

# What is Depth of Field? How aperture, focal length and focus control sharpness

by Jeff Meyer July 17, 2013 Digital Camera World website

*What is depth of field? Understanding depth of field is one of the first big hurdles in photography. Knowing how your aperture, focal length and focusing work together to affect depth of field and control what appears sharp in your photos will give you incredible confidence as a photographer.*

*In this quick tutorial we answer some of the common questions people have about depth of field and show you a few tricks for knowing how to control it.*



Image by Sylvain Sonnet

## What is 'depth of field'?

A camera can only focus its lens at a single point, but there will be an area that stretches in front of and behind this focus point that still appears sharp.

This zone is known as the depth of field. It's not a fixed distance, it changes in size and can be described as either 'shallow' (where only a narrow zone appears sharp) or deep (where more of the picture appears sharp).

## Why do I need to know about it?

Because depth of field has an impact on both the aesthetic and technical quality of a picture. Sometimes you'll want to use an extensive depth of field in order to keep everything sharp.

A classic example is when you're photographing a landscape, where generally the most desirable outcome is to capture detail from the foreground to the horizon.

Other times, a shallow depth of field will be preferable. It enables you to blur background and foreground details, causing distractions to melt away and allowing you to direct viewers to the focal point in a picture.

## OK, so where do I find the depth of field control on my camera?

Many digital cameras come with a Depth of Field Preview button near the lens mount (see Page 3 on how to use this!), or enable you to assign the same function to one of the other buttons. However, this doesn't have any effect on the depth of field.

The image you normally see through the viewfinder or on the Live View screen is displayed at the lens's maximum, or widest, aperture; the aperture you dial in on the camera body will only be set when you take a picture.

However, pressing the Depth of Field Preview button allows you to view the scene at the working aperture, so that you can see what areas will appear sharp.

There's a range of ways to control the depth of field – the choice of aperture, focus distance and the type of camera. In a nutshell, wider apertures and closer focusing distances lead to a shallower depth of field.



f/2.8

## Remind me what you mean by 'wide' aperture...

Wide or large apertures correspond with the small f-stop numbers available on your camera. So an aperture of f/2.8 is wide, while an aperture of f/22 is small.

Again, focusing distance plays a part on the overall effect, with wide apertures offering considerably more depth of field when focused on a subject far away than they do when focused on a subject that's close to the lens.

However, changing the focusing distance is often the least convenient way to control depth of field – it's much easier to simply select an alternative aperture setting.

The only thing you need to be aware of is that shifting from a large aperture to a small one can lead to blurred photos.

### **I thought small apertures made more of a shot appear sharp?**

They can do, but the choice of aperture has to be balanced with the shutter speed and ISO in order to maintain a consistent exposure.

Larger apertures let in more light, so faster shutter speeds can be used to freeze movement. Switch to a smaller aperture, and the amount of light passing through the lens is reduced.

Consequently, the shutter speed has to become slower, increasing the risk of camera shake and subject movement. To get round this, you could increase the ISO (What is ISO? [Click here!](#)). This allows you to use smaller apertures to increase the depth of field and use faster shutter speeds.

### **OK, so how does the type of camera affect depth of field?**

It's the size of the imaging sensor inside the camera that makes the difference. The larger the sensor, the shallower the depth of field will be at a given aperture.

This is because you'll need to use a longer focal length or be physically closer to a subject in order to achieve the same image size as you get using a camera with a smaller sensor – and remember the effect that focusing closer has on depth of field.

This is why a full-frame camera produces a much shallower depth of field than an APS-C SLR or compact system camera (CSC) at equivalent focal lengths and apertures.

### **Is it true that longer lenses produce a shallower depth of field?**

The focal length of the lens does appear to have a significant impact on depth of field, with longer lenses producing much more blur. A 200mm lens focused at 12ft will have a wafer-thin depth of field compared to a 20mm lens focused at 12ft.

However, if the subject occupies the same proportion of the frame, the depth of field (the area that appears sharp) is essentially the same whether you're shooting with a wide-angle lens or a telephoto!

You would, of course, have to move closer with a wide lens or further away with a telephoto lens to maintain the same subject size.

The reason longer lenses appear to produce a shallower depth of field is thanks to their narrow angle of view: compared to a wide lens, a telephoto will fill the frame with a much smaller area of background, so any blur appears magnified too. Use this characteristic to add a professional sheen to your portraits.