Intro to Photography

Ross den Otter

Session 5
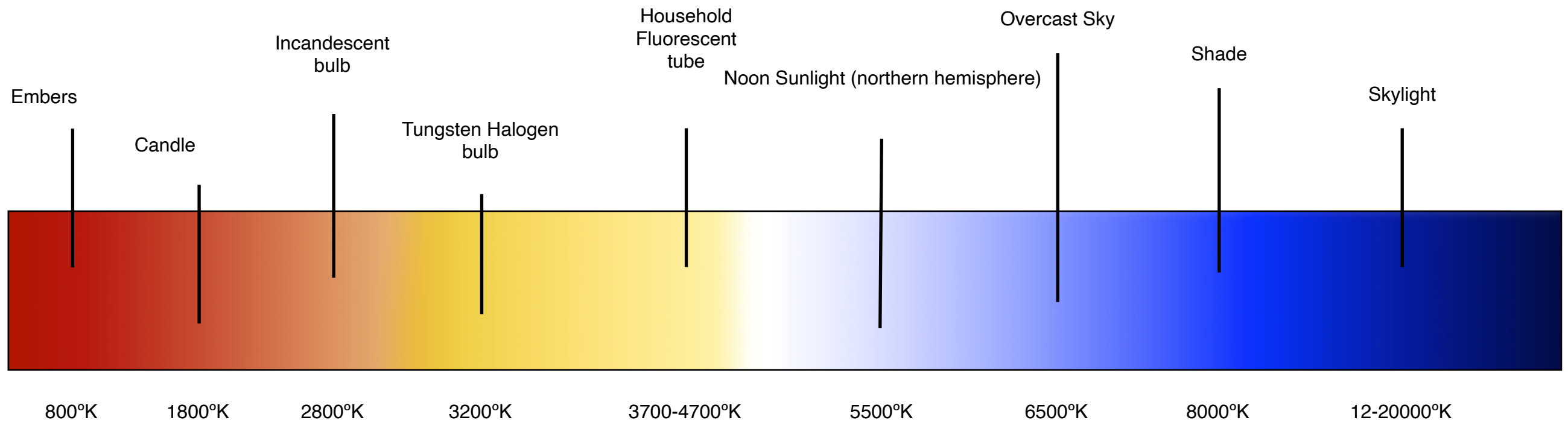
Midterm Recap…

What colour is the light?
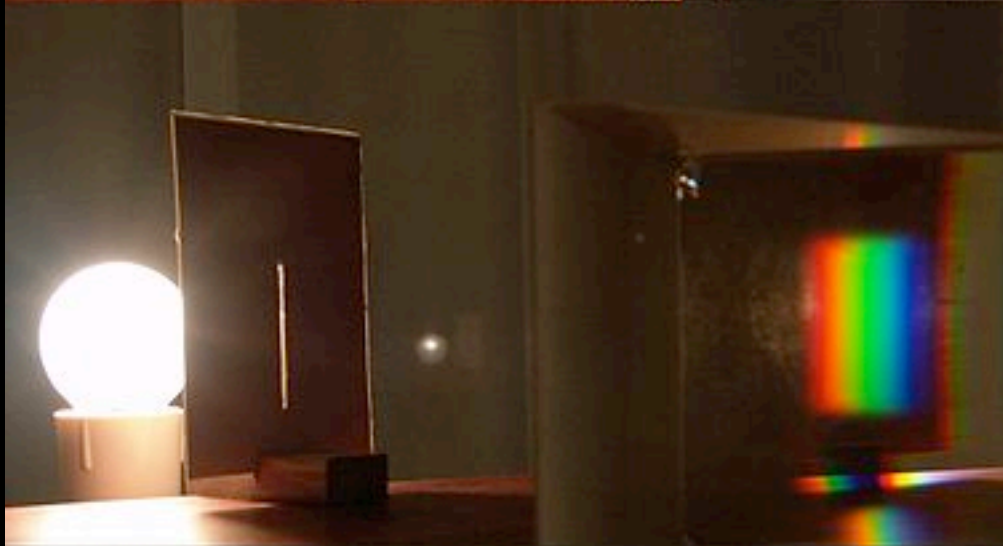
Recording Colour
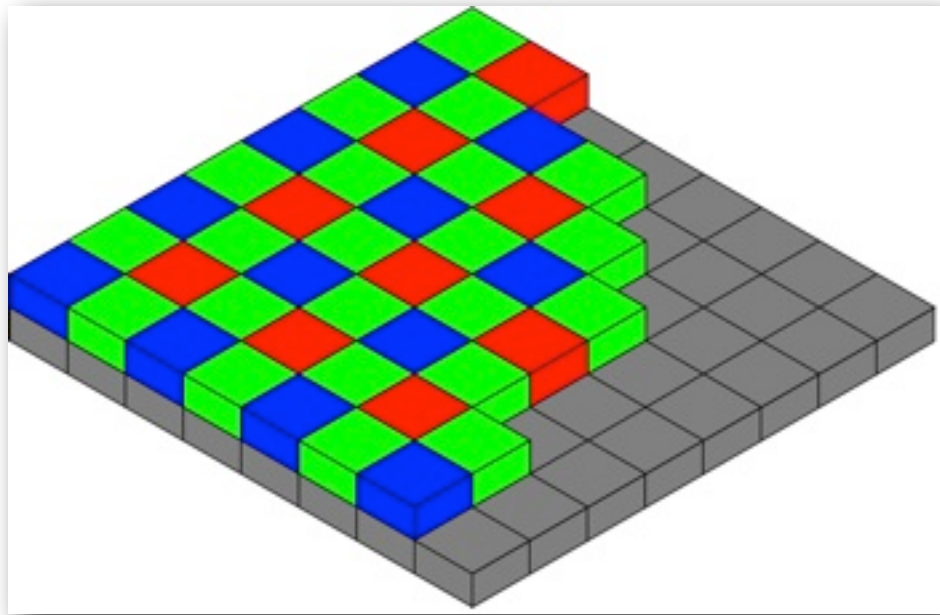
Typical Bayer sensor array

Embers	Candle	Incandescent bulb	Tungsten Halogen bulb	Household Fluorescent tube	Noon Sunlight (northern hemisphere)	Overcast Sky	Shade	Skylight
800°K	1800°K	2800°K	3200°K	3700-4700°K	5500°K	6500°K	8000°K	12-20000°K

A range of colour temperatures

~2700 K
60 W Incandescent

3500 K
13 W Fluorescent

5500 K
13 W Fluorescent

Daylight

Tungsten

Cloudy

Auto

How much light is there here?

ISO and Sensitivity

ISO - Noise

200 ISO

ISO - Noise

12800 ISO

Is my subject moving and do I need to freeze that action?

Shutter speed
2 seconds

Shutter speed
1/1000 second

Do I want a blurry background or a sharp one?

Aperture

1.

f:4.0

2.

f:22

Aperture and the circles of confusion

f:2.0

f:16

Metering
Patterns

Metering

Your meter sees everything as 18% or middle grey.

centre weighted average
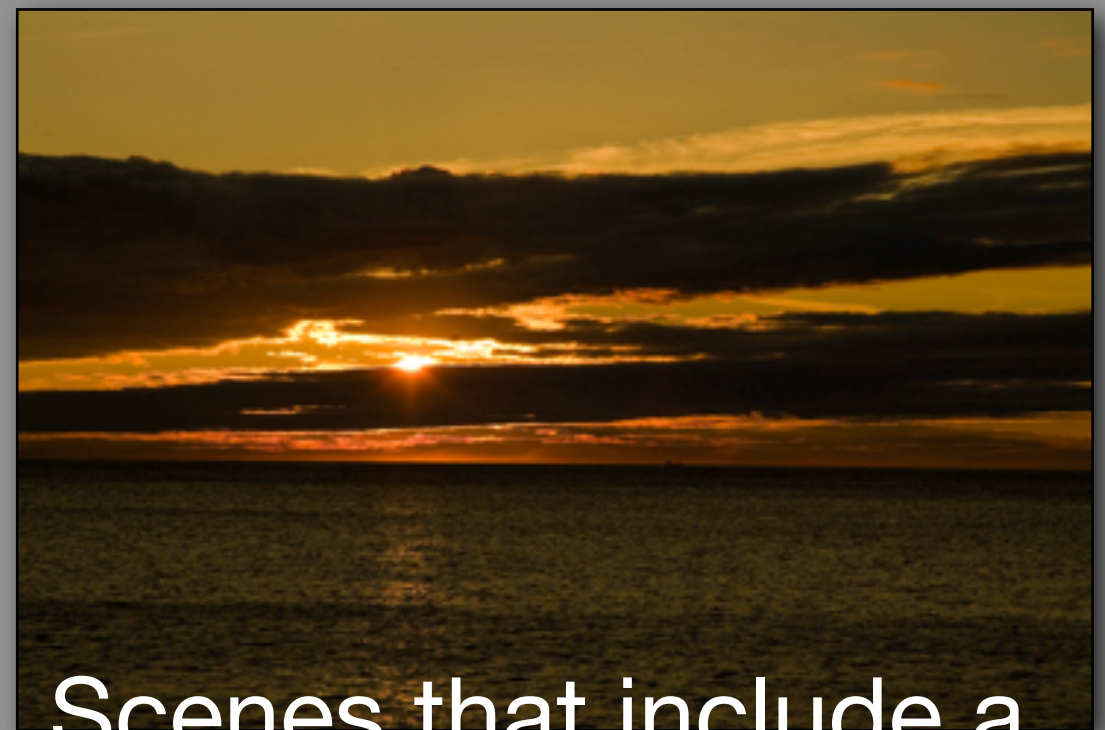
spot

matrix, evaluative or multi segment

spotlit scenes

objects on a black field

scenes with shadows

Scenes that include a bright light

Lenses

SLR Camera Lenses

Fixed Lenses:
(also called 'prime lenses')

28mm Wide-angle
50mm Standard
85mm Portrait
200mm Telephoto

Zoom Lenses:

17-35mm Wide-angle
28-70mm Standard
70-200mm Telephoto
28-300mm Long Range

Specialty Lenses:

Tilt Shift Lenses
Macro Lenses
Fisheye Lenses
Ultra-Wide/ Long Lenses

45mm

150mm

75mm

200mm

All of the exposures were made at f5.6 from the same spot.
Angle of view changes, perspective does not.

45mm

45mm cropped

200mm

When you crop the photo to match the 200mm framing the images share the same perspective. The depth of field is different and so is the resolution.
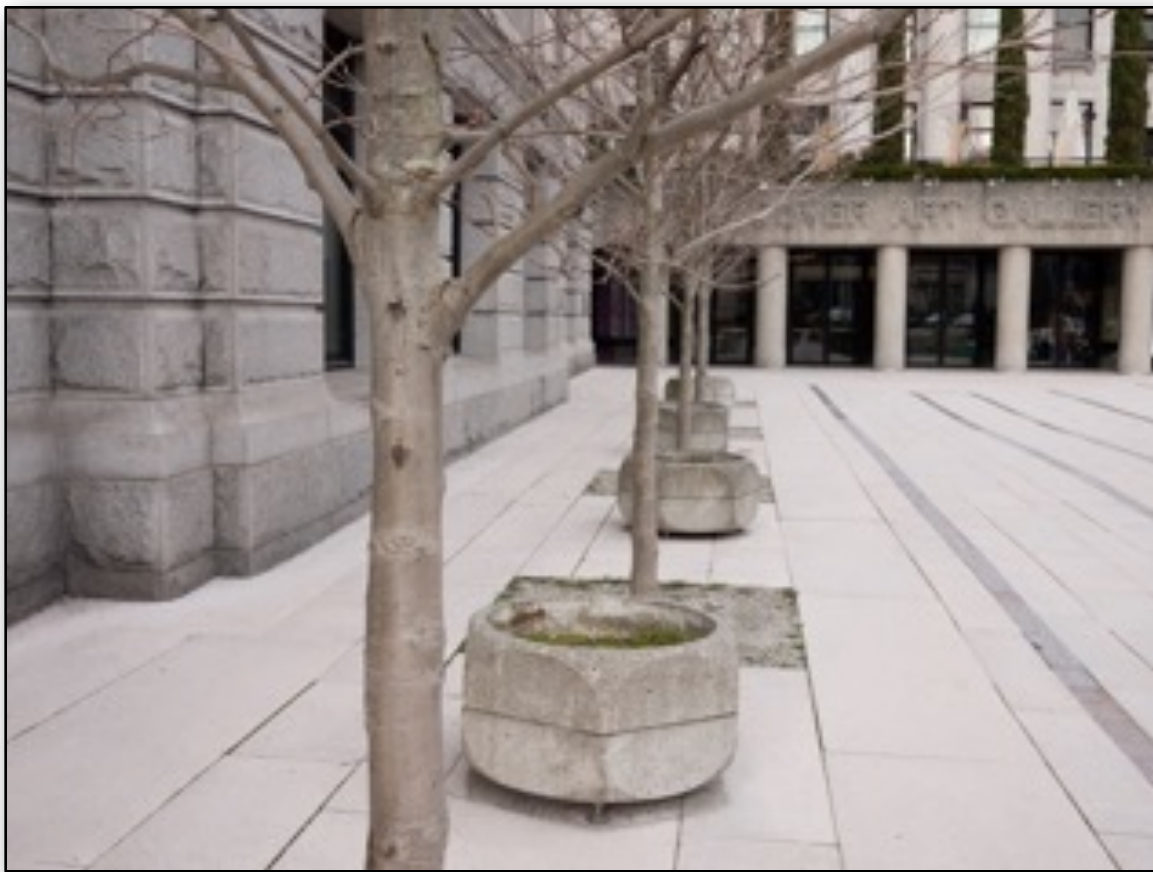
The camera position was changed to keep the front tree the same size from photo to photo. This is when the perspective changes.

20mm

100mm

45mm

150mm

75mm

190mm

Lens Behaviour

Wide Angle
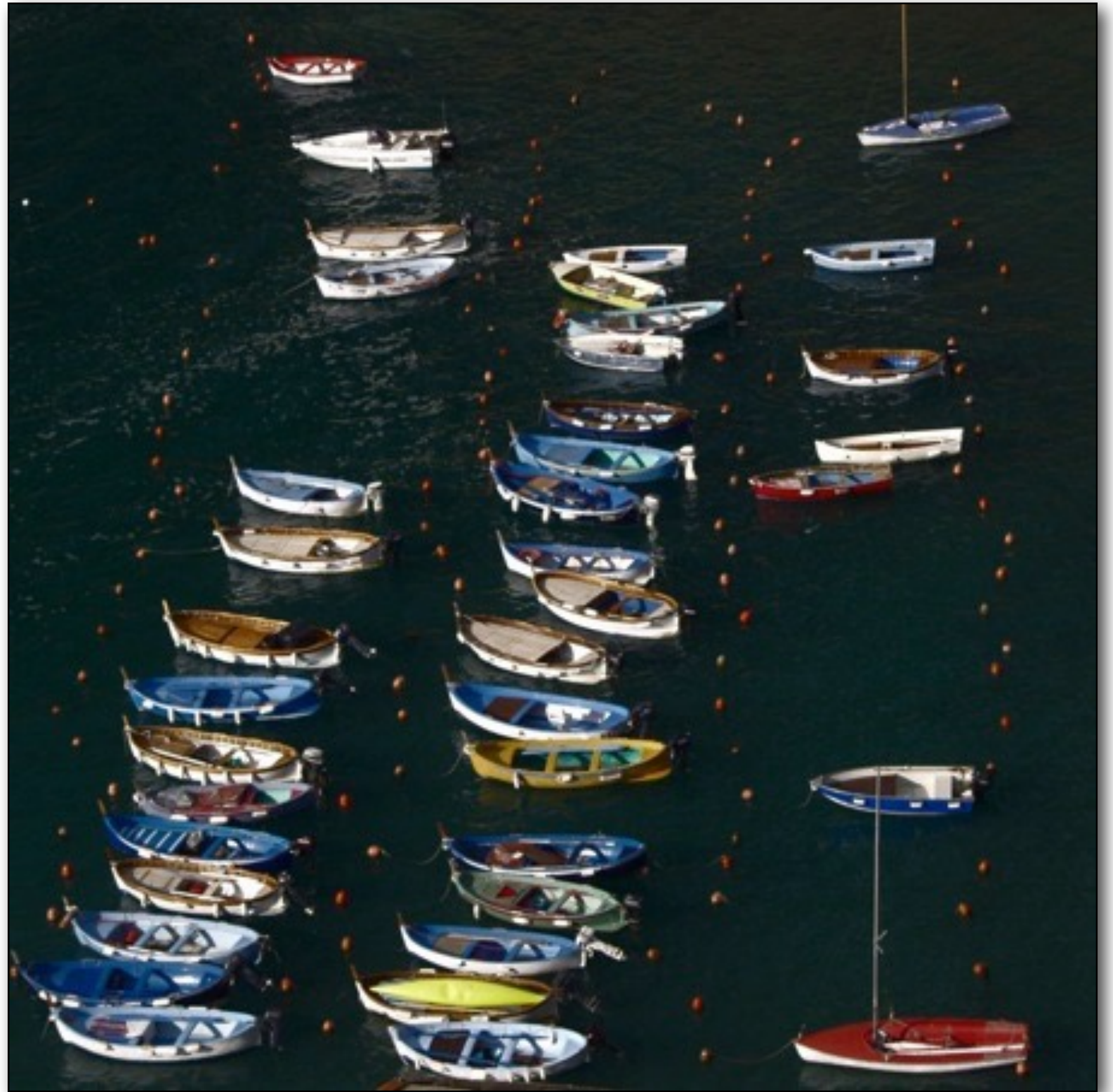
Telephoto

Expansion

Compression

expansion

compression

Moving along from where we left off last week

Perspective

Vertical and horizontal lines

Most straight lines are man made, except the horizon. We have expectations for straight lines; skyscrapers that don't appear to be falling backward and rail lines that converge in the distance, and keep the horizon level. Each of these elements are controlled by camera placement and lens selection. Converging and parallel lines are governed by intersecting planes. If lines in the scene intersect with the plane of the sensor those lines in the scene will converge. If lines in the scene remain parallel to the plane of the sensor, then those lines will remain parallel in the photograph.

In plain english, if you tip your camera up to fit the top of the building in, the building will look like it's tipping back.

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They built this tower on soft ground with a shallow foundation of only 3 metres and it started tilting after the addition of the second floor.

They waited 100 years or so for the soil to compact; settling some scores with Genoa, Lucca, and Florence in the meantime. When they got back to work on it they added another six stories; curving them to compensate for the lean.

Here's the dilemma, do you keep the horizon straight or do you correct the lean of the tower in the photo by rotating your camera?

Myself, like most tourists to Pisa, choose to mess around with "forced perspective".

An optical illusion, forced perspective is a technique that makes an object's relative appearance larger, smaller, closer or father away than it actually is. The technique is used in photography, filmmaking, sculpture and architecture.

Forced perspective was used to make a statue of the lion on the steps of the loggia seem much larger than the giant copy of David standing outside the entrance of the Palazzo Vecchio in Florence Italy. From my memory the lion is substantially less than half the size of David.

Michelangelo used forced perspective in the creation of his masterpiece David. David's hand and head are disproportionally larger than his body to make those elements more prominent. Some have thought David was intended to be placed on Florence's cathedral roofline and was to be viewed from below.

The architects that designed this mosaic pattern use forced perspective to create an undulating wave pattern, symbolic of the oceans the nation of Portugal controlled during its Golden Age.

Forced perspective.
Me in New York, thinking about home.

This photo was taken with a short focal length lens where the working distance was less than three feet. Notice the immense hand holding the glasses that are too large for his head which is too large for his body.

You may also note he's wearing a shirt where GENIUS is misspelled; not everyone does...

Forced perspective in photography is achieved by placing objects in the frame at varying depths and manipulating the relationship of the objects through lens selection, angle of view and proximity to the camera and the other objects.

Forced perspective can be used to exaggerate the relationship of a subject's features. Generally the distorted relationship of those features create comedic characterizations.

When you fill the frame with your subject while using a wide angle lens on your camera you get forced perspective. It might be fine for some purposes but you won't score high for beauty.

working distance
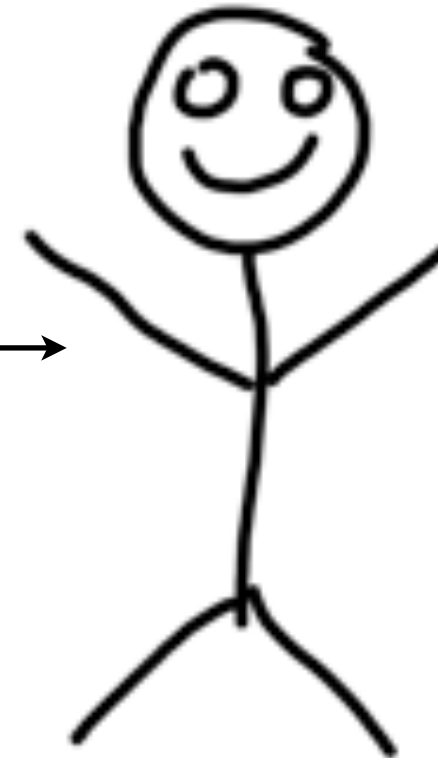
If your goal is to make a flattering photograph of someone, take it from a respectful distance.

A head and shoulders portrait taken with a lens that has a focal length double diagonal of your camera sensor measurement, which is considered the perfect portrait lens, will need a camera to subject distance of between 4 and 6 feet. This combination of lens and working distance gives a perspective to your subjects face that is close to how we see people. For simplicity sake I call the distance from camera to subject the working distance.
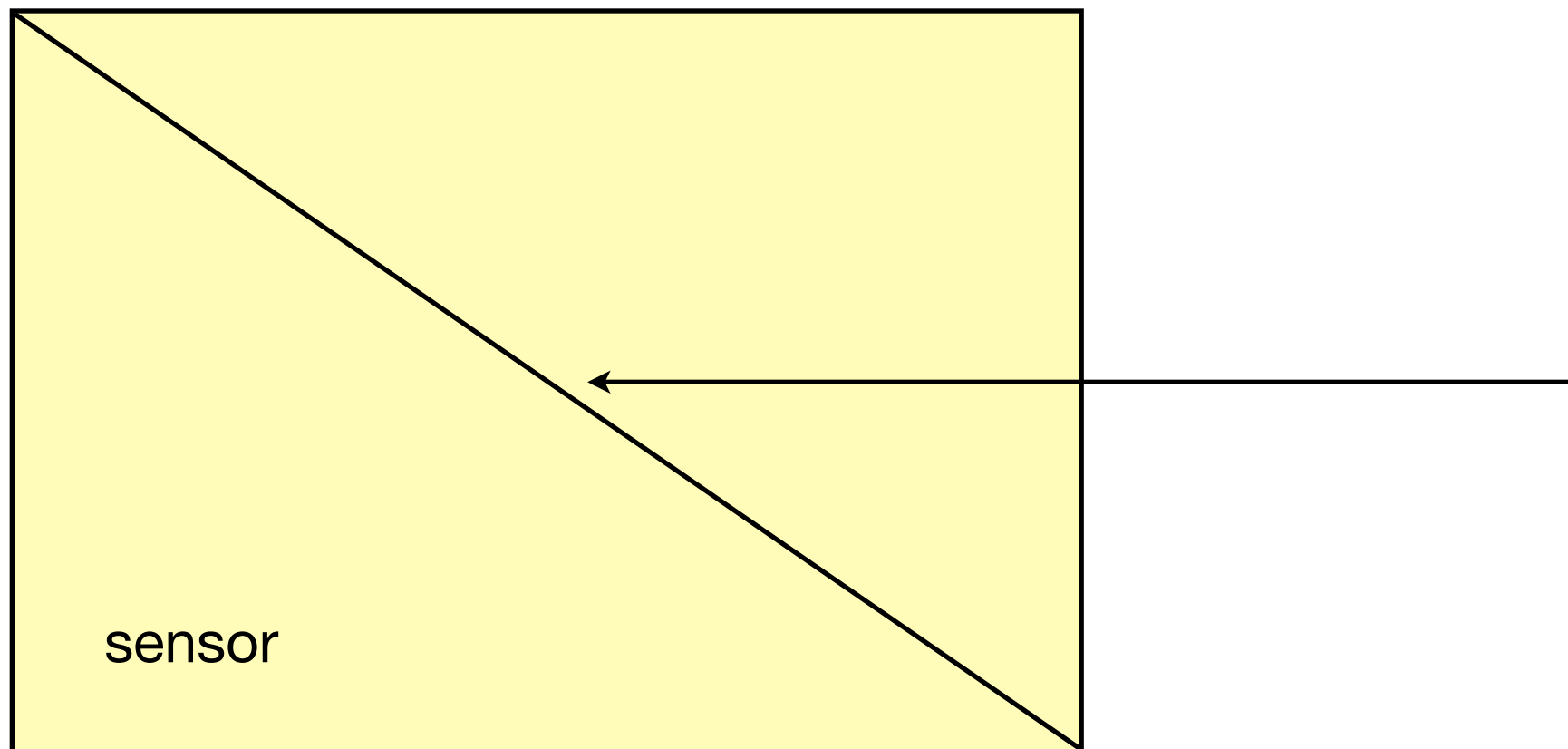
Twice this measurement is the standard portrait focal length.

Sensor type	Sensor dimensions	Sensor diagonal	Normal lens focal length
Four Thirds	17.3 × 13 mm	21.63 mm	22 mm
4/3"	18.0 × 13.5 mm	22.5 mm	23 mm
APS-C	22.7 × 15.1 mm	27.3 mm	27 mm
DX	23.7 × 15.8	28.4 mm	28 mm
FX or (35 mm film)	36 × 24 mm	43.3 mm	50 mm

Table of format measurements and normal lenses for popular camera sensors sizes.

By using a long lens to make these photo of Stefano Giulianetti he's isolated from the background and the features of his face are flatteringly compressed. In both cases the lens was a 180mm on a Nikon D2x the aperture was set to f 6.7

Same Guy

Manual Exposure

Exposure

When we talk about "light meters" or "metering a scene", we are looking at this symbol (circled in red) in the view finder.

When the camera is set to "Manual Mode" this symbol will change as the camera is pointed at brighter of darker scenes or with changing reflectance of the subject.

In "A or Av", "S or Tv", or "Program" modes, the symbol won't change; the shutter speed, aperture, and / or both settings will change instead.

Exposure

Exposure is the process of exposing the sensor to light

• determined by taking a measurement using a light meter
• is relative to a specific ISO
• is a combination of aperture and shutter speed to yield total quantity of light

Over exposure

• means that too much light has reached the sensor
• image will appear washed out or too light possible information loss in the highlight areas (often called "blown out" highlights).

Under exposure

• means that not enough light has reached the sensor
• image will appear muddy or too dark
• shadow details might be lost (often called "blocked up" shadows)

Exposure

Light meters or exposure meters, measure the quantity of light and translate that into a combination of f/stop and shutter speed to give the correct exposure based on the ISO (sensitivity).
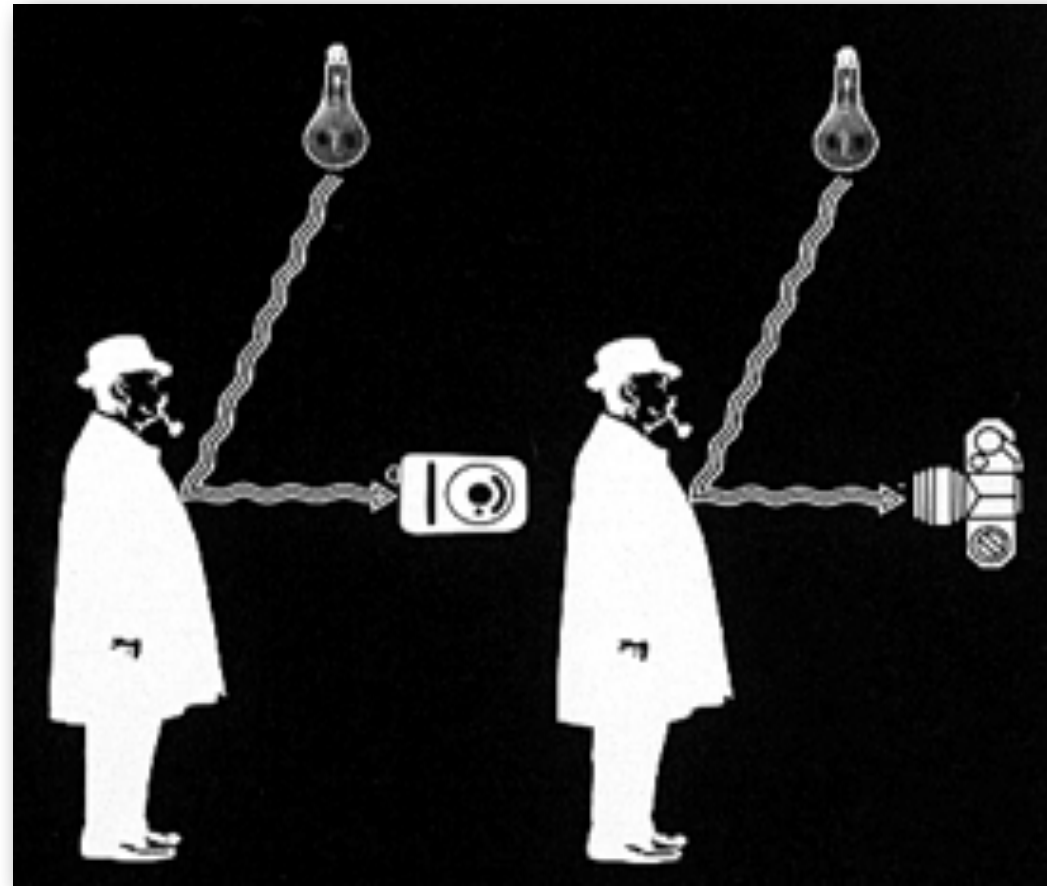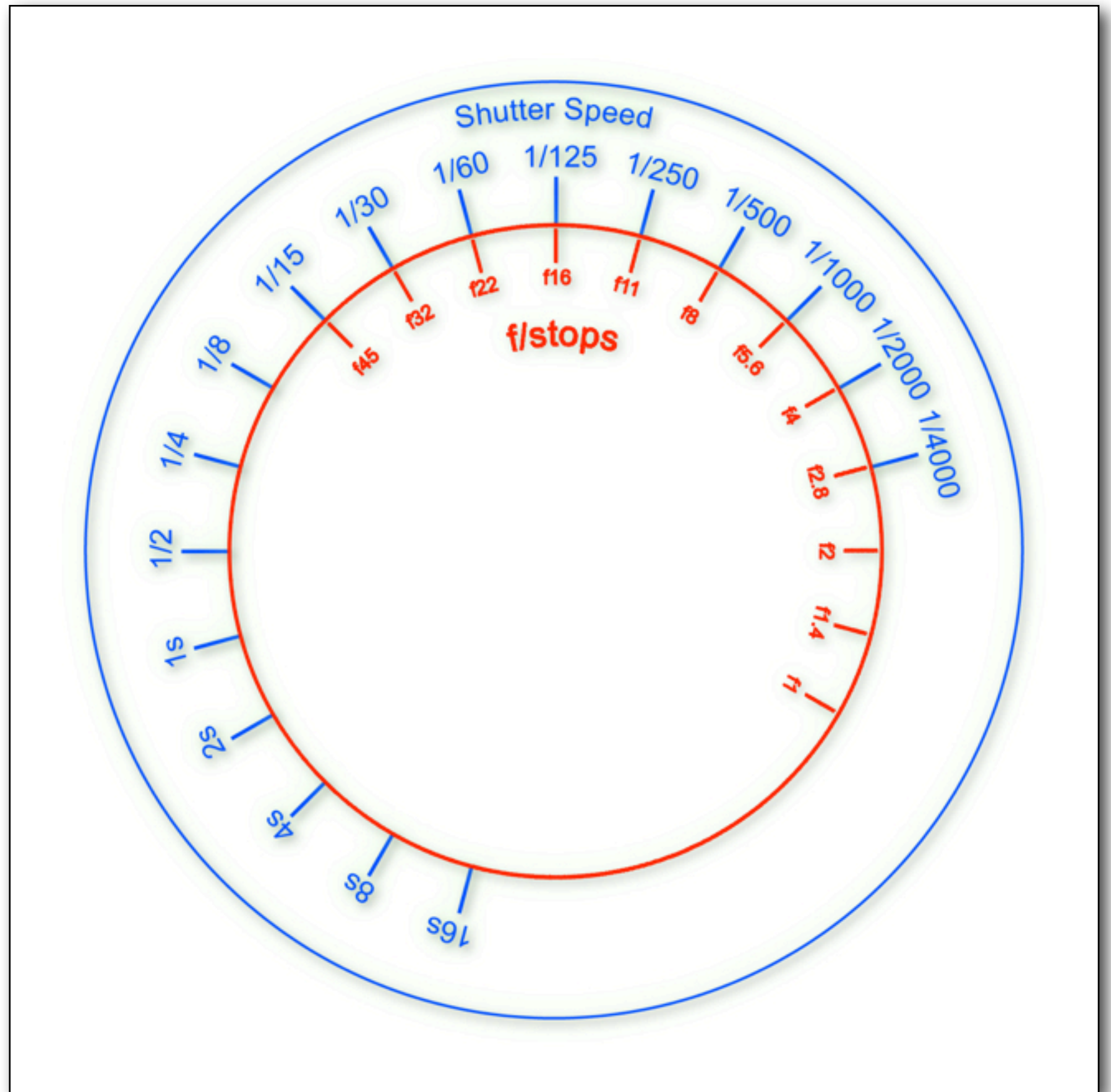
Exposure
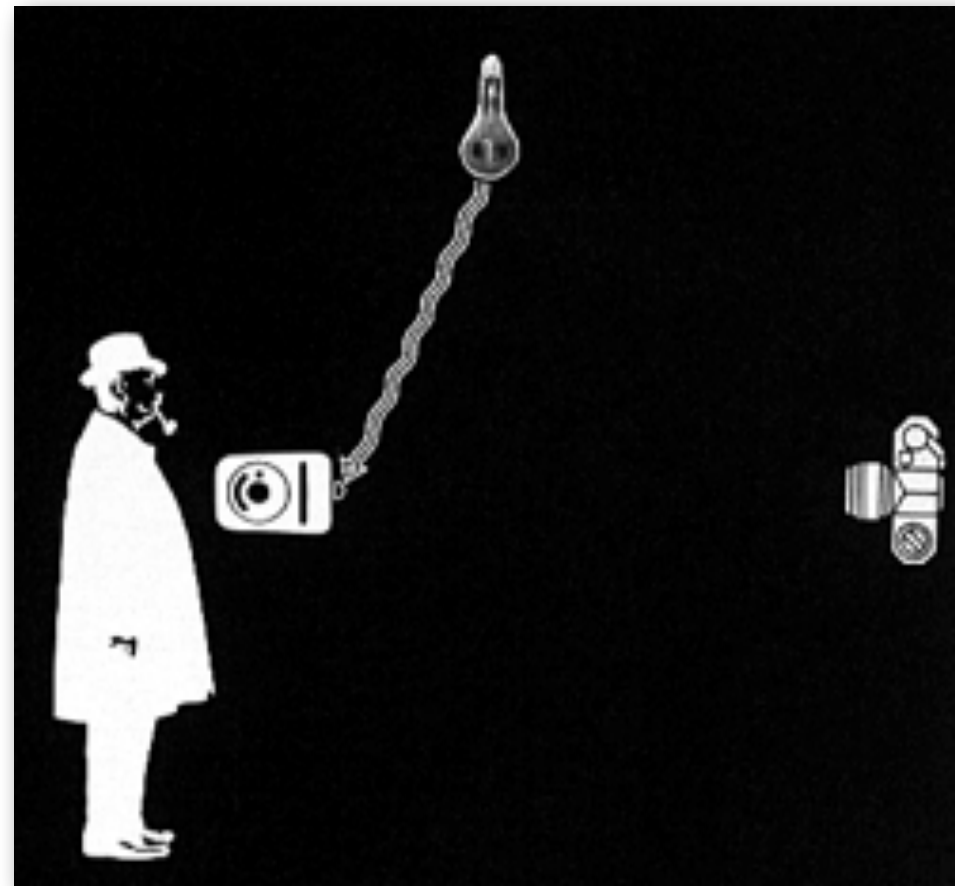
Incident Meters measures the light FALLING ON your subject. The measurements are NOT influenced by a subjects colour and reflectivity!
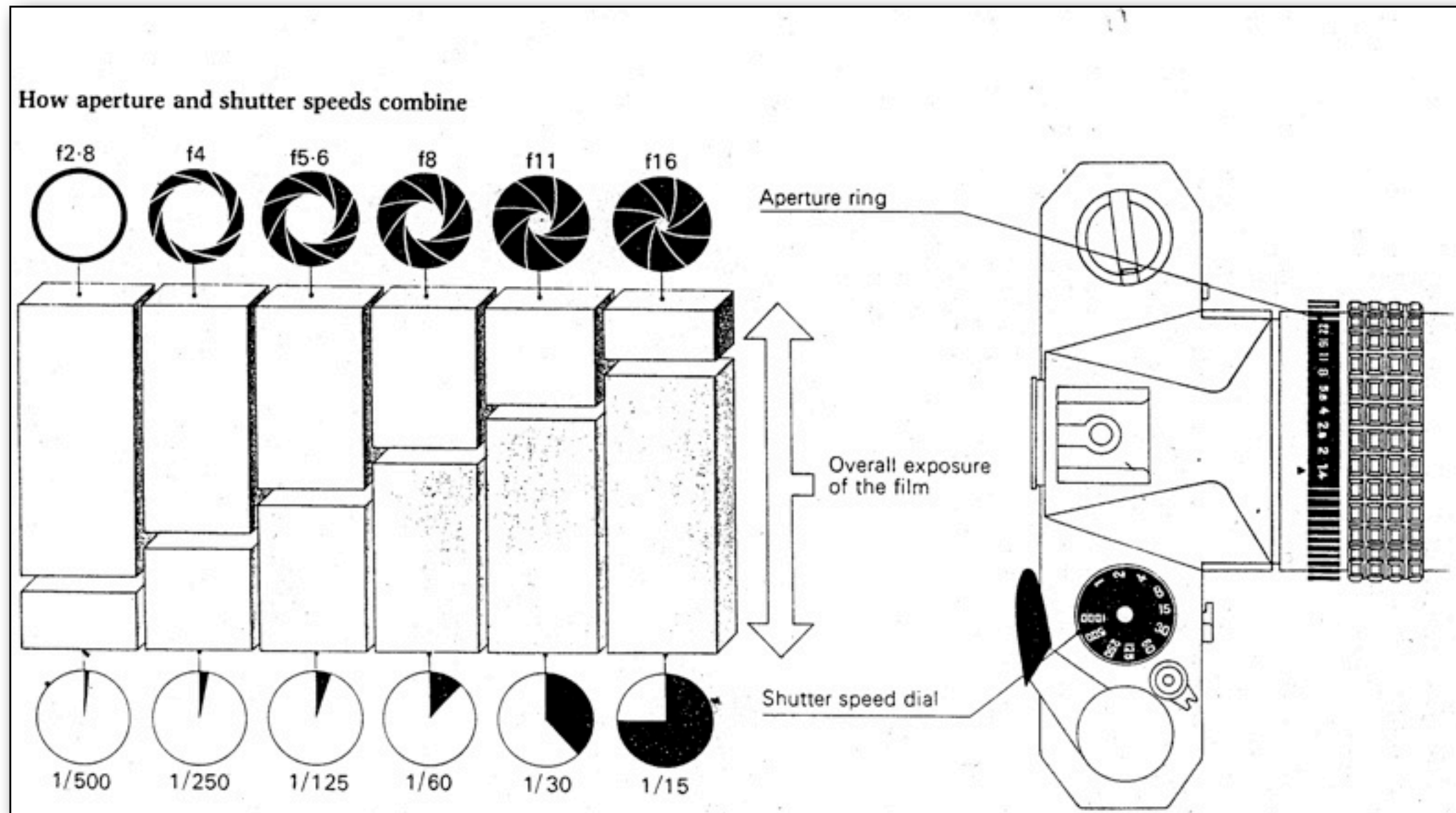
Exposure

Reflective Meters measures the light REFLECTED from your subject.

Measurements **are influenced by a subjects colour and reflectivity**, which will result in changed readings even if the relative amount of light falling on the subject does NOT change.

This dial shows the exposure combinations for the sunny 16 rule at 100 ISO

Shutter and Aperture Relationship

How aperture and shutter speeds combine

Minimum focus distance and macro photography demo…

emphasizing motion

The importance of blur

Nikon D2x 80-200mm zoom lens at 200mm
exposure 1/40 sec at f22 ISO 100

This image is an example of panning with the action. The horses were in a full gallop at about 45km/h. By moving the camera to follow the action they remain sharp while the land and background they are running on is recorded with a bit of blur in the direction of the camera pan.

Panning

1/20 second f5.6 ISO 200