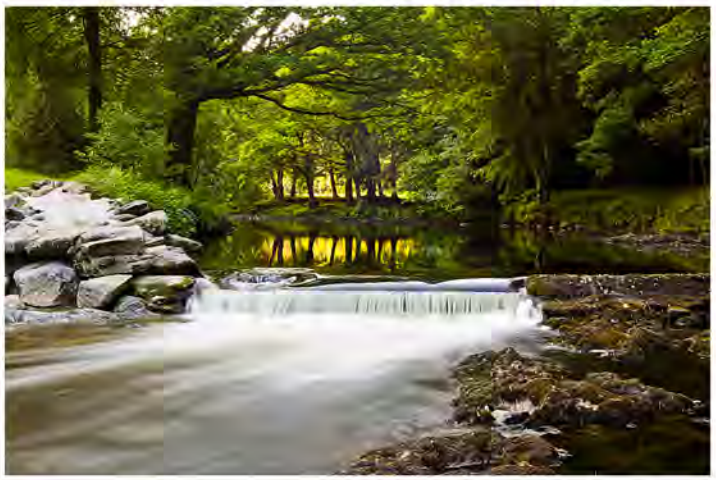
CHUDLEIGH CAMERA CLUB

Basic Skills 3 Focus Sheet.

Giving your images depth (an introduction to depth of field)

What is Depth of Field (DOF)



The way a subject is reproduced in a photograph can be very different from how it looked to you as you took the picture. When you cast your eye over a scene, everything in it seems more or less equally sharp, but sometimes in the finished shot only part of the subject appears acceptably sharp.

This zone of sharpness is called the depth-of-field, and it extends in front of and behind the point that you actually focused on. The size of the zone is determined by three key factors - the aperture of the lens, the focal length of the lens used, and the distance you are from the subject. Varying these three elements allows you almost complete control over the depth-of-field in a picture.

When most of the picture is sharp, we say there's lots of depth-of-field. When only part is sharp, we say depth-of-field is limited. As we'll see later, whether you go for extensive or limited depth-of-field depends upon the subject matter and how you want to depict it.

Three main factors that can be used to control depth-of-field

1 The aperture.

There's a simple, direct relationship between aperture and depth-of-field - the smaller the aperture, the more extensive the depth-of-field. So if you want to keep as much as possible sharp, you should set as small an aperture as possible - preferably f/16, or even f/22 if your lens offers it. Depending on lighting conditions and your ISO, you may need to use a tripod or some other form of support at such small apertures, as the resulting long shutter speeds create a risk of camera-shake. If, however, you want to concentrate attention on just one part of the scene, and throw the rest out-of-focus, you should select a large aperture. Exactly how large this can be depends on the maximum aperture of the lens you're using. On a 50mm standard lens it will be f/1.7, f/1.8 or f/2, but on a standard zoom it will typically be f/3.5 or f/4.5. For general picture-taking, when you want most of the picture to be in focus, you might want to set a middling aperture of around f/8 to f/11. This is what a program exposure mode sets when left to its own devices Whenever possible you should take control of aperture selection and use either an aperture-priority or manual mode.

2 The focal length of the lens.

Attach a wide-angle lens and you'll benefit from extensive depth-of-field, which makes it easy to keep everything in focus. The wider the angle-of-view, the greater the depth-of-field. Choose a telephoto lens and the depth-of-field is immediately more limited. The longer the focal length, the more restricted the zone of sharpness is.

3 The Camera-to-Subject Distance

For various technical reasons, the closer you get to the subject the more limited the depth becomes. In fact, when shooting close-up subjects it can extend to just a few millimeters in front of and behind the subject.

So that's the theory, but what does it all mean in practical picture-taking terms?

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Four common techniques using depth-of-field

Use these four common approaches when planning a shot to ensure depth-of-field works for you

1 Everything sharp.

With subjects such as landscapes, groups, interiors and travel you'll usually want to keep everything sharp. Using a wide-angle lens set to a small aperture will give you extensive depth-of-field, perhaps from around one meter through to infinity. But there will be times when foreground interest is closer than that. Here you need to resort to a neat little technique called hyperfocal focusing that allows you to increase the depth-of-field.

As a rule-of-thumb, there's twice more depth-of-field behind the subject than in front of it. So if you photograph a distant subject such as a landscape and focus on infinity you waste lots of depth-of-field. By focusing a little closer, you'll extend the depth-of-field at the front so it comes nearer to the camera, while still making sure that infinity falls within the depth-of-field behind the actual point of focus.

2 Main subject sharp with background completely out-of-focus.

There are some subjects where you want the main subject to stand out strongly from an out-of-focus background. Portraiture, where the emphasis is on the person, rather than the location, is probably the most popular area. What you need here is a use a telephoto lens at its widest aperture. It's also worth moving the subject as far away as possible from the background - in cramped studio situations this is often impossible but outside against a wall or foliage it's usually easier. Take care, though, that you focus accurately, as the limited depth-of-field will be unforgiving of any focusing errors. For portraits focus on the eye for the best results.

3 Main subject sharp, with background out-of-focus but still recognisable.

Sometimes throwing the background completely out-of-focus is going too far. You want to show the subject in its natural environment, but with the background toned down to it doesn't compete for attention. A person on the beach, for instance, an animal in the zoo, or a flower in a garden. Here a standard to short telephoto lens, somewhere from 50mm to 135mm, is ideal - especially if it's coupled with a middle range aperture of around f/8.

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4 Zone of sharpness deliberately limited.

Occasionally you may want to limit the depth-of-field to a very specific zone. Maybe in a portrait you want just the eyes in focus, and not even the ears or the tip of the nose. Here, a depth-of-field scale on the lens helps, or, failing that a depth-of-field preview facility on the camera, This will give a visual indication of what will and won't be in focus by manually stopping down the lens.

Depth of field and point of focus a working Example.

Using a shallow depth of field is common in portraiture when you want to make the background soft and fuzzy, but you can use it in other ways too, particularly if you're shooting in close.

Think of your shallow depth of field as a band of sharpness you can move in and out of your picture by adjusting your point of focus. In other words - where you choose to focus. In this first image a wide f/3 aperture was used and the point of focus was on the Strawberries. As you can see, the strawberries are sharp and everything beyond them is soft.

And in the second one the point of focus was swapped from the strawberries to the 'Naked Jam' label on the jar.

By shifting the point of focus this band of sharpness a bit further into the picture and made you notice the label first, the aperture has not changed it is only the point of focus that has changed.

As practice I suggest you set up a shot where you're in close looking along a line of something. Go raid the cupboard and find some jars of your own maybe. Line up your shot and play around with the point of focus.

OK – so now let's take a look at increasing your depth of field. To do this you have to select a small aperture. That's a high 'f' number like f/16 or more. (Don't forget that as you make your aperture smaller you're cutting down the amount of light getting to your camera's sensor so using your light meter you must slow down your shutter speed to compensate and get the correct exposure.)

With a suitably small aperture (in this case f/16) depth of field expands on either side of where you focus. In the image over the page the point of focus was just a tiny bit behind the strawberries.

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When you look back at all three 'Naked Jam' images you can see what a difference you can make by changing aperture and point of focus. Depth of Field truly is a wonderfully creative thing!

So when you want to emphasise the subject by putting them against a blurry background you use a wide aperture (low 'f' number) as you would to isolate the subject in an outdoor portrait, and when you want to increase depth of field maybe for a landscape you use a small aperture (high 'f' number).

Summary

Overall, the practical use of depth-of-field can be summed up as follows:
To maximise depth-of-field and have as much sharp as possible use a wide-angle lens, set a small aperture and stand back from your subject, to minimise depth-of-field with only a small zone of the scene sharp use a telephoto lens, set a large aperture, and get closer to your subject.

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