Photography Seminar

Exposure Settings – Day 2

Exposure

- Just a note – as I speak about the three steps, I'm skipping one right now. We'll spend more time on it later – plus doing a better job with composition depends on knowing exposure
  - Recall
    - Think
    - Compose
    - Expose

Exposure

Why should we even care?

Well, recall that camera meters aren't too accurate in reading your mind. They don't know what you think is right.

Exposure

Secondly, controlling exposure means *you* are controlling what the photo looks like.

Remember -- You are Smarter than Your Camera!!!!

So, let's take a look at how this all works.

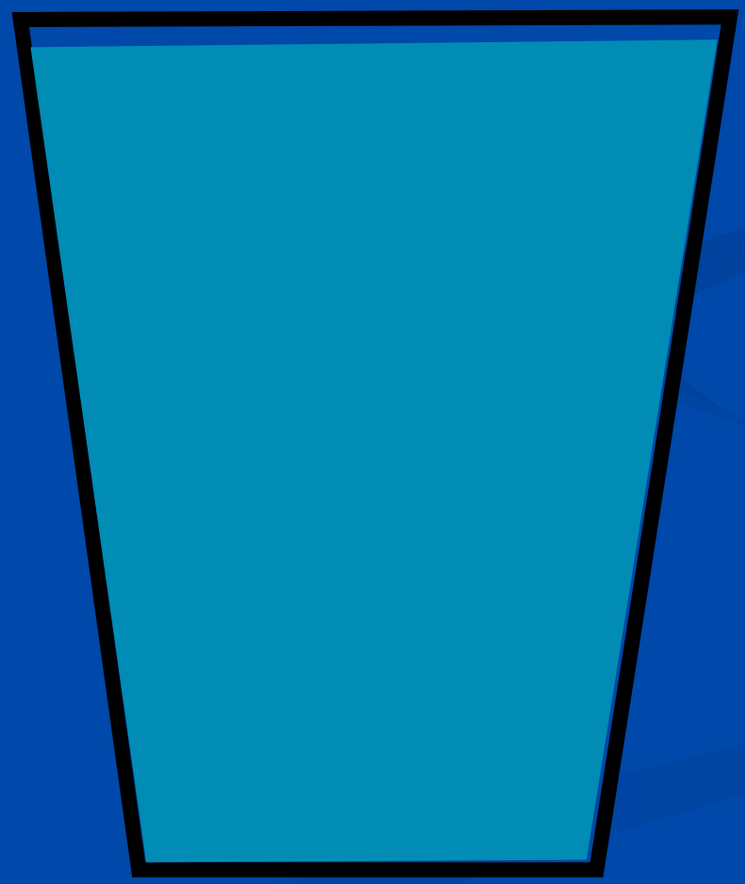
Exposure

- Governs several things:
  - how much motion blur is in the image
  - how much of the overall scene is “in” or “out” of focus
  - the technical quality of the image (whether or not there is detail in the shadows or highlights)

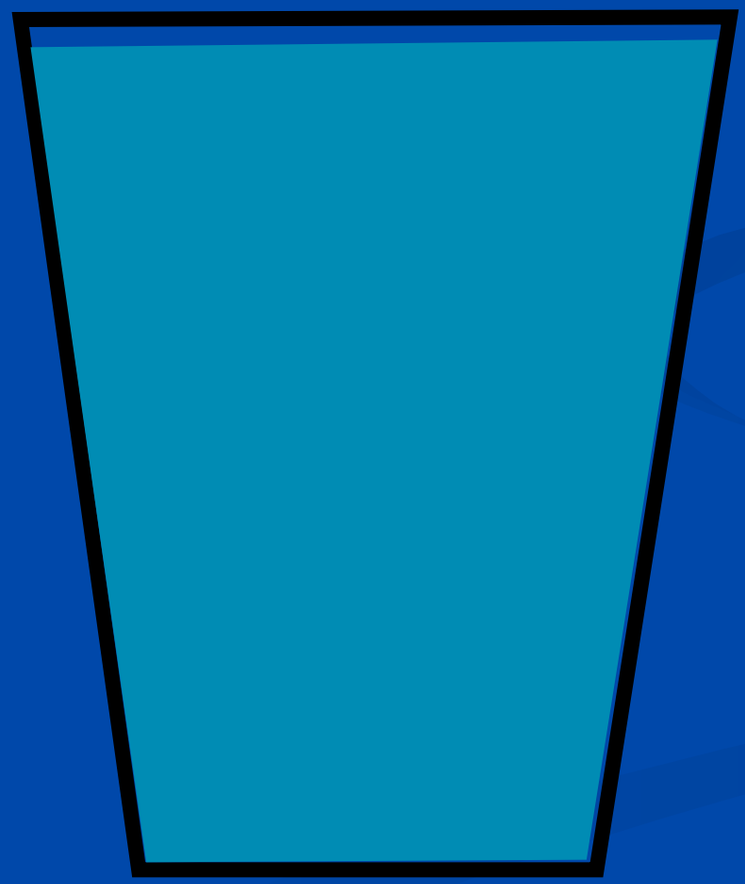
Exposure

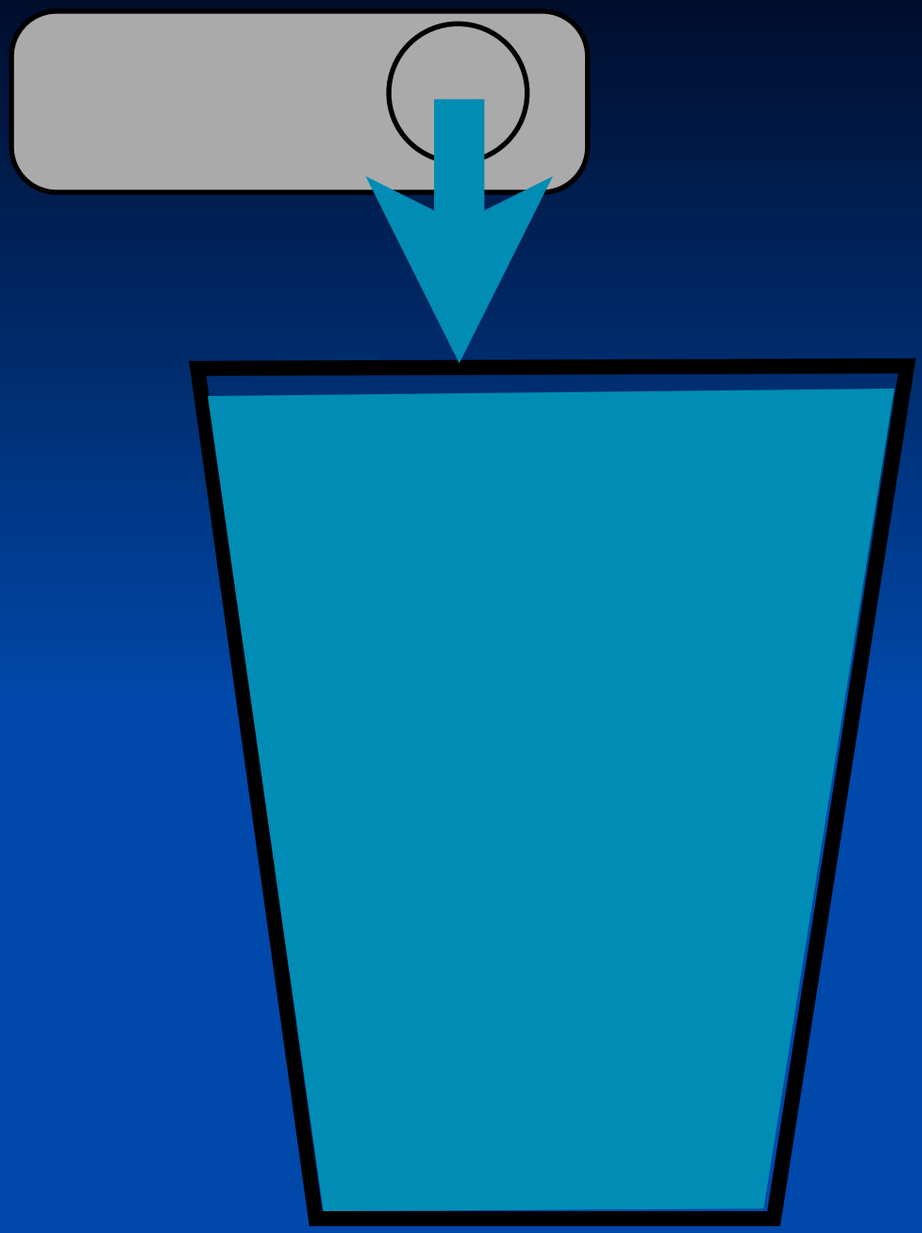
- Governed by three things:
  - Shutter Speed
  - Aperture Setting
  - Film/Sensor Speed Setting

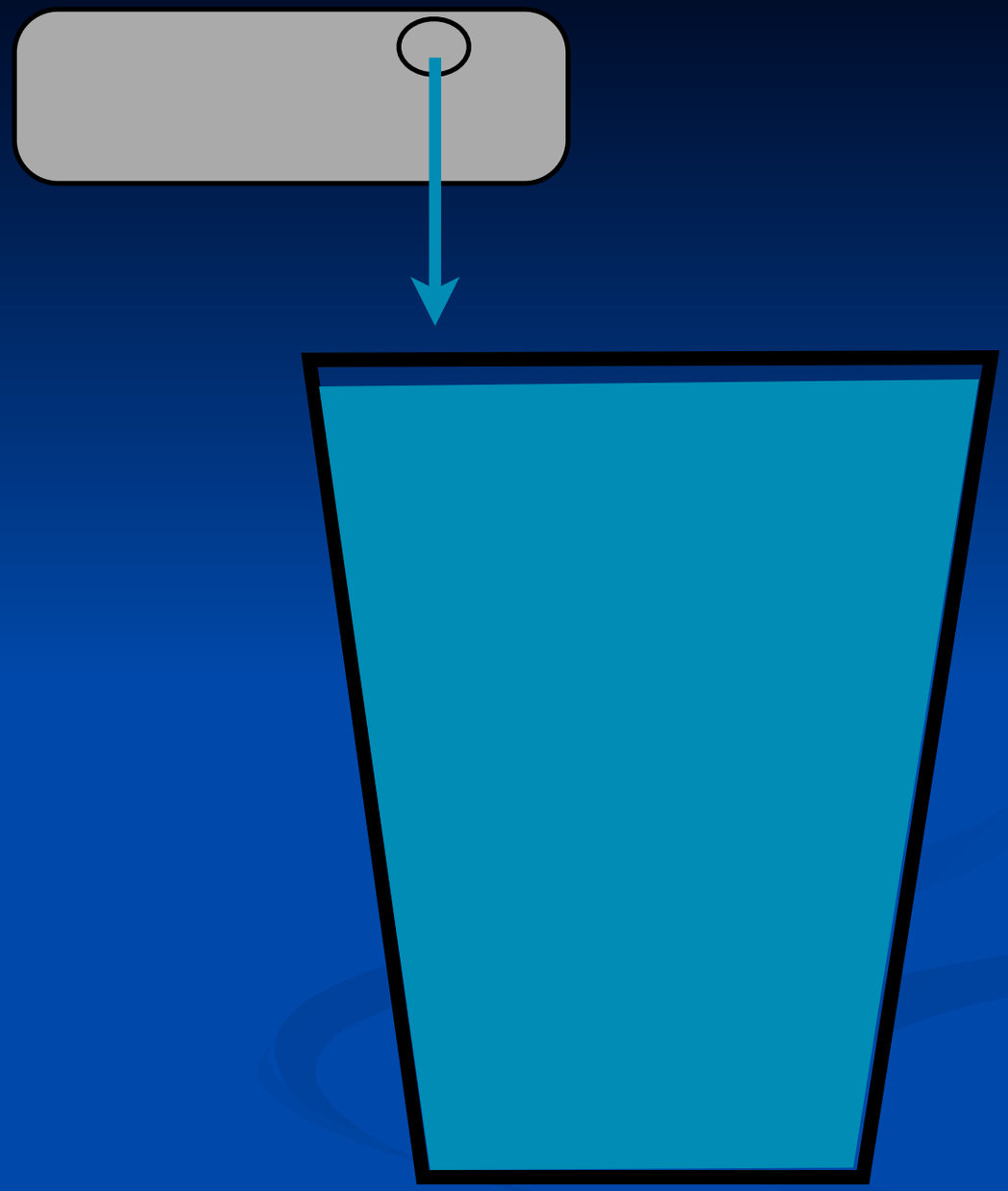
One way to think about the proper amount of light is to consider how water is needed to fill the bucket. Too much and it overflows. Too little and it's not full. When we talk about too much light, it's overexposure. The image is white and washed out. When we talk about too little, it's underexposure and it results in images that are too dark.

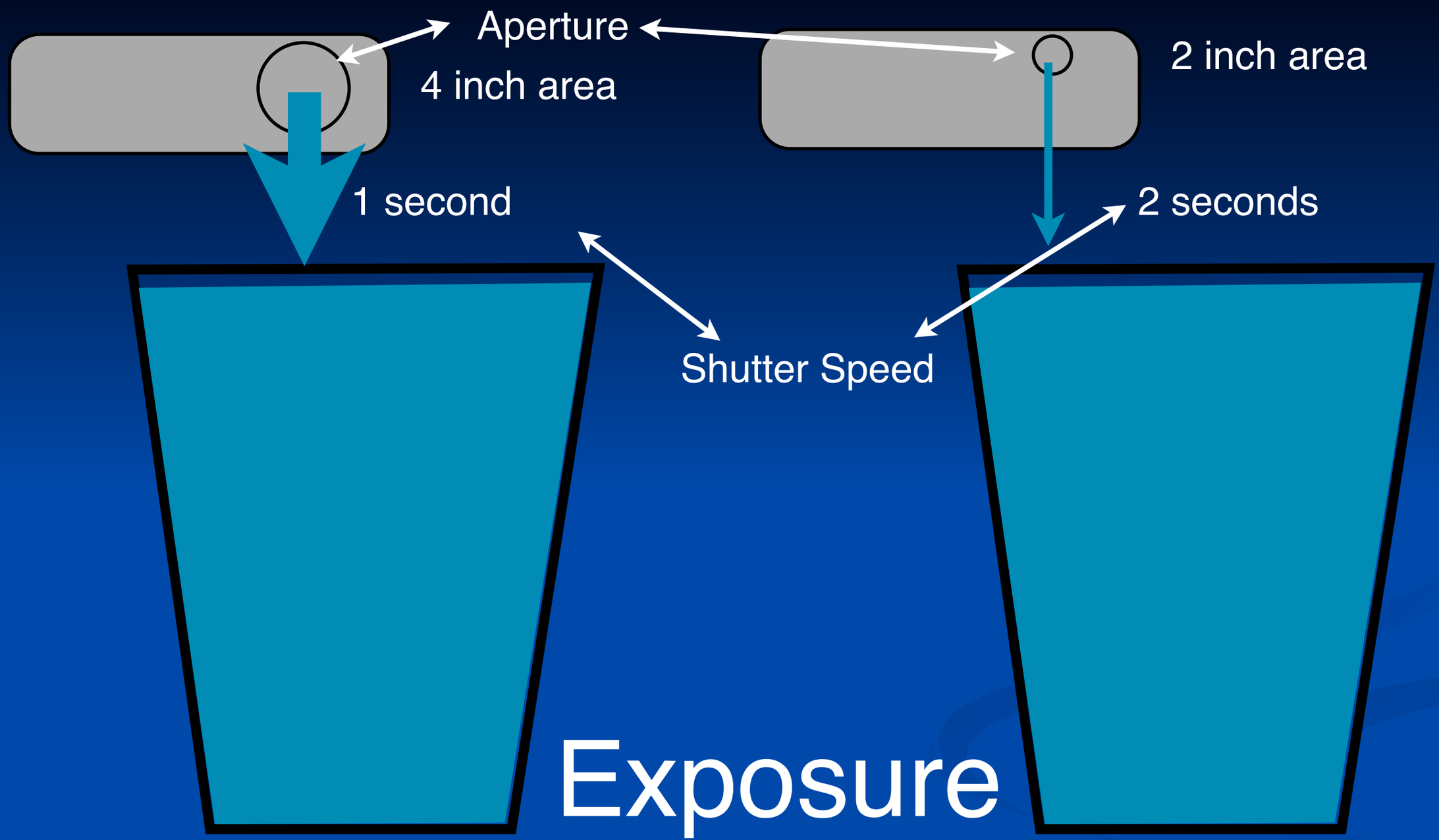


Once we “figure” out the correct exposure, we need to figure out what we can do to make the image better. You see, we control the amount of focus, blur, motion and action in an image. So, let’s keep going with this comparison. And we’re going to introduce some actual photography terms.





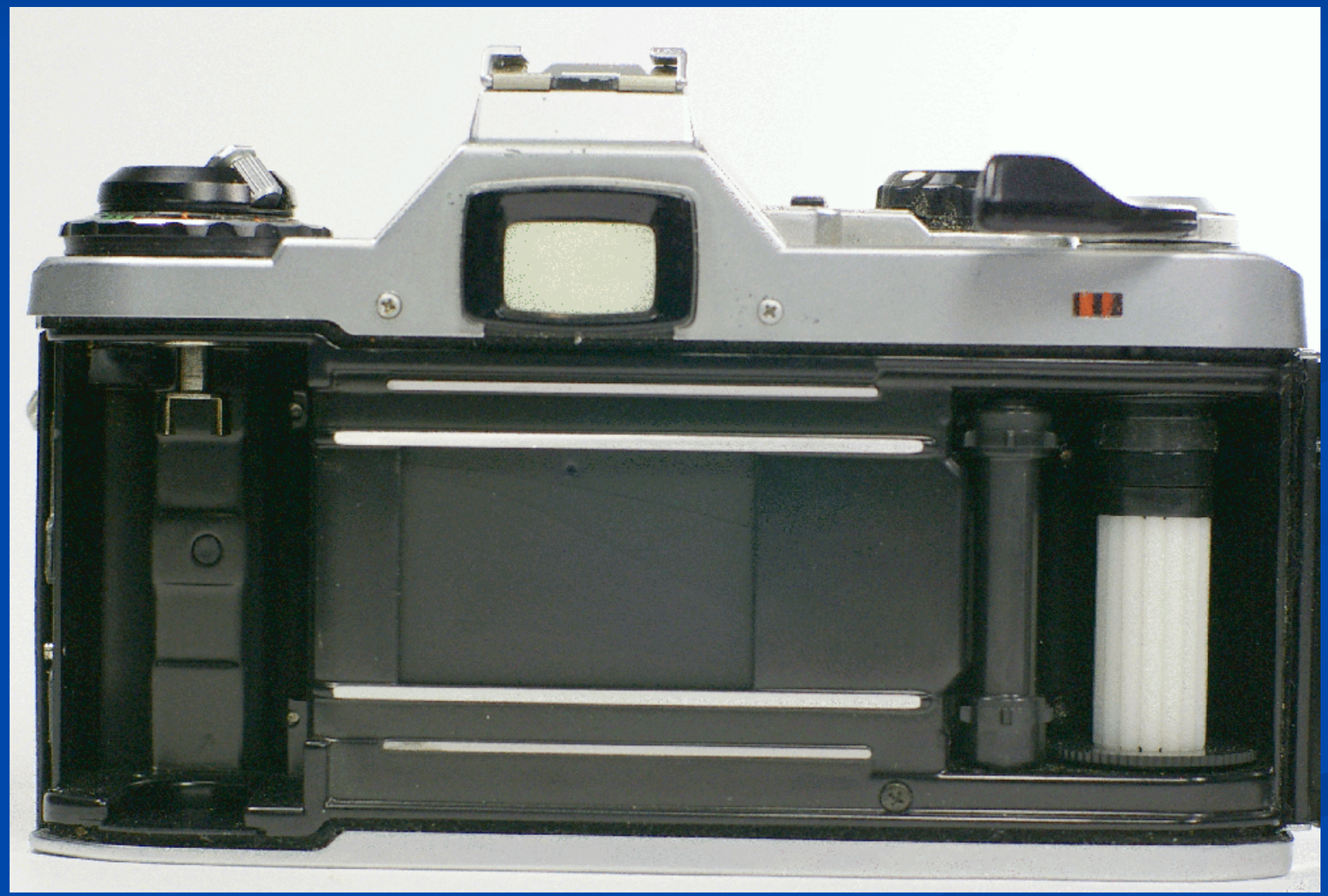



Aperture
4 inch area
2 inch area
1 second
2 seconds
Shutter Speed

Exposure

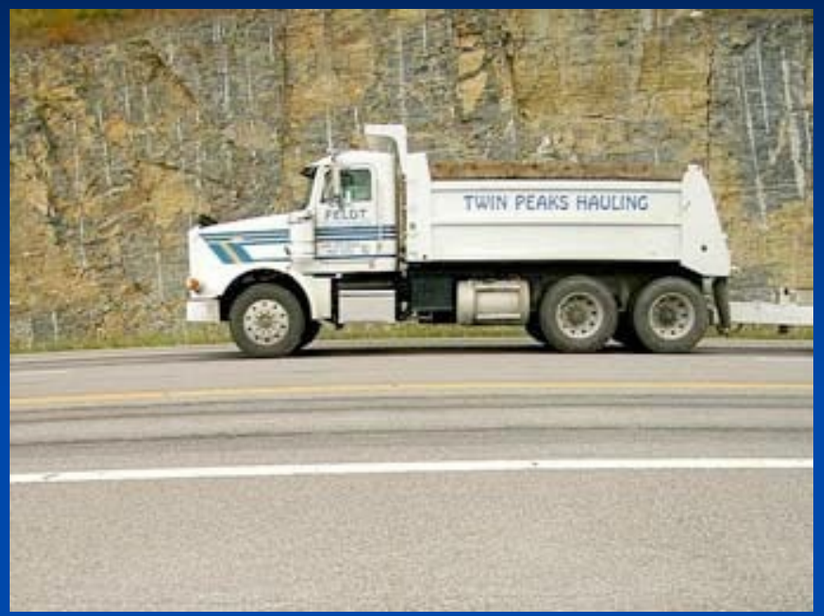
The Shutter

Controls how long the sensor is exposed to light



The Shutter

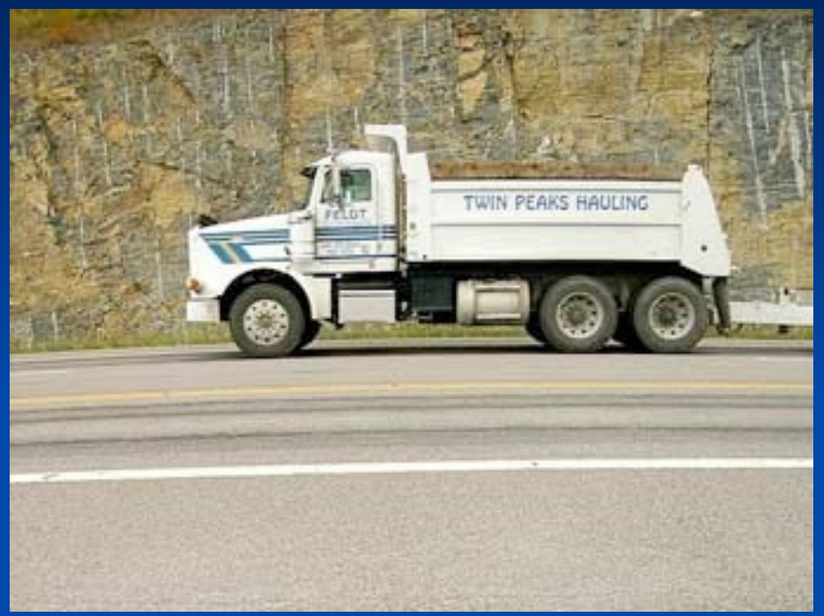
Controls how long an exposure is



1/1000

The Shutter

Controls how long an exposure is



1/1000

1/30

The Shutter

Controls how long an exposure is

1/30

1/1000

1/8

The Shutter

Controls how long an exposure is

1/1000

1/8

The Shutter

Controls how long an exposure is

4 to 20 seconds

The Shutter

Controls how long an exposure is

Panning while shooting to create a feeling of motion

1/30 to 1/15 of a second

The Shutter

Controls how long an exposure is

This allows you to control how much motion blur there is or is not in a photo.

As a note, please realize I am not saying how sharp or clear the photo is – that has to do with focus. We are talking purely in terms of motion.

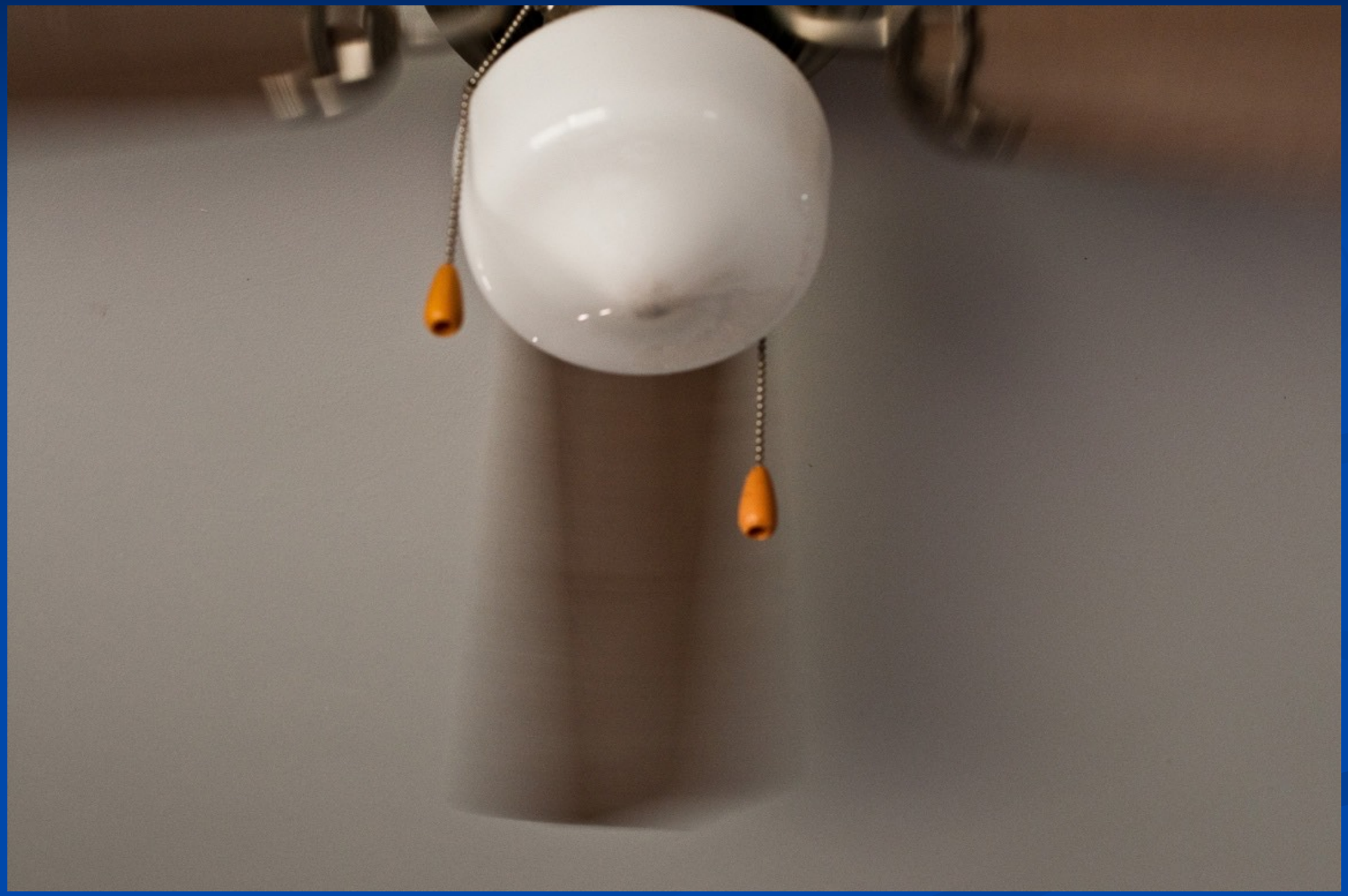
1/4 Second

1/8 second

1/15 second

1/30 second

1/60 second



1/125 second

1/250 second

1/500 second

The limitations of photography are in yourself, for what we see is only what we are. - Ernst Haas

Now, for the second part of controlling exposure. Aperture or lens opening.

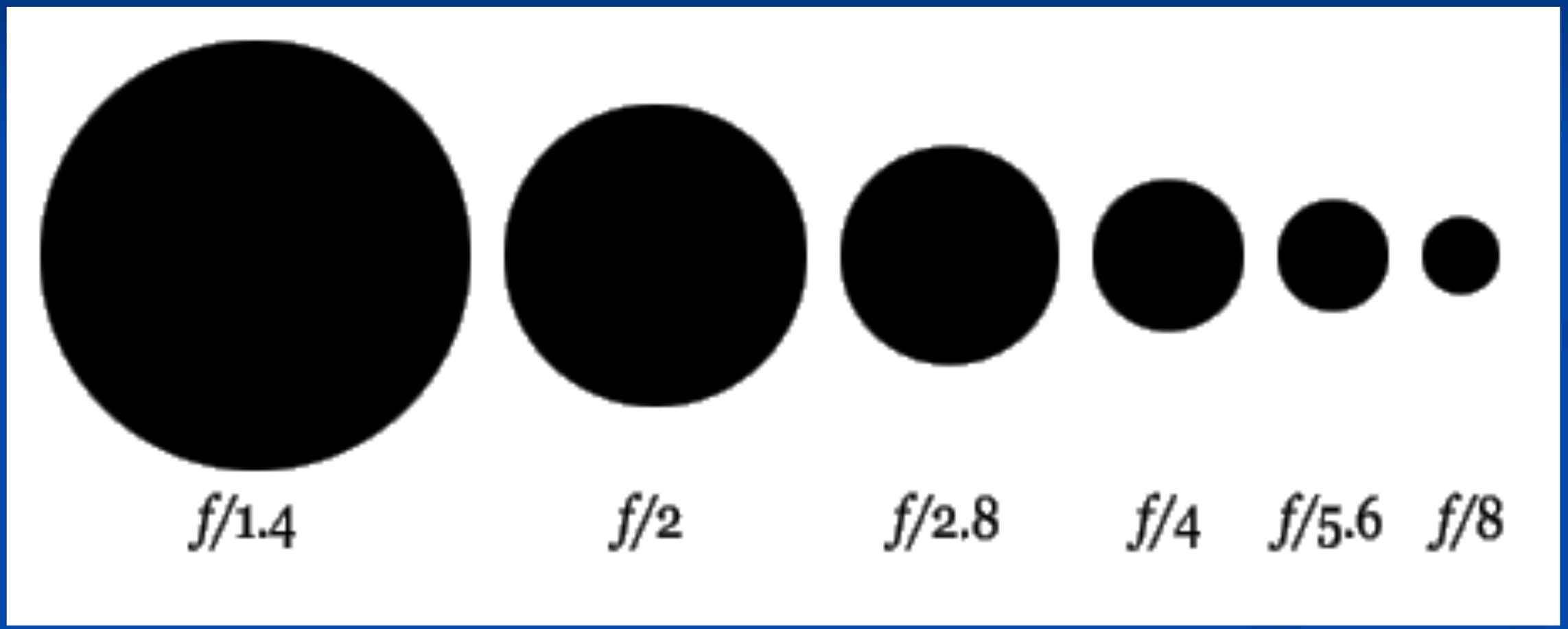
Aperture

Your camera's aperture does two things. First, since we know that it controls the amount of light let into the camera, it stands to reason that it also controls how dark or light your picture is going to be. The second thing it does is control how much of your picture is in focus. This is referred to as "depth of field", which we'll also discuss in later.

f/32

f/5.6

Lens Aperture or f/stop



The Aperture

Controls how much light gets in
More commonly known as f/stop

Lens Aperture or f/stop

When looking at aperture, we are looking at a decision we are making of how much we want to be sharp and how much we want to be blurry.

We make the decision of what details are important to see and what are not important to see.

Your choice

- Do you want a sharp image with no blur? High Shutter speed (but this means you will have a shallow depth of field)
- Do you want a blurry image? (you will probably have a large depth of field, but who cares since it's probably blurry)
- Do you want lots to be in focus? (you will have a slow shutter speed)
- Do you want little in focus? (you will probably have a high shutter speed)

Oh, just one more thing. . .

- There is one more thing – and it is pretty much as important as the last two things. But sometimes not well mentioned when looking at some self-help books on photography. And definitely not explained well in manuals.

Film Speed or “Sensor” Speed

Now – to explain one small thing. In both the film and the sensor, speed refers to the exact same thing. How responsive to light is it?

Film Speed or “Sensor” Speed

In other words, can it get by with just a little bit of light?

Film Speed or “Sensor” Speed

Or does it need a whole lot of lighting?

Film Speed or “Sensor” Speed

Both have one big similarity, the more sensitive also means the more “noisy”.

Film or “sensor” Speed

Faster films = 400, 800, 1600, 3200

Slower films = 200, 100, 64, 25

Overall follows same doubling pattern as f/stops or shutter speeds.

Fast Film

Capture high speed action in low light.

Disadvantages: noise becomes a problem, grainy appearance, some colors are off, shadows and highlights very shallow range.

Advantage: You can get the shot without extra light being used.

1/250 @ f 2 @ 1600 ISO

Slow film speeds

Disadvantages: Needs lots of light

May need to use artificial light (flash, reflector, etc)

Loss of depth of field, motion problems

Advantages: Nearly invisible grain, better "latitude" of the film, colors are natural

Slow Film Speeds

1/250 @ f13 100 ISO

Medium Film Speeds

200 to 400 on average

Disadvantages: grain does appear, too much depth of field.

Advantages: grain minimal, better shutter speeds possible.

1/500 @ f/8 400 ISO

- All this really does come down to the bare and simple term of compromise.

- So, how do we know what to compromise? Oh, lordy, back to day one and the concept of “think.” Simply put, what do we want this photo for?

The Mathematical Nature of Photography

- When one part goes up, another part goes down as long as the third remains constant.

- For our purposes, look at the film speed as constant. We set it for the type of photography we are doing, let's say outdoors.

Mathematical Nature of Photography

- So – ISO is set to 100 speed.

Example exposures: (they are all the same amount of light!)

1/1000 at f/5.6

1/500 at f/8

1/250 at f /11

1/125 at f/ 16

- Rough guidelines:
  - Shooting landscapes, want lots in focus so setting more likely to be 1/125 @ f/16. F/16 ensures a good depth of field, low shutter speed may not make any difference as long as there is little to no motion in the photo (landscape setting)
  - Shooting animals running, want the ability to stop the action. 1/1000 at f/5.6. 1/1000 ensures the speed is fast enough to stop the action. But, one downside is now you have to make more sure of the focus as there is little depth of field. (action setting)

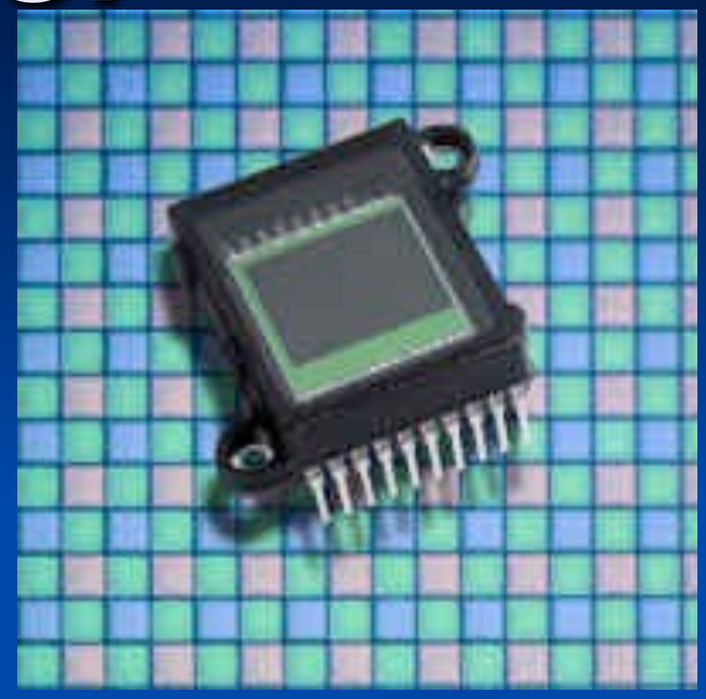
- Rough guidelines:
  - Shooting portraits, 1/1000 at f/5.6. You aren't worried about the speed of the subject, but you are concerned about the aperture as the lower numbered apertures mean less is in focus so the background behind the subject drops out of focus. (portrait setting)

- Rough guidelines:
  - Shooting portraits, 1/500 at f/8 or 1/250 at f/11 because you do want to capture the environment. (shoot at the landscape setting even though it is portrait)

Quality Issues

- We’re going to look at the size of the sensor as it is also very important in determining the final technical quality of the image.
- And what megapixels are.

Film vs. Sensor



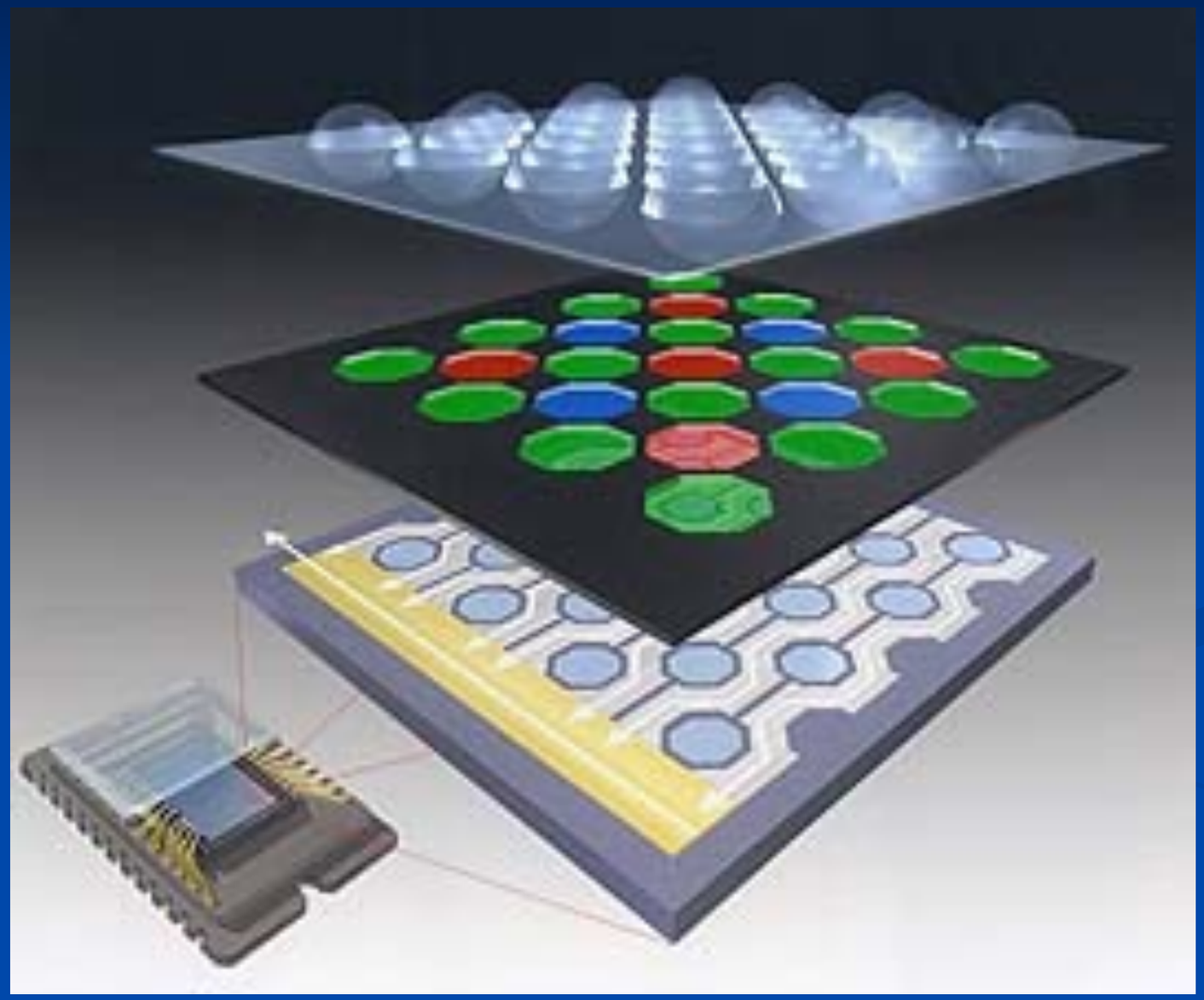
One thing I have not spoken about.

Film size, sensor size and how does this affect quality.

I hate to be simplistic, but rule of thumb, the smaller it is the lower the quality.

- The size of the sensor determines much in determining the final quality of the image.

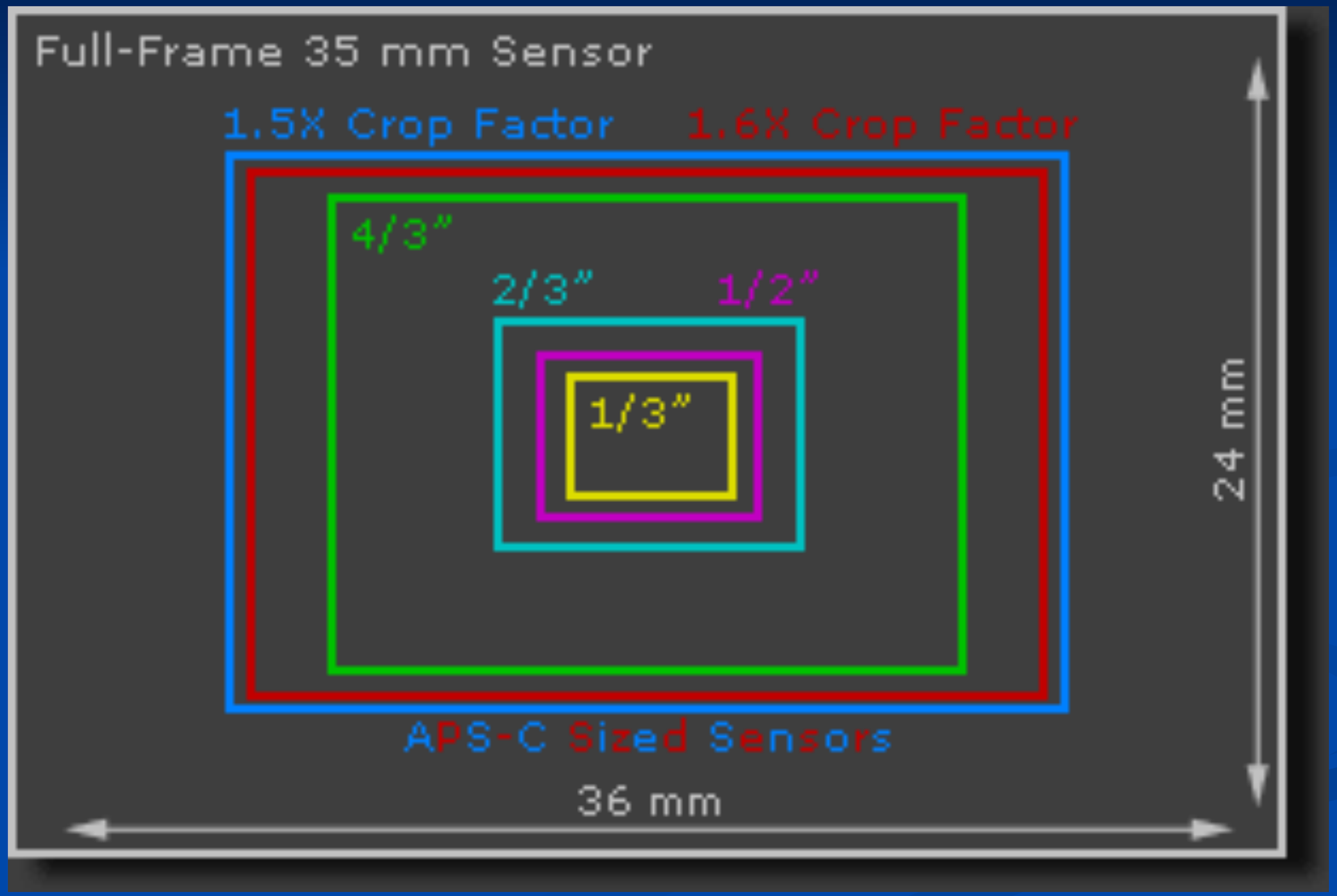
Sensor



Colored filters cover each photosite on the image sensor so the photosites only capture the brightness of the light that passes through. The lenses on top of each pixel are used to collect light and make the sensor more sensitive.

Courtesy of Fuji

Sensor Size


Full-Frame 35 mm Sensor
1.5X Crop Factor
1.6X Crop Factor
4/3"
2/3"
1/2"
1/3"
APS-C Sized Sensors
36 mm
24 mm

- But -- we hear manufacturers and others talking about how important megapixels are.
- Well . . . the term sales hype comes to mind.

Not all data is equal

You have 12 million coins.

Sounds good.

Yep, you’re rich. You have more than you will ever know what to do with.

Not all data is equal

You have 12 million coins.

Sounds good.

Yep, 12 million Japanese Yen.

About $135,000

Not all data is equal

You have 12 million coins. Still sounds good?

Make that 12 million

American gold coins

Final Thing for today

- What is the Megapixel Myth?
- It's the notion that more pixels will always get you a better quality image.
- More pixels often mean smaller pixels, which are noisy in low-light situations.
- More important are sensor size, ISO sensitivity, and the quality of the optical components lens. These factors are often overlooked.

What do I mean?

Megapixel camera	Photo Pixel Count Maximum Setting	Printer Resolution	Print Size
1	960 x 1280	240 PPI	3.2 x 4.3
2	1200 x 1600	300 PPI	4.0 x 5.3
3	1536 x 2048	300 PPI	5.1 x 6.8
4	1704 x 2272	300 PPI	5.7 x 7.6
5	1944 x 2592	300 PPI	6.5 x 8.6
7	2304 x 3072	300 PPI	7.7 x 10.2
8	2448 x 3264	300 PPI	8.2 x 10.9

What do I mean?

It simply means that you need to have an idea with
where you are going with the concept of megapixels.

And that it is a buyer beware market!

Assignment

You need to take your camera and figure out how to use the Exposure Compensation or Bracketing mode.

Shoot a photo of a person sitting in a shadow outdoors at what the camera says is correct.

Then shoot a photo of that is “over” exposing it by a total of one stop

Then shoot a photo of that same thing that is is underexposing by a total of one stop

Send me the best of the three along with what you saw as the difference.