

**Quit Using
Your Camera
on
Program!**

(Program Workbook)

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Taking Control of Your Camera

Digital Sensors - Size Matters!

A lens throws a circular image onto the film/sensor plane. That circle has to cover the film/sensor from corner to corner.



The illustration at left shows a 35mm frame of film well within the circular projection of the image by the lens and the image recorded on the film.

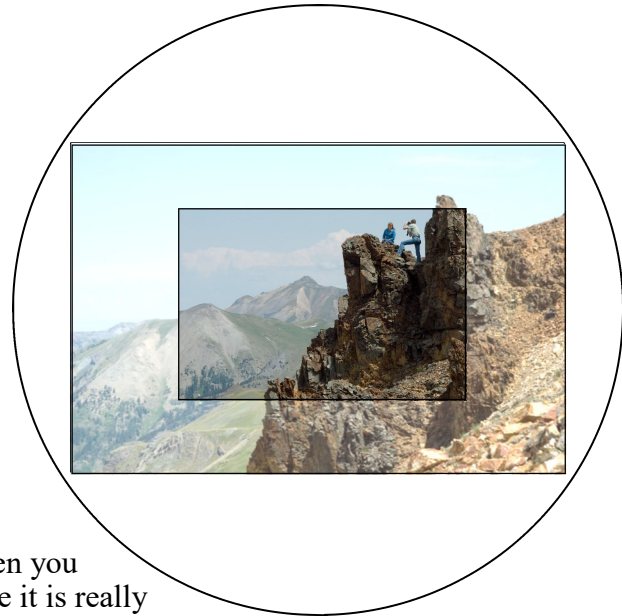
This is also how a digital camera with a full frame sensor would record the image. This is because the sensor is the same size as the 35mm frame of film.

Digital cameras are generally offered with “full frame” or “half frame” sensors. A full frame sensor will yield an image in the same way it would have been recorded on a piece of 35mm film.

A half frame sensor is about half the size of the full frame and only records the about half of the image that the full frame sensor would capture.

This has the effect of recording the image with more of a telephoto effect with the same lens.

The general factor to express this telephoto effect is to multiply the focal length by 1.6. This means a 200mm lens on a camera with a half frame sensor looks like a 320mm lens.

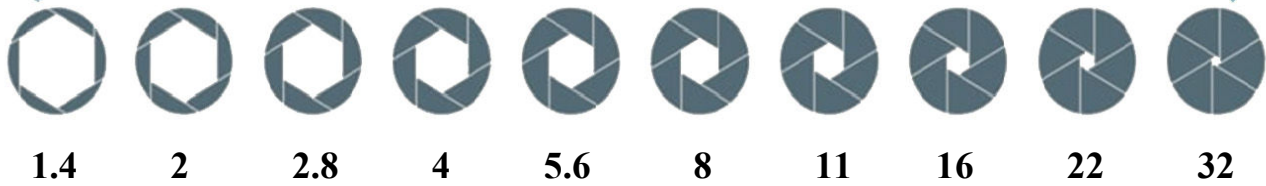


This is cool for telephoto images, but it is sad when you no longer have a wide angle lens at 28mm because it is really like having a 45mm lens on a camera with a half frame sensor. For a camera with a half frame sensor, you will want to consider a “digitally integrated” (DI) lens such as Tamron’s 17-50 F2.8 for your wide angle needs. It throws a smaller image circle which renders a wide angle image on the smaller sensor. But beware, DI lenses will not move with you to a camera with a full frame sensor as the circle is too small to cover the sensor corner to corner.

Taking Control of Your Camera

F-stops

The F-stop, or “aperture” is the control in the lens that “opens up” or “stops down” the diaphragm inside as a way to control the amount of light that reaches the film or sensor. The f-stops are:



The f-stops on your lenses may not be numbered exactly the same as these, but they will be close. These are considered to be “whole stops”. There may also be “half stops” and “1/3 stops” between each of these. F-stops are a unit of measure that refer to the size of the lens opening. They also continue on past 32.

You really should commit the listed f-stops, in order, to memory! Memorize the numbers as listed rather than those on your lens. We will learn to interpret the numbers on your lenses, later.

NOW COMES THE TRICKY PART!

**The smaller the F number, the larger the lens opening.
The larger the F number, the smaller the lens opening.**

A large lens opening such as F3.5 will let more light reach the film than a small lens opening such as F22. As a matter of fact, there is a relationship between each of the f-stops:

Any time you move your lens from one F# to the next smaller F#,
the amount of light that reaches the film **DOUBLES**.

EXAMPLE:

**F5.6 lets in twice as much light as F8.
F4 lets in twice as much light as F5.6.**

This pattern is the same throughout the F#'s
To look at this on the other hand:

**Moving the lens from F5.6 to F8, cuts the light in half!
Moving the lens from F4 to F5.6 cuts the light in half!**

And this pattern continues.

So in summary:

1.4 - 2 - 2.8 - 4 - 5.6 - 8 - 11 - 16 - 22 - 32...
Larger Openings <-----> Smaller Openings
More Light Reaches the Film <-----> Less Light Reaches the Film
Move One F-stop, Light Doubles <-----> Move One F-stop, Light is cut in half

Changing the lens opening from one f-stop to the next will either double the amount of light that reaches the film or cut it in half, depending on which way you move it.

Taking Control of Your Camera

Shutter Speeds

This camera control is usually found on the body of the camera, although it is sometimes found on the lens. The shutter speed controls the amount of light that reaches the film by determining how long the lens remains open. Memorize these shutter speeds:

...1sec. - 1/2 - 1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000...

Notice that shutter speeds continue in both directions. Also note that we go from 1 second to 1/2 second. Your camera will not show these speeds in fraction form. When you look at your shutter speed dial and it says 500, it means that it is 1/500th of a second!

(Now comes the tricky part!)

The smaller the shutter speed number (1/1000), the faster the shutter.

The larger the shutter speed number (1/2), the slower the shutter.

(Just because your camera says 1000 - it is not bigger than 2. Remember they are fractions.)

A fast shutter speed allows less light to reach the film than a slow shutter speed. More light reaches the film during 1/2second than 1/1000th of a second.

Shutter speeds have the same relationships to each other as do the f-stops in that when you move from one shutter speed to the next: You either double the amount of light that reaches the film or you cut it in half.

EXAMPLE:

Move from 1/250 to 1/125 and the amount of light reaching the film doubles.

Move from 1/30 to 1/15 and the amount of light doubles.

The pattern continues.

ON THE OTHER HAND:

Move from 1/30 to 1/60 and the amount of light reaching the film is cut in half.

Move from 1/500 to 1/1000 and the amount of light reaching the film is also cut in half.

The pattern continues.

So in Summary:

...1sec. - 1/2 - 1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000...

Slower Speeds <-----> Faster Speeds

More Light Reaches Film <-----> Less Light Reaches Film

Moving Objects may Blur <-----> Moving Objects Appear Sharp

Changing the shutter speed from one to the next will either double the amount of light that reaches the film or cut it in half, depending on which way you move it.

Taking Control of Your Camera

Exposure

The basics of photography begin with correctly exposing the film by finding the right combination of f-stop and shutter speed. Exposure can be expressed in this formula:

$$\text{Exposure} = \text{INTENSITY} \times \text{TIME}$$

or, $E = IT$

"Intensity" is the f-stop and "Time" is the shutter speed.

If the formula is true (which it is), then we can plug-in some numbers just to see what happens. So let's do it...

$$E = F8 @ 1/125$$

(F8 and 1/125 are variables that I selected entirely at random for this example.)

"E" will represent the amount of light that reaches the film. If you remember any algebra, because there is an = in the equation, I can change my variables, so long as I keep them an equal value.

For Example:

$$E = 2 \times 10, \text{ and } E = 4 \times 5.$$

(E is the same answer in both, but we used different variables.)

In my sample, I stated $E = F8 @ 1/125$. If for some reason I wanted to change the F8 to F5.6, could I do it? YES! As long as I keep the amount of light that reaches the film equal!

If I move from F8 to F5.6, I am making the lens open up to let twice the amount of light reach the film. In order to remain equal, I have to cut the light in half by moving the shutter speed to the next faster speed.

$$E = F8 @ 125$$

and

$$E = F5.6 @ 250$$

F5.6 @ 1/250 would be an equal, or equivalent exposure to F8 @ 1/125 because in both cases, the exact amount of light reaches the film. As a matter of fact, there can be many equivalent exposures:

$$F22 @ 1/15$$

$$F16 @ 1/30$$

$$F11 @ 1/60$$

$$F8 @ 1/125$$

$$F5.6 @ 1/250$$

$$F4 @ 1/500$$

$$F2.8 @ 1/1000$$

Each of the above exposures yield the exact amount of light onto the film. This process is the same no matter which f-stop and shutter speed combination you choose to start out with. The hard part about exposure is figuring out which f-stop and shutter speed to start with in the first place. (We will cover this in-depth later.)

It is at this point that you may be thinking, "Gosh, If F8 @ 1/125 will work, why the heck would I want to change to F4 @ 1/500?" This is where we first begin to realize the magic of photography.

Taking Control of Your Camera

Depth of Field

The f-stops not only control the amount of light that reaches the film, but they also control depth of field. DOF is defined as "the area in the photograph that will be in acceptable focus."

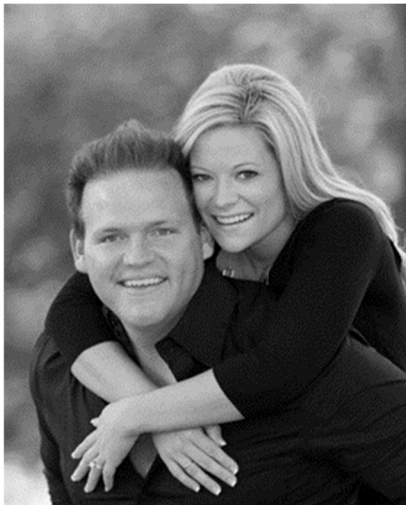
**The larger the lens opening, the shallower the DOF
The smaller the lens opening, the greater the depth of field.**

**A shallow DOF means that the background and the foreground will appear more out of focus.
A large DOF means the background and the foreground will appear sharper.**

Depth of field extends in front of the subject as well as behind the subject. As a matter of fact, 1/3 of the depth of field is in front of the subject and 2/3's are behind the subject. (This assuming you have focused on the subject.) If the depth of field is 6 feet and your subject is 12 feet away from the camera, everything from 10 ft. to 16 ft. will appear sharp.

Controlling the depth of field allows the photographer to "soften" or blur the background to a degree, so that unwanted distractions are eliminated.

Even a medium depth of field helps the photographer to isolate the subject from an otherwise "busy" background.



Shallow Depth of Field

A shallow DOF means that the background and the foreground will appear more out of focus.

The image of this young cowboy has a very shallow depth of field. Notice how the background is quite out of focus. This illustrates what an image might look like at F2.8.

This technique allows the photographer to place the emphasis on the subject without distractions from the background.

Large Depth of Field

A large DOF means the background and the foreground appears sharper or more in focus.

This bridal image has a much larger depth of field. This illustrates what an image might look like at F11.

A larger depth of field is useful in this image because the elements in the background are used as part of the overall composition.



Taking Control of Your Camera

Controlling Motion

The shutter speeds not only control the amount of light that reaches the film, but they also control the apparent movement of objects in motion during the exposure.

Objects that are moving during the exposure will appear almost stationary at fast shutter speeds, and may record as a blur during longer shutter speeds.



Slow Shutter Speed
This image was recorded at F16 @ 1/8 with the camera on a tripod. Notice how the slow shutter speed recorded the movement of her hair blowing in the wind.



Fast Shutter Speed
This image was recorded at F2.8 @ 1/250. Notice how the fast shutter speed arrested the movement of her hair blowing in the wind.

By the way, shutter speeds help control movement of the camera by the photographer. We all have a tendency to shake when we hold the camera. For a picture to be truly sharp, the camera needs to be kept very still during the exposure.

When hand-holding the camera, use shutter speeds that are no slower than the focal length of the lens you are using.

For example,

It is recommended that you use shutter speeds of at least 1/60 or faster when your hand-holding the camera and using a 50mm lens. Use 1/250 if you have a 200mm lens on the camera.



Slow Shutter Speed
This image was recorded with a 100mm lens at F16 @ 1/8 with the camera hand-held. Notice how the slow shutter speed recorded the movement the camera in my hands.



Fast Shutter Speed
This image was recorded with a 100mm lens at F4 @ 1/125 with the camera hand-held. Using a shutter speed that is at least equal to the focal length of the lens (100mm = 1/125) allows me to hand-hold the camera and record a sharp image.

Using speeds slower than the focal length of your lens may require a tripod or some other camera support.

Taking Control of Your Camera

ISO Numbers

The ISO number of the film is a way of rating a film's or sensor's sensitivity to light.

The higher the ISO number, the more light sensitive it is.

The smaller the ISO number, the less light sensitive it is.

In other words:

The higher ISO's such as 400 and 800, are quite light-sensitive and are capable of recording in low-light situations such as indoors with no flash or even outside at night. The lower ISO's such as 100 and 200 require more light, so they are used outside during daylight or indoors with a flash.

It is really important to use the right ISO for the lighting conditions under which you are working. No one setting will really do both.

ISO's have the same relationships to each other as do f-stops and shutter speeds.

200 ISO is twice as sensitive as 100 ISO.

400 ISO is twice as sensitive as 200 ISO.

The higher the ISO, the more you will likely introduce digital noise to your images. This will be more apparent as you begin to enlarge your images. These imperfections may appear as pixelization or uneven tonal values in areas of large color expanse such as a sky.

The ISO dial on your camera calibrates your camera meter, so that it reads the light correctly for the ISO speed. For now, we have not talked about the camera meter, but we will later.

Taking Control of Your Camera

Calculating Exposure

At last we reach a point where we will actually know enough stuff about camera to start taking photographs. We are going to begin with daytime exposures only, and gradually will be discussing indoor and studio exposures.

Every situation that you encounter has a measurable amount of light to work with, and with the help of the camera meter, we could measure the exact amount of light for that situation. For now, however, we're simply going to learn to estimate the amount of light without the help of the meter.

At this point we're working under daylight conditions only, and there is a little formula that makes this easy. We are looking for a starting exposure and this chart makes that simple to memorize for us. The formula is:

Lighting Pattern / Starting Exposure

Sunny / F16@1/ISO

Partly Cloudy / F11@1/ISO

Overcast / F8@1/ISO

Heavy Overcast / F5.6@1/ISO

For each of the lighting patterns, the f-stop is given. The shutter speed will be determined by the ISO.

For example, if it's a sunny day, and you are using 100 ISO, the starting exposure would be F16 at 1/125.

(1/125 is the closest shutter speed to 100 ISO.)

If you are using 400 ISO, the closest shutter speed will be 1/500, so your starting exposure would be F16 at 1/500.

Once you have determined the starting exposure, then you can go through the process we learned earlier, to determine the equivalent exposure you might wish to use, depending on the effect you want.

Example 1

Let's say it is a "heavy overcast" day, and you are using 400 ISO. The exposure would be F5.6 at 1/500.

You might like an increased DOF, so try

F8 @ 1/250

or

F11 @ 1/125

or

F16 @ 1/60

All of these exposures will work, but F16 will give you the most DOF. You can even go to F22 at 1/30, but remember 1/30 may be too slow to hand-hold the camera without noticeable camera shake.

Taking Control of Your Camera

Example 2

This time we find ourselves on a sunny day with 100 ISO. The starting exposure will be F16 at 125. We want to "stop" kids on bikes so we try :

F11 @ 250

or

F8 @ 500

or

F5.6 @ 1000.

Yes, there will be a shallower DOF, but what is really important here? By the way, notice that I have quit using the fraction form to discuss shutter speeds. You can too.

Bracketing

Bracketed exposures may ensure proper exposure when you find yourself in difficult lighting situations. Bracketing is simply the taking a photograph using several different exposures.

First, do your best to determine the correct exposure and take the photograph using that f-stop and shutter speed combination. Then, shoot a second image using the same f-stop but at one speed faster than the original one. You may also shoot a third image at one speed slower than the original.

For example: If you determine the exposure is F8 @ 125, then shoot at that exposure and then also shoot F8 @ 60 and F8 @ 250. This will yield three different exposures and then you can evaluate which image you prefer.

You may also bracket by keeping the shutter speed constant and changing only the f-stop.

For example: If you determine the exposure is F8 @ 125, then shoot at that exposure and then also shoot F5.6 @ 125 and F11 @ 125.

Bracketing may be very important if you shoot slide film or do digital photography. It may be the difference in a shot that works and one that does not. Slide film and digital must be exposed "right on". Bracketing is not really very necessary when shooting color negative film. It is very forgiving when you make a mistake.

Metering

Many cameras have a built-in meter that will measure the amount of light that is falling onto the film plane. Meters vary from camera to camera in how they work, and how they deliver information to the photographer.

Some cameras will give you a shutter speed based on where you have set F-stop. Others will give you an f-stop based on where you have set the shutters speed. Still others use only a needle system where you have to make needle line-up to an "N" or some other point to determine the amount of light.

Meters can be easily be fooled by bright or dark backgrounds. It is very important to meter the most important part of the image. Often times, we need to isolate what the meter sees in order to get an accurate reading. Once you have determined correct meter reading, you may need to turn your camera to "manual" and set the f-stop and shutter speed based on your correct reading.

Taking Control of Your Camera

Determining Exposure

Using a Light Meter



Reflective:

- Camera meters measure reflective light (light reflecting from a surface)
- Camera meter averages the exposure to 18% grey

Incident:

- Hand-held meters measure the light falling on the surface or subject
- Not influenced by tonal values of the subject or background

If your meter is set to measure in 1/10ths, be sure to interpret the 1/10 reading for your final exposure!

F8.0₂ = _____

F11.0₈ = _____

F5.6₄ = _____

F8.0₇ = _____

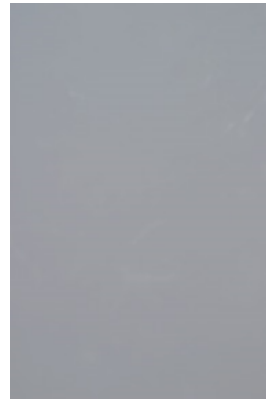
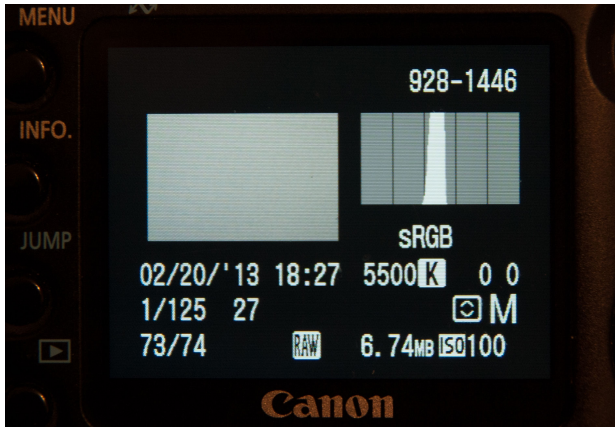
F2.0₉ = _____

F2.8₃ = _____

Taking Control of Your Camera

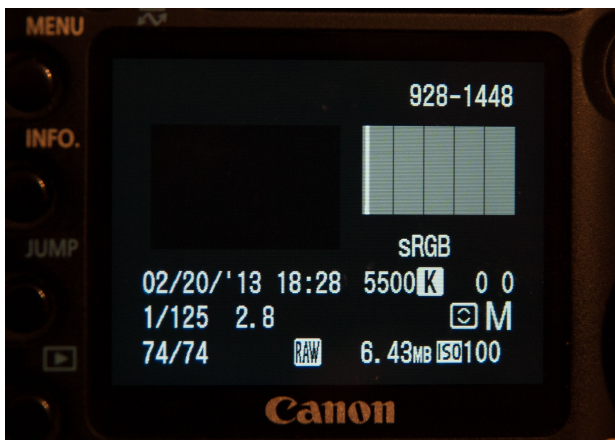
Determining Exposure

Histograms



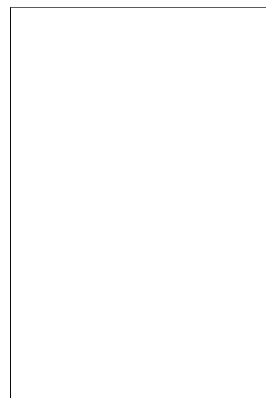
Histograms are a graphic representation of the tonal values of the pixels within the image.

The graph horizontally represents the pixel's numerical value from _____ on the left to _____ on the right.



0 values represent _____ while 255 represents _____.

The graph represents an approximate _____ stop range.



The blacks appear on the _____ side of the graph while the whites or highlights appear on the _____ side of the graph.

Taking Control of Your Camera

Photographing Using Natural Light

Quality of Light

Specular:



Diffused:



Color Temperature

- 1000-2000 K
- 2500-3500 K
- 3000-4000 K
- 4000-5000 K
- 5000-5500 K
- 5000-6500 K
- 6500-8000 K
- 9000-10000 K

Light Source

- Candlelight
- Tungsten Bulb (household variety)
- Sunrise/Sunset (clear sky)
- Fluorescent Lamps
- Electronic Flash
- Daylight with Clear Sky (sun overhead)
- Moderately Overcast Sky
- Shade or Heavily Overcast Sky

Taking Control of Your Camera

Using The In-Camera Meter



Proper Exposure (18% Grey)



Two Stops Underexposed



One Stop Overexposed

Taking Control of Your Camera

Camera Meter Modes



**Evaluative Mode
(Matrix)**



Center Weighted



Partial Mode



Spot Meter Mode

Taking Control of Your Camera

Do you understand the Basics? Take this review to find out.

1. Which line has the “full” f-stops in the correct order?

- A. 1.4 - 2.8 - 4 - 5.6 - 8 - 16 - 22 - 32...
- B. 1.4 - 2 - 2.8 - 4 - 5.8 - 8 - 16 - 22 - 32
- C. 1.4 - 2 - 2.8 - 4 - 5.6 - 8 - 11 - 16 - 22 - 32...
- D. 1.4 - 2.8 - 4 - 5.6 - 8 - 11 - 16 - 22 - 32...

2. Which line has the “full” shutter speeds in the correct order?

- A. 1 - 2 - 8 - 15 - 60 - 125 - 250 - 500 - 1000...
- B. 1 - 2 - 4 - 8 - 15 - 30 - 125 - 250 - 500 - 1000...
- C. 1 - 2 - 8 - 15 - 30 - 60 - 125 - 250 - 1000...
- D. 1 - 2 - 4 - 8 - 15 - 30 - 60 - 125 - 250 - 500 - 1000...

3. The f-stops serve two purposes - what are they?

- A. To control motion and control depth of field
- B. To control motion and control the amount of light that reaches the sensor
- C. To control the amount of light that reaches the sensor and ISO speed
- D. To control the amount of light that reaches the sensor and depth of field

4. If you move the f-stop from F5.6 to F8, what happens to the amount of light that reaches the sensor?

- A. Decreases
- B. Increases
- C. Stays the same

5. What is Depth of Field

- A. How far the camera can focus
- B. The area in the photograph that is in focus
- C. The distance in the background that is in focus
- D. The distance between the camera and the subject

6. What happens to the depth of field when you move the lens from F11 to F16?

- A. Decreases
- B. Increases
- C. Stays the same

7. Given F8 @ 1/125, what would the new shutter speed need to be if you moved the lens to F5.6?

- A. 1/250
- B. 1/60
- C. 1/500
- D. 1/30

Taking Control of Your Camera

8. Why would you want to move the lens from F4 to F2.8?

- A. To increase the depth of field
- B. To use a slower shutter speed
- C. To allow less light to reach the sensor
- D. To decrease the depth of field

9. What does the ISO of the film or sensor tell us?

- A. What f-stop to use
- B. What shutter speed to use
- C. Its' sensitivity to light
- D. Which lens to use

10. Define "equivalent exposure".

- A. Exposures equal to the ISO
- B. Exposures that yield the same amount of light onto the sensor
- C. Exposures where the f-stop stays the same and only the shutter speed changes
- D. Exposures where the shutter speed stays the same and only the f-stop changes

11. Give an equivalent exposure to F11 @ 1/15.

- A. F11 @ 1/30
- B. F8 @ 1/15
- C. F8 @ 1/8
- D. F16 @ 1/8

12. The shutter speeds serve two purposes - what are they?

- A. To control motion and control depth of field
- B. To control motion and control the amount of light that reaches the sensor
- C. To control the amount of light that reaches the sensor and ISO speed
- D. To control the amount of light that reaches the sensor and depth of field

13. What is the slowest shutter speed that you should use if you are hand-holding your camera?

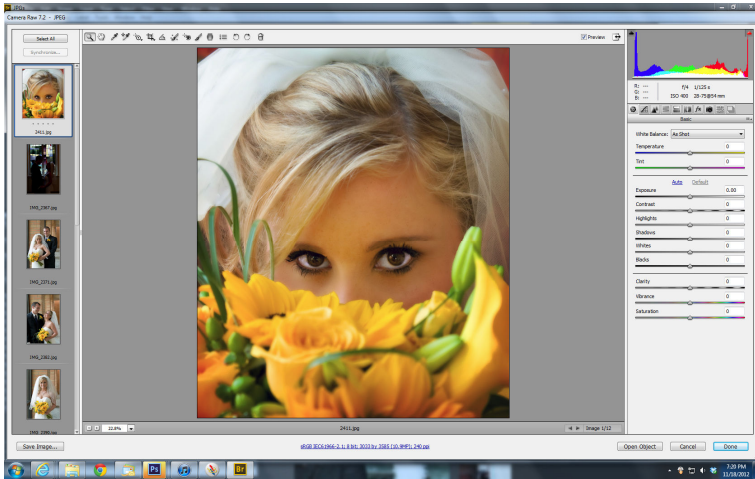
- A. 1/60 with a 200mm lens
- B. 1/125 with a 28mm lens
- C. 1/60 with a 50mm lens
- D. 1/60 with a 28mm lens

14. Why would you want to change the shutter speed from 1/60 to 1/250?

- A. To increase the depth of field
- B. To use a slower shutter speed
- C. To "freeze" a moving object
- D. To "blur" a moving object

Taking Control of Your Camera

Photographing in RAW

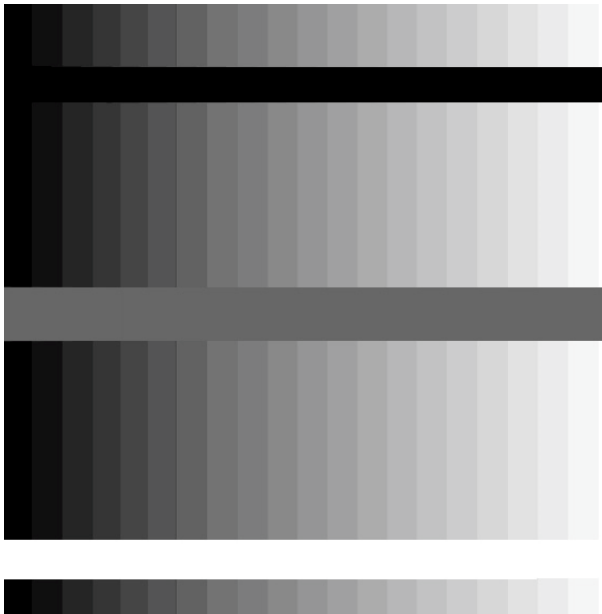


Capturing your images in RAW format provide you with the entire amount of data that your camera is capable of recording.

This provides you with the full range of digital data for image processing.

Images captured in RAW have a wider range of image corrections for _____, _____, _____, _____ and more.

When you opt to capture in Jpeg mode, your camera compresses your file—sort of like squeezing a _____ causing you to lose _____ all for the sake of having a smaller file.



This smaller, compressed Jpeg file loses about _____ % of the information your camera was capable of capturing. This means that your editing of exposure, color, contrast and such is much more segmented making adjustments to your images more _____.

Taking Control of Your Camera

Steve's Camera Set Up

Image capture quality RAW

Capturing your images in RAW allows the photographer to work with the full complement of data the camera is capable of capturing. Establish a workflow that utilizes RAW processing for speed of editing and for image protection.

Look in camera menu settings for “Image Quality” and select “RAW”. There is no need for “RAW + JPG”.

Set camera to half-stop increments

Your camera likely came out of the box set in 1/3 stop increments. Changing the camera to half stops makes navigation of your exposure controls more efficient.

Canon users, use the Custom Functions menu and look for “Exposure Level Increments”.

Nikon users look for “Exposure Values” or “EV settings”.

Set up focus selection to a single point

We do not want the camera to select where it wants to focus. Set up your focus selections to a single point which can be toggled around the viewfinder and placed at the point of your subject for accurate focusing.

Take focus off the shutter button

It is completely inefficient to have to focus before every image, plus it is hard on your equipment. Removing the focus from the shutter button allows you to focus with the button on the back and take all subsequent images at the same distance without having to re-focus for every image.

The following two pages may help you with finding the controls on your menu for taking the focus off your shutter. Consult your user's manual for complete info.

Taking Control of Your Camera

Take Focus off Shutter Button: Canon Cameras

Be sure to check your camera manual for confirmation on the Custom Function number for Back-Button AF in your EOS model. Here are examples of the C.Fn menu selection for recent EOS models:

EOS Rebel T3: C.Fn 7 (option 1 or 3)

EOS Rebel T3i: C.Fn 9 (option 1 or 3)

EOS Rebel T4i: C.Fn 6 (option 1 or 3)

EOS 60D: C.Fn IV-1 (option 1, 2, 3, or 4)

EOS 7D: C.Fn IV-1 (Custom Controls — Shutter, AF-ON, AEL buttons)

EOS 6D: C.Fn III-5 (Custom Controls -- Shutter, AF-ON, AEL buttons)

EOS 5D Mark II: C.Fn IV-1 (option 2 or 3)

EOS 5D Mark III: C.Fn menu screen 2 (Custom Controls -- Shutter, AF-ON, AEL buttons)

EOS-1D X: C.Fn menu screen 5 (Custom Controls -- Shutter, AF-ON, AEL buttons)

The terminology often used on the menu for this particular custom function may seem a little confusing, so an explanation is in order. In cameras without a separate C.Fn called "Custom Controls", the function is headed "Shutter/AE lock button", or similar wording.

What this means is that anything *before* the slash mark refers to how the shutter button will behave. Anything *after* the slash tells you how the rear button will work if that option is selected. Using the popular EOS 50D as an example, here's what you see on-screen, and here's what it means:

o: Metering + AF start (*note: there's no slash here*)

Factory-default setting. You activate camera's meter and AF by pressing shutter button half-way down. Rear AF-ON button also does same if it's pressed, so you don't get the benefits of removing AF activation from the shutter button when this option is set.

1: Metering + AF start / AF stop

AF is still at shutter button. Pressing the rear button will actually LOCK the focus; potentially useful if you shoot a lot of moving subjects in AI Servo AF and prefer to activate AF with a conventional half-press of shutter button. Focus is unlocked by removing thumb from back-button.

2: Metering start / Meter + AF start

Back-button AF activation. Shutter button no longer activates AF, but of course fires the shutter. Metering is continuously updated — if you shoot a sequence of pictures, the camera takes a fresh meter reading for each one. There's no locking of exposure, unless you separately press the AE Lock button (this last item is not possible on some EOS models).

Taking Control of Your Camera

3: AE Lock / Metering + AF start

Back-button AF activation. Difference between this setting and option 2 directly above is that when you press the shutter button half-way, your exposure is locked and won't change until you pull your finger off the button entirely. Thus, if you shoot a sequence of pictures in any auto exposure mode, the exposure setting used for the first shot is used for each subsequent shot. Can be useful if you were using back-button AF to easily lock focus and shoot a series of portraits, where you wouldn't expect lighting to change.

4: Metering + AF start / Disable

Similar to setting "o" above, but now, the camera's rear AF-ON button is disabled. AF activation is at the shutter button. Convenient if you're worried about accidentally pressing the back-button and don't want to use back-button AF.

Take Focus off Shutter Button: Nikon

I was unable to find as much documentation for Nikon cameras, but here is a bit of info for moving the focus off the shutter and onto the back for some of the popular models.

D3100, D3200, D5100, D80

Menu Option

Buttons

AE-L/AF-L button

AF-ON

D700

(option a5:AF Activation - set to AF-ON button only).

D7000

1) Assign the AE-L, AF-L button on the back of the camera to be AF-On. To do this, go to your camera menu and look in the custom setting menu (the pencil). In the custom setting menu, go to Controls, and then choose F5 "Assign AE-L/AF-L button." Within this menu, choose "AF-On."

2) Now you need to set up the camera so it will take a picture even when focus has not been achieved. This is preferable in most situations because you may have focused and recomposed the shot. To do this, go to your Custom Setting Menu and choose Autofocus. Within this menu, select A1 "AF-C priority selection" and set it to "release." Then set AF-S priority selection to "release" as well.

(I am not a Nikon user and I don't really understand the need for step two, but this may be specific to the functions of the D7000.)

Taking Control of Your Camera

Equipment Basics

Lens Selections:

Your Vision Is In The Lens You Use

So much of capturing your vision for any given image is in selecting the right lens. A lens will effect the perspective of the background as it relates to sharpness and as it relates to your subject.



What You See And What You Get

The focal length (mm) of the lens determines the "angle of view" - or how much you see in the image.

Lens Definitions

Full Frame Sensor

Normal - 50mm

Wide Angle - 28mm

Telephoto - < 75mm

Half Frame Sensor

Normal - 30mm

Wide Angle - 18mm

Telephoto - < 50mm



Steve's Lens Selection Tips:

1. Purchase great lenses! They will long outlast the life span of your camera.
2. Avoid lenses only suited for half-frame sensors.
3. Don't try to get all the focal lengths in one lens.
4. Select lenses that are F2.8.
5. Avoid Variable Aperture lenses.
6. Image stabilization adds to the cost of the lens.
7. Generally, your camera manufacturer will make the best lenses for your camera.

Taking Control of Your Camera

Suggested Exposures for Existing-Light Exposures

Picture Subjects	100 ISO	200 ISO	400 ISO	800 ISO	1600 ISO
Home interiors at night—Areas with average light Areas with bright light	1/8 sec <i>f</i> 2 1/15 sec <i>f</i> 2	1/15 sec <i>f</i> 2 1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2 1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 2.8 1/30 sec <i>f</i> 4	1/30 sec <i>f</i> 4 1/60 sec <i>f</i> 4
Candlelight close-ups	1/4 sec <i>f</i> 2	1/8 sec <i>f</i> 2	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8
Indoor/outdoor holiday lighting at night, Christmas trees	1/4 sec <i>f</i> 2	1/8 sec <i>f</i> 2	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8
Interiors with bright fluorescent lights [‡]	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/60 sec <i>f</i> 5.6	1/60 sec <i>f</i> 8
Brightly lighted downtown street scenes (Wet streets add interesting reflections)	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 4	1/125 sec <i>f</i> 4
Brightly lighted nightclub or theatre districts— Las Vegas or Times Square	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/125 sec <i>f</i> 4	1/125 sec <i>f</i> 5.6
Neon signs and other lighted signs	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/125 sec <i>f</i> 4	1/125 sec <i>f</i> 5.6	1/125 sec <i>f</i> 8
Store windows	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/60 sec <i>f</i> 5.6	1/60 sec <i>f</i> 8
Subjects lighted by street lights	1/4 sec <i>f</i> 2	1/8 sec <i>f</i> 2	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8
Floodlighted buildings, fountains, monuments	1 sec <i>f</i> 4	1/2 sec <i>f</i> 4	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8
Skyline—10 minutes after sunset	1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 4	1/60 sec <i>f</i> 5.6	1/125 sec <i>f</i> 5.6	1/125 sec <i>f</i> 8
Skyline—distant view of lighted buildings at night	2 sec <i>f</i> 2	1 sec <i>f</i> 2	1/2 sec <i>f</i> 2	1/4 sec <i>f</i> 2	1/8 sec <i>f</i> 2
Moving auto traffic on expressways—light patterns	20 sec <i>f</i> 16	10 sec <i>f</i> 16	10 sec <i>f</i> 22	10 sec <i>f</i> 32	5 sec <i>f</i> 32
Fairs, amusement parks	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/60 sec <i>f</i> 2	1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 4
Amusement-park rides—light patterns	4 sec <i>f</i> 16	2 sec <i>f</i> 16	1 sec <i>f</i> 16	1 sec <i>f</i> 22	—
Fireworks—displays on the ground	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/60 sec <i>f</i> 5.6	1/60 sec <i>f</i> 8
Fireworks—airial displays (Keep shutter open on Bulb for several bursts.)	<i>f</i> 8	<i>f</i> 11	<i>f</i> 16	<i>f</i> 22	<i>f</i> 32
Lightning (Keep shutter open on Bulb for one or more streaks of lightning.)	<i>f</i> 5.6	<i>f</i> 8	<i>f</i> 11	<i>f</i> 16	<i>f</i> 22
Burning buildings, campfires, bonfires (flames)	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4	1/60 sec <i>f</i> 4	1/125 sec <i>f</i> 4	1/125 sec <i>f</i> 5.6
Subjects lighted by campfires, bonfires	1/8 sec <i>f</i> 2	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4
Night football, soccer, baseball, racetracks [‡]	1/30 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8	1/125 sec <i>f</i> 2.8	1/250 sec <i>f</i> 2.8	1/500 sec <i>f</i> 2.8
Baseball, hockey, bowling	1/30 sec <i>f</i> 2	1/60 sec <i>f</i> 2	1/125 sec <i>f</i> 2	1/125 sec <i>f</i> 2.8	1/250 sec <i>f</i> 2.8
Boxing, wrestling	1/60 sec <i>f</i> 2	1/125 sec <i>f</i> 2	1/250 sec <i>f</i> 2	1/250 sec <i>f</i> 2.8	1/250 sec <i>f</i> 4
Stage shows—Average Bright	1/30 sec <i>f</i> 2 1/60 sec <i>f</i> 2.8	1/30 sec <i>f</i> 2.8 1/60 sec <i>f</i> 4	1/60 sec <i>f</i> 2.8 1/125 sec <i>f</i> 4	1/125 sec <i>f</i> 2.8 1/250 sec <i>f</i> 4	1/125 sec <i>f</i> 4 1/250 sec <i>f</i> 5.6
Circuses—Floodlighted acts Spotlighted acts (carbon-arc)	1/30 sec <i>f</i> 2 1/60 sec <i>f</i> 2.8	1/30 sec <i>f</i> 2.8 1/125 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8 1/250 sec <i>f</i> 2.8	1/125 sec <i>f</i> 2.8 1/250 sec <i>f</i> 4	1/250 sec <i>f</i> 2.8 1/250 sec <i>f</i> 5.6
Ice shows—Floodlighted acts Spotlighted acts (carbon-arc)	1/30 sec <i>f</i> 2.8 1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8 1/125 sec <i>f</i> 2.8	1/125 sec <i>f</i> 2.8 1/250 sec <i>f</i> 2.8	1/250 sec <i>f</i> 2.8 1/250 sec <i>f</i> 4	1/250 sec <i>f</i> 4 1/250 sec <i>f</i> 5.6
School—stage and auditorium	—	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8
Swimming pool—tungsten light indoors, above water	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/60 sec <i>f</i> 2	1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 4
Hospital nurseries	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8	1/60 sec <i>f</i> 2.8	1/60 sec <i>f</i> 4	1/125 sec <i>f</i> 4
Church interiors—tungsten light	1 sec <i>f</i> 5.6	1/15 sec <i>f</i> 2	1/30 sec <i>f</i> 2	1/30 sec <i>f</i> 2.8	1/30 sec <i>f</i> 4