

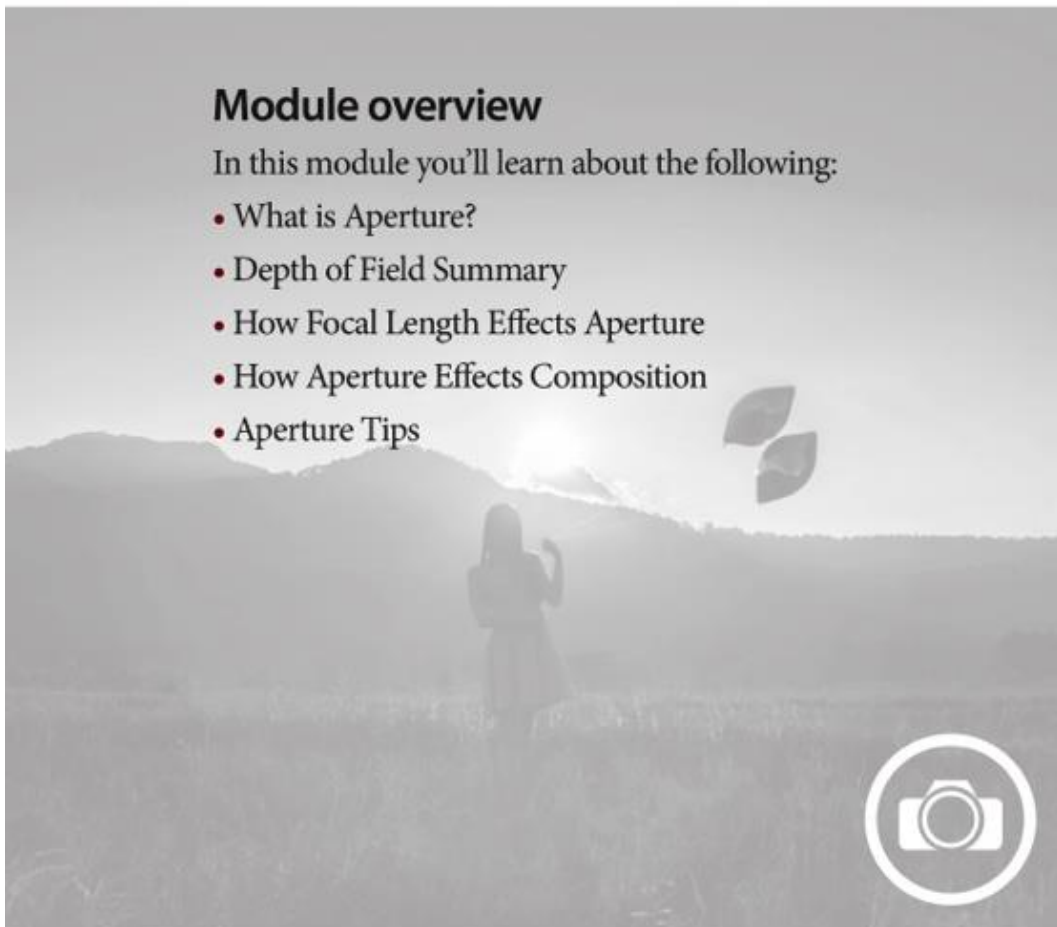


Module 3: **Aperture**

Module overview

In this module you'll learn about the following:

- What is Aperture?
- Depth of Field Summary
- How Focal Length Effects Aperture
- How Aperture Effects Composition
- Aperture Tips



“There is only you and your camera. The limitations in your photography are in yourself, for what we see is what we are.”

Ernst Haas
(1921 – 1986)

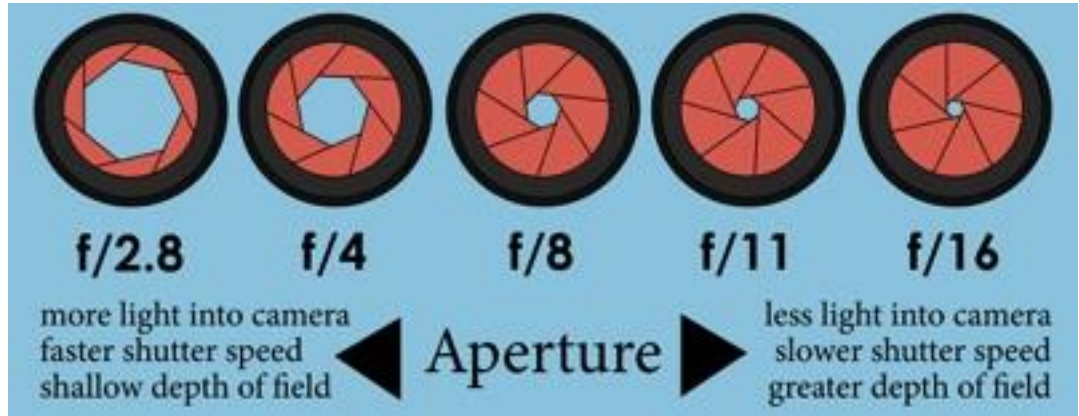
3.1 What is Aperture?

Tip: switch your camera to aperture priority mode. This will be A or Av on your mode dial.

In this mode, you can adjust the aperture and the camera will set the shutter speed accordingly.

Try shooting the same thing using your highest, lowest and a medium aperture setting, and see the difference it makes in each photograph.

Aperture is the hole in the lens that allows light to hit the sensor. It is adjustable to allow more or less light in, depending on the situation. The size of this hole is controlled by a series of blades that open or close, depending on the aperture setting. The increments are referred to as “f/stops”. The numbering system can lead to some initial confusion because the lower the number, the larger the aperture.



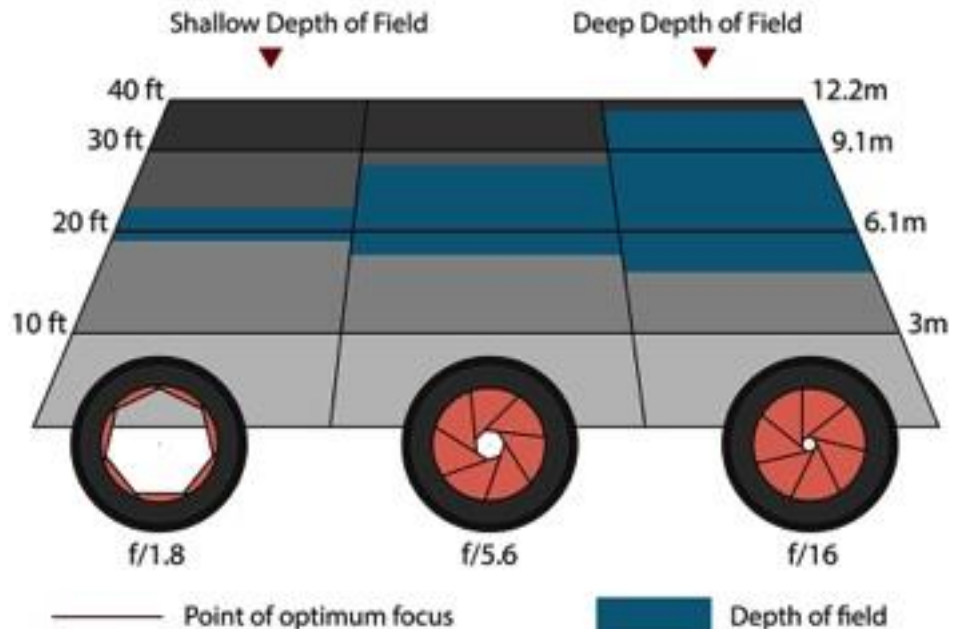
Not only does the aperture size affect the amount of light that hits the sensor, it also affects the depth of field. So what is depth of field?

3.2 Depth of Field Summary

Depth of field will be covered in more detail in a later module, but for now here are the basics.

Many photographs, especially landscapes, have three main components: the foreground, the middle ground and the background. The foreground is comprised of the things closest to you, the background is the furthest away and everything in between is the middle ground. So how does the aperture affect the depth of field?

If you're using a large aperture setting, let's say f/2.8, then this will give you a shallow depth of field. For example, if you're focusing on something in the middle ground, then the background and foreground will be out of focus. Using a smaller aperture like f/22 will give you a greater depth of field, so the background, middle ground and foreground will be sharper.



Tip: if you're using a large aperture setting, you have to be extra careful with your focusing.

Your camera's autofocus might select the wrong thing to focus on.

If this is a problem, then switch the focus mode to manual.

Let's look at both ends of the aperture scale.



With an aperture of $f/1.8$, the focus is set on the subject (in this case the model) and the background is completely blurred.



This image was shot using an aperture setting of $f/22$; by using a smaller aperture, the foreground, middle ground and background are all in focus. However, this creates a problem: by restricting the amount of light, the shutter speed had to be increased (in this case $1/4$ of a second) to get the correct exposure, and this creates motion blur.

This example was done deliberately but illustrates one of the problems created – when it comes to exposure settings, if you want to eliminate the motion blur caused by the small aperture, then you must increase the ISO.

Tip: many telephoto lenses do have a fixed aperture when zoomed in and out.

A Nikon 18-105mm lens will have a maximum aperture of f/3.5 at 18mm, but when you zoom in to 105mm, the maximum aperture decreases to f/5.6.

Only professional-grade telephoto lenses (the big heavy ones) have a fixed aperture at different focal lengths.

3.3 How Focal Length Affects Aperture

Something that appears to influence depth of field is zooming. The photographs below were shot with same DSLR and the same 18-135mm lens. One was shot at f/3.5 and the other was shot at f/5.6: which is which?



The image on the right looks like it was shot with a larger aperture but it wasn't.

The reason the background is more out of focus is because of the focal length. The image on the left has a focal length of 18mm and the one on the right has a focal length of 113mm. Why does this make a difference?

Because when you use a telephoto lens to zoom in on your subject, you will also magnify anything that is blurred. If the image on the left had been shot using the same settings but with the focal length increased, then the background would appear more blurred. The reverse is also true: if the image on the right had been shot at 18mm, then the background would appear to be sharper.

This is why depth of field is so important and why changing the aperture setting can make a big difference.

There's a general rule of thumb when it comes to choosing your aperture settings.

- Use larger apertures for portrait and macro photography.
- Use smaller apertures for landscape photography.
- Use medium apertures for general purposes.

These rules are not hard and fast though. For example, you might want to shoot a portrait that has the background (maybe a famous landmark) in focus, or might want a landscape image with the foreground out of focus to give your image a greater sense of scale.

Tip: even though smaller apertures are recommended for shooting landscapes, don't be afraid to experiment with larger apertures, especially if there's something interesting in the middle-ground.

Here's another example. This time the same subjects were shot at f/5.6 and f/36 on an 18-105mm lens with the focal length set to 66mm.



The first shot was taken at f/5.6. Normally, this would not create such a shallow depth of field. Actually, the depth of field is the same as you would get at a focal length of 18mm, but by zooming in to magnify the subject you also magnify the blur – creating the illusion of a shallow depth of field.



So whenever you use a telephoto lens, you have to account for this factor.

Tip: most telephoto lenses have a maximum aperture of f/3.5.

A 50mm prime lens (prime meaning a fixed focal length) will usually have a maximum aperture of f/1.8 or f1.4; that is why they are used so much for portrait photography

3.4 How Aperture Affects Composition

Look at the two images side by side; which one looks better?



It's a subjective question, but most people would say the one on the left. If you were to ask them why they preferred it, they might struggle to give you an answer – because they both look very similar.

The reason most people would prefer the image on the left is because the two figures are in sharp focus, the blurred background makes the focus appear sharper and the two figures stand out more. By having everything in sharp focus, the two figures lose any visual impact.

This is why most portrait photographers use large apertures; having an out of focus background make the subject of the portrait stand out more.



This looks fine but the background is distracting. Your eye is still drawn to the subject; in composition terms, this is referred to as the focal point (not to be confused with focal length).

So how can this be improved?

Tip: if you need a blurred background but don't have a lens with a very large aperture, it's possible to fake it with a telephoto lens by stepping back from your subject, going to maximum zoom and setting your aperture to the maximum available (probably around f/5.6).



By increasing the aperture and the focal length, the subject becomes more dominant and the background is less noticeable.

3.5 Summary

- Light travels through the aperture in the lens.
- A small aperture will let in less light than a larger aperture.
- The aperture settings are measured in F-stops.
- Remember that the larger the F-stop number, the smaller the aperture is.
- Aperture also affects the depth of field.
- A small aperture creates a shallow depth of field.
- A large aperture creates a greater depth of field.

3.6 Assessment Questions

- 1) True or False? A large aperture lets less light into the camera.
- 2) What is the function of aperture blades?
- 3) Does the aperture affect focusing?
- 4) Which aperture setting has a greater depth of field, f/5.6 or f/16?
- 5) How does aperture affect shutter speed?
- 6) Does focal length affect depth of field?
- 7) Why is a small aperture setting preferable for shooting landscapes?
- 8) What type of photograph might require an aperture setting of f/1.8?
- 9) Do all lenses have the same aperture range?
- 10) When using a small aperture, what can you do to increase the shutter speed?

3.7 Assignment

Set up two large objects (or people) with the closest being approximately six feet away from the camera and the furthest about 12 feet away from the camera (or more depending on how much space is available).

The composition is not important, but it does help to think about where the objects will be positioned in the frame.

Using the lens at its widest focal length (probably about 18mm), take a series of photographs from the same position but adjust the aperture by one F-stop each time (you might want to use aperture priority mode for this).

Start with the largest aperture and then gradually decrease until you reach the smallest. You will either need a tripod or to make sure that your camera is resting on a flat surface, because as the aperture gets smaller, the shutter speed will start to get longer.

Then look at pictures and see the effect the aperture setting has on each shot.