

## Understanding Depth of Field for Beginners

A Post By: [Bruce Wunderlich](#)



# A GUIDE TO *DEPTH OF FIELD* FOR BEGINNERS

You may have heard the term depth of field (DoF), but if you are new to photography you may not yet be taking advantage of how DoF can enhance your photos.

**A basic definition of depth of field is:** the zone of acceptable sharpness within a photo that will appear in focus. In every picture there is a certain area of your image in front of, and behind the subject that will appear in focus.



This zone will vary from photo to photo. Some images may have very small zones of focus which is called shallow depth of field.

Here's a [series of images with very shallow depth of field](#).

Others may have a very large zone of focus which is called deep depth of field.

Here's a [collection of images with much deeper depths of field](#).

Three main factors that will affect how you control the depth of field of your images are: [aperture](#) (f-stop), distance from the subject to the camera, and focal length of the lens on your camera. Here are some explanations and answers to other common questions concerning depth of field.

### **How does aperture control depth of field?**

Aperture refers to the access given to light from the lens to the camera sensors. The [size of your aperture](#) (the diameter of the hole through which light enters the camera) controls the amount of light entering your lens. Using the aperture (f-stop) of your lens is the simplest way to control your depth of field as you set up your shot.

***Large aperture = Small f-number = Shallow (small) depth of field***

***Small aperture = Larger f-number = Deeper (larger) depth of field***

It may be easier to remember this simple concept: The lower your f-number, the smaller your depth of field. Likewise, the higher your f-number, the larger your depth of field. For example, using a setting of f/2.8 will produce a very shallow depth of field while f/11 will produce a deeper DoF.



### **How does distance control depth of field?**

The closer your subject is to the camera, the shallower your depth of field becomes. Therefore, moving further away from your subject will deepen your depth of field.

### **How does the focal length of a lens control depth of field?**

Focal Length refers to the capability of a lens to magnify the image of a distant subject. This can get complicated, but the simple answer is that the longer you set your focal length the shallower the depth of field. Example: Your subject is 10 meters (33 feet) away, using a focal length of 50mm at f/4; your depth of field range would be from 7.5 -14.7 meters (24.6-48 feet) for a total DOF of 7.2 meters (23.6 feet). If you zoom into 100mm from the same spot, the depth of field changes to 9.2-10.9m (30.1-35.8') for a total of 1.7m (5.7') of depth of field. But if you move to 20m (66') away from your subject using the 100mm lens, your depth of field is almost the same as it would be at 10 meters using a 50mm lens.



This image of a swan hiding in the tall foliage was captured from about 5m (16') with a 300mm focal length lens. This combination of focal length and distance created a depth of field of approximately 5cm (2").

### **What if I just have a point and shoot camera, or don't know how to change those settings?**

Even with a point and shoot camera, there are ways to control your depth of field. In the Scene Modes menu, look for a symbol of a human head, which is the setting for portraits. This will give you a narrow depth of field. In the same menu there is also a mountain symbol, which is a setting for landscapes, which will give you a deeper depth of field.

If you are a beginner with a DSLR there are some simple ways you can control depth of field and still use automatic shooting mode. By choosing [Aperture Priority mode](#) you can set your aperture to get the depth of field that you want, and the camera will automatically set the shutter speed.

### **Can I set the depth of field exactly for each situation?**

Yes, but because changing your aperture affects your shutter speed, the result may not meet the needs of your image. For instance, if you are trying to increase your depth of field by reducing aperture size you will also need to increase (slow down) your shutter speed which could make your image blurry. Understanding [how all these settings work together](#) can increase your control over depth of field.

### **Is depth of field equally distributed in front and back of my focus point?**

No, it's usually about one third in front and two thirds behind your focal point, but as your focal length increases it becomes more equal.

### **How will understanding depth of field improve my images?**

Managing depth of field is one of the most important tools at your disposal, because having tack sharp images is one of the most important factors to getting that great shot. Knowing how to make the parts of your image you want sharp and the parts you want to be out of focus, is a great artistic tool to create great images.



Getting the right depth of field for your shot can make all the difference.

### **When should I use a shallow depth of field?**

Using a shallow depth of field is a good way to make your subject stand out from its background and is great for portrait photography. Shallow DoF can also be useful in [wildlife photography](#), where you want the subject to stand out from its surroundings. This is also useful because many wildlife photo opportunities are low light situations, and increasing your aperture size will give you more light. Shallow depth of field is also effective for [sports photography](#) where many times you want to separate the athlete from the background to bring attention to them. The result of this should also help give you a fast enough shutter speed to freeze the action.



This image captured at 300mm focal length and f/5.6 produced a very shallow depth of field. Because of this, it is important to set your focal point on the subject's eye. Notice how the bird pops out from the background.

**When should I use deeper depth of field?**

In [landscape photography](#) it is important to get as much of your scene in focus as possible. By using a wide angle lens and a small aperture you will be able maximize your depth of field to get your scene in focus.



This landscape was captured with a 50mm focal length at f/16. The focus point was set at 8 meters, which made everything from 4 meters to infinity in focus.

### **How can you determine depth of field?**

There are several on-line sites that will provide depth of field charts for your camera and lenses. Also, there are a number of apps available for smart phone users that can calculate it for you while you're in the field. Most cameras have a DoF preview button which will give you a preview as you look through the eye piece. (This is probably the easiest and most under-utilized method.) Using this button may cause your image to appear darker as you view it through the eye piece, but not to worry. Your image will be properly exposed as long as you have the correct exposure settings.

### **Can depth of field be adjusted to get everything in focus?**

Yes, using what is called [the hyperfocal distance](#). When you are focused at the hyperfocal distance, your depth of field will extend from half the distance to your focal point to infinity. Use a DOF calculator to [find your hyperfocal distance](#). If you don't have a DoF calculator, a good rule of thumb is to focus a third of the way into the scene. Using an aperture of about f/11 or higher with a wide angle lens will maximize your depth of field.

### **What about depth of field in macro photography?**

Because most [macro images](#) are produced in low light and with a longer focal length, the depth of field is often very shallow. Adjust your lens to the smallest aperture that the light will allow. It may also be

necessary to increase your ISO to allow you to properly expose the image and to maximize your depth of field. Still, in many macro images your DoF may be very minute. With this very narrow focus it becomes necessary to use a tripod, because even the slightest movement of the camera will move your macro subject outside your depth of field.



This 120 mm macro even at f/8 still has a very shallow depth of field.

### **What is bokeh?**

[Bokeh \(boh-ke\)](#) comes from the Japanese word meaning blur. This effect is produced by the out-of-focus areas in your image that are beyond the depth of field. Bokeh commonly refers to the pleasing circle shapes caused by the shape of the lens aperture. Usually created when shooting with your aperture wide open, such as f/2.8, bokeh can also be created with smaller apertures if the background is distant enough.

[Learn more about how to get beautiful bokeh in your images here.](#)



Bokeh in this image was created by the distance of the subject to the background, which fell well beyond the depth of field.

### **To summarize controlling depth of field:**

#### **Increase depth of field**

- Narrow your aperture (larger f-number)
- Move farther from the subject
- Shorten focal length

#### **Decrease depth of field**

- Widen your aperture (smaller f-number)
- Move closer to the subject
- Lengthen your focal length

Take control of your depth of field. Understanding how these adjustments control your it will greatly improve your photography. What questions do you have about depth of field? Please share your photos and comments.

### **Recommended Reading for Beginner to Intermediate Photographers**

If you enjoyed reading this tutorial we've put together a series of comprehensive advice for photographers:

- [Ultimate Guide to Photography for Beginners](#)
- [Ultimate Guide to Landscape Photography](#)
- [Ultimate Guide to Taking Portraits and Photographing People](#)
- [Ultimate Guide to Nature and Outdoor Photography](#)
- [Ultimate Guide to Street Photography](#)
- [Ultimate Guide to Getting Started in Lightroom for Beginners](#)
- [Ultimate Guide to Fine Art Photography](#)
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**Bruce Wunderlich** is a photographer from Marietta, Ohio. He became interested in photography as a teenager in the 1970s, and has been a passionate student of the art ever since. Bruce recently won Photographer's Choice award at the 2014 Shoot the Hills Photography Competition in the Hocking Hills near Logan, Ohio. He has also instructed local classes in basic digital photography. Check out Bruce's photos at [Flickr](#)