

MITOCW | MITRES_10-001S16_Track10_300k

So let's look a little more closely at aperture settings, which in fact is a discussion on, really, what we call depth of field.

Depth of field is about what is in focus and what is not in focus in your picture.

Your aperture setting on your lens sets the size of your aperture.

Or maybe it's easier to think of it as a hole.

The size of that hole determines how much of your image is in focus.

When you set your lens to the largest aperture that your lens offers, we say that your lens is wide open.

And in that wide open setting is what you see in your view finder.

If you want to see what is in focus through your viewfinder, that is, if you set your aperture, let's say, at F/32, you'll have to press the 'Preview' button to see what will be in focus.

By pressing the 'Preview', the aperture will close down to your chosen F-Stop, and you'll see a darkened image in your viewfinder.

It's another reason why I use the software.

Remember, in the software's Live View, we see the image with the chosen aperture on the screen much easier than seeing a darkened image and trying to figure out what's in focus.

There's no need to press a 'Preview' button when you use software.

So in our situation, two eight is the largest aperture in this particular 105 lens.

We call it F-stop 2.8 , or $F / 2.8$.

Notice that the number is actually written as F over 2.8 .

When we set the diaphragm to those numbers written on the lens, the numbers in fact represent fractions and for that reason F over two eight is larger in terms of size of the aperture than, let's say, F over 4.

And F4 is larger than five six, and so on.

This can be a little confusing, but if you think in terms of fractions, it will make more sense.

So these are the settings we'll look at in this exercise.

You'll see more potential settings on your lens.

But for our purposes here, these should be enough to make the point about focus changes.

We'll stay with these five.

Okay now here is the image I made of our music box at F/4.

Take a hard look at what is in focus and what is not.

Not very much in the foreground and background, and so we say this image has a narrow depth of field.

Not a whole lot is in focus.

Now at 5.6, here is the image again.

Let's compare the two.

We're seeing very slight changes in focus.

That's what we're looking for.

Take a hard look what's in focus.

And now we'll go to F/8.

And comparing F/8 to five six, little by little, more of the image is coming into focus.

You should stop the video and give the two a careful look.

Notice the turning mechanism a tad more in focus in F8 and a tad more as well in the screws and everything else in that object plane.

We'll go to the next F-stop, F/11 and we'll compare to the previous image, F/8.

And again, you should stop the video to make the comparison.

And just to move things along a bit, we'll just go right to F/32.

Look at how small the aperture is.

And look at how so much more of the image is in focus compared to the previous.

Now to drive home the point even further, let's compare F/32 with F/4.

So you really see a significant change.

That's what these observations are about.

We're seeing how focus or depth of field changes more and more, get's into focus, as we close down, or stop down the aperture to the smaller fraction settings on your lens.

But remember, as we close the aperture to smaller settings like F/32, we also decrease the amount of light we let into the camera.

We're not getting the right exposure until we compensate by increasing the amount of time the shutter is open.

For example, when I change from one second [clicking sound] to two seconds [clicking sound], I'm keeping the shutter open twice as long, allowing more light into the camera.

The longer the shutter is open, the longer we permit the light to enter the camera and to be read by the sensor, compensating for the small aperture setting.