Today:

- Admin
- Cameras
- Lenses
  - Lens laws
  - Typical lenses
  - Focal lengths
  - Aperture, depth of field

JH Bring to class:
Closeup lenses
extension tubes
Iris
View camera

Admin:
Creative Commons/ Copyright survey results

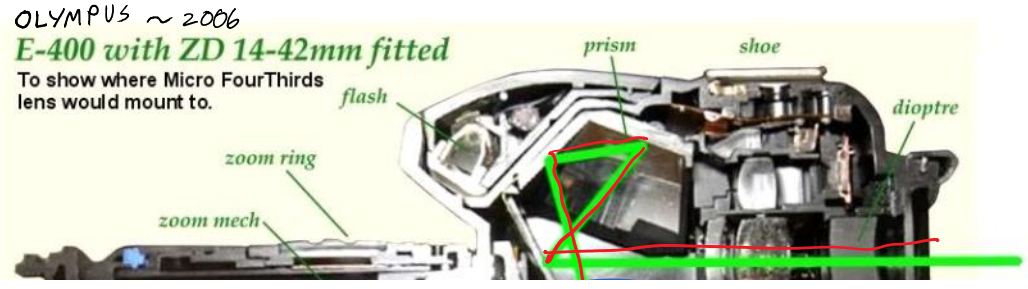
PHOTOGRAPHY FUNDAMENTALS

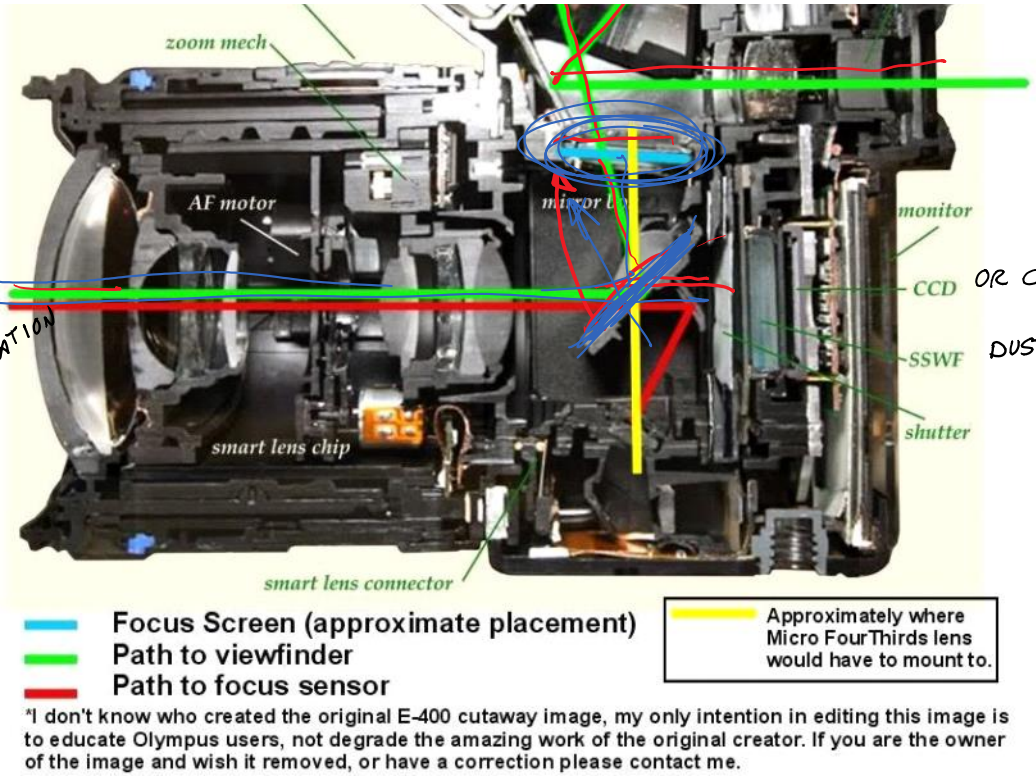
1) Framing
2) Camera
3) Lenses
4) Exposure Control
5) Resolution

2)Cameras: Roughly 4 common types, but technology is changing quickly

DSLR	Mirrorless	Point and Shoot	Camcorders
Digital Single Lens Reflex	Interchangeable lens but no viewfinder, just LCD	PHD Push Here Dummy	

DSLR





IS = IMAGE STABILIZATION

OR CMOS

DUST CLEANER

http://media.photobucket.com/image/dslr%20optics%20diagram/Mikefellh/E-300Stuff/WhereM43lensWouldBe.jpg

AE = auto Exposure
AF = Auto Focus

Mirror flips up when shutter triggered = REFLEX.
For long exposures, lock mirror up to prevent vibration.
Use circular polarizers on lens front to get past partial mirrors into AF and AE sensors

Mirrorless: Same capabilities as DSLR, but no optical viewfinder, no mirror or reflex. Light goes straight through to sensor. Maybe electronic shutter only.

PHD: Small sensors; lower resolution even if mpx the same; diffraction limits approached?
Often no lens choices. Can still add close-up lens.
Composition is harder. LCD screens tough to use in sun, don't show fine focus (on low end cameras). Usually can't preview depth of field.
Much lighter, more portable.
Comparable performance at prosumer level.

CAMCORDERS: primarily for video. Records to disk or solid state memory. Usually longer

record time than still cameras. Built-in effects, maybe editing, quieter mechanisms, set white balance, better microphones

Camera technology is changing rapidly. Lines between designs are shifting. Superzooms, for example.

3) LENSES

Minute paper. What are the numbers on your lens? What do they mean?

18-200 mm 135-56 g
75-300 mm / 9.1-146 1:3.8-4
16-55 mm 1:3.5-5.6
75-300 1:4-5.6

FOCAL LENGTH APERATURE

IS = image stabilization

ϕ 77mm 24-70mm 2.8

thread diameter for add-on filters

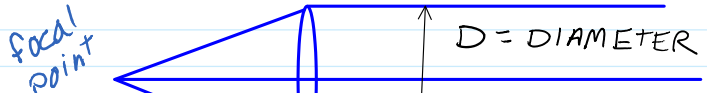
4.5-90.0 mm 1:3.5-6.8 20x IS

focal length aperture optical zoom Image Stabilization

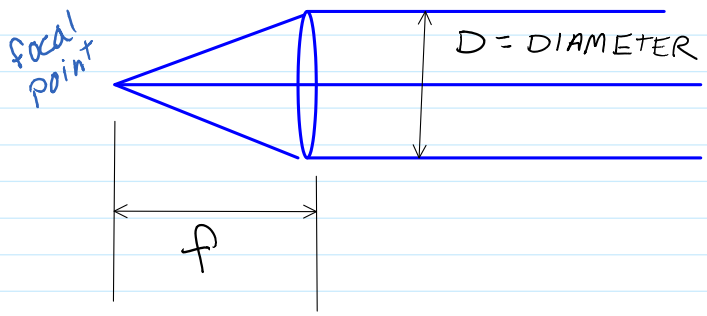
f

Lenses are defined by FOCAL LENGTH and APERTURE and Diameter

f = focal length = distance from center of lens system to sensor when focused at infinity



Symbol for center of lens
Or sensor location



Symbol for center of lens
Or sensor location

Ø Symbol for thread diameter

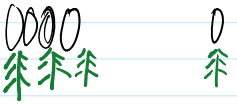
Variable focal length = ZOOM lens.
Now is default. Non-zoom are called 'prime' lenses.

10 years ago, 35 mm film cameras were standard, and the standard lens was 50 mm. f> 50 mm = telephoto long
f < 50 mm = wide angle short

Aperture defined as f/D = f/ = f number = f#
INVERSELY related to diameter.
Nondimensional. More about aperture later.

PHDs have small sensors, so focal lengths and diameters are smaller:
Common values for PHD cameras:
f = 5 - 60 mm, f/ = 4 - 8
28-336 mm equivalent to 35 mm, i.e. same FOV
w = wide T = tight, or telephoto

18-55
18-200
18-135



For DSLR, bigger sensors, up to 'full frame' 35 mm
f = 18- 60 mm, f/ 1.8 - 22