

LENS

Basics

Length

Focus, Zoom, Iris

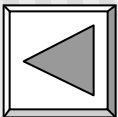
Iris, *f*-Stop

Depth Of Field

Zoom IN

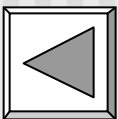
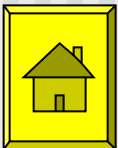
Zoom OUT

Other Stuff



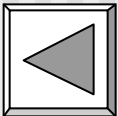
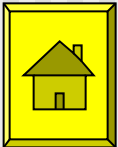
LENS Basics

- Length is measured in Millimeters (mm)
- A Zoom Lens is a variable length lens
- Show # referring to shortest length



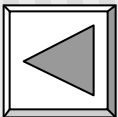
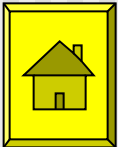
LENS Length

- Show length example w/ Fancy Visual Aid



LENS Length

- Longer Length – Narrow field of view
- Shorter Length – Wide field of view

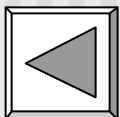
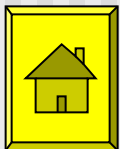
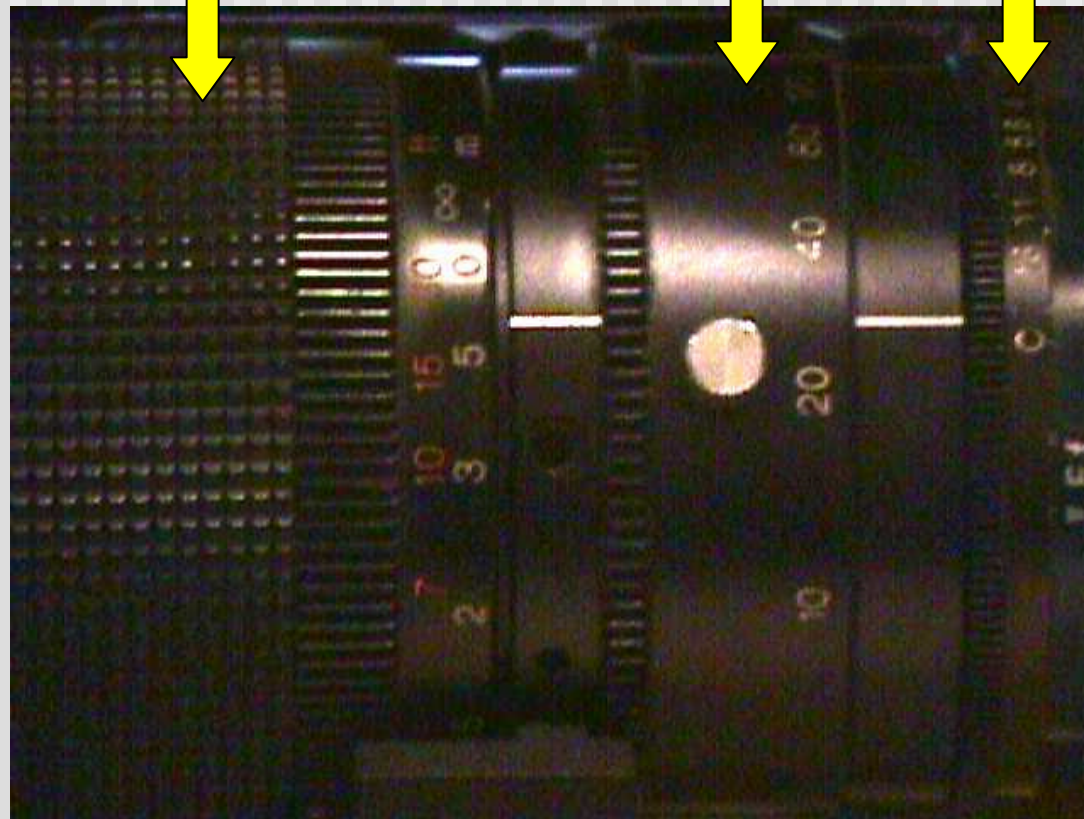


Focus, Zoom Iris

Focus

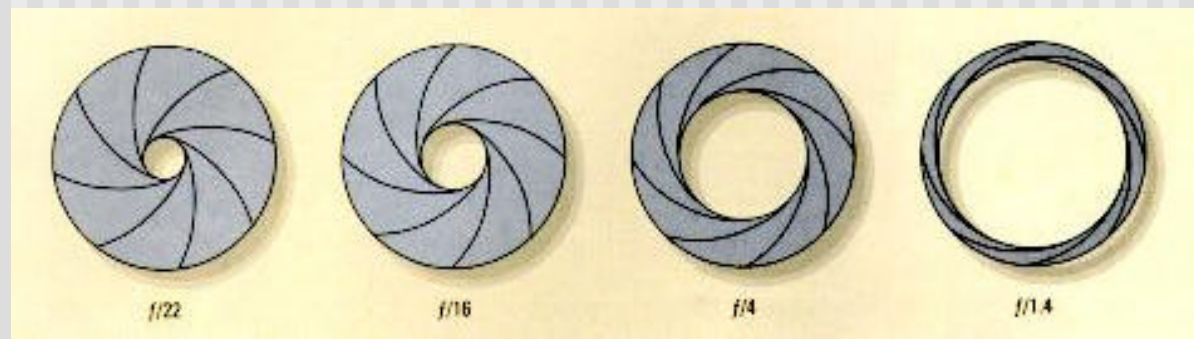
Zoom

Iris



Iris

- Determines amount of light
- F-stop
 - Smaller the f #, the larger the opening

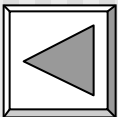
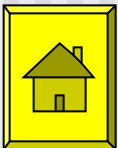


F/22

F/16

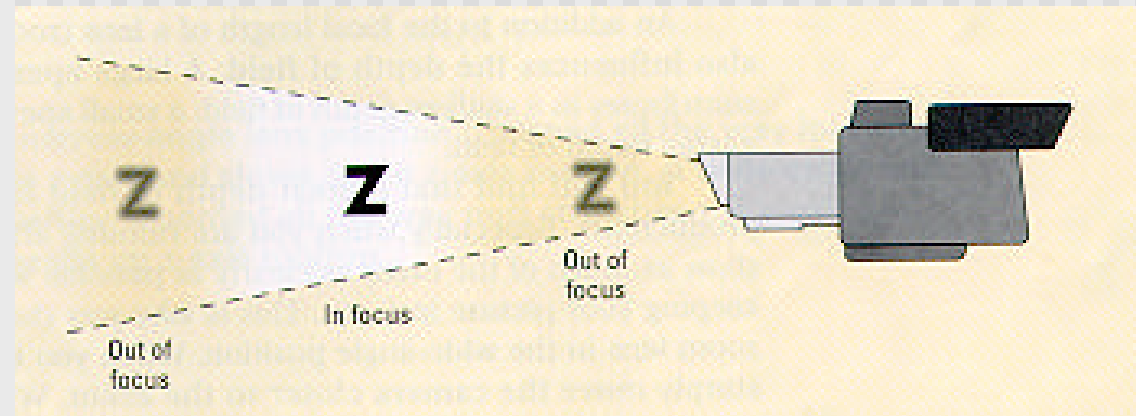
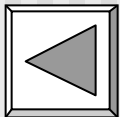
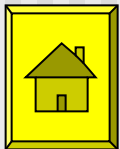
F/4

F/1.4



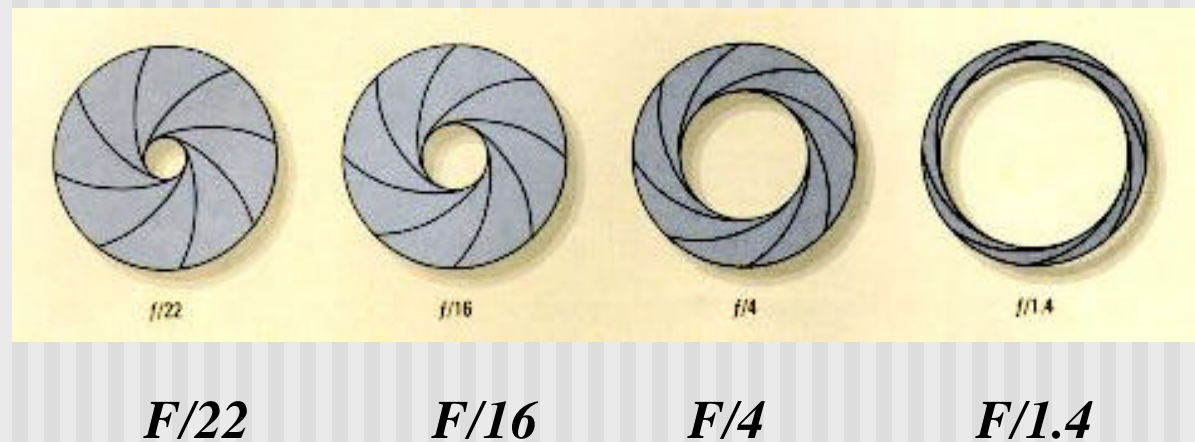
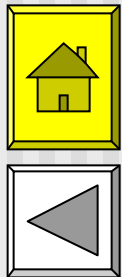
Depth of Field

- Area Which objects appear to be in focus



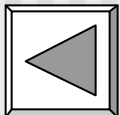
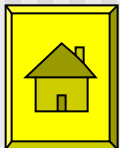
Depth of Field

- Deep depth of field requires lots of light (Small iris/Large F #)
- Shallow depth of field occurs in low light (Large iris/Small F #)



Depth of Field

- Deep depth of field requires lots of light (Small iris/Large F #)
- Shallow depth of field occurs in low light (Large iris/Small F #)



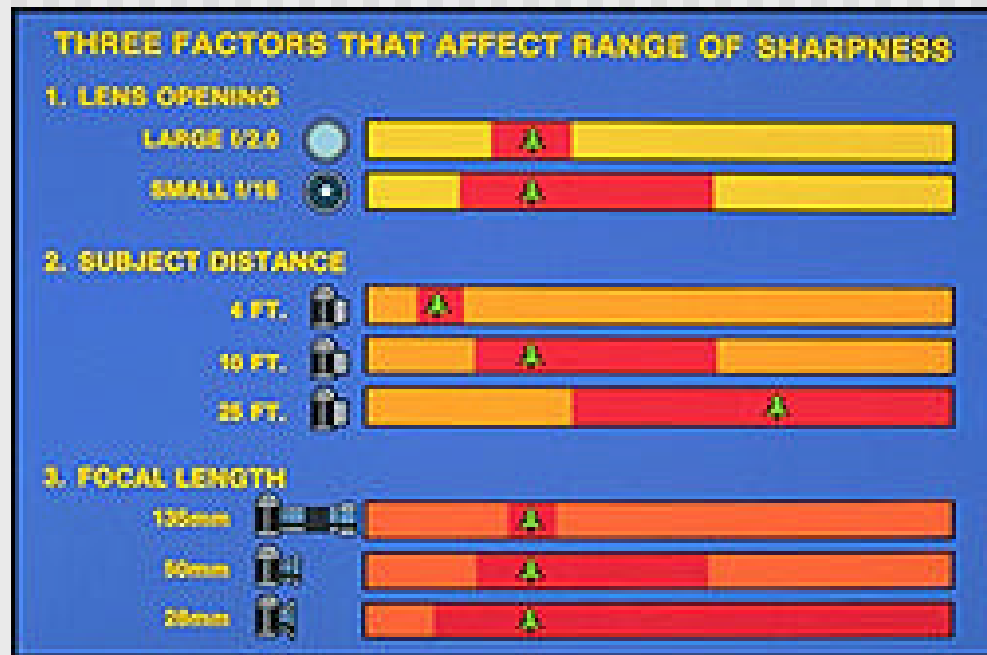
Depth of Field

3 FACTORS THAT AFFECT DEPTH OF FIELD

LENS
OPENING

SUBJECT
DISTANCE

FOCAL
LENGTH



Large f/2.0

Small f/16

4 Feet

10 Feet

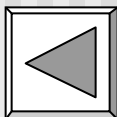
25 Feet

135 mm

50 mm

28 mm

**** All Measurements are with a 35 mm Still Camera, Video Cameras will be different ****



Depth of Field

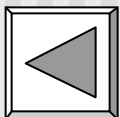
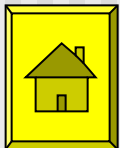
- Generally desire deep depth of field
- Shallow depth of field Ok to draw attention
- Rack Focus



**Shallow
Depth of
Field**



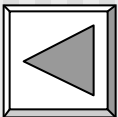
**Deep
Depth of
Field**



Zoom IN

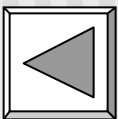
- Zooming IN

- Longer Length
- Image Appears to be Closer
 - More Jitter (Cam Movement Exaggerated)
- Narrower Field of View
- Shallower Depth of Field



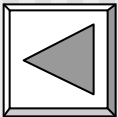
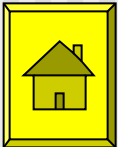
Zoom OUT

- Zooming OUT
 - Shorter Length
 - Image Appears to be Farther Away
 - Less Jitter (Cam Movement Minimized- better for hand-held – need to physically get closer)
 - Wider Field of View
 - Deeper Depth of Field



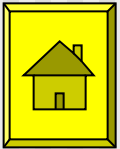
Fitting A Lens

- What Size Chip?
 - $2/3''$
 - $1/2''$
 - $1/3''$

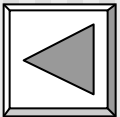


Fitting A Lens

- Aspect Ratio?
 - 4:3
 - 16:9
 - Both (Switch)



- Lens Lengths



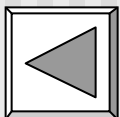
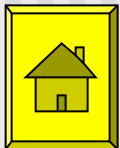
Other

- Chromatic Aberration

http://www.usa.canon.com/html/industrial_bctv/faq/chraberr.html

- What do the Lens #'s Mean

http://www.usa.canon.com/html/industrial_bctv/faq/lensmodel.html



- Optical Shift (IS) Image Stabilizer

http://www.usa.canon.com/html/industrial_bctv/faq/opticalstab.html