Check for Understanding: Exposure values

Let's look at EV again...

Check for Understanding: Exposure values

Brightness is measured in EV (Exposure Value), and EV is a scale centered at 0.

Check for Understanding: Exposure values

Brightness is measured in EV (Exposure Value), and EV is a scale centered at 0. An EV of 0 is defined as 1 second at f1.

Check for Understanding: Exposure values

Check for Understanding: Exposure values

Question:

Are there other ways to express the same exposure?

Check for Understanding: Exposure values

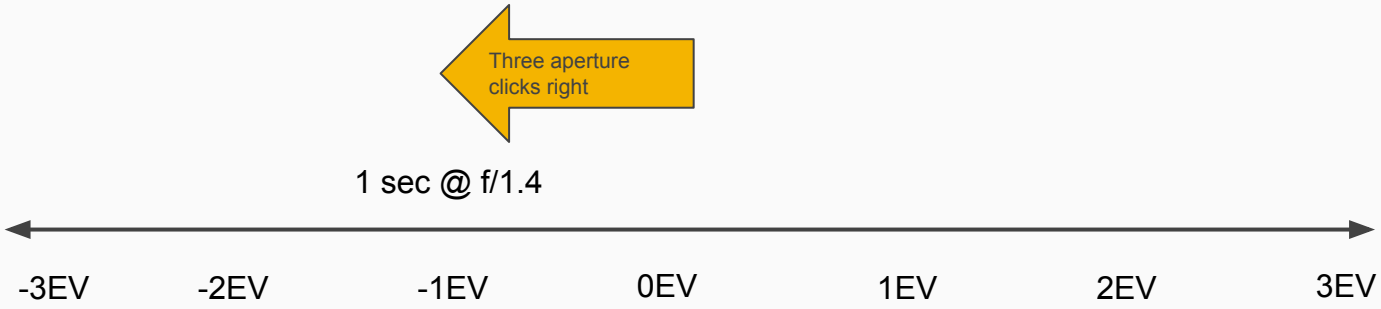
Question:

Are there other ways to express the same exposure?

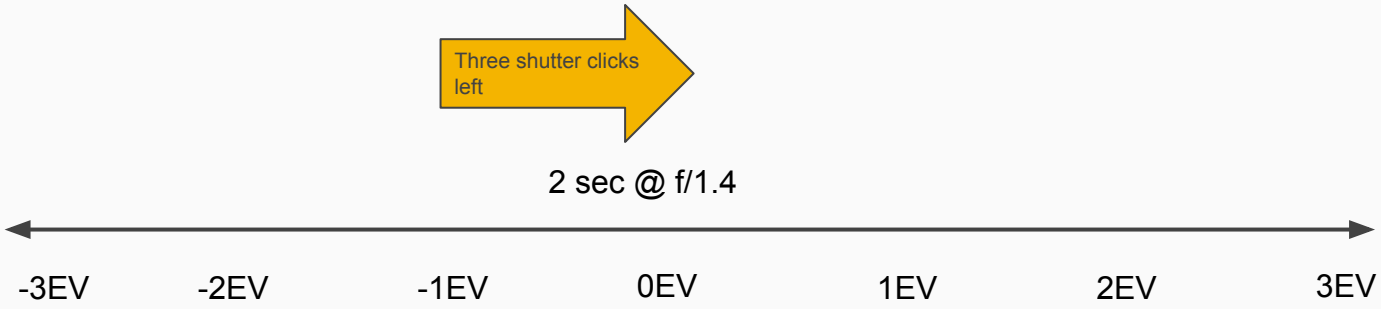
Answer:

Of course… three clicks one way for aperture and three clicks the other way for shutter speed is the same exposure

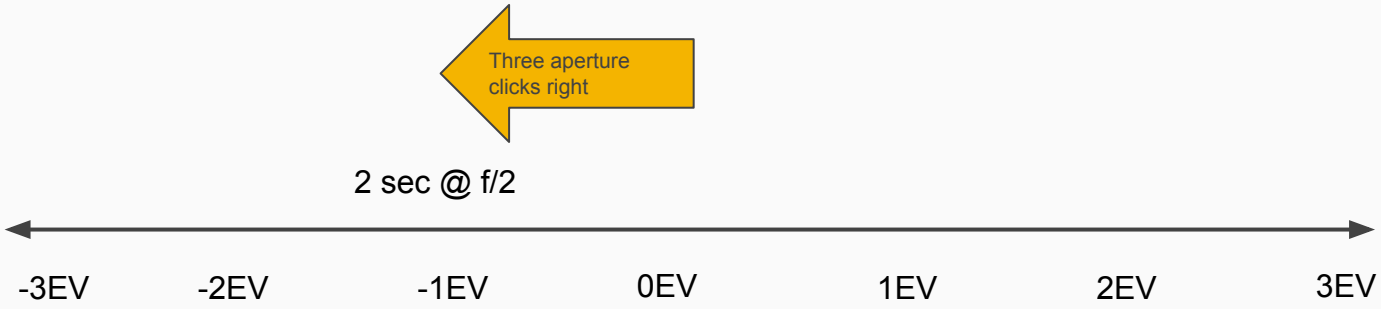
Check for Understanding: Exposure values



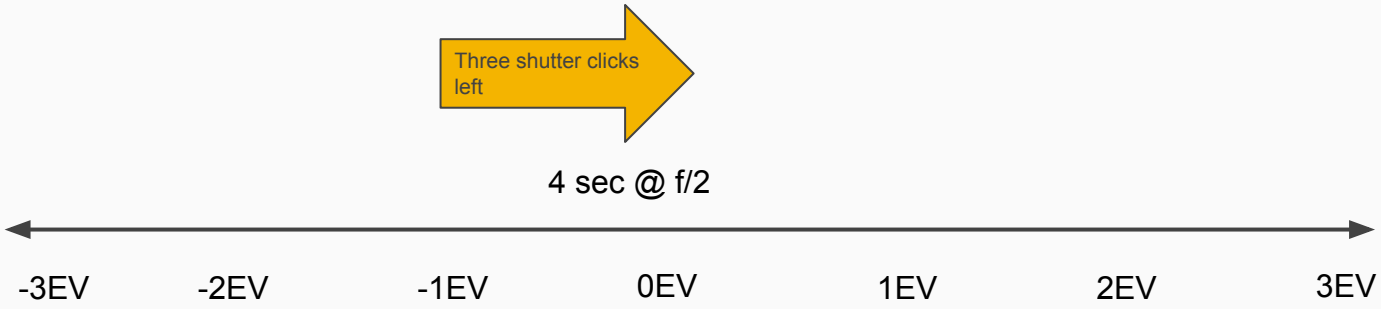
Check for Understanding: Exposure values



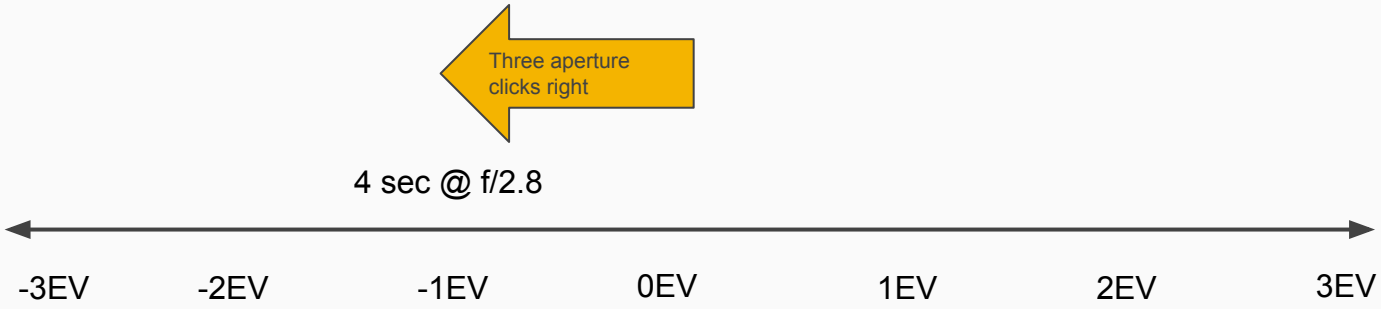
Check for Understanding: Exposure values



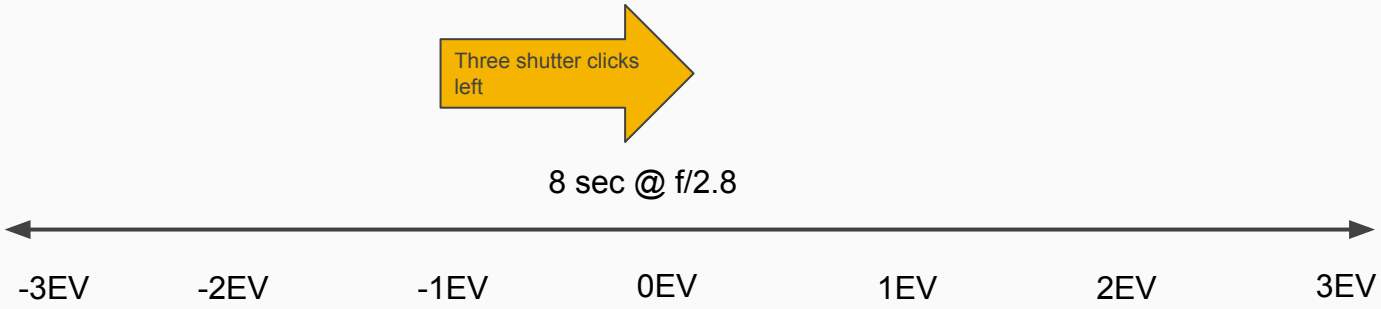
Check for Understanding: Exposure values



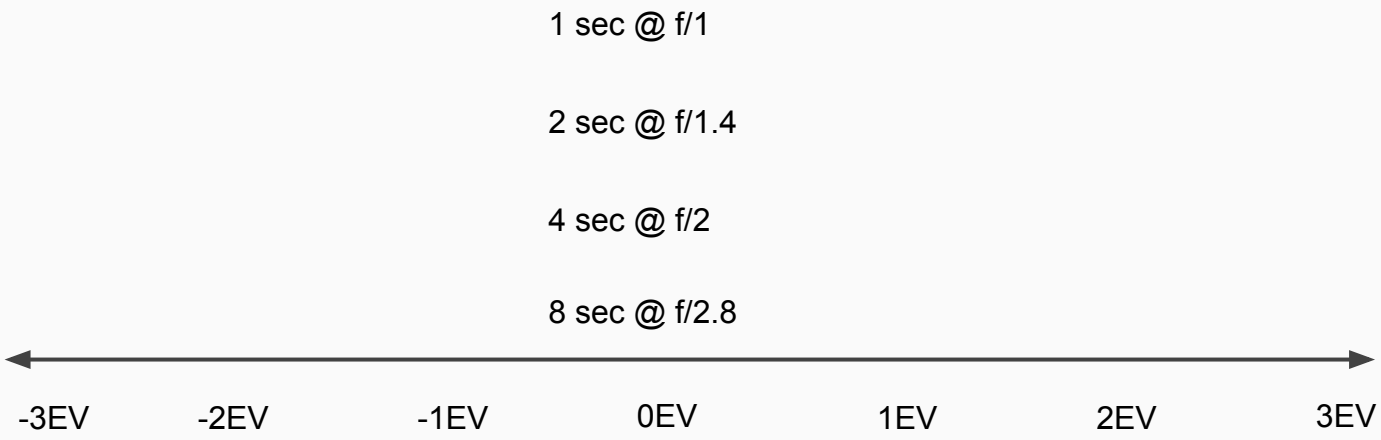
Check for Understanding: Exposure values



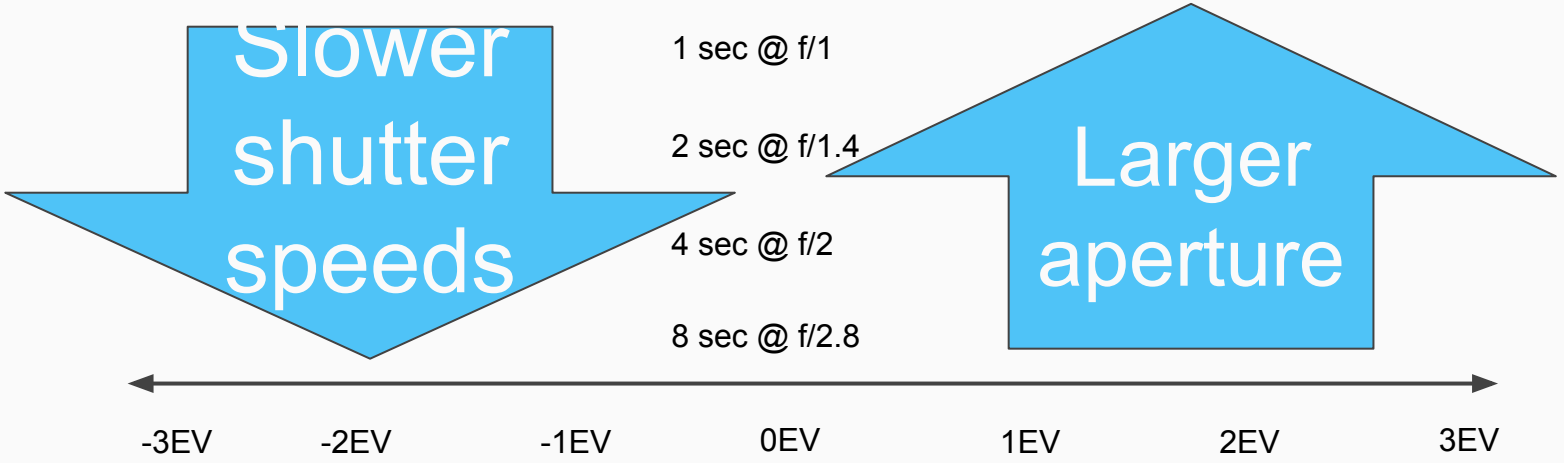
Check for Understanding: Exposure values



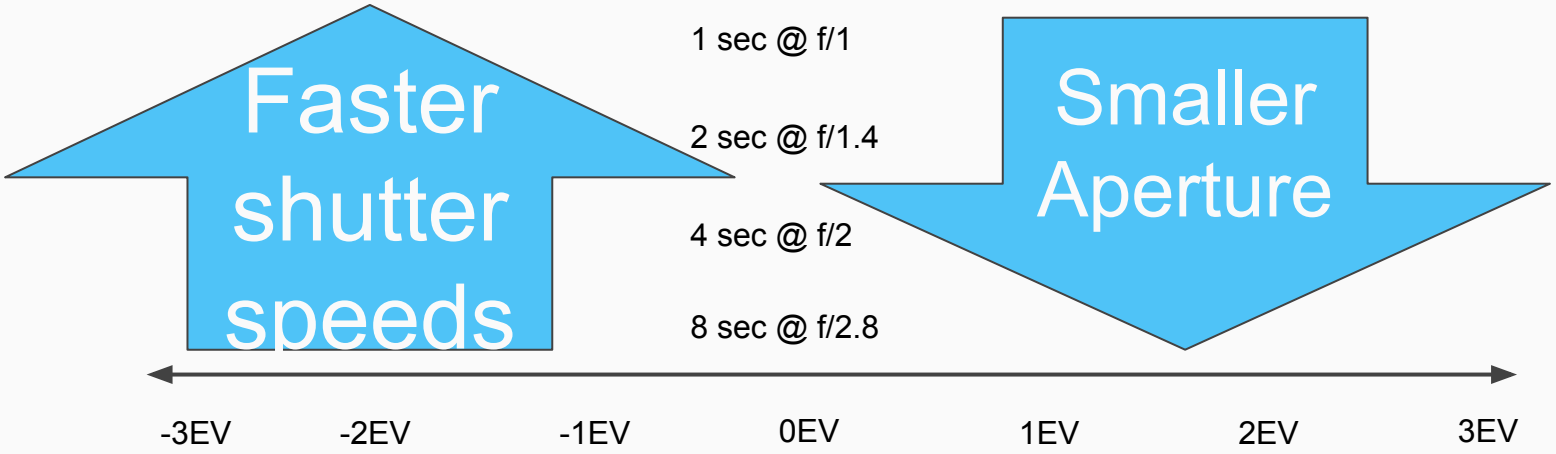
Check for Understanding: Exposure values



Check for Understanding: Exposure values



Check for Understanding: Exposure values



Question:

If we can achieve the same exposure through different combinations of shutter speed and aperture, why does it matter which aperture we choose?

Answer:

Because aperture doesn't just control how much light comes into the camera, it also controls *depth of field*

Depth of Field

DoF

the distance between the closest and furthest things in focus

Depth of Field

kinda...

the distance

between the closest

and furthest things

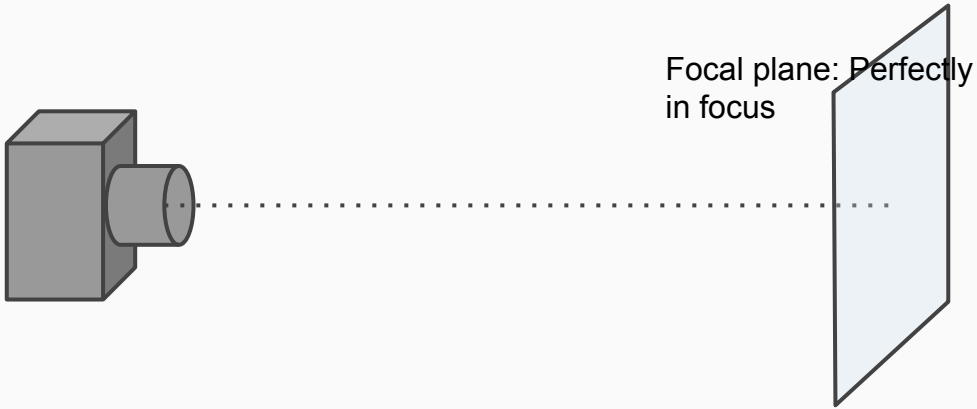
Except there doesn't need to be things

in focus

And only one thin sliver is actually in focus, and everything else just *appears* to be in focus

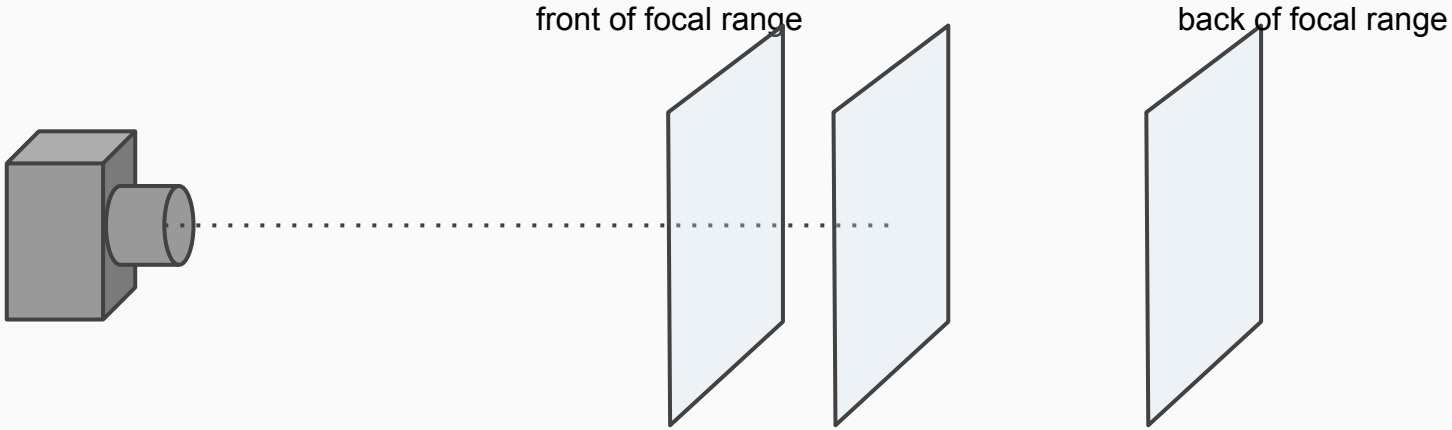
Depth of Field

The focal plane is a plane parallel to the recording medium that extends out through the lens. Things on the focal plane will be perfectly in focus, and things on either side of the the focal plane will gradually lose sharpness



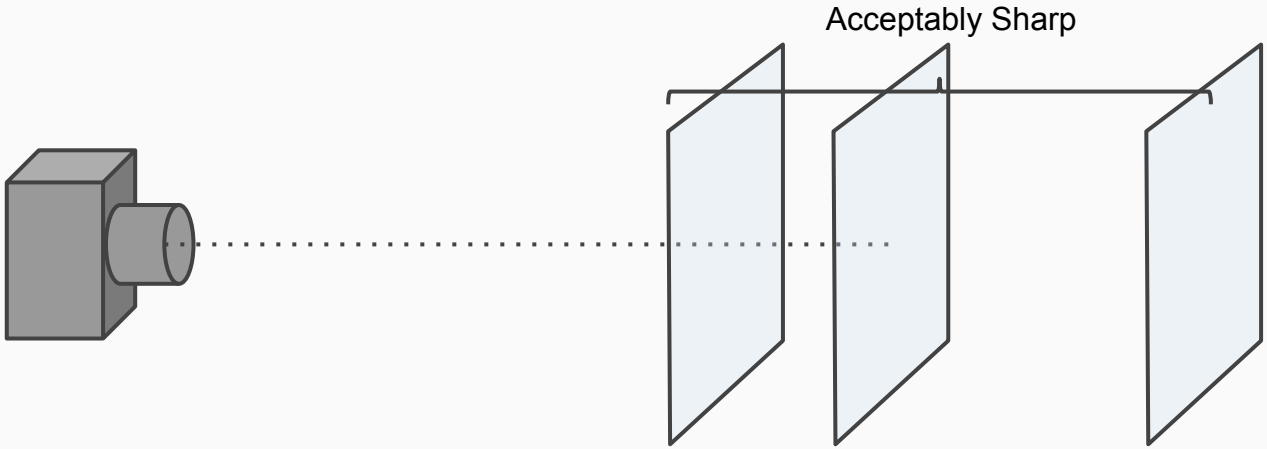
Depth of Field

There are two other planes that make up the focal range. The things between the two planes are not perfectly in focus and gradually lose sharpness the further they are from the focal plane.



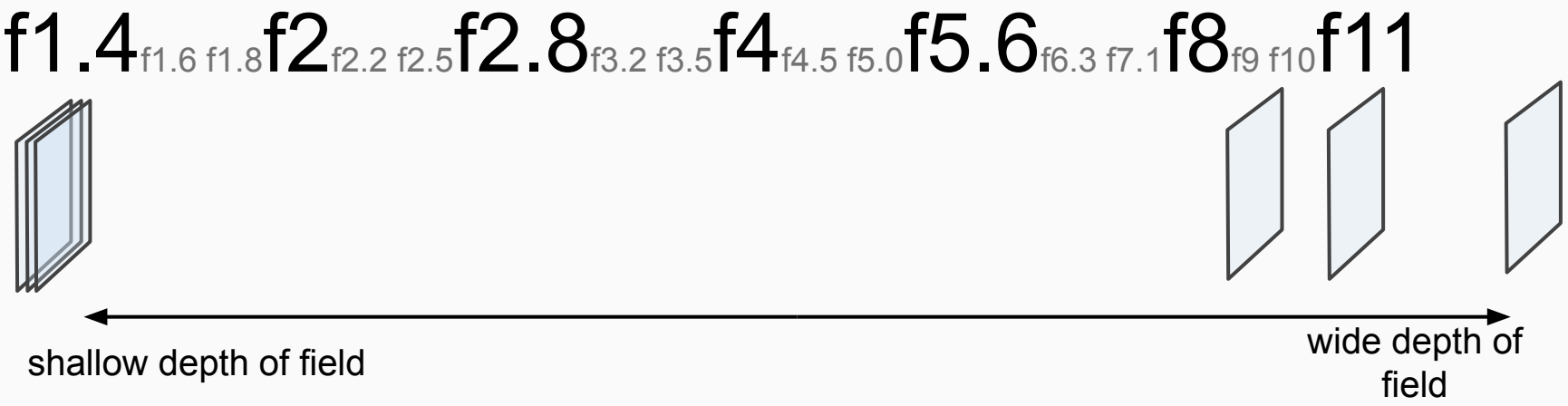
Depth of Field

Everything from the front plane to the back plane is said to be *acceptably sharp*, and is commonly referred to as being in focus. The distance between the planes is the depth of field.



Depth of field

The smaller the f-ratio (f-stop), the smaller the depth of field.

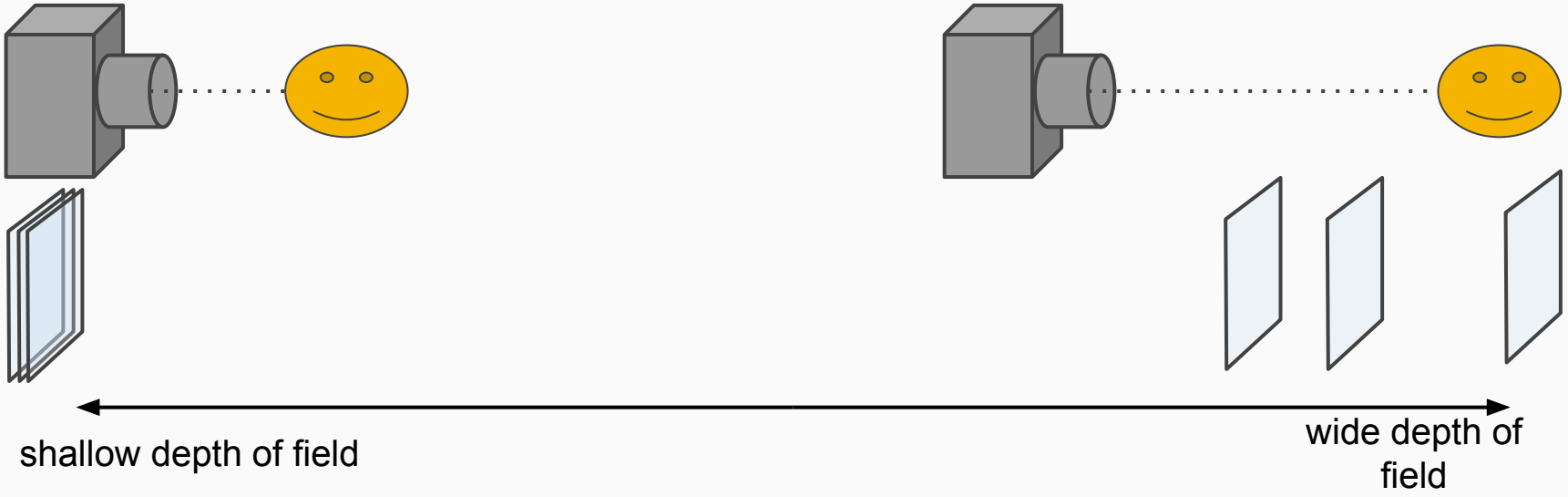


Depth of field

The longer the focal length, the smaller your depth of field.

Depth of field

The further the subject distance, the larger the depth of field.



Shutter Speed

The length of time the shutter is open and light is coming into the camera.

Shutter Speed

Shutter speeds are sometimes displayed as inverse fractions. For instance, a shutter speed of 200 means 1/200th of a second.

Shutter Speed

Shorter shutter speeds freeze action.

The faster (shorter) the shutter speed, the faster the action that can be frozen.

Shutter Speed

Longer shutter speeds capture motion.

The slower (longer) the shutter speed, the more motion will be captured– including camera shake, or the vibration from the shutter.

Shutter Speed

Focal length matters when it comes to camera shake

The classic rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you're using

Shutter Speed

Focal length matters when it comes to camera shake. The classic rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using

Shutter Speed

Focal length matters when it comes to camera shake. The classic rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using

Example:

If you are shooting at a 200mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/200th of a second.

If you are shooting at 30mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/30th of a second

HOWEVER

Things are trickier than that now

Unless you are shooting full-frame, the rule must be changed.

Simply, you must multiply your focal length by 1.6 to get your effective focal length. 200mm becomes 320mm and 30mm becomes 48mm

Shutter Speed

The new rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using, multiplied by 1.6

Shutter Speed

The new rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using multiplied by 1.6

Example:

If you are shooting at a 200mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/320th of a second. (200 * 1.6 = 320)

If you are shooting at 30mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/48th of a second (30 * 1.6 = 48)

HOWEVER

Things are trickier than that now

Many modern lenses feature image stabilization to help compensate for camera shake.

Nikon calls their system Vibration Reduction (VR)

These systems are usually good for a minimum of 2 stops of shutter speed reduction and sometimes more.

Shutter Speed

The new rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using multiplied by 1.6, and then divided by four

Shutter Speed

The new rule is:

to avoid camera shake, the slowest usable shutter speed is the inverse of the focal length you are using multiplied by 1.6, and then divided by four

Example:

If you are shooting at a 200mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/80th of a second. (200 * 1.6 = 320, 320 / 4 = 80)

If you are shooting at 30mm focal length, the slowest shutter speed you can use to avoid motion blur would be 1/12th of a second. (30 * 1.6 = 48, 48 / 4 = 12)

HOWEVER

Things have always been trickier

Good shooting technique can reduce these numbers even further.

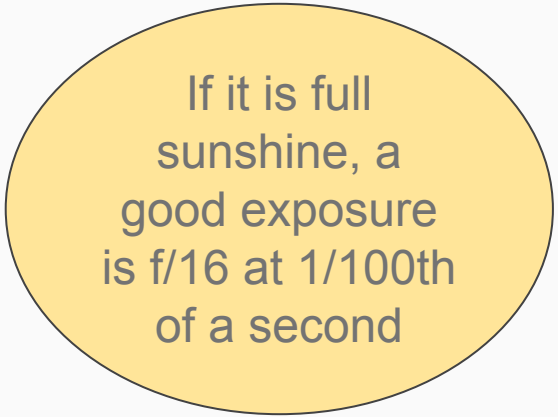
Tripods are always better when motion blur is a concern, and almost generally better.

Don’t use image stabilization with a tripod

Sometimes, the fact that an image is blurry is a good thing– we are making art here.

Sunny 16

Long ago, wise photographers established a mnemonic called Sunny 16.

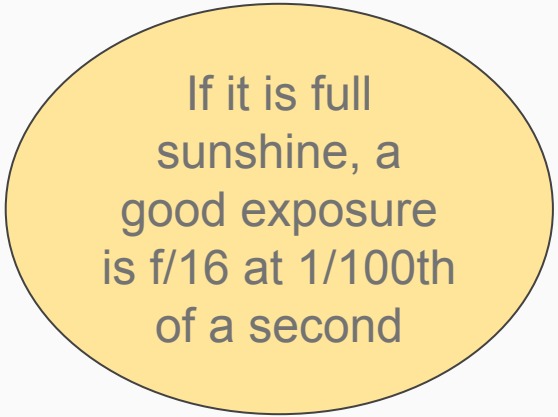


Add a stop of light for every step down– slightly overcast, overcast, heavily overcast, shade.

Add a stop if your subject is backlit

Sunny 16

What would one need to think about if they were shooting with the Sunny 16 rule?

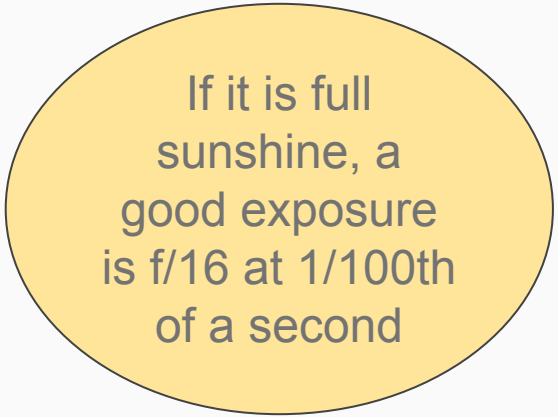


Add a stop of light for every step down– slightly overcast, overcast, heavily overcast, shade.

Add a stop if your subject is backlit

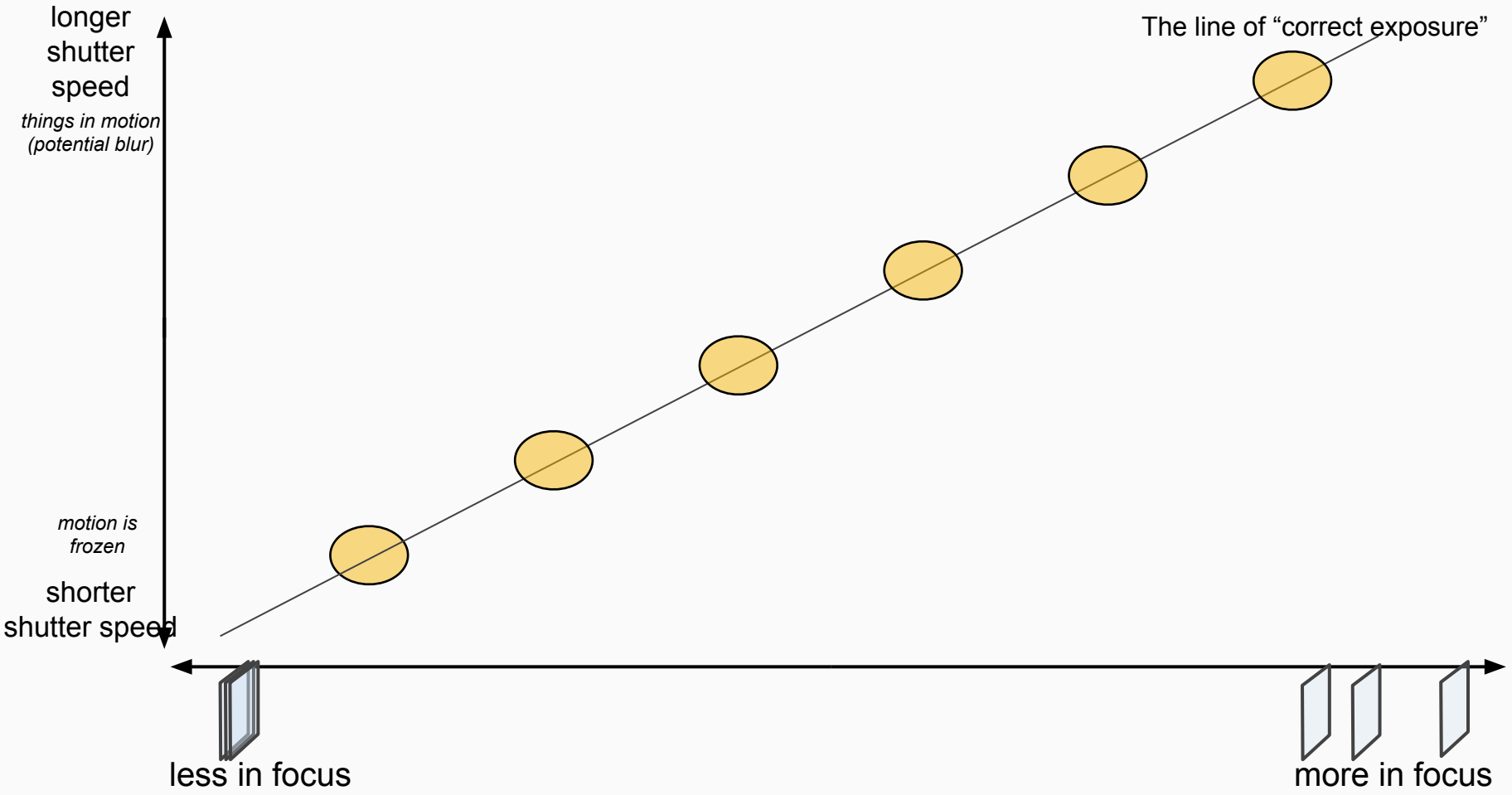
Sunny 16

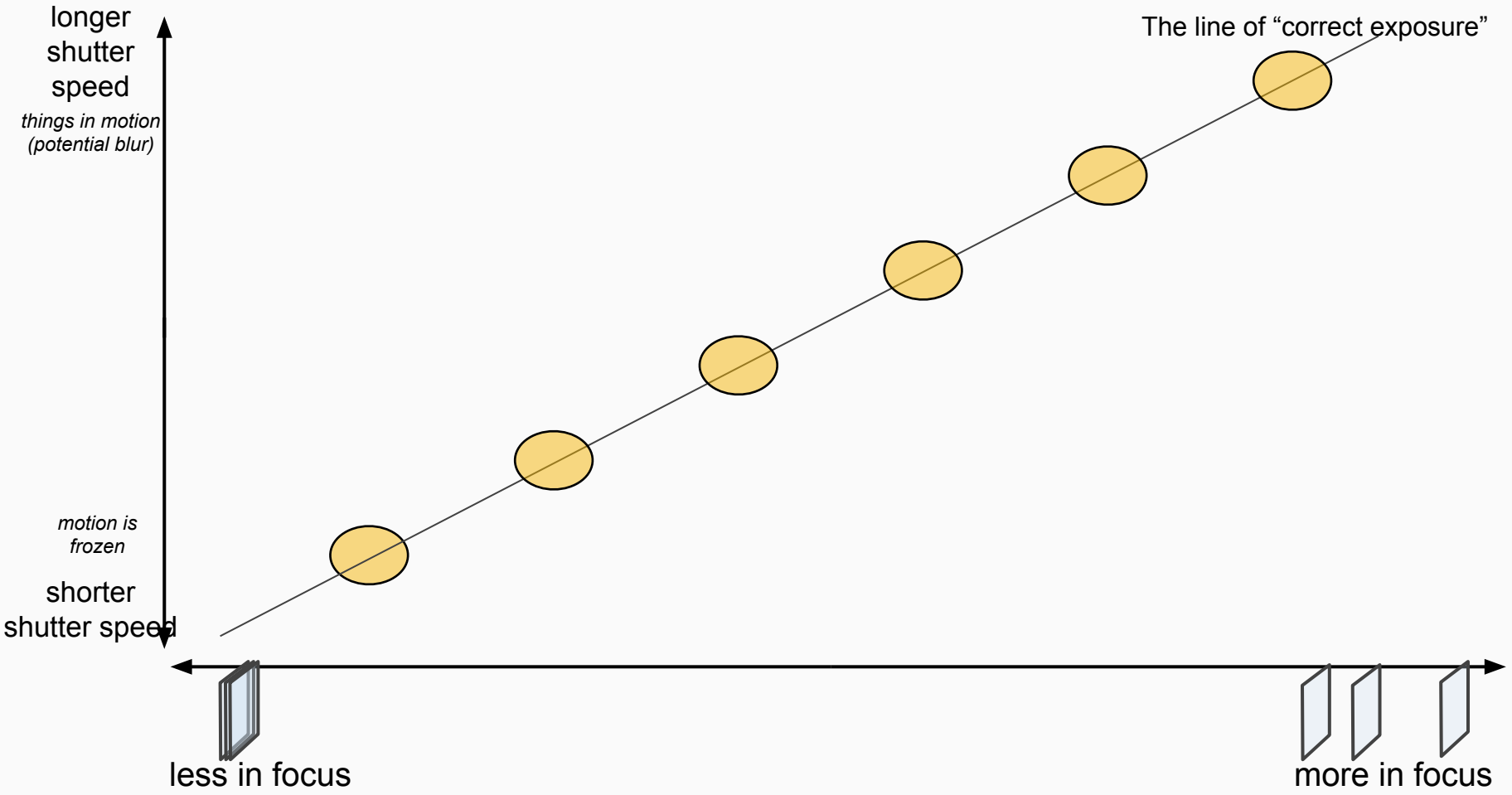
What are some adjustments we could make to the Sunny 16 rule?



Add a stop of light for every step down– slightly overcast, overcast, heavily overcast, shade.

Add a stop if your subject is backlit


longer
shutter
speed
things in motion
(potential blur)
motion is
frozen
shorter
shutter speed
The line of “correct exposure”
less in focus
more in focus


longer
shutter
speed
things in motion
(potential blur)
motion is
frozen
shorter
shutter speed
The line of “correct exposure”
less in focus
more in focus