Lens Characteristics

Frank Richards
With a few slides appropriated from Marea Downey
And some images by Wayland Threadgill, Kaye Hargis,
Bob Sherman and Garry Kelly

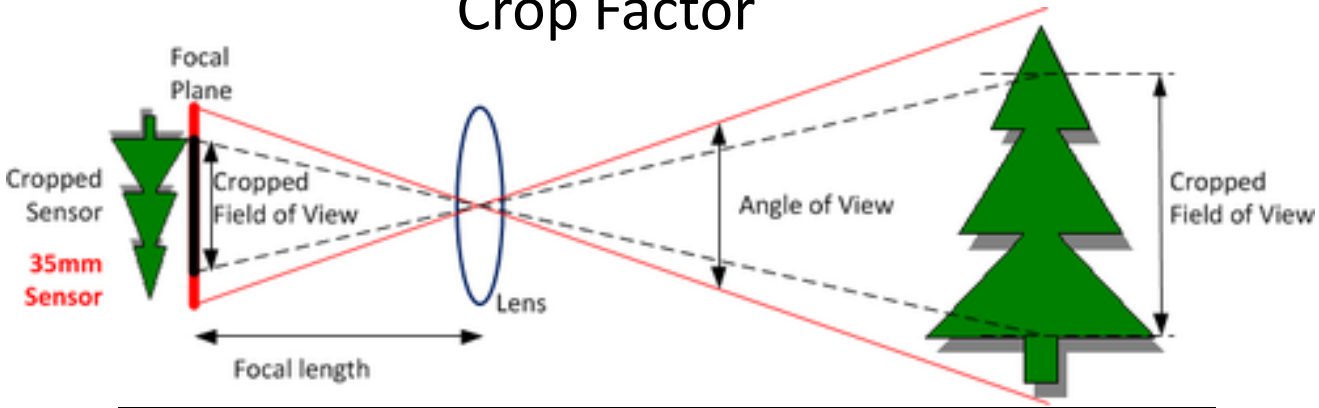
3-9-2015
3-12-2015 Rev A

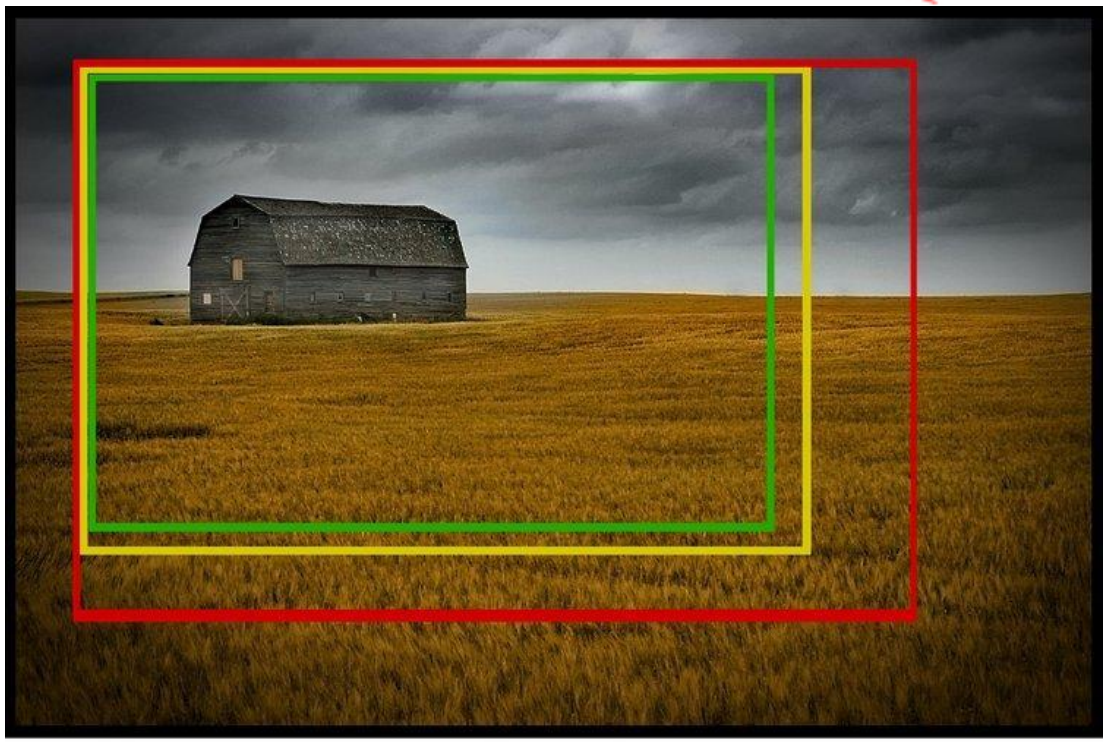
Lenses and Focal Lengths

(Full Frame Equivalent)

Wide angle	< 35 mm
Normal lens	40 - 80 mm
Telephoto	> 100 mm
Macro	50 – 200 mm

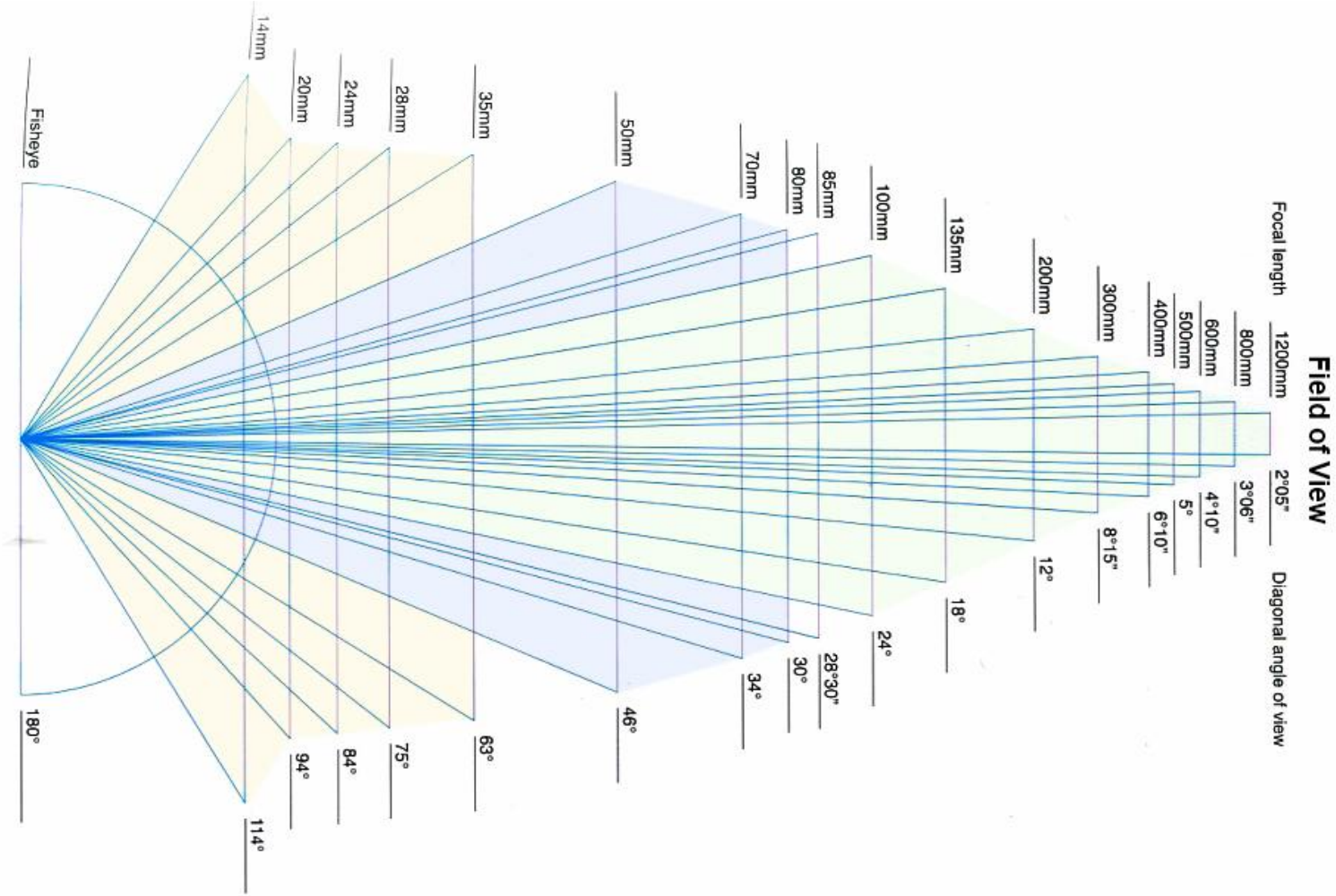
Crop Factor





Full Frame 1.3 Crop 1.5 Crop 1.6 Crop

Field of View



Normal Lens

- 40 to 80 mm
- FOV as the eye sees it
- Little distortion
- No special attributes – some would say blah

FATHER MAGUS SWEENEY
A HOLY AND ESTIMABLE PRIEST
WHO WAS HANGED IN NEWPORT
JUNE 8TH 1798
BECAUSE HE HAD JOINED WITH
HIS COUNTRYMEN
IN THE REBELLION OF 1798

Wide Angle Lens

- < 35 mm
- Wide FOV
- Large DOF
- Emphasizes foreground, diminishes background
- Provides depth and brings viewer into image
- Leading lines pronounced
- Provides environment for near subject
- Perspective distortion on close-ups and keystoning

Telephoto Lens

- > 100mm
- Narrow FOV
- Shallow DOF
- Compresses scene
- Simplifies scene
- Isolates subject from environment
- Short telephoto are useful for portraits

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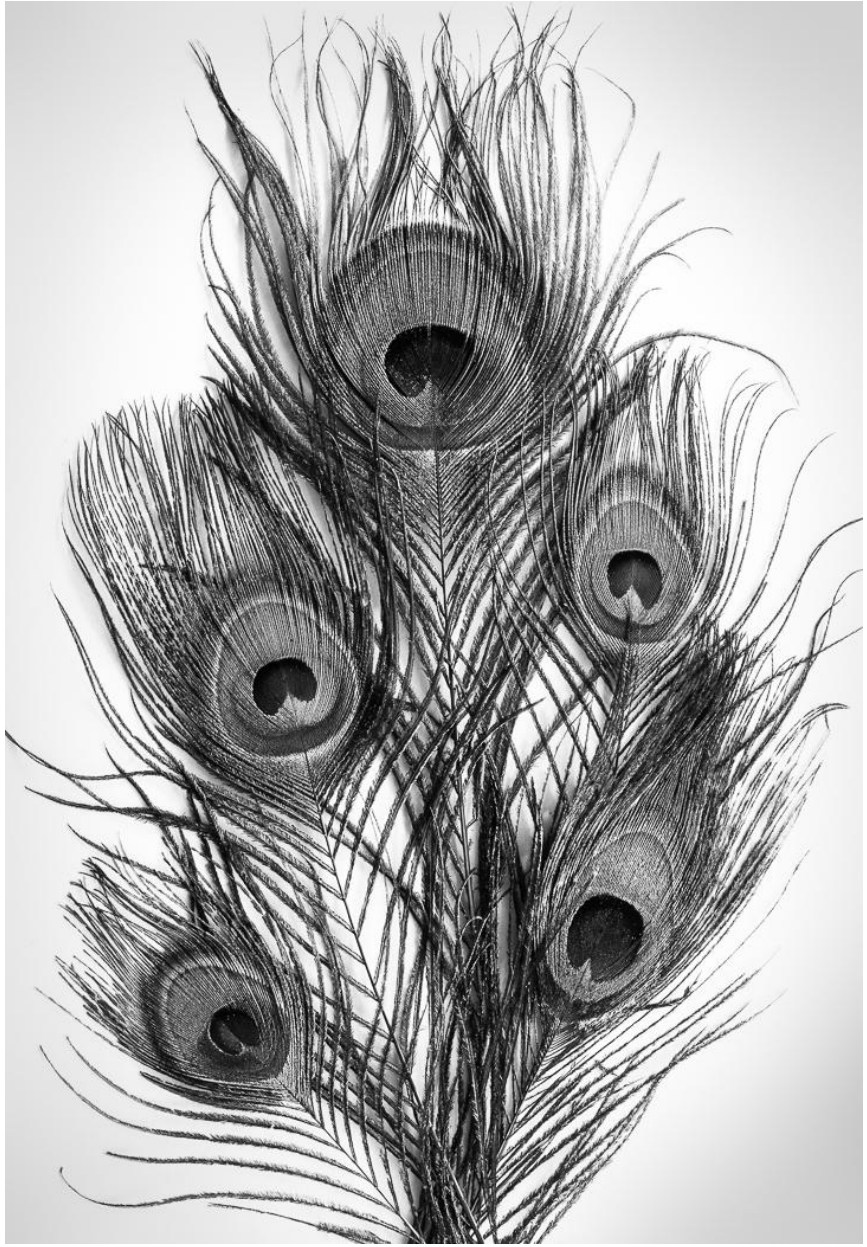
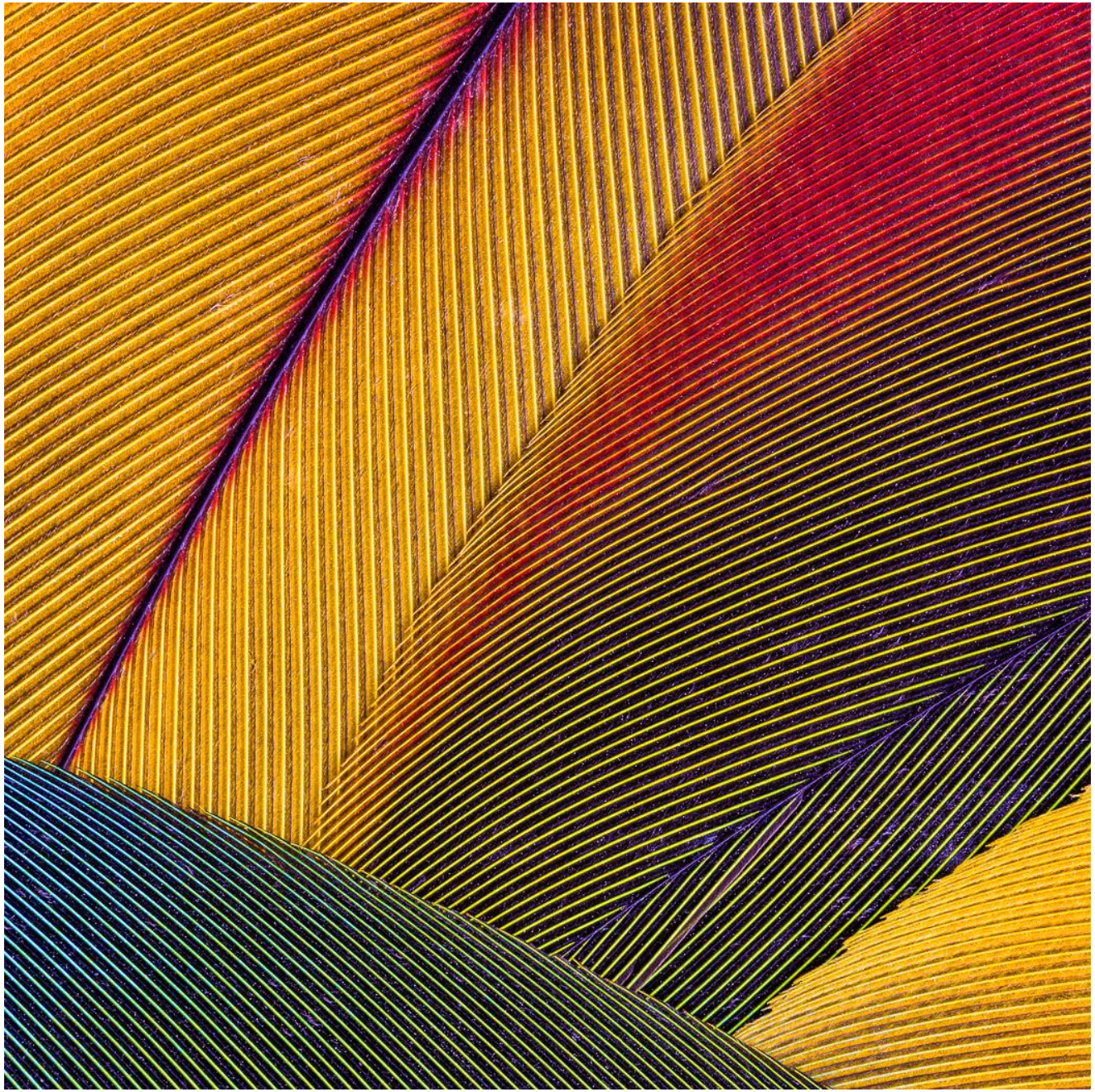
Macro Lens

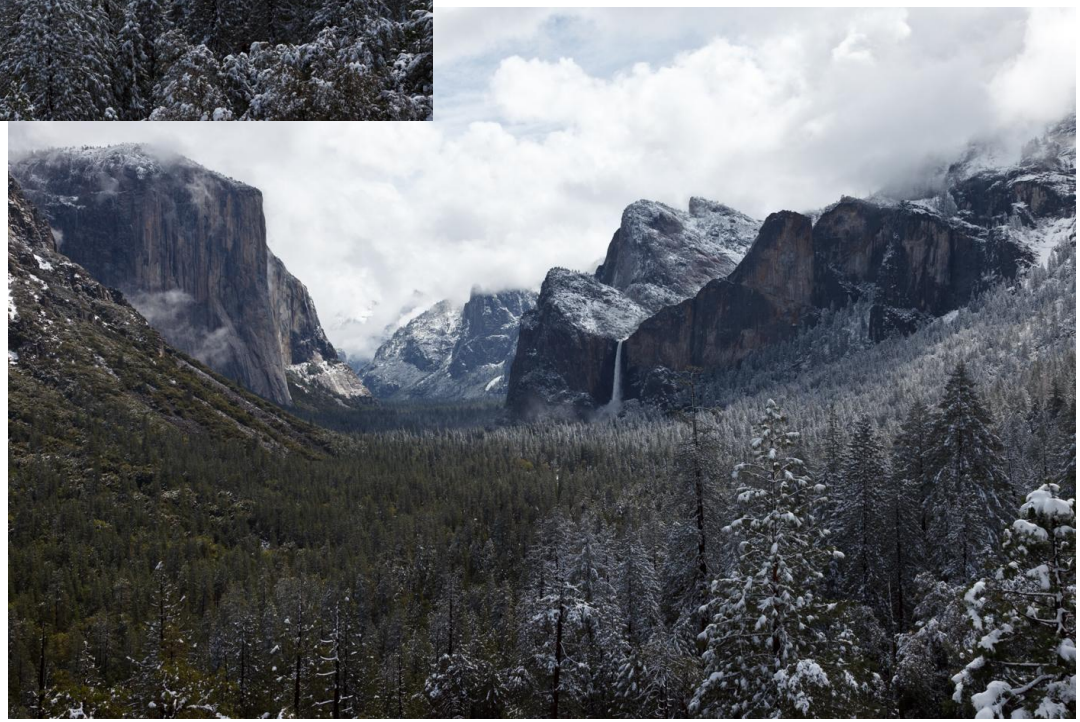
- Optimized for close focus
- Typically 1:1 or 1:2 magnification (full frame)
- Zooms with macro-settings
- Larger than life
- Generally 50 to 200 mm focal length range
- Focal length impacts FOV and working distance
- Similar characteristics to wide angle and telephoto depending on focal length.





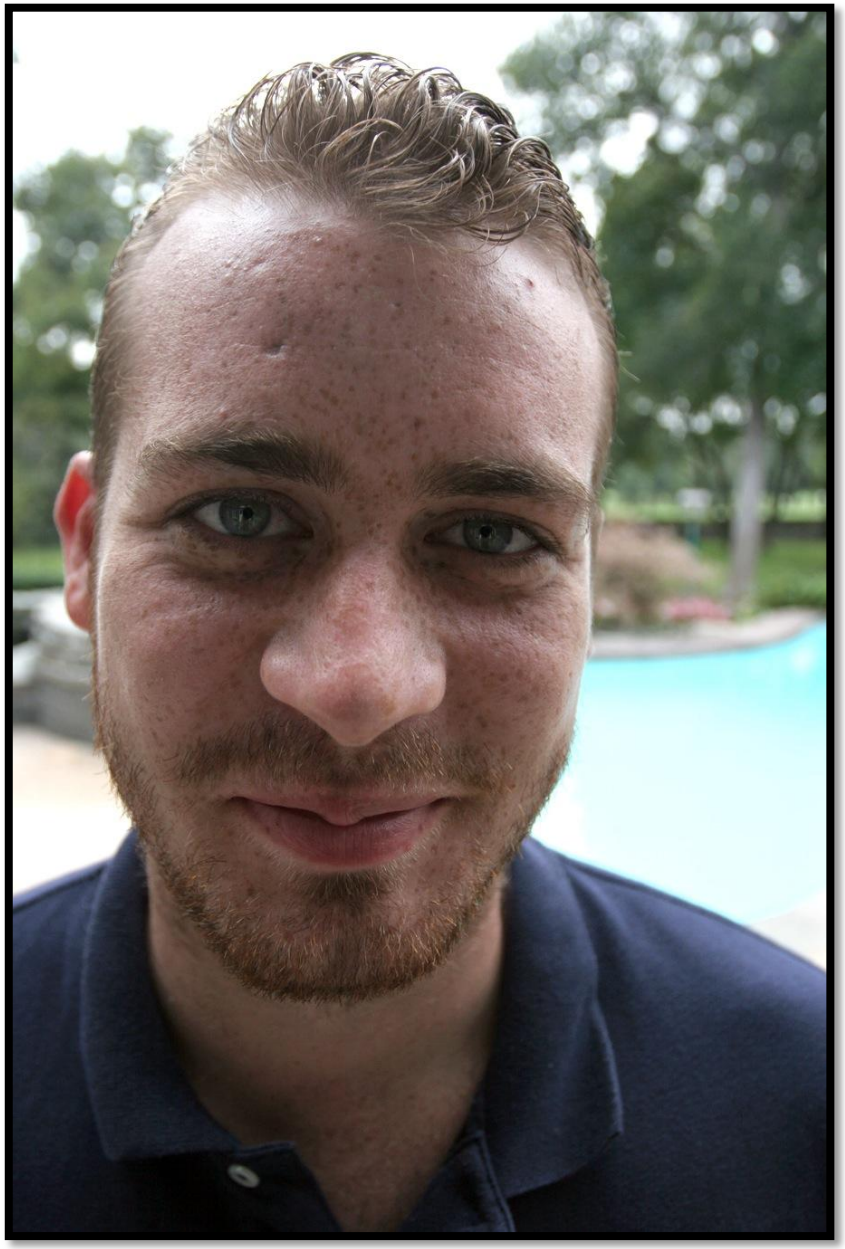
Some Comparisons

Normal

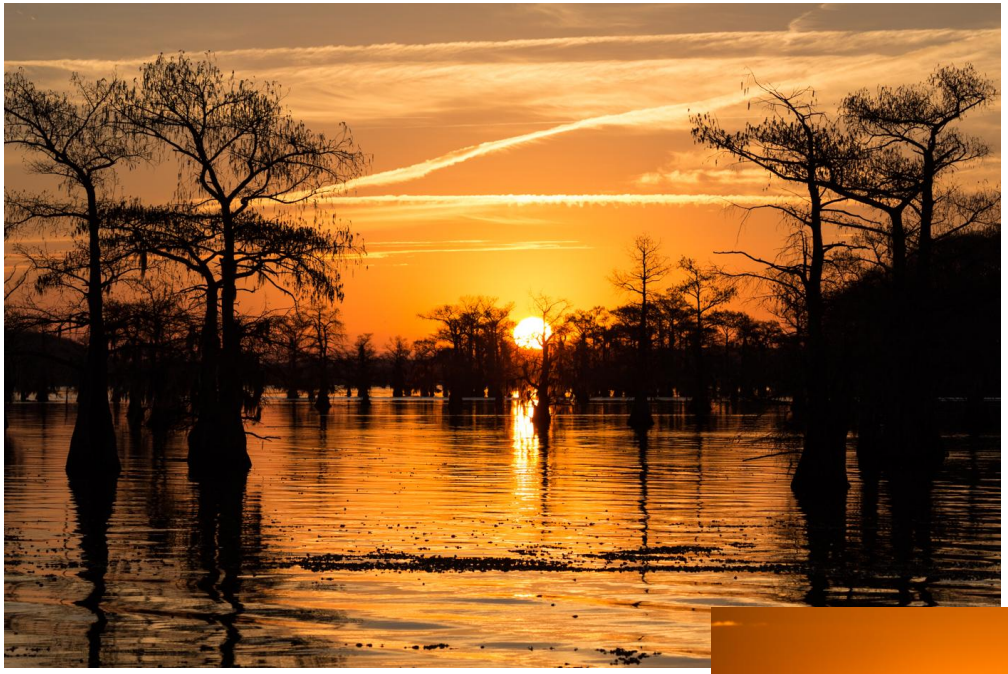


Wide

Short Telephoto



Wide Angle



Wide

Telephoto

Normal

Telephoto

What Lens Was Used?

My Shannon

Carlsberg
Needs
PATRICK BOURKE
MENSWEAR
07:54
FUJIFILM
ENNIS
PHOTO CENTRE
ENNIS
PATRICK BOURKE

R I P

Other Adaptors and Lenses

- Extension tubes
- Tele-extenders
- Screw in close-up lens
- Tilt-shift
- Lens Baby
- Etc…

Walk Around Lens

- Where are you walking
- What are shooting
- Personal style
- Size and weight
- Kit lenses

Depth of Field

Area in the image that the eye perceives as sharp

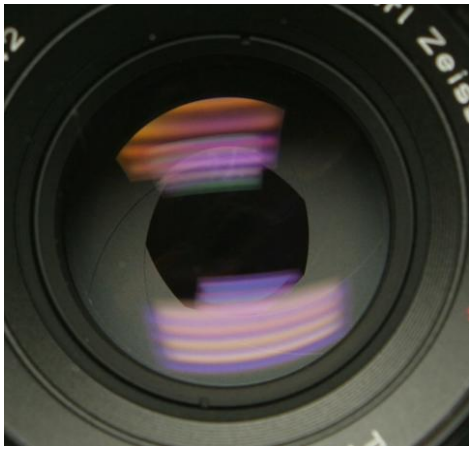
Affected by:

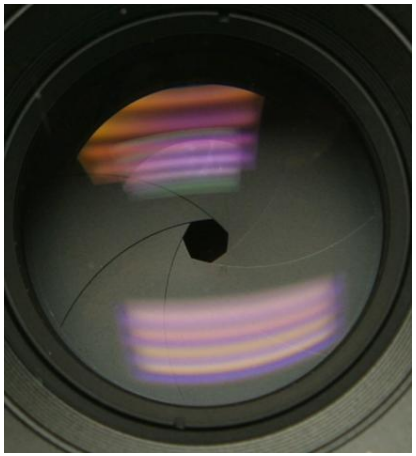
- Aperture size
- Subject-to-camera distance
- Lens Focal Length

A rule of thumb suggests “Depth of Field” usually extends one-third in front, and two-thirds behind, the subject

Aperture

The aperture size affects Depth of Field.





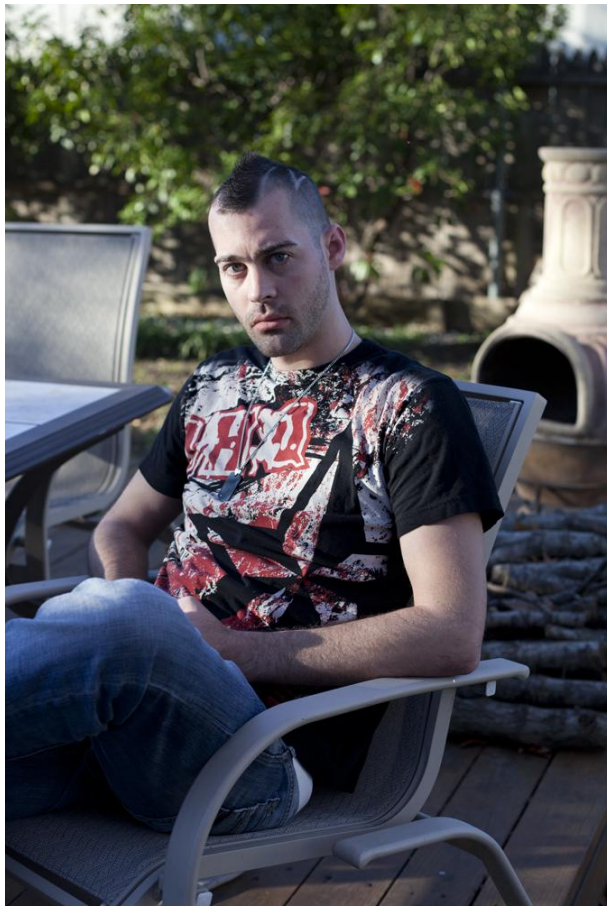
Remember:

- Large aperture = small numbers; f/2.8 f/4
- Small aperture = large numbers; f/16 f/22

Depth of Field controlled by Aperture

Examples with 50 mm fixed lens

Aperture at f/16 gives wide depth of field.



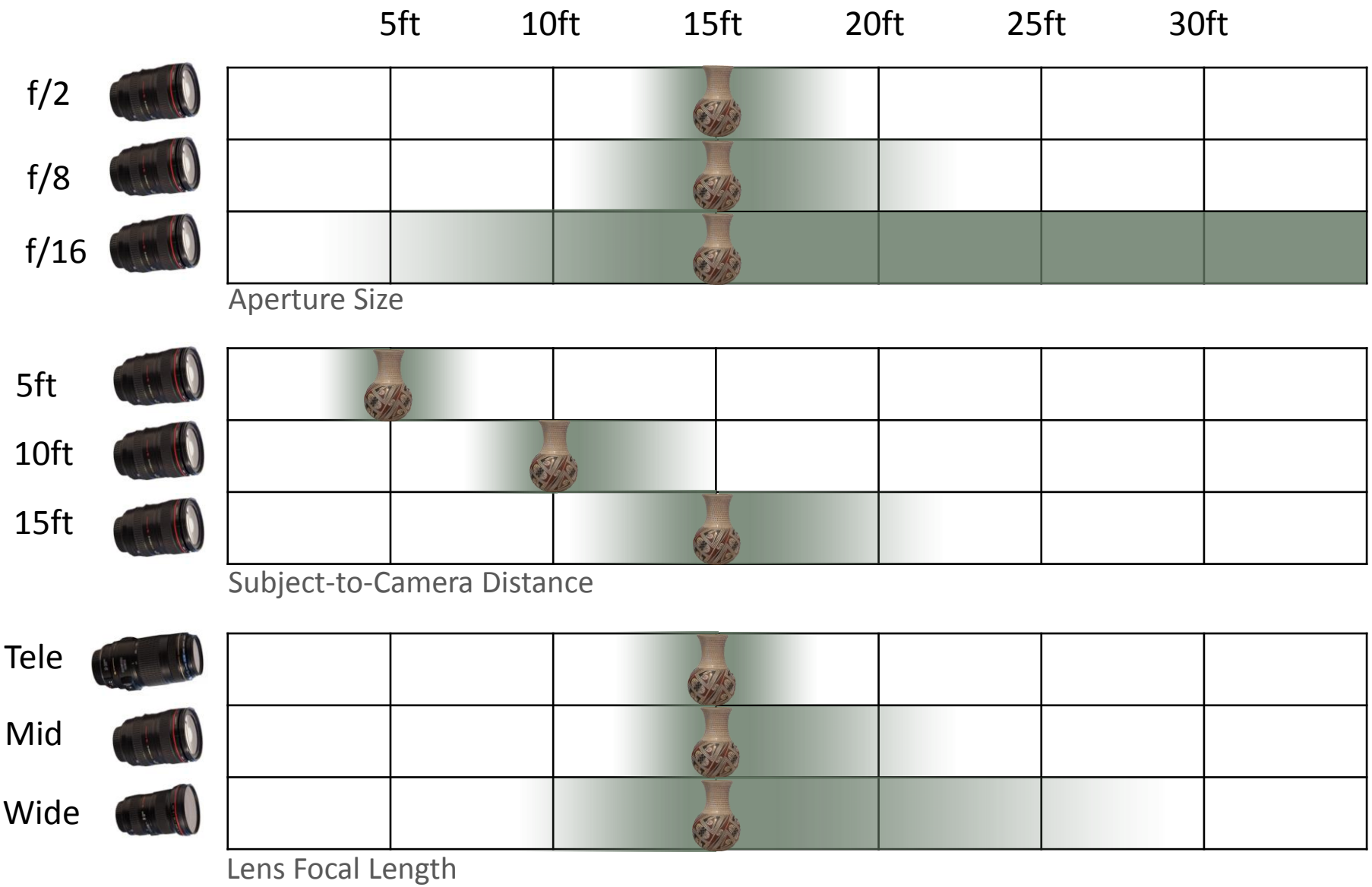
Aperture at f/4 gives shallow depth of field.

Subject to Camera distance

When the subject is closer to the camera, the depth of field is more shallow

Both have same exposure: 1/800th second, f/11, focal length 200mm

Effects on Depth of Field



Adapted from: “John Hedgecoe’s New Book of Photography”