

Today: End of IV1 critique

Video editing lite

Lens Focus

Friday: IV 2 is due at midnight

Lecture: Facilities and equipment

More lenses and exposure

- Chem Stores: on campus source for glassware, chemicals, lab supplies (credit cards OK): <https://www.colorado.edu/chemistry/research/facilities/chemstores-chemstores-east>
- Optics cleaning tips: <http://www.newport.com/How-to-Clean-Optics/141176/1033/content.aspx> for lab optics
<https://www.adorama.com/alc/faq-how-to-clean-camera-lenses> for camera lenses
Cleaning fluids: OK to buy a commercial variety, or try distilled water first, then isopropyl (rubbing) alcohol, then ethyl alcohol (lab grade), then acetone as a last resort.

Video Editing

Use iMovie if you have a Mac

PCs: "MiniTool MovieMaker | Easy-to-Use Free MovieMaker Software." Accessed August 26, 2020. <https://moviemaker.minitool.com/>.

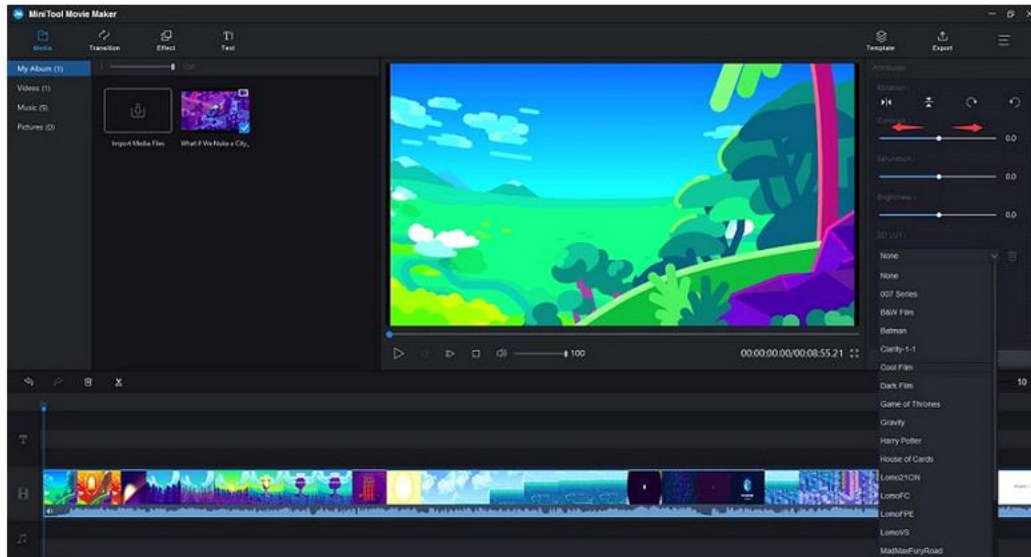
Easy to use, requires little computer power. Options are limited. For example, can't crop, and color changes are limited to presets.



Step 1. After downloading and installing MiniTool Movie Maker, select **Full-Feature Mode** to enter the main interface and click **Import Media Files** to import your video.

Step 2. Drag and drop the video to the timeline or click **+** to add it to the timeline.

Step 3. Double click the target video on the timeline and the video editing window will pop up. To change the color correction settings, just left-click the indicator and move it to the left or right along the slider. When releasing the mouse button, the respective value will be set.



Color 'grading', correction etc.: Double click the clip. Gets you contrast, brightness and saturation.

Then go to Text tab to add title.

If you don't want title animation, use Powerpoint to create a still image with your text and insert that.

Can trim time of clips, do cuts and transitions

PHOTOGRAPHY FUNDAMENTALS

- 1) Framing
- 2) Camera
- 3) Lenses

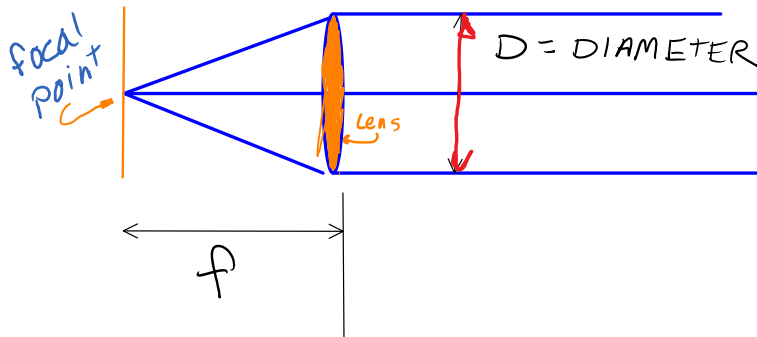
4) Exposure Control

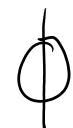
5) Resolution


3) LENSES

Lenses are defined by FOCAL LENGTH and APERTURE and Diameter

D = maximum hole diameter that light comes through, when used as lens spec.
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 thread diameter

Variable focal length = ZOOM lens.

Now is default. Non-zoom are called 'prime' lenses.

20 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 $f/D = f/\# = f \text{ number} = f\#$
INVERSELY related to diameter.
Nondimensional. More about aperture later.

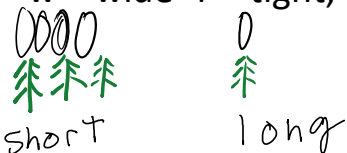
PHDs have small sensors, so focal lengths and diameters are smaller:

Common values for PHD cameras:

f = 5 - 60 mm, f/ = 4 - 8

28-336 mm equivalent to 35 mm, i.e. same FOV

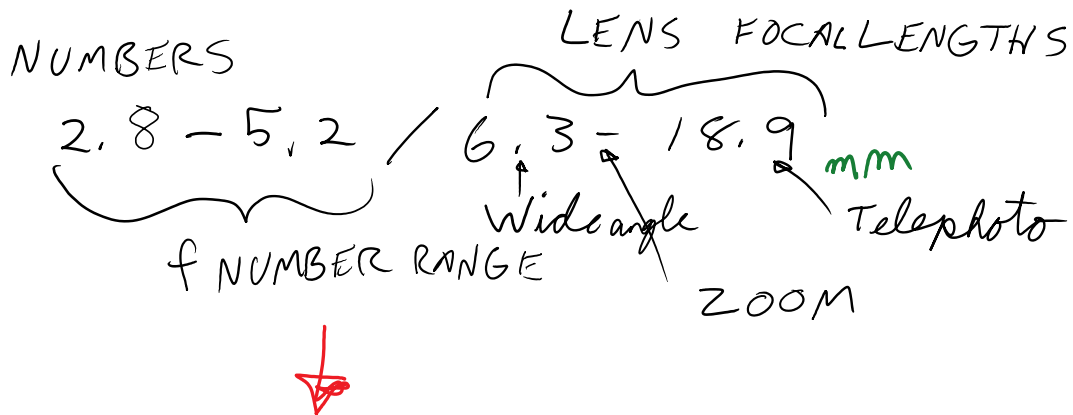
w = wide T = tight, or telephoto



For DSLR, bigger sensors, up to 'full frame' 35 mm

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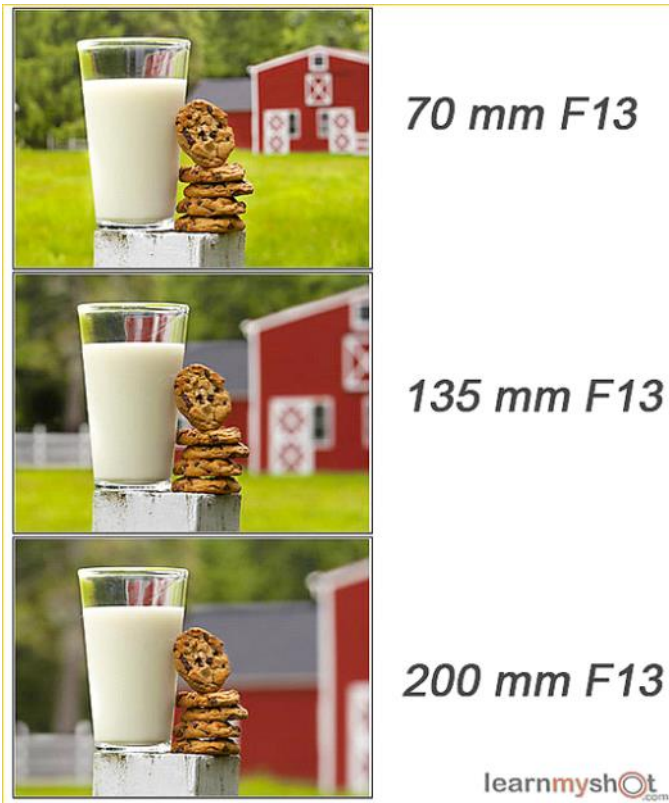
f = 18- 60 mm, f/ 1.8 - 22



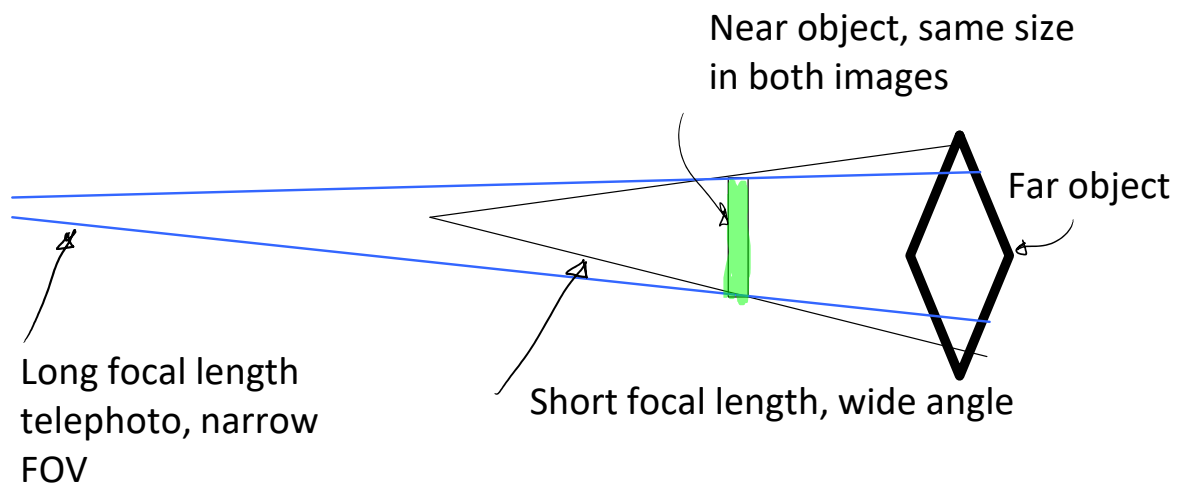
	DSLR	Mirrorless	Point and Shoot	Film	Phone camera only
	Digital Single Lens Reflex Optical viewfinder	Interchangeable lens but no viewfinder, just LCD	PHD Push Here Dummy. LCD viewer, fixed lens		
<u>Sensor size</u>	23.5x15.6 mm 22.2-14.8	Same as dslr 36X24			
<u>Focal length range</u>	18-55 70-300	16-50 24-105			

Impact of focal length on framing:

As f increases (longer lens), field of view narrows
'Telephoto compression' happens too



https://www.youtube.com/watch?v=4yyFKNfRq_M



TRY THIS NOW

Make images at different lens focal lengths (zooms) and note the image compression effect.

FOCUS

'In focus' when all collected light from a point on the object shows up at a single point in the image.

