09.Exposure1

Monday, September 24, 2018 5:36 PM

Today: End of GW critique, then Focus, Exposure, shutter speeds, ISO/Sensitivity

Policy: Late images/vids will not be critiqued in class
Schedule changes: Team First Critique start Friday. Image/Vid still due today
Guest Lectures: FYFD Nicole Sharp Oct 10. Abbie Rastatter video editing tutorials Oct 12.
Move Cloud 1 due date to Oct 12? Cloud 1 critiques start Oct 15

Free video editing software, recommended by Duncan Lowery
https://www.blackmagicdesign.com/products/davinciresolve/

Note: For some reason, you have to wait for the video banner at the top to play through before the download button will appear.

Anyone in class can access lynda.com for free to watch in-depth courses on how to correctly use the software.

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## Focus

Homework: Can you get the most magnification by zooming out and moving close, or by zooming in and moving back? At which extreme can you focus closest?

No optical zoom

zooming out and moving close

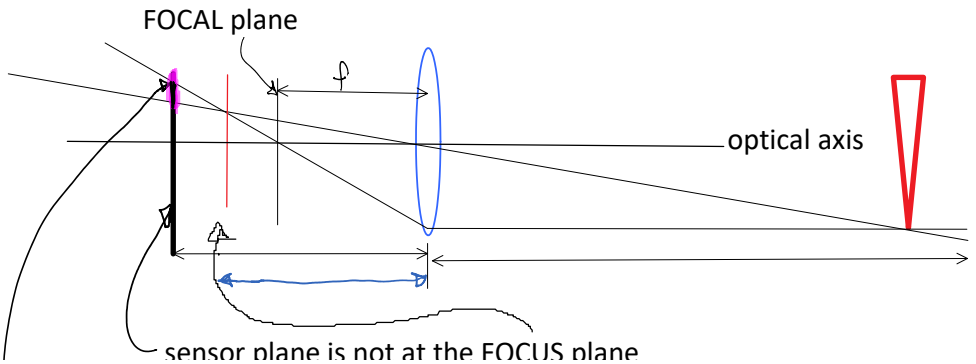
| Cell | ~~PHD~~ small sensor | ~~DLSR~~ Large sensor |
|---|---|---|
| | 0 | 2 |

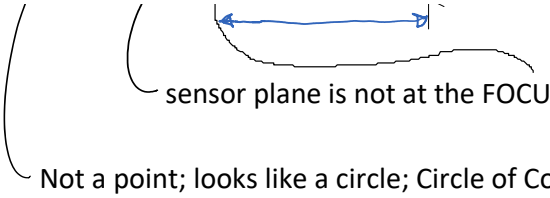
by zooming in and moving back?

| Cell | PHD | DLSR |
|---|---|---|
| | 8 | 12 |

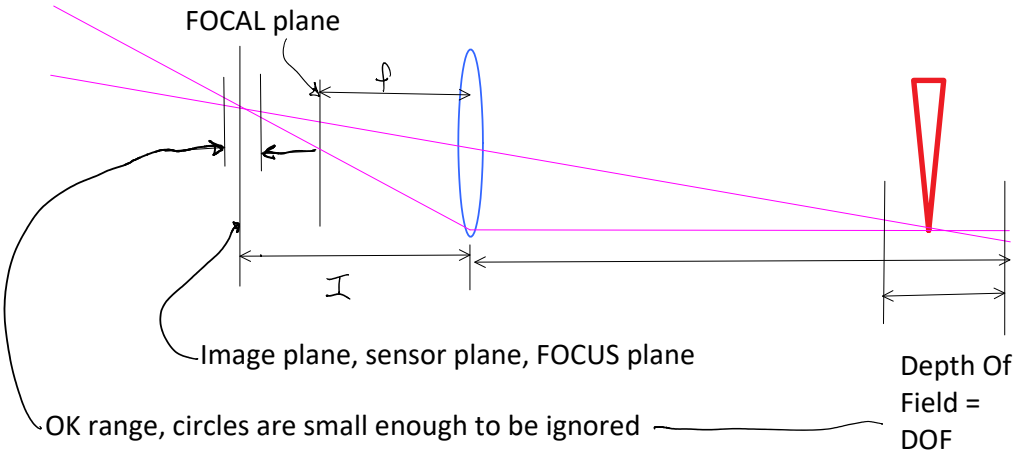
Hard to compare magnifications (image size/ object size) because sensors are all different sizes. Try this:
Homework Exercise: Can you get the most magnification by zooming out and moving close, or by zooming in and moving back? At which extreme can you focus closest? Make an image of a 25¢ coin. At what lens settings do you get the greatest magnification, where the coin is as large as possible in the image and still sharply in focus?
Example: Iphone 8. Exported medium resolution image. Quarter size is 166/640 px=0.2594 , 26% of the image, at 3" image distance. No optical zoom.

OUT OF FOCUS

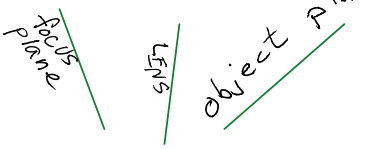




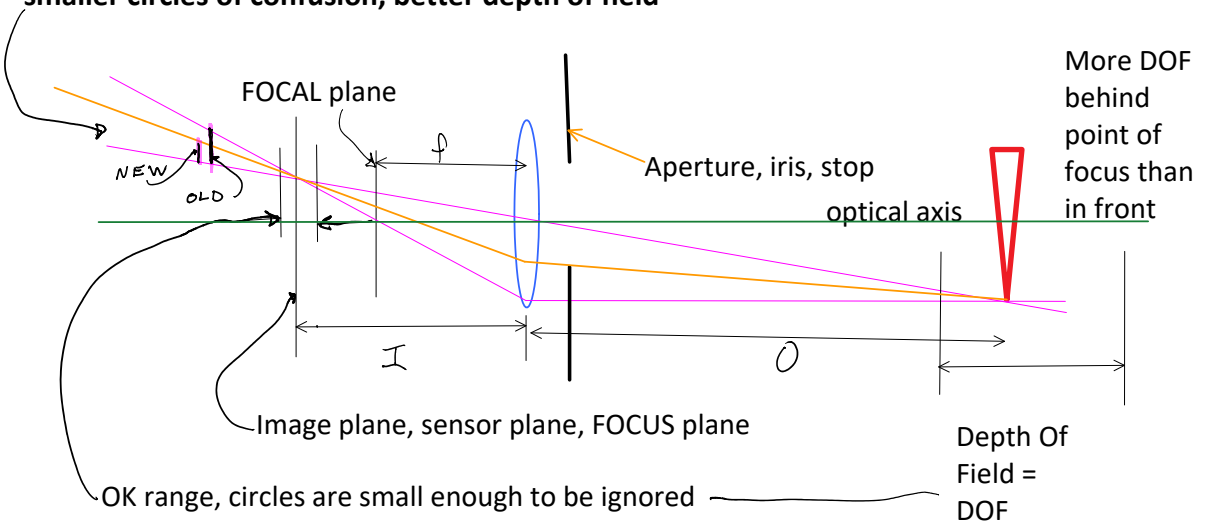

Depth of Field

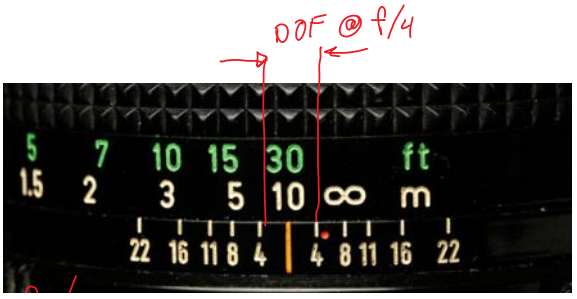



LensBaby: lets you angle the lens axis compared to the camera body axis. Effectively makes the object plane not parallel to the sensor plane. Same as 'swing' of field view camera
http://lensbaby.com/lenses




**Improve DOF by reducing aperture diameter: smaller hole, smaller circles of confusion, better depth of field**



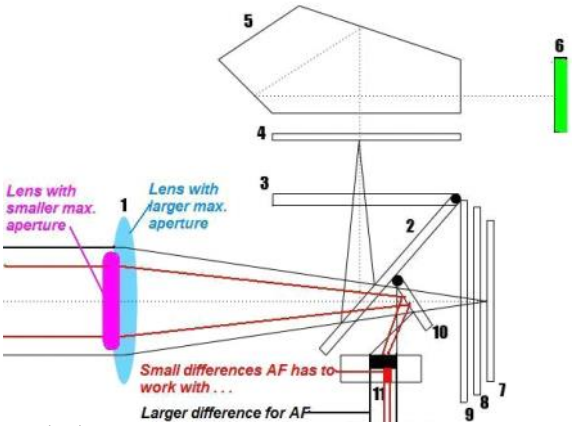




http://jimdoty.com/learn/exp101/exp_big3/exp_big3.html

More DOF behind best focus because of nonlinear lens equation


nonlinear lens equation

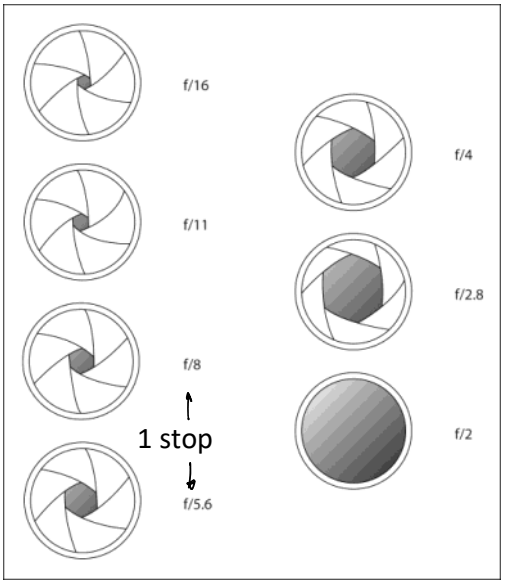
Worse autofocus performance at small apertures. Use a large diameter lens/ large aperture for low light levels.




No good attribution.
https://www.canonrumors.com/forum/index.php?topic=15521.0

BUT, what else happens as aperture gets smaller? What is the problem with tiny apertures?
Think, pair, share

LESS LIGHT




Aperture (iris) mechanism made from overlapping pivoting leaves.

Aperture has impact on exposure too, how much light total hits the sensor.
Units: 1 stop = 1 EV Exposure Value = factor of 2 in area, light.
Camera adjustments in 1/3 stops

Stop used to be a metal plate with hole punched in it. It stopped light.

2.8, 3.5, 4, 5.6, 8, 11, 16, 22, 32, 45, 64

http://media.wiley.com/assets/1007/41/0-764

2.8, 3.5, 4, 5.6, 8, 11, 16, 22, 32, 45, 64

$f/\# = \frac{f}{D}$

http://media.wiley.com/assets/1007/41/0-7645-9802-3_0213.jpg

http://www.lavideofilmmaker.com/cinematography/f-stops-focal-length-lens-aperture.html

Ansel Adams founded f/64 club. Tiniest hole, maximum DOF.
Modern lenses often best sharpness at f/5.6 or design point. We will come back to this when discussing resolution.

Homework Exercise: Make the same image with three f/stops: max, min and low medium. (Keep ISO the same, and use tripod or keep shutter time short.) Inspect the three images closely. What happened?

4. EXPOSURE

For a given light intensity, exposure = (aperture area) X (time shutter is open)

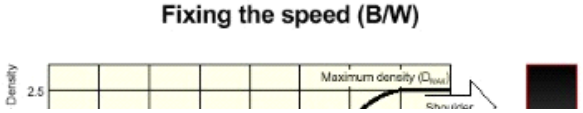
Shutter speeds: 30 = 1/30th of a second etc.
5 = 1/5th of a second
30" = 30 seconds
T = time, click to open shutter and again to close
B = bulb, shutter stays open as long as button is pressed (or bulb is squeezed)

got to here 9/24/18

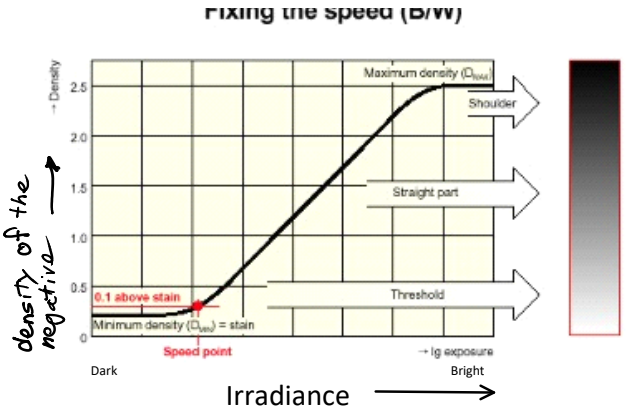
Check your camera shutter speed options. What is the range?
Tv or S = Time priority; you set the shutter speed and ISO, camera AE will choose the aperture.
Av = aperture priority. You choose the aperture, camera will choose shutter speed.

Equivalent exposures: f/5.6, 1/100 sec
f/8, 1/50 sec
f/11, 1/25 sec

ISO = sensor sensitivity, gain
1 EV = 1 stop = factor of 2 in ISO
100 200 400 800 1600 3200 6400 12800 25000
Used to be called ASA for film.
From American Standards Association (now named ANSI)
ISO = International Organization for Standardization




http://www.sapiens.itgo.com/documents/foto/photographic_terms8.htm




http://www.sapiens.itgo.com/documents/foto/photographic_terms8.htm

Minute paper:

1. Have you been taught to count in binary or base 8 or 16? When?
2. What is a pixel? What is it made of (for software purposes)?