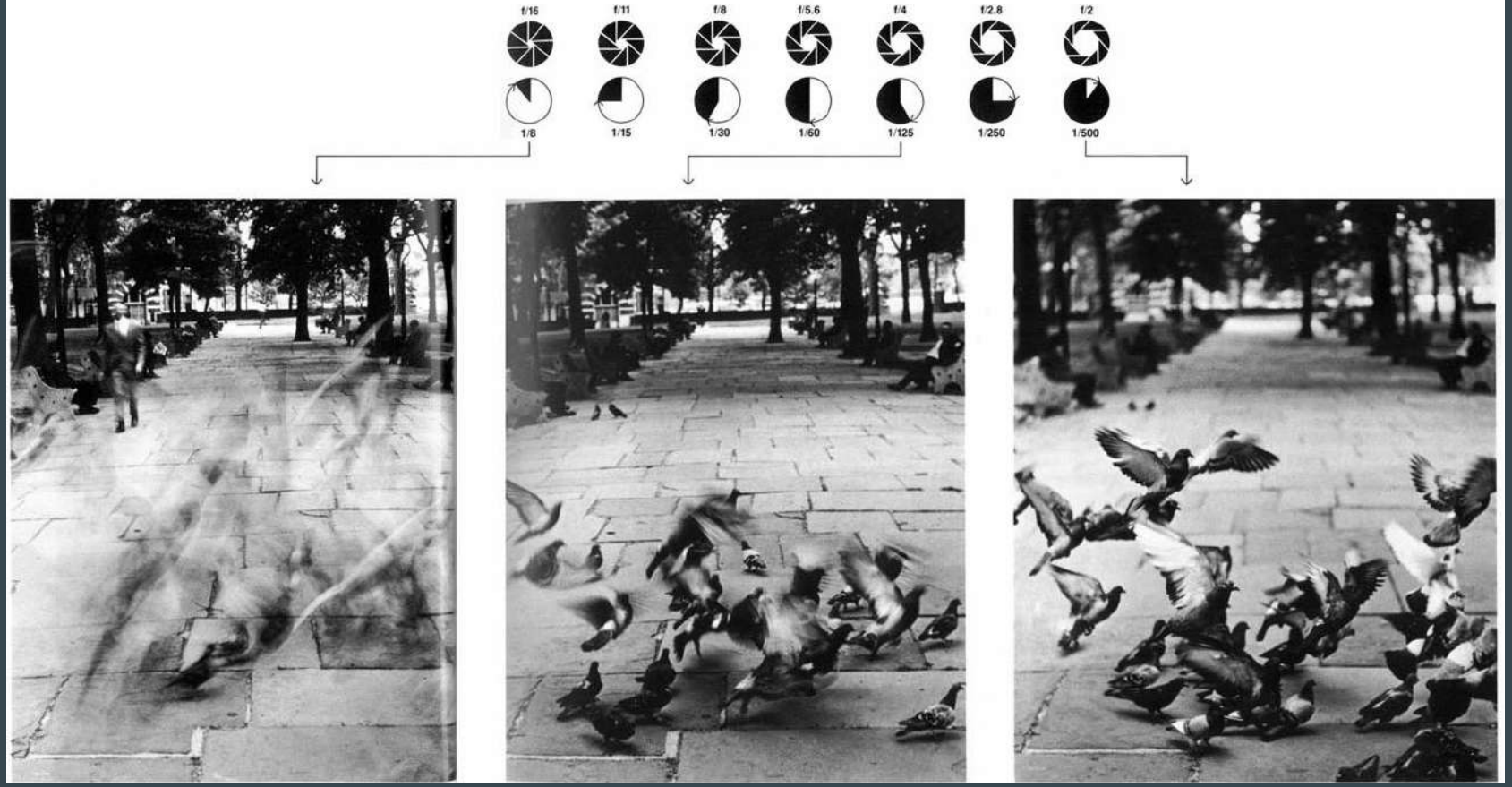
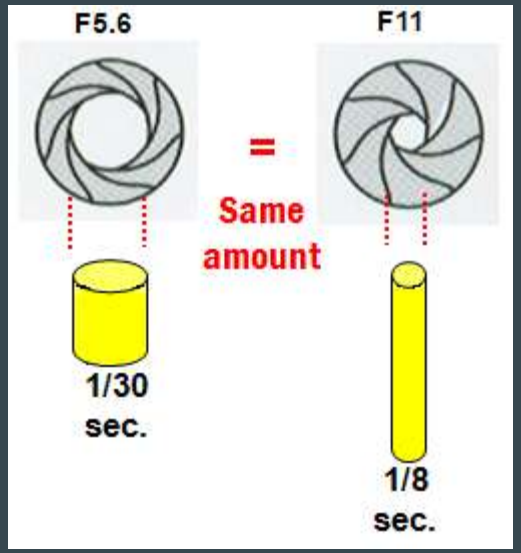
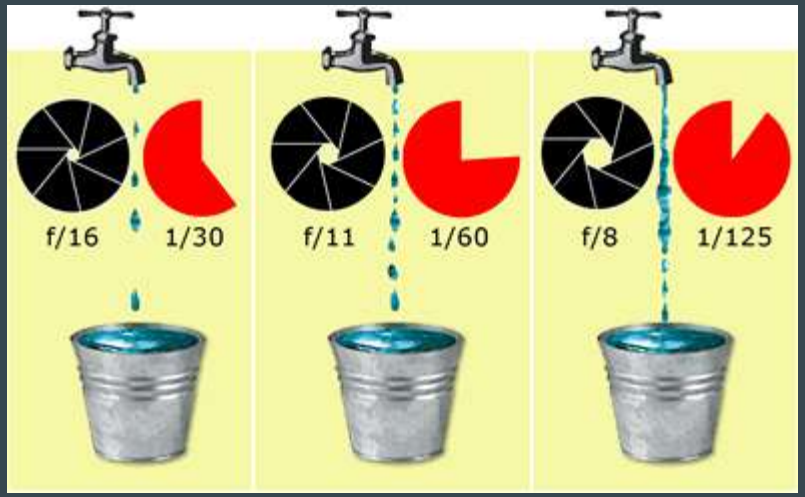
Advanced
Shutter and Aperture
...



We already know that shutter and aperture are the 2 ways to let in light into the camera. We also know that the visual effect of the shutter speed is how motion is shown, and that aperture controls the depth of field.

But how do aperture and shutter speed work together?





If you let in more light with your aperture then you must let in less light with your shutter if you want to maintain the same amount of light hitting the sensor. Or vice versa.

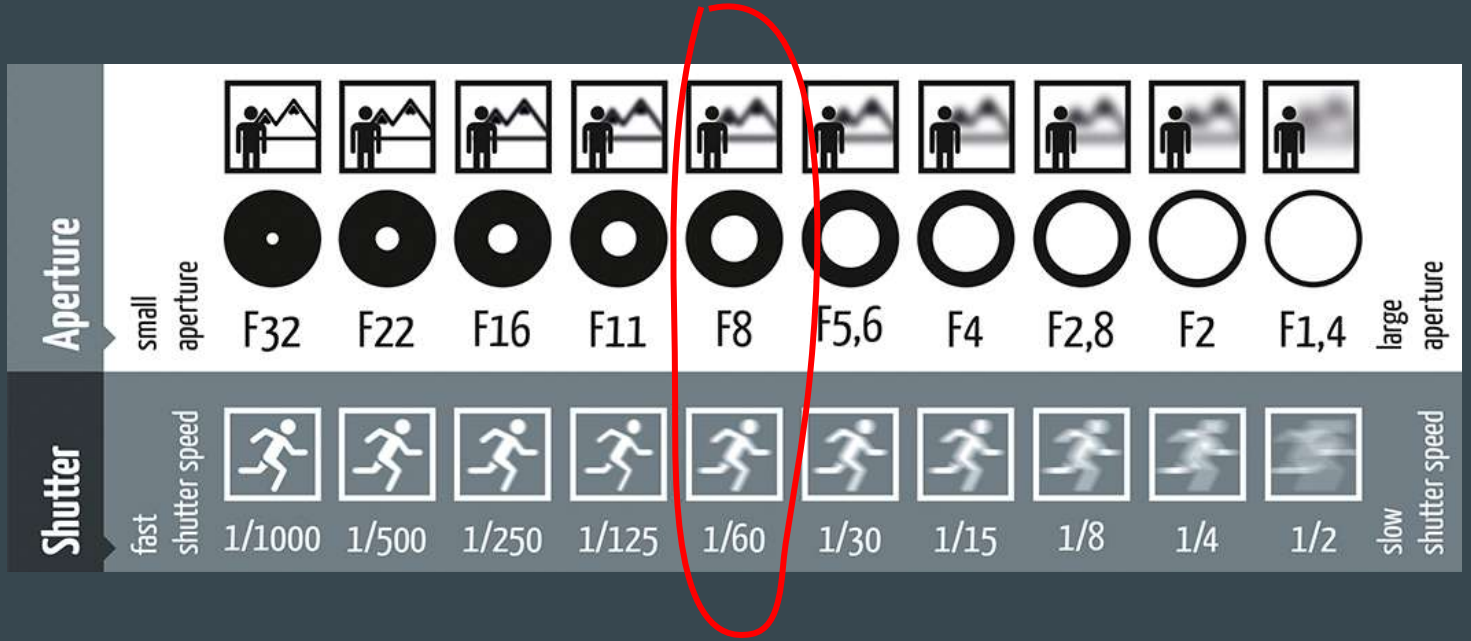
If you change one of the settings, it will affect the amount of light let in the camera

In these examples, the shutter (1/125) stays the same, and the aperture is changing. By looking at the light meter, we can see that the amount of light let in has changed.

The center image is the correct exposure.

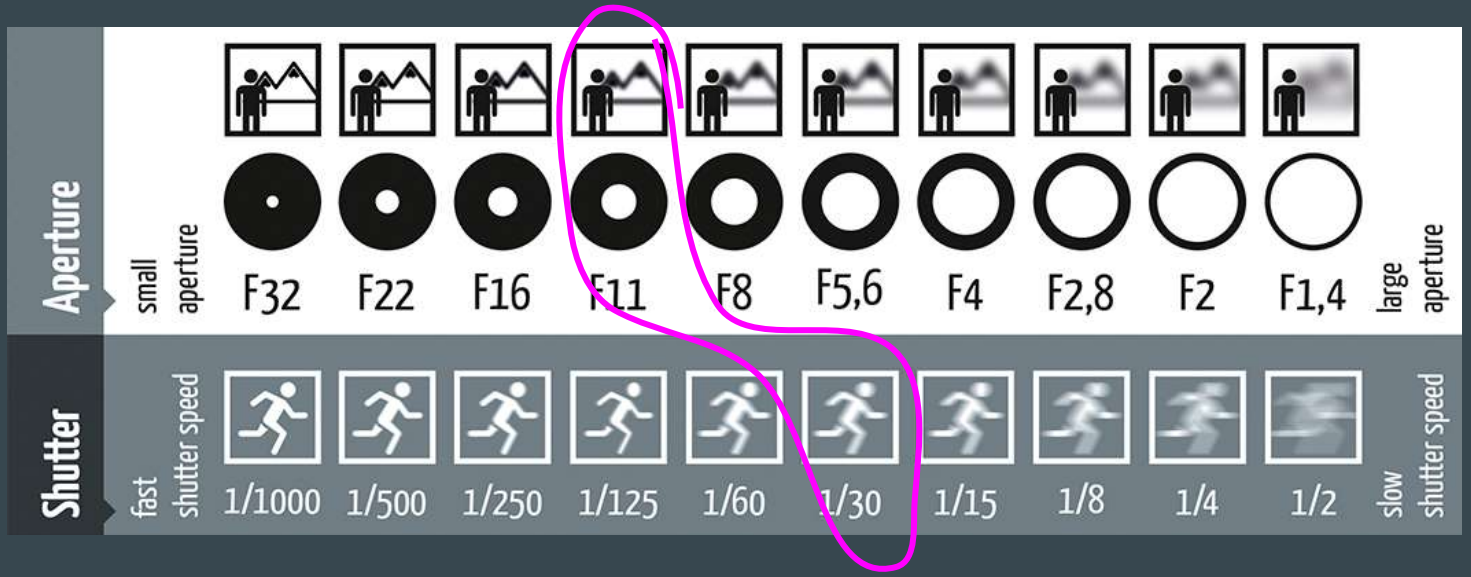
Different combinations can be equal to each other...

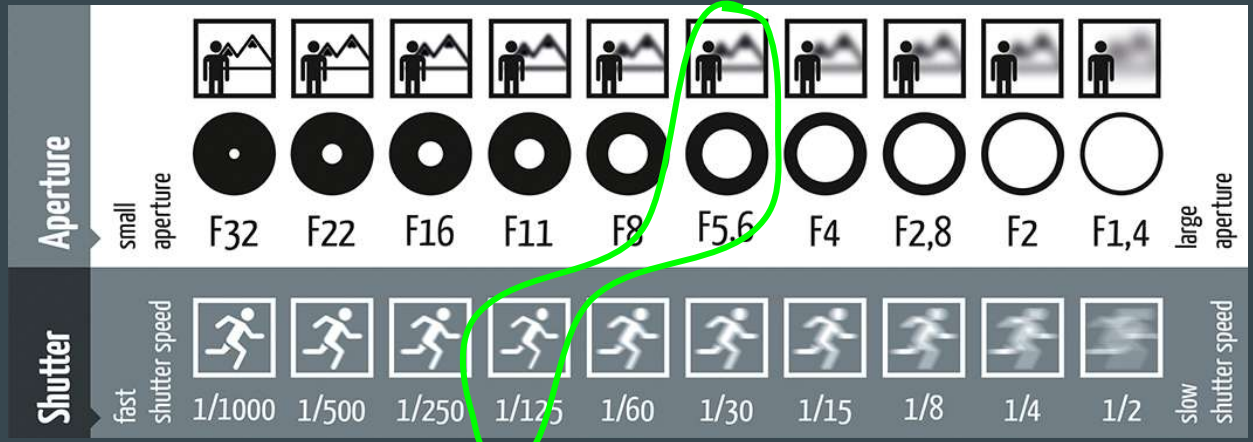
...in terms of light

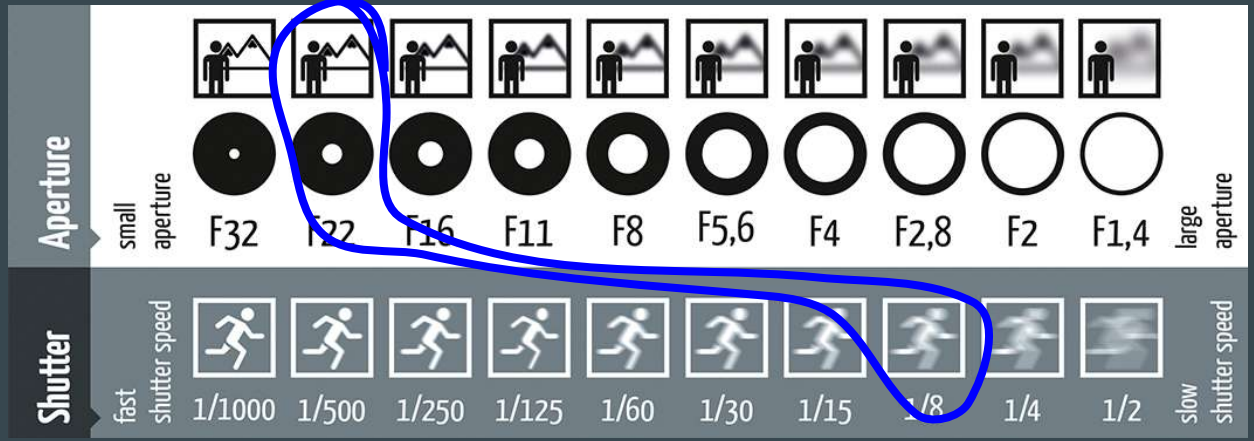


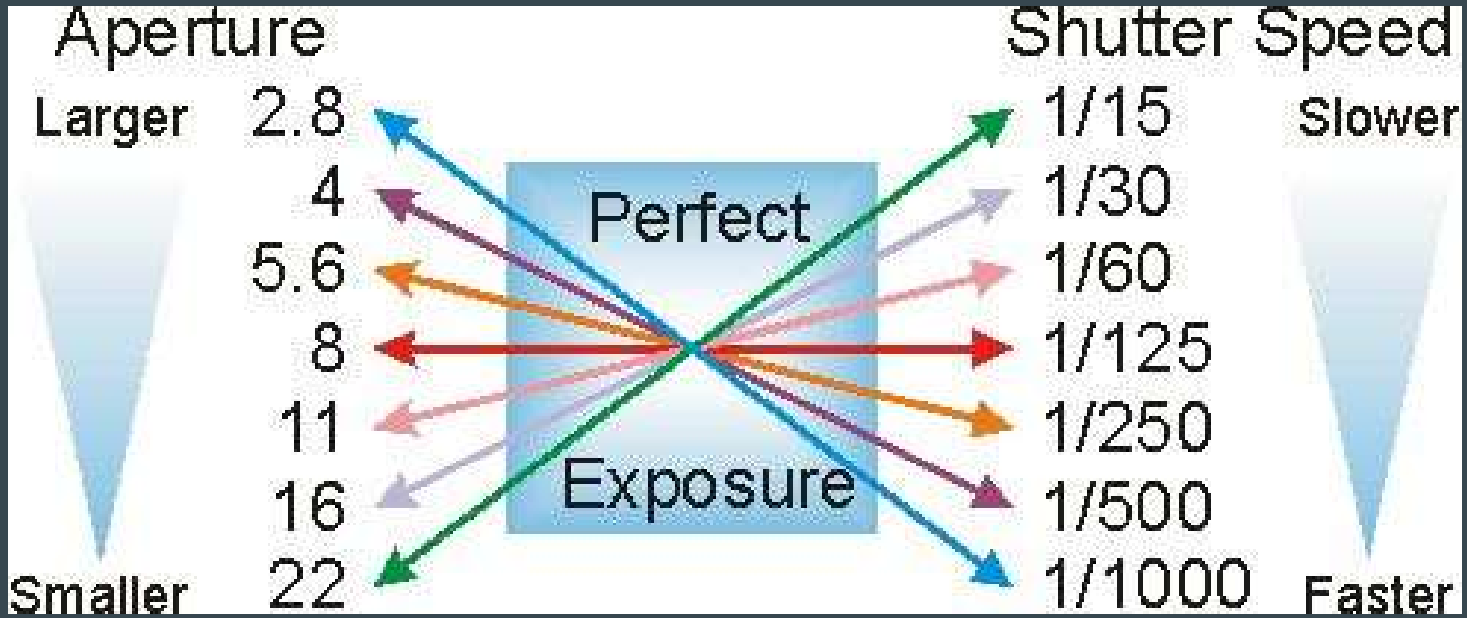
Different combinations can be equal to each other...

...in terms of light

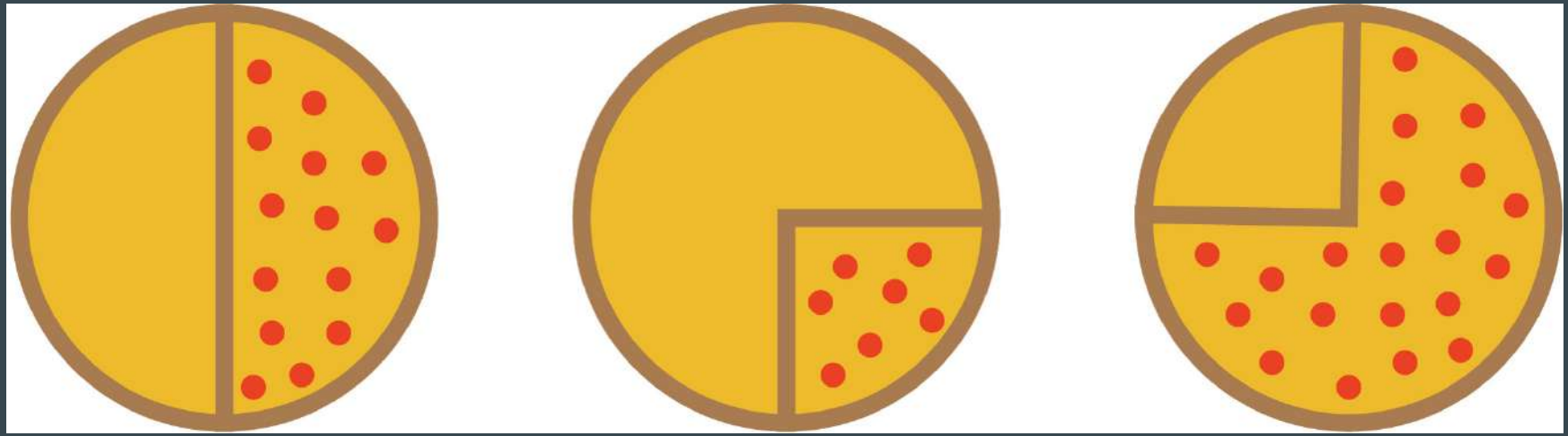



Aperture
small aperture
F32
F22
F16
F11
F8
F5.6
F4
F2,8
F2
F1,4
large aperture
Shutter
fast shutter speed
1/1000
1/500
1/250
1/125
1/60
1/30
1/15
1/8
1/4
1/2
slow shutter speed


Aperture
small aperture
F32
F22
F16
F11
F8
F5,6
F4
F2,8
F2
F1,4
large aperture
Shutter
fast shutter speed
1/1000
1/500
1/250
1/125
1/60
1/30
1/15
1/8
1/4
1/2
slow shutter speed

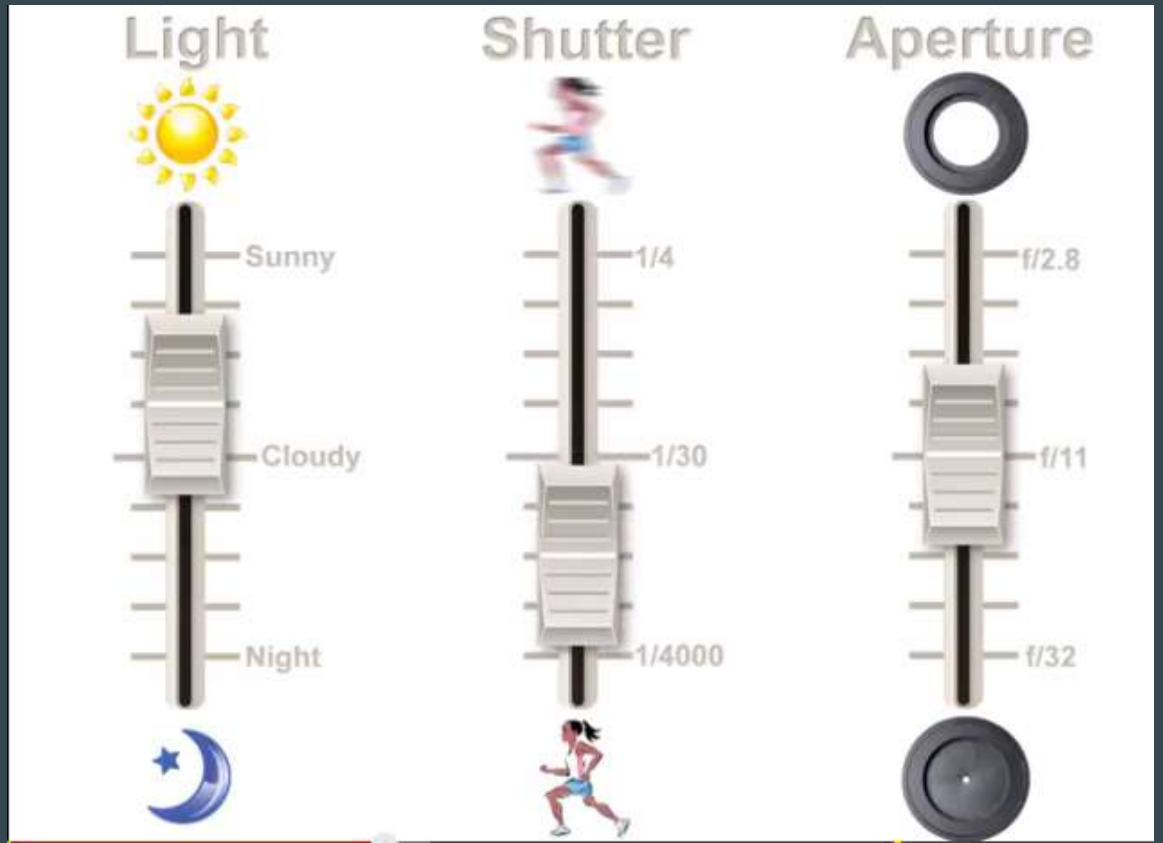

Aperture
Larger
Smaller
2.8
4
5.6
8
11
16
22
Perfect
Exposure
Shutter Speed
Slower
Faster
1/15
1/30
1/60
1/125
1/250
1/500
1/1000

For this metaphor, PIZZA = LIGHT

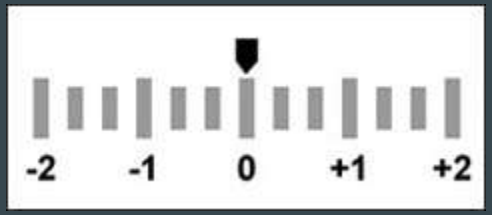



Fast
Shutter speed
Slow
High
f-number
Low

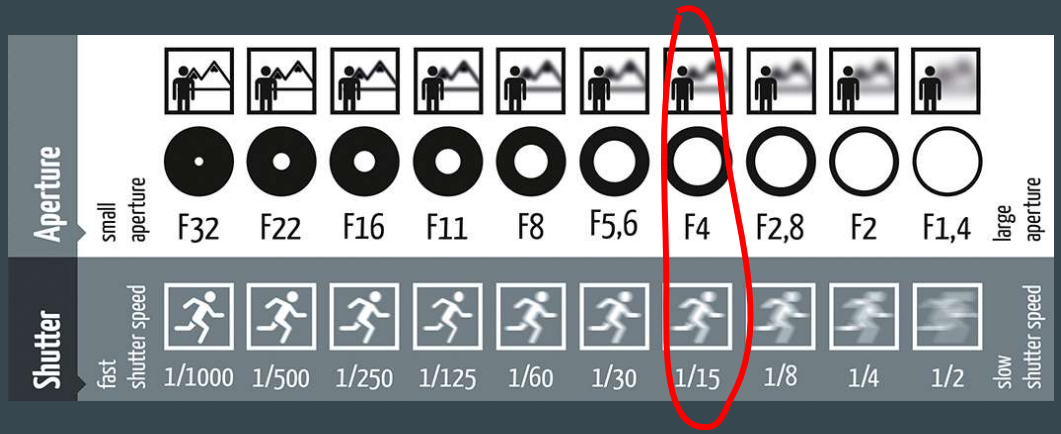
We need to consider the available light when choosing our settings



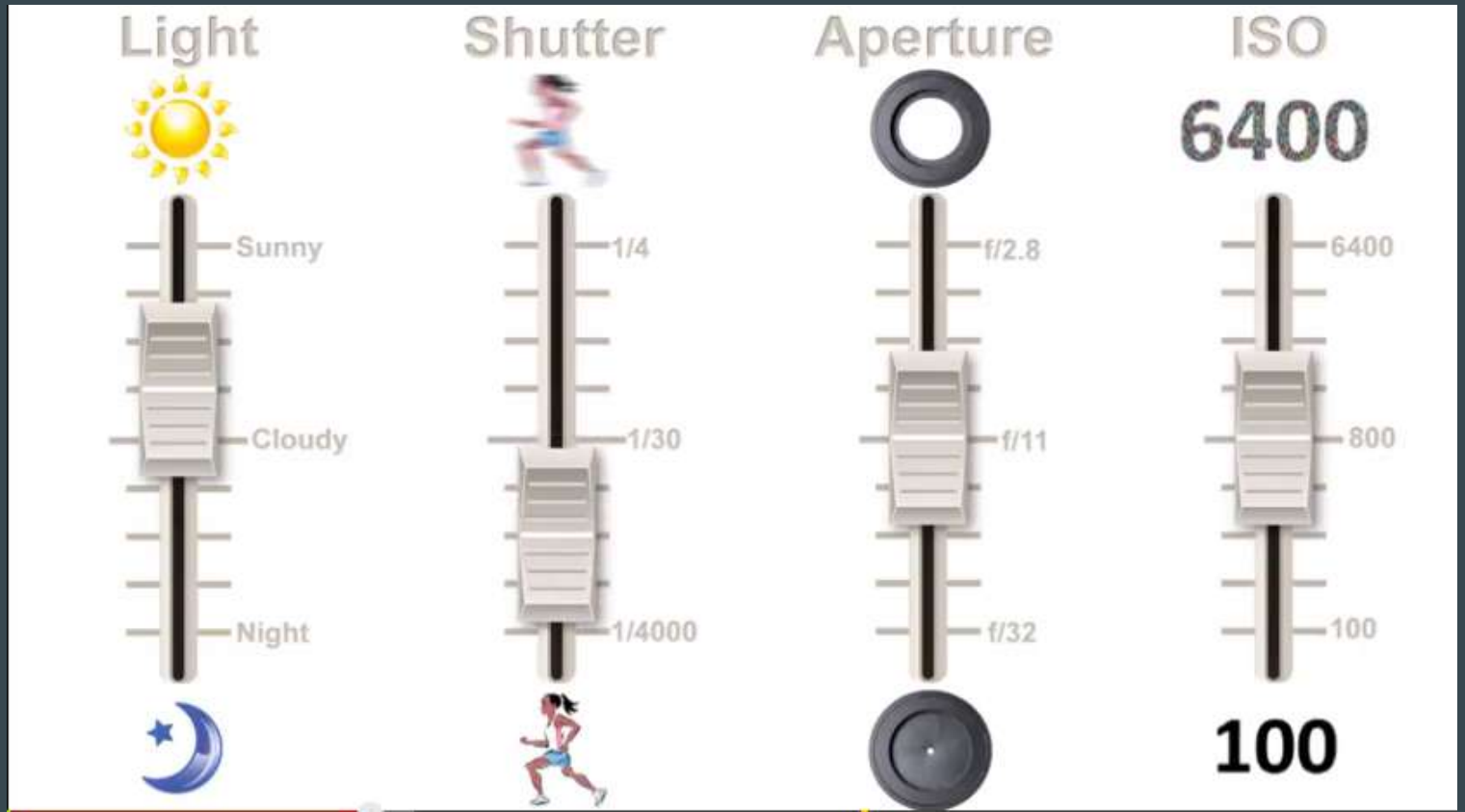
Your camera always wants a certain amount of light



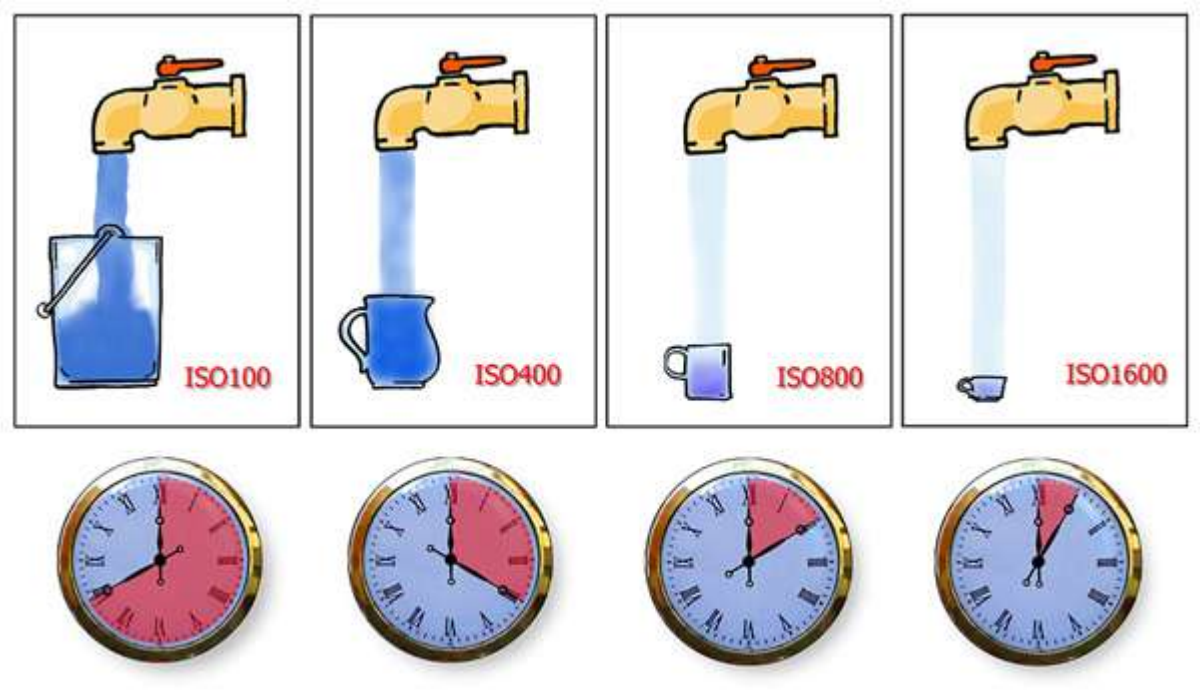
So based on the light, you readjust the settings



Finally, ISO also affects your settings



The ISO determines how sensitive your camera is to light

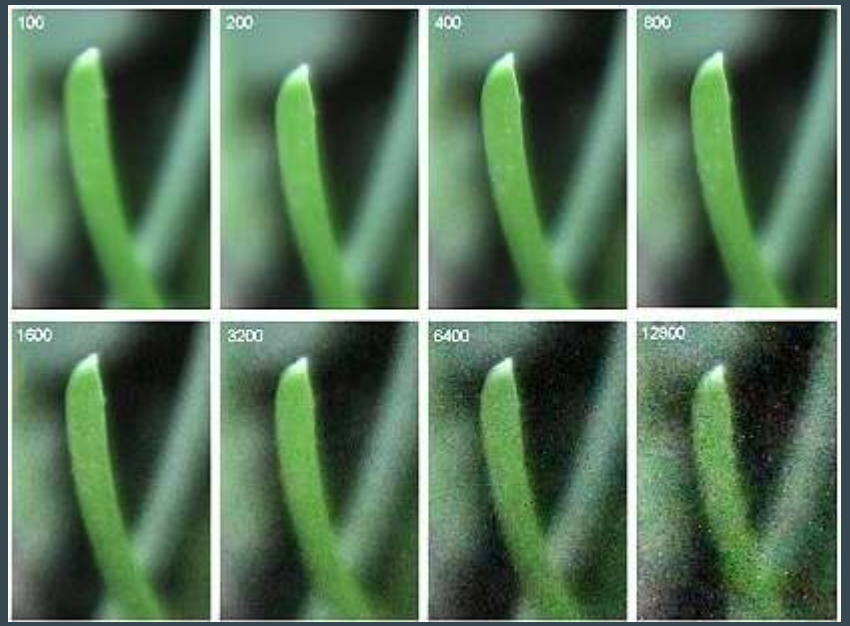


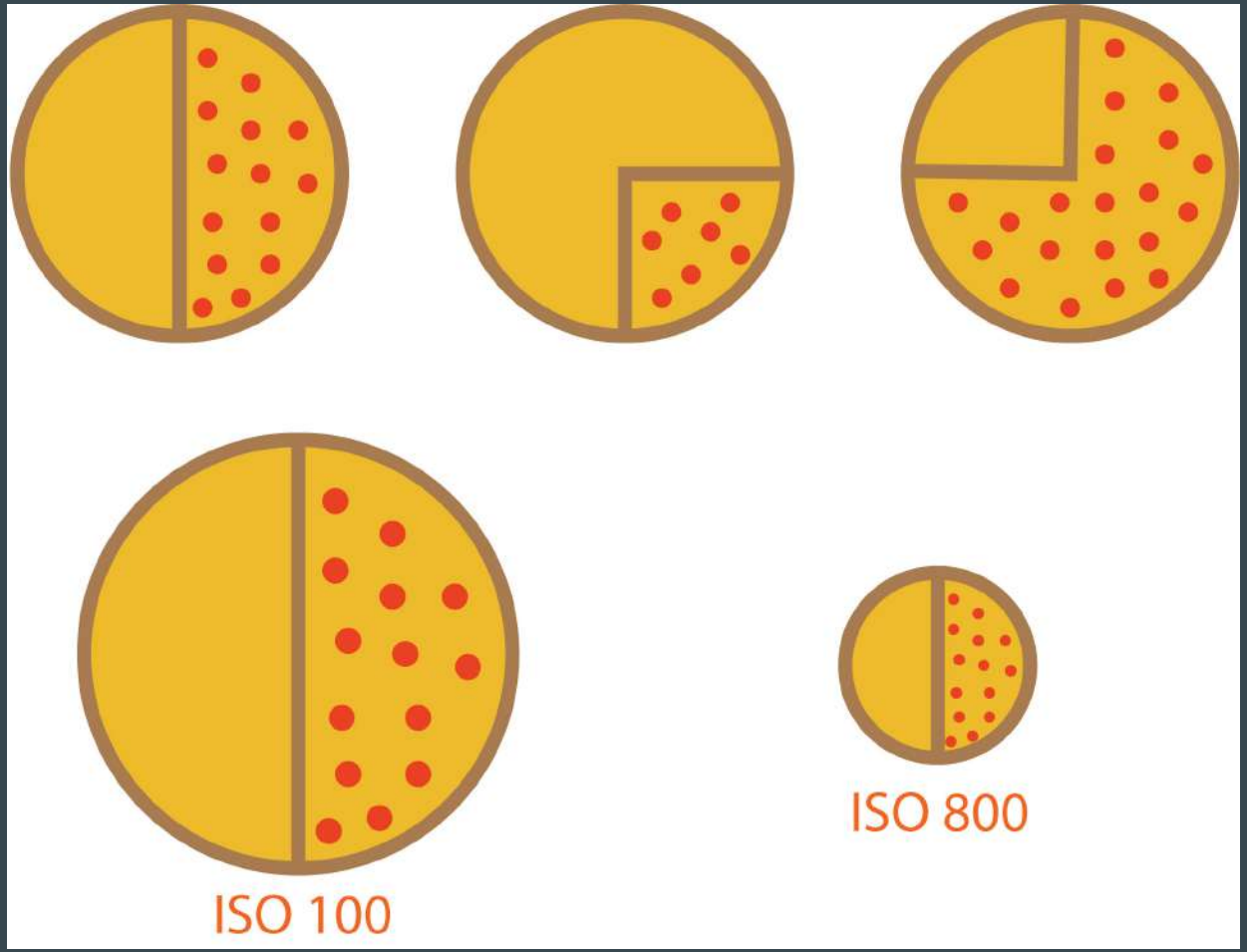
Essentially, how much light it wants in the first place

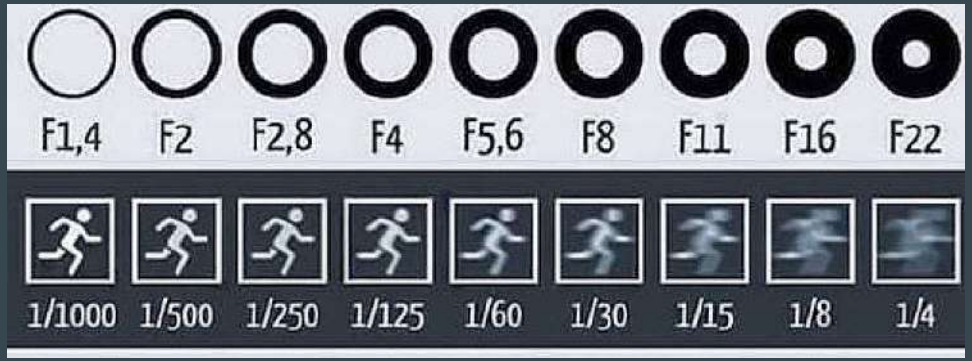
ISO tradeoffs

Lower ISO - less noise but more light needed

Higher ISO - more noise, but less light needed by the camera




ISO 100
ISO 800


F1,4
F2
F2,8
F4
F5,6
F8
F11
F16
F22
1/1000
1/500
1/250
1/125
1/60
1/30
1/15
1/8
1/4