Week 06

USING DEPTH OF FIELD

Deciding which areas of the frame should be sharp and which should be out of focus is key to taking a good photo. This zone of sharpness is called depth of field, and it depends on three things: the aperture, the distance between the subject and the camera, and the focal length of the lens.

In this module, you will:

- **see how different apertures** affect depth of field;
- **examine the theory of depth of field** and the three factors that influence it;
- **try it yourself** by following special depth-of-field photoshoots;
- **explore how to use** depth of field creatively;
- **review your images** to see what worked, what didn't, and why;
- **improve your photographs** using digital software to alter the depth of field;
- **review what you've learned,** and see if you're ready to move on.

Let's begin...

TEST YOUR KNOWLEDGE

What is depth of field?

Using depth of field lets you highlight important elements while downplaying distractions. Use the descriptions here to decide which of these images best displays shallow, medium, or deep depth of field. Some of them could apply to more than one image. Try to choose the closest match.

A Deep: Everything in the image is sharp from front to back.

B Medium: Objects in the foreground are in focus. Background details are blurry, but still identifiable.

C Shallow: A small part of the subject is in focus, the rest blurry.

D Deep: Helps reinforce a repeating pattern in an image.

E Medium: Background details are recognizable, giving context.

F Shallow: Subject focused, background unidentifiable.

G Deep: Detail can still be seen in objects farthest from the camera.

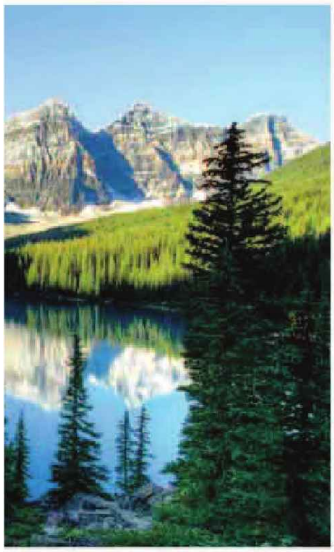
H Medium: Highlights foreground activity by slightly blurring elements in the background.

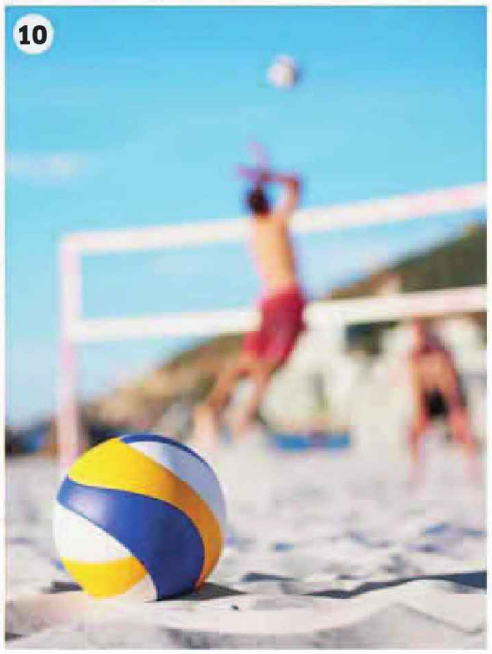
I Shallow: Viewer's eye is drawn to a small part of the frame.

J Deep: All elements are sharp, giving everything almost equal relevance.

ANSWERS

A/ 1: Farm in snowy landscape
B/ 8: Pies on a table
C/ 5: Set of colored pencils
D/ 9: Seats in a sports stadium
E/ 10: Beach volleyball game
F/ 2: Blowing seeds from a dandelion
G/ 7: Line of people
H/ 6: Scientist handling a test tube
I/ 4: Close-up of a leaf
J/ 3: Banff National Park, Canada





NEED TO KNOW

- Depth of field can be used to give objects context, blur distracting backgrounds, isolate details, and direct the viewer's eye around the frame.
- Shallow depth of field can transform a messy background into a wash of color, letting the main subject take center stage.
- When the background is out of focus but still recognizable in a medium depth-of-field image, it tells the viewer that the secondary elements are still relevant.
- Deep depth of field can emphasize patterns, encouraging the eye to recognize repeating shapes as it travels from the front to the back of the frame.
- When the picture is entirely sharp, everything has significance, from patches of grass in the foreground to snowy mountain peaks in the distance.

Review these points and see how they relate to the photos shown here

UNDERSTAND THE THEORY

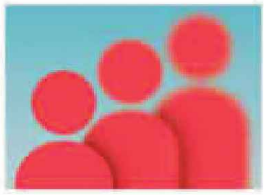
Depth of field

Depth of field refers to the area of acceptable sharpness within an image. In reality, only the element you have chosen to focus on—and anything else located on the same plane—will be perfectly sharp, but a certain area in front of and behind your subject will also appear sharp. This zone of sharpness depends on three factors: the aperture of the lens, the distance between the camera and the subject, and the focal length of the lens. Furthermore, where this zone of sharpness begins and ends depends on where you focus the lens.

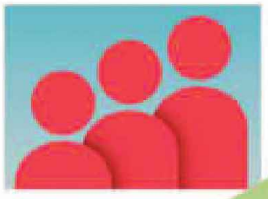
APERTURE

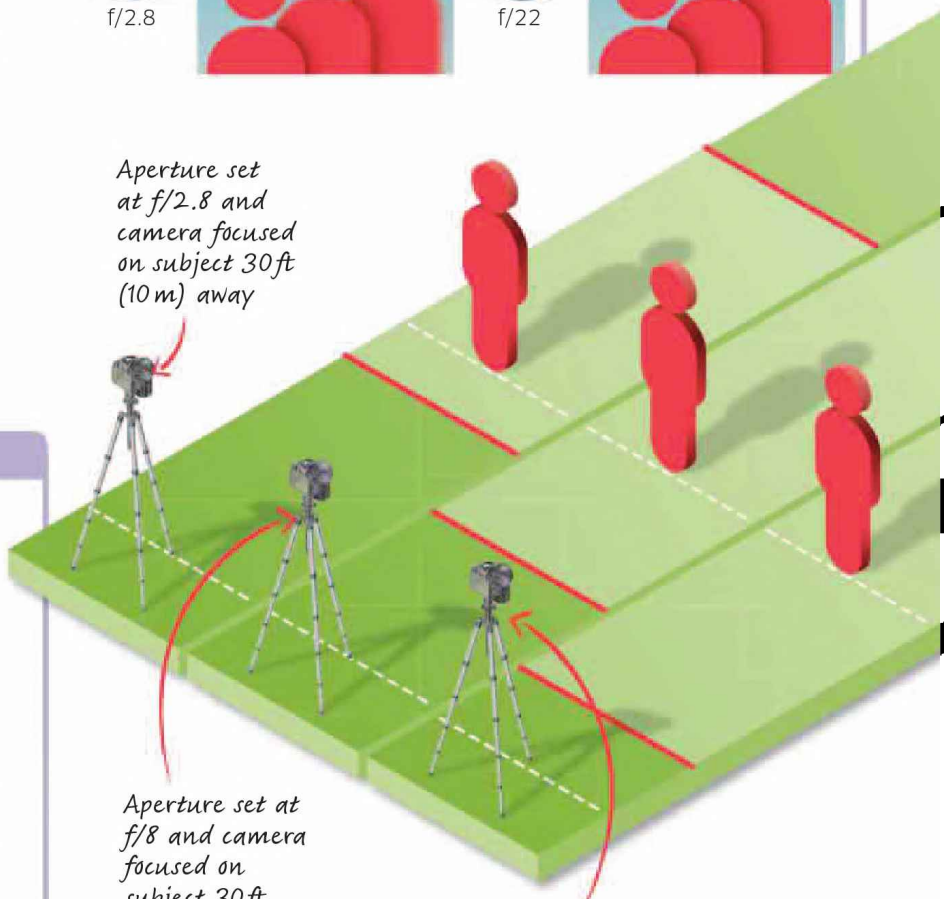
The size of the aperture of a lens is indicated by a measurement called an f-number—the smaller the number, the larger the opening. A large aperture (indicated by a small f-number, such as f/2.8) will result in shallow depth of field, while a small aperture (indicated by a large f-number, such as f/22) will result in deep depth of field.

f/2.8



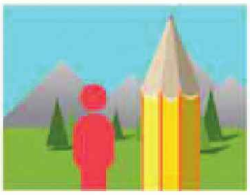
f/22



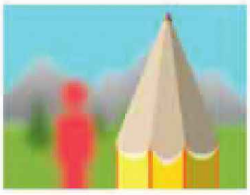


SUBJECT DISTANCE

The closer your lens is to your subject, the less depth of field you will obtain in your image, and vice versa.

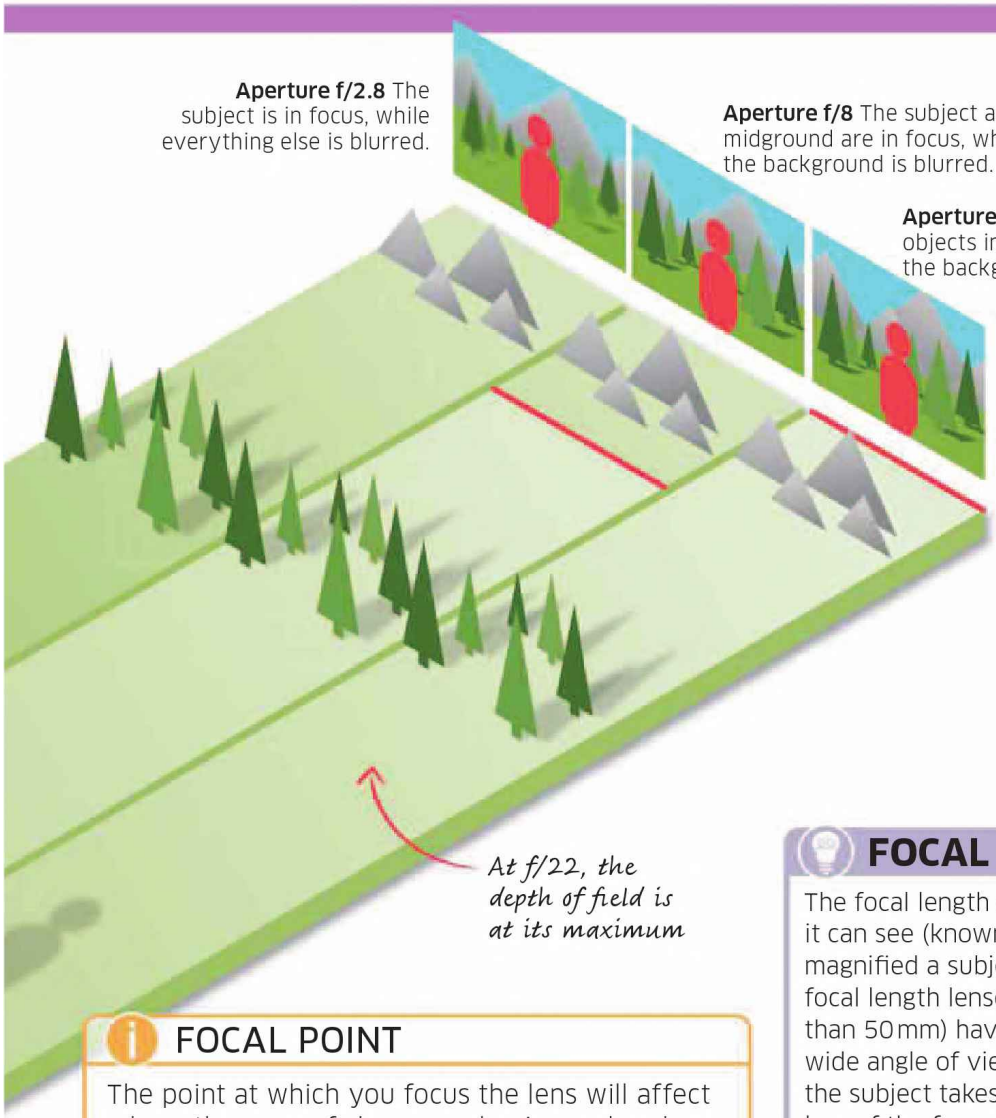


Try holding a pencil at arm's length: notice how much of the area around the pencil is acceptably sharp.



Move the pencil toward your face and observe how the background becomes more blurred the nearer it gets to your eyes.

> There is nothing worse than a **sharp image** of a **fuzzy concept.**
>
> ANSEL ADAMS

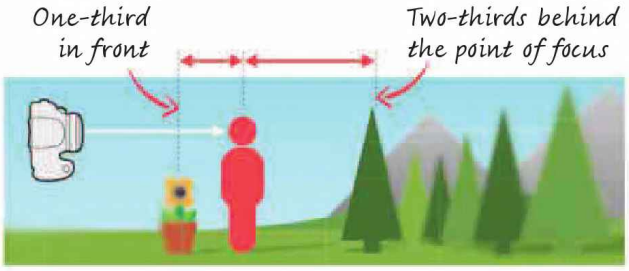


AT A GLANCE

To increase depth of field (or the impression of it), use a small aperture, step back from the subject, or use a lens with a short focal length. Conversely, to decrease depth of field, select a large aperture, step closer to the subject, or use a lens with a long focal length.

FOCAL POINT

The point at which you focus the lens will affect where the zone of sharpness begins and ends. Depth of field extends from about one-third in front of the point of focus to two-thirds behind it.



FOCAL LENGTH

The focal length of the lens determines how much it can see (known as its angle of view), and how magnified a subject appears in the frame. Shorter focal length lenses (less than 50mm) have a wide angle of view, so the subject takes up less of the frame than it would if it were shot at the same distance with a telephoto lens. Just as the subject appears magnified with a telephoto lens, so does any blur. As a result, short focal length lenses appear to offer greater depth of field than long focal lengths.

Subject takes up less of the frame using a short focal length.

Subject appears magnified using a long focal length.

Using shallow depth of field

Keeping a small area of the frame sharp is a great way of directing the viewer's attention to major points of interest. The technique is often used by portrait photographers, who tend to focus on a subject's eyes, allowing messy details to be disguised by blur.

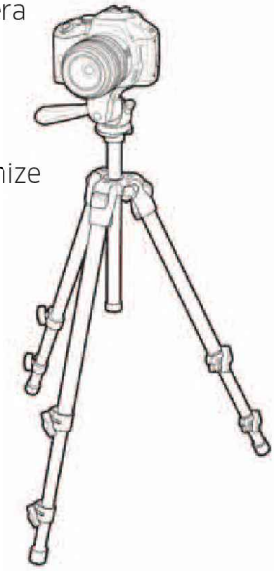
1 Attach a standard or telephoto lens

For ideal portraiture shooting, attach a lens with a focal length between 50 mm and 105 mm. Shallow depth of field can be achieved with almost any lens, but telephoto lenses give the most dramatic results.

Telephoto lenses have a long focal length and a narrow angle of view.

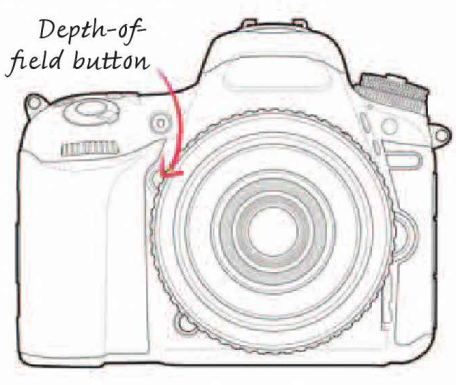
2 Mount the camera on a tripod

Mount the camera on a tripod and then use a remote release to trigger the shutter to minimize any movement.



6 Use the depth-of-field preview button

Many dSLRs come with a depth-of-field preview button that allows you to see exactly what will appear in focus. Alternatively, you can use a depth-of-field calculation app.



7 Decide on your point of focus

Spend a few moments considering where you would like the viewer's eye to travel to first. With that in mind, select an autofocus point or switch to Manual focus and train the lens on your chosen area.

8 Shoot and review the results

Take a few shots, play them back, and zoom in to see where the zone of acceptable sharpness begins and ends. If it's not where you hoped it would be, change the settings and try again.

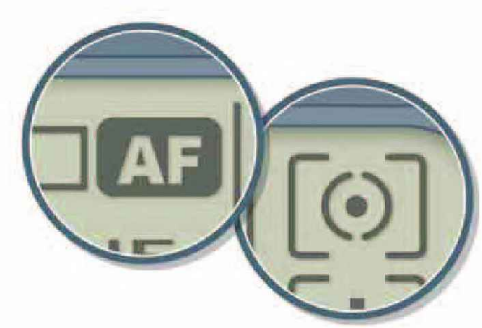
Focusing on your subject's eyes helps the viewer relate to the subject

Where to start: Find a willing model and gather together all the necessary equipment, including a telephoto lens, a tripod, and a remote shutter release. You might also consider downloading a depth-of-field calculation app.

You will learn: How to keep a small part of the image sharp while allowing the background to become out of focus and blurred.

3 Adjust metering, autofocus, and drive modes

Decide on the type of metering you want to use (see pp.78–79) based on your subject. Set your camera to continuous shooting mode.



4 Use the lowest ISO setting

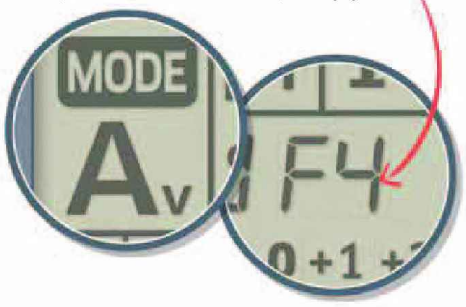
Select a low ISO speed (such as ISO 100) and decide how much of the subject you would like to appear in focus.

A low ISO speed will produce pictures full of detail and color

5 Select Aperture Priority mode

Switch to Aperture Priority and choose a large aperture (such as f/4) to keep shutter speed fast and enable you to freeze any movements made by your subject.

Setting a large aperture will produce a small depth of field



Shooting an engaging portrait requires skill, sensitivity, and confidence.

WHAT HAVE YOU LEARNED?

- Creating a shallow depth of field is as much a technical exercise as a creative one.
- To get the best effect, you need to use a lens with a focal length of 50mm or more, a large aperture, and continuous firing to catch any changes in your subject's expressions.
- Using Aperture Priority mode allows you to set the size of the aperture, giving you the greatest control over the depth of field.

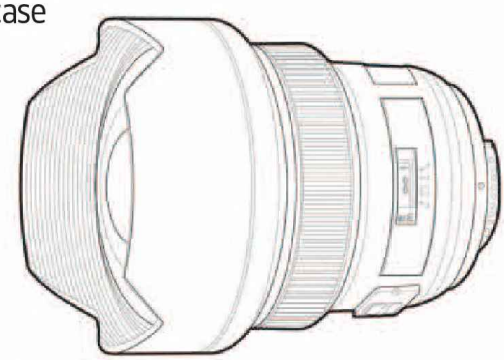
LEARN THE SKILLS

Using deep depth of field

When everything in the frame is in focus, the viewer knows that all of the elements are important. The deep depth-of-field technique is used by landscape photographers who deploy lead-in lines such as fences or rivers—or, in the case below, rows of flowers—to direct the viewer's gaze around the frame.

1 Attach a standard or wide-angle lens

Deep depth of field can be achieved with almost any lens, but for the most effective shots, attach a wide-angle lens. These lenses have a short focal length and a wide angle of view.



Wide-angle lenses give the impression of increased depth of field.

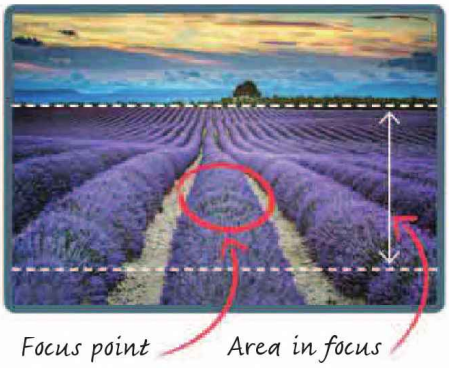
2 Mount the camera on a tripod

When you use small apertures, you often need to use a slow shutter speed. If you try to handhold the camera during a long exposure, the risk of camera shake is significant. To avoid this, mount the camera on a tripod and use a remote shutter release.

You can also use your camera's self-timer

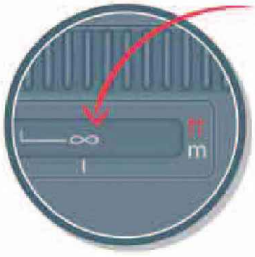
6 Decide on your point of focus

Chose a specific area of the scene to focus on. As a rough guide, depth of field extends from one-third in front of the point of focus to two-thirds behind it.



7 Find the hyperfocal distance

To achieve front-to-back sharpness, you need to find the hyperfocal distance. Focus your lens on infinity and train the lens on the horizon. Press the depth-of-field preview button to find the nearest part of the scene that's sharp (the hyperfocal point) and refocus here.



Use the infinity symbol on the lens barrel to find the hyperfocal distance

8 Shoot and review the results

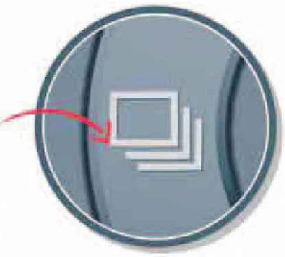
Take a few shots, play them back, and zoom in to see where the zone of acceptable sharpness begins and ends. If it's not where you hoped it would be, change the settings and try again.

Where to start: Choose a landscape where everything from the foreground to the background has some relevance and needs to be in focus. Look for lead-in lines that will draw the viewer's eye into and around the picture.

You will learn: How to shoot a landscape with the aim of keeping everything in the frame in focus. You will do this by using a small aperture and by carefully calculating the hyperfocal distance.

3 Adjust metering, autofocus, and drive modes

As always, what type of metering you want to use (see pp.78–79) will depend on the subject. Decide on whether to take a single shot or to keep the shutter firing depending on whether or not your subject is moving and, if so, how quickly.



Continuous shooting mode lets you take multiple images

4 Choose the correct ISO setting

When you're using small apertures, the light reaching the sensor is reduced, forcing the use of slow shutter speeds. If your subject is moving, you may want to consider raising the ISO.

Increase the ISO to keep a fast shutter speed

5 Select Aperture Priority mode

Switch to Aperture Priority and choose a small aperture. Some lenses are less effective at their minimum and maximum apertures, so select an f-stop (see p.76) a few steps away from the extremes.

Aperture Priority

WHAT HAVE YOU LEARNED?

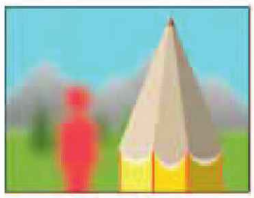
- In order to achieve deep depth of field, you need to use a standard or wide-angle lens and mount the camera on a tripod to avoid camera shake.
- Using small apertures will result in slow shutter speeds, so if your subject is moving you may need to boost the ISO speed—try not to go beyond ISO 800, though, or the image quality will suffer.

Be sure to always save your best images

PRACTICE AND EXPERIMENT

Exploring depth of field

There are no rules insisting that landscapes must be sharp from front to back, or portraits shot with shallow depth of field, so experiment with different aperture sizes and varying distances between you and your subject until you get the effect you desire.



MOVING IN CLOSE

EASY
45 MINUTES
BASIC + tripod
INDOORS OR OUTDOORS
SMALL AND MEDIUM-SIZED OBJECTS

If you focus on a subject 30ft (10m) away, the zone of sharpness will be greater than if you train your lens on a subject just 3ft (1m) away.

- **Set** the aperture to f/11 and take a shot of an object 30ft (10m) away.
- **Use** the same focal length and aperture to take a photograph of an object 3ft (1m) away. Note how depth of field grows as the distance between camera and subject increases.
- **Find** a small object, and move in close to take a picture. Depth of field is extremely shallow when you are close to your subject.

ISOLATING A SUBJECT

EASY
45 MINUTES
BASIC + tripod
INDOORS OR OUTDOORS
A CLEAR SUBJECT AND BACKGROUND

Shoot an object using a large aperture (such as f/4) and a small aperture (such as f/16) without changing your position.

- **Note** how the foreground and background fall out of focus, and the subject becomes more isolated, as the aperture gets wider.
- **Observe** the effect that changing the aperture has on depth of field, and play around with the idea.
- **Shoot** a row of objects, such as a collection of bottles, trying to keep one, two, or three of the items in focus simply by changing the aperture.

Using a large aperture has isolated the subject against a blurry background

Pro tip: When light is forced through a small aperture, it bends slightly, resulting in softer images. This is known as diffraction. To ease the problem, use an aperture two stops down from the smallest setting when trying to obtain deep depth of field.

CHANGE THE FOCUS

EASY
45 MINUTES
BASIC + tripod
INDOORS OR OUTDOORS
A BUSY SCENE WITH SEVERAL FOCAL POINTS

As we have seen, the viewer's eye is attracted to the sharpest part of the picture first, so you need to choose your point of focus carefully.

- **Decide** which area you would like to prioritize.
- **Select** an autofocus point that covers this area. If none do, place your subject in the middle of the frame, press the shutter-release button halfway to lock focus, and recompose the picture. Alternatively, switch the lens to Manual focus and rotate the focusing ring until your chosen point appears sharp.
- **Use** the depth-of-field preview button to check how much of the scene will appear in focus before taking a shot.

The point of focus is the second Buddha in the row

STANDING OUT

MEDIUM
1 HOUR
BASIC + tripod
INDOORS OR OUTDOORS
SUBJECT IN RELEVANT BACKGROUND

Sometimes, subjects are so dependent on their environment that it's best to keep the background recognizable, but not completely sharp.

- **Switch** the camera to Aperture Priority, and select an f-number that's roughly halfway between the settings available for the lens you're using.
- **Use** the depth-of-field preview button to check how much of the scene will appear in focus before taking a shot.
- **Switch** to a smaller aperture and try again if the background is not sharp enough.

Keeping the background recognizable helps us to place these penguins in the Antarctic

WHAT HAVE YOU LEARNED?

- Large aperture equals shallow depth of field.
- Small aperture equals deep depth of field.
- The closer the subject is to the lens, the less depth of field there is.
- By choosing a mid-range aperture, you can keep the main subject in focus while still keeping the background identifiable.

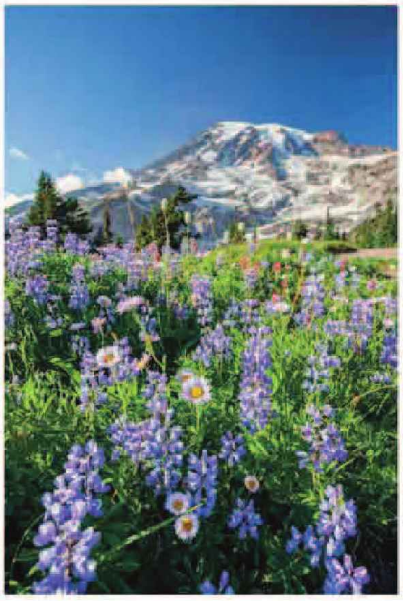
ASSESS YOUR RESULTS

Reviewing your shots

Having experimented with different apertures, lenses, and focal points, choose your favorite photographs and run through the checklist below. Reviewing your work is an important part of the learning process, so spend some time analyzing what worked and what didn't.

Does any blur look intentional?
When you add blur for artistic effect, it needs to look intentional. None of the trees in this orchard are completely sharp, but the blurriness gives a sense of depth to the picture.

How is the viewer's eye directed?
Does the viewer see all of the elements in the order you intended? These flowers at the foot of Mount Rainier are pin-sharp, which attracts our eye first, but our attention is then drawn to the peak at the back.

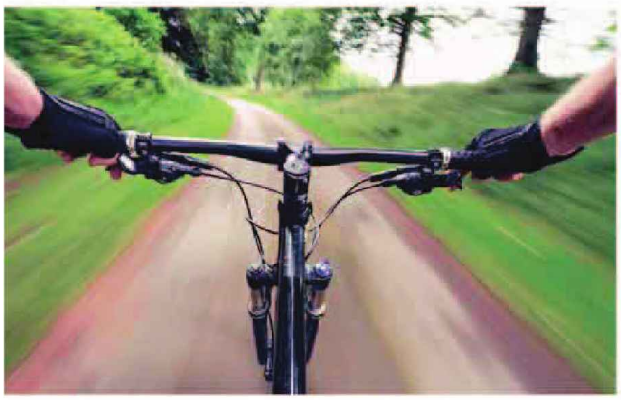


Is the aperture appropriate?
Have you selected an aperture that draws attention to the main subject? In this image, the globe holds our gaze without our becoming distracted by the girl's green jumper.

Is enough of the image in focus?
Is the background also part of the story? This image focuses on the food, but it also wants us to know that a chef has prepared the meal, so the figure has been made recognizable.

> Photography is about **acquiring** the skills to take advantage of **luck.**
>
> SANDRA C. DAVIS

Is the focal point appropriate?
When you want to achieve front-to-back sharpness, you need to choose your focal point carefully. To maximize depth of field, this image has focused one-third of the way into the frame.



Is the shutter speed appropriate?
When using small apertures, you're often forced to use slow shutter speeds, but if your subject is moving—such as the bike in this example—you might need to experiment until you get the right combination.

Have you checked the frame edges?
Scan the frame edges for unwanted elements before releasing the shutter. Cropping out the lower buds here would focus the viewer on the top flower.

Is the background distracting?
It's essential to pay attention to strong colors, even when they are out of focus. The green hedge in this image would have been very distracting it if it was in focus.

Adjusting depth of field

There will be occasions when the aperture you've selected isn't quite large enough to throw the background out of focus, but you can adjust depth of field during post-production. This picture of a boat on the Isle of Barra, Scotland, was taken using an aperture of f/22. As a result, much of the background is sharp and draws the eye to the back of the frame.

1 Protect your file

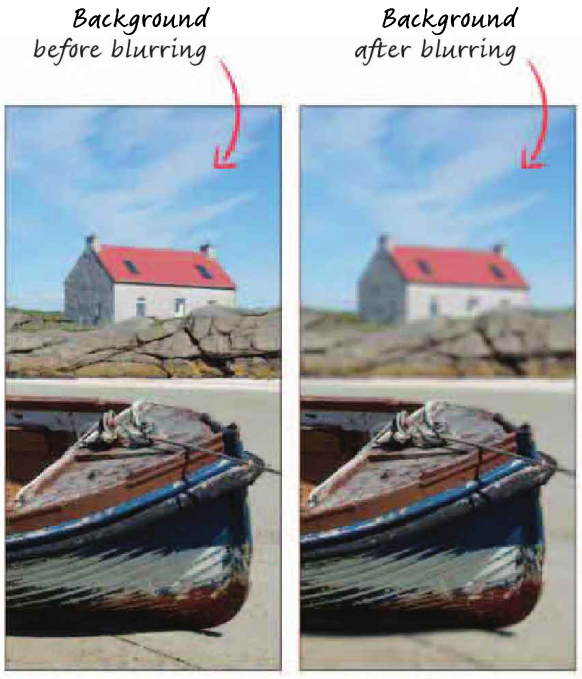
In order to protect your original file, duplicate the Background layer first. Select the Lasso tool and, without being too precise, draw around the area you want to keep sharp (in this case, the boat).

4 Alter depth of field

Click on Filter at the top of the screen, and then Blur, Lens Blur. A box will appear with a large preview of your image, and a series of sliders on the right. Under the Depth Map heading, make sure the Source is Alpha 1. Now check the box that says Invert.

5 Add finishing touches

Staying with the Lens Blur dialog box, under the Iris heading you will find a Radius slider. Move the slider left and right until you achieve the effect you desire. When you're done, click OK and save the file.



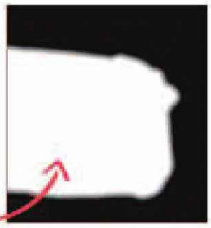
Pro tip: Save time by using keyboard shortcuts to access common digital tools and settings. For example, in Photoshop you can bring up the Lasso tool by pressing "L," or enter Quick Mask mode by pressing "Q."

2 Quick Mask

Click on the Quick Mask button and the area you want to appear out of focus should now be colored red.

3 Soften the edges

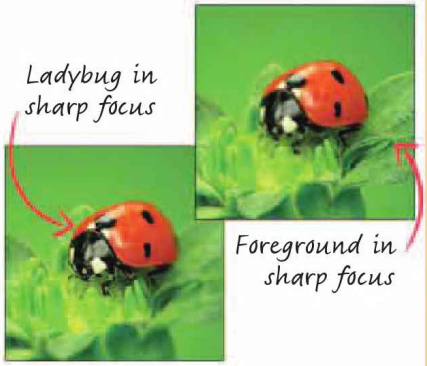
Click on Filter at the top of the screen, and then Blur, Gaussian Blur. A box will appear with a black-and-white graphic in a window. This graphic shows how steeply the edge of your selection will turn from sharp to out of focus. Move the slider left and right until you achieve the effect you desire. Click OK. Now exit the Quick Mask mode by clicking on the Standard Mode icon in the Tools palette.



The viewer is no longer distracted by the background.

FOCUS STACKING

To mimic a deep depth of field, it's important to note that no software can make an out-of-focus picture sharp—the information just isn't there to begin with. However, by shooting several frames at different focusing distances and combining the results, you can create a file with greater depth of field than any single aperture will allow.



This image of a ladybug displays maximum sharpness due to the combination of multiple frames.