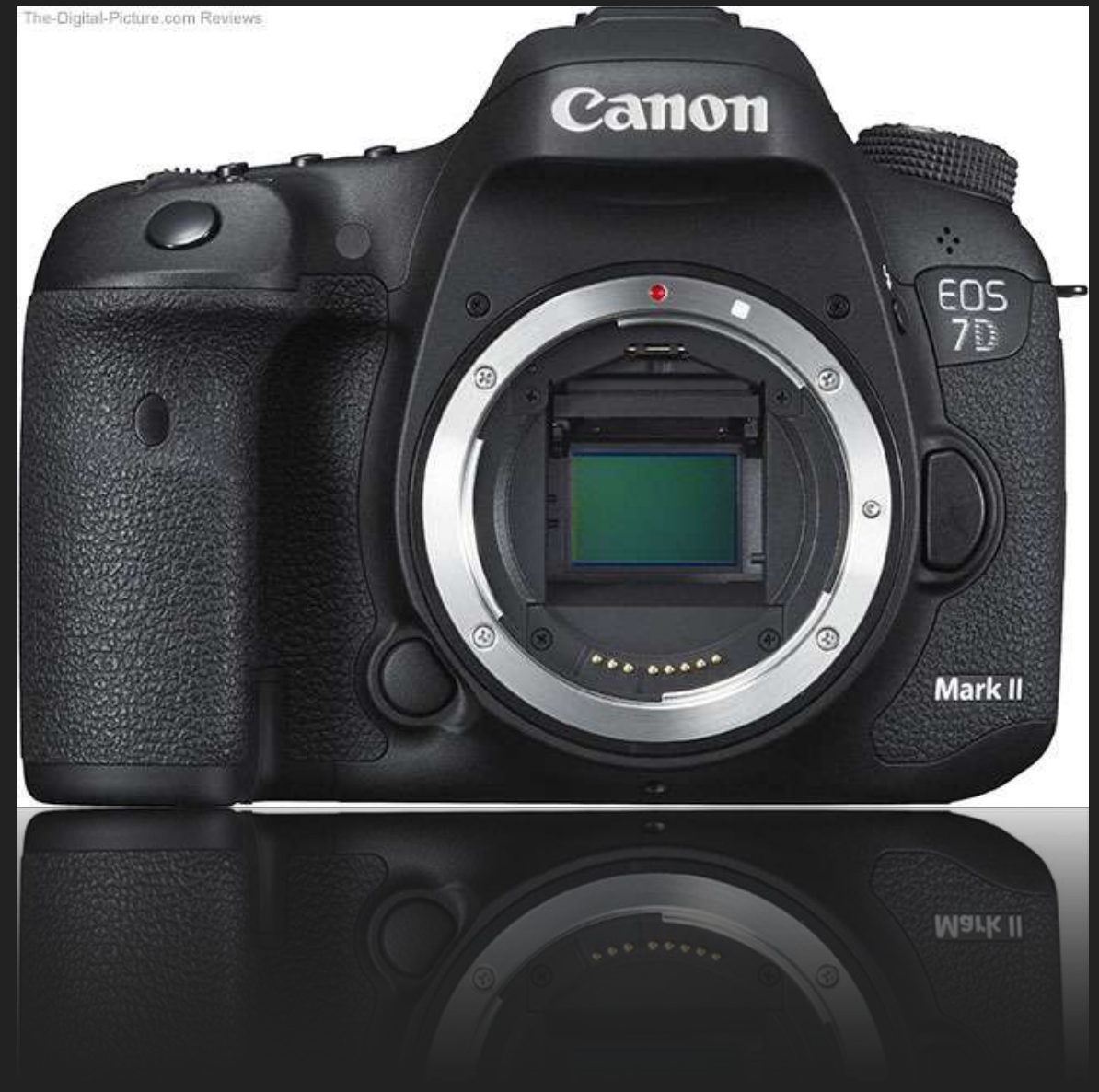
DSLR (“DIGITAL SINGLE LENS REFLEX”)

- ▶ Light enters the camera, is resolved and focused by the lens, and reflects off a 45 degree mirror, into the pentaprism (or another mirror), and to the viewer's eye)
- ▶ During exposure (when the shutter is pressed), the mirror flips up and blocks the viewfinder; instead of hitting the mirror, the light travels to the image sensor.



CAPTURING THE IMAGE

- ▶ Located behind the lens and mirror, inside the camera body.
- ▶ Resolution = 18mp ("Megapixels"—or 18,000 pixels).
- ▶ $5184 \times 3456 = 17,915,904$ pixels = 18 megapixels
- ▶ Rectangular in shape (Aspect ratio: 3:2)
- ▶ Makes a sharp print up to 17x22"
- ▶ Enough resolution to crop part of image.



STORING THE IMAGE

- ▶ Image files are recorded on removable media called "memory cards." The type most cameras use are called "SD cards."
- ▶ Bigger cards hold more images (16gb or more)
- ▶ Faster cards allow more images to be shot quickly before the camera has to stop and work
- ▶ The camera's "buffer" holds images as they are written to the card
- ▶ Raw files require more memory and speed than JPEG's
- ▶ Can be taken out of camera and inserted into your computer's SD card slot



SHUTTER SPEED

FREEZE OR BLUR?

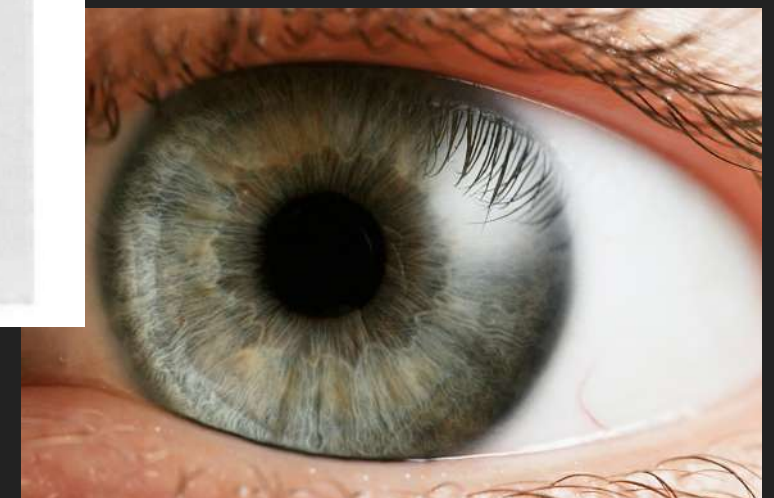
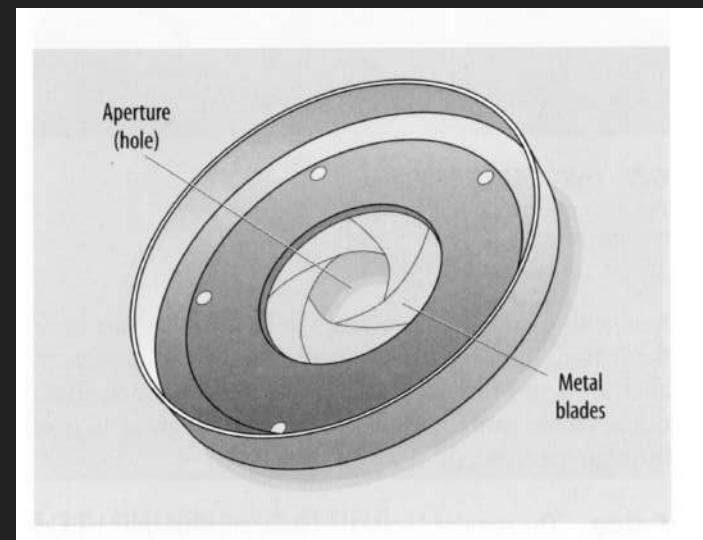
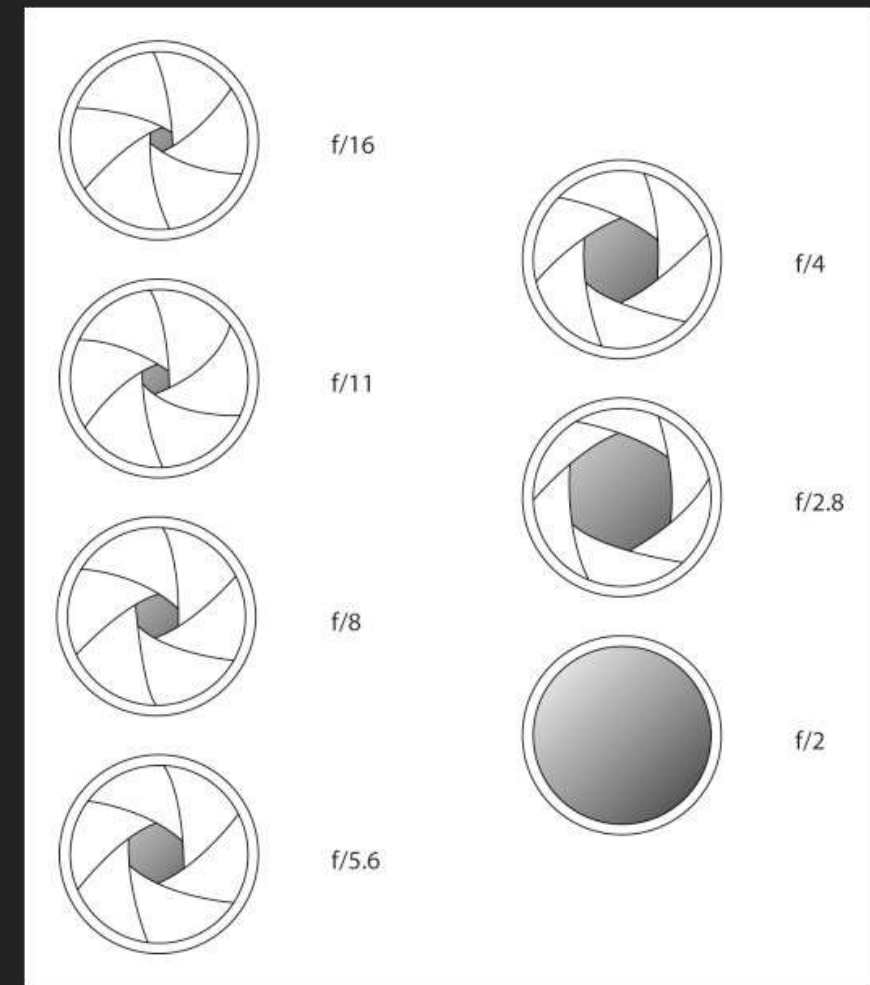
- ▶ The duration that the shutter (in the camera) is open determines how much light gets into the camera
- ▶ Shutter speed is measured in fractions of a second
- ▶ Fast shutter is good for bright light; a slow shutter is needed for low light
- ▶ Note that a fast shutter (1/250 and faster) will freeze motion; a slow shutter speed (1/15 or slower) will blur motion



APERTURE

OPEN OR CLOSED?

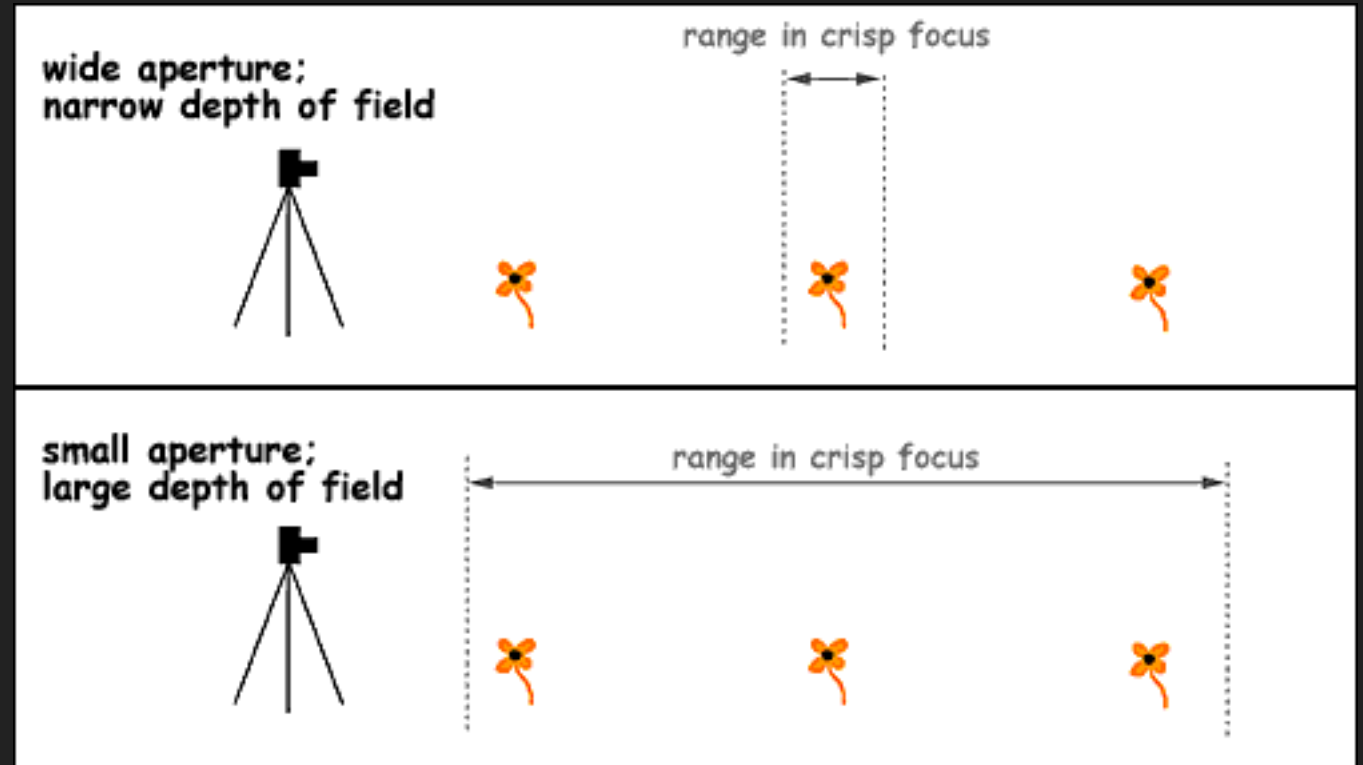
- ▶ The “aperture” is the opening in the lens formed by a metal diaphragm or “iris” (like the iris in your eye)
- ▶ Like shutter speed, the aperture also controls how much light exposes your image.
- ▶ The higher the “f stop,” the smaller the hole. 1/16 is “stopped down” while f/2 is “wide open.”
- ▶ Note that open apertures give less depth of field (shallow focus); small apertures give greater depth of field (deep focus)



APERTURE

DEPTH OF FIELD

- ▶ Depth of field (DOF) is how shallow or deep the focus is. Can you see further into the distance?
- ▶ Shallow DOF is good for Portraits (whenever you want to use focus to bring attention to the subject)
- ▶ Deep focus (increased DOF) is good for Landscapes (when you want to see it all clearly)
- ▶ Open aperture (smaller numbers) = shallow DOF
- ▶ Closed aperture (larger numbers) = increased DOF



RAW VS. JPEG

- ▶ Camera can record both.
- ▶ Raw files or “digital negatives” contain the most information. They are the best for editing, because they have a high dynamic range (can recover a lot of shadow and highlight detail) and you can correct color—can fix shooting mistakes!
- ▶ Raw files have much bigger image sizes; JPEG’s throw a lot of info away, but still look great.
- ▶ Raw files need to be processed through software (like Adobe Lightroom); JPEGs do not.



File Size Comparison



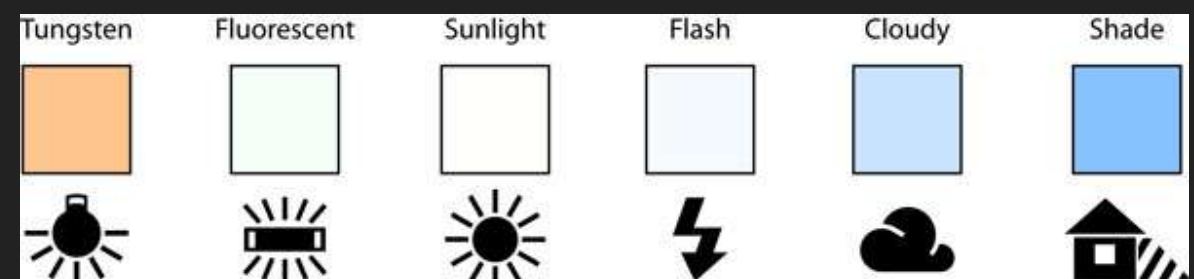
WHITE BALANCE

CONTROLLING COLOR

- ▶ Different kinds of light have different “color temperatures” (Color temperature is measured in “Kelvins”)
- ▶ Daylight and flash (photo studio strobe light) is 5200-5600K and is bluish. Some interior light (tungsten and fluorescent) is warmer, at 3200K
- ▶ White light is the mixture of all colors in the spectrum
- ▶ Set your camera at the right “White Balance” (indoor or outdoor) to make white look correct, and all the other colors will look correct too.
- ▶ White balance can be set to “Auto,” which lets the camera decide shot to shot
- ▶ White balance can be altered in Lightroom (with Raw files)



WB SETTINGS	COLOR TEMPERATURE	LIGHT SOURCES
	10000 - 15000 K	Clear Blue Sky
	6500 - 8000 K	Cloudy Sky / Shade
	6000 - 7000 K	Noon Sunlight
	5500 - 6500 K	Average Daylight
	5000 - 5500 K	Electronic Flash
	4000 - 5000 K	Fluorescent Light
	3000 - 4000 K	Early AM / Late PM
	2500 - 3000 K	Domestic Lightning
	1000 - 2000 K	Candle Flame



LENSES

TIGHT OR WIDE?

- ▶ “Zoom” lenses can do both, but let in less light; “Prime” lenses are set at one focal length, but let in more light and are often sharper
- ▶ Zooming in blurs out background for portraits
- ▶ Telephoto (very zoomed in) is great when you can’t get close enough (sports, wildlife)—but not for interacting with your subject and being “present”
- ▶ Wide is great for landscapes or interiors, but may cause distortion (the image “wraps around” and straight lines bend, especially at the edges of the frame)
- ▶ Can focus closer with wide; need to get further back with telephoto (zoomed in)
- ▶ “Normal” or “standard” focal lengths look like what we see—somewhere between wide and telephoto
- ▶ “Macro” lenses allow extremely close focus

