Photzy

CREATING BEAUTIFUL BACKGROUND BLUR

Premium Photography Guide
Written by Karlo de Leon

CONTENTS

INTRODUCTION

I've noticed that creating background blur is among the first techniques that beginner photographers are looking to achieve. Just take a good look at the cover photo: a sharp subject of a sleeping puppy's snout and the background blurred out. Sometimes, like the photo on page 6, you'll also get balls of light included in the blur. You can do all this without the need for Photoshop to create the effect.

It's a cool technique many of us want to master. And it's a good technique to initially work on because it's supposed to be so easy to achieve. However, the plight of new photographers asking other photographers for advice is that we may get incomplete information about a technique; the internet isn't always as helpful either, even if there are already a ton of articles on how to achieve background blur.

I'm sure some of you may have read or heard that to be able to create this effect, you need a '*shallow depth of field*', and to do that, you need to have a '*large aperture*'.

Recommended Video: Important to our discussion of background blur is your familiarity with aperture and lenses. If you're not familiar with aperture, watch this free Understanding Aperture tutorial video, as I will only cover it briefly here.

Recommended Reading: For lenses, read this free quick guide, Understanding Lenses. For those of you wondering about depth of field, we will discuss that here.

I actually learned a bit of these photography concepts even before I seriously got into photography and started shooting, but like many new photographers, what I received was incomplete information.

When I finally bought my first camera, I was disappointed to know that my trusty kit lens couldn't create the effect I wanted. I dialed down my aperture to the largest it could go to create a shallow depth of field, but at f/3.5, which is my kit lens's aperture limit, the blur effect still wasn't enough. Sure there was a tiny bit of background blur, but not to the point where there were light balls in the background that make photos look dreamy. It wasn't even at a level of average satisfaction.

The solution I thought of was to buy a lens that could produce more blur – perhaps a 50mm f/1.8 lens since it's the cheapest lens that could produce a really large aperture. Sure, I could do that so I could create the effect I wanted, but I was also thinking, do I have to buy another lens or piece of equipment every time I find what I have lacking? Photography isn't exactly an inexpensive hobby. I'm pretty sure some of you can relate.

Key Lesson: Buying a new lens isn't necessarily a bad idea. In fact, this idea works because it does increase my chances of getting the effect I want. But as a clueless beginner, it was a bad proposition because I was deciding based on my lack of understanding of how things work.

If we pursue this road, though, we will end up blaming our gear as opposed to looking for ways to work with what we have, what we see, and how we can maximize the tools already available to us.

If you're already familiar with aperture and how it relates to background blur, here are three questions I'd like you to think about.

1. Is it possible to use an aperture size of f/2.8 and not have background blur?

2. Is it possible to use an aperture size of f/22 and still produce significant background blur?

3. Can a 200mm lens create a beautiful background blur effect at f/16?

Want to know the answers? Read on…

ABOUT THIS GUIDE

Although we will be discussing a specific technique today instead of the usual behavioral aspects of photography that I always love to discuss, I still would like to zero in on things that will affect the way we approach specific results in photography.

The things that will help us to be able to create beautiful blur are:

1. An understanding of the role of depth of field in creating background blur
2. A firm grasp of how to control depth of field by experiencing the different determinants of depth of field and how they work in combination with each other
3. Knowledge of the other factors that affect background blur
4. Being able to identify if our gear is suitable to create background blur

These are our key objectives.

In this guide, I will do my best to explain what it is that creates background blur so you may be able to create them effectively. Your job is to take your camera out and experiment on different settings to figure out what kind of background blur you can get with the type of camera and lenses you have.

We will zero in on the factors that affect background blur. Your understanding of these essential concepts will allow you to make sound decisions based on your camera's limitations, the limitations of your shooting situation, and your own limitations when it comes to resources. I won't be discussing calculations that could bore most of you. If you're looking for that kind of information, this is not where you will find it; although I will show you a tool later that you could use to explore measurements if you're interested. Since I started my photography career in travel photography, I never had time to look at the numbers so my training does not involve knowing exact measurements. Rather, I rely on my eyes and I compare what I see with what settings I use. I suggest that you do the same as you go through this guide. If you find that you like that approach, feel free to use it later on.

This guide will also have review questions and shooting exercises. I suggest you answer or perform them right away before moving to a new section because the guide is designed so that each section builds on the other. I also suggest that you use different lenses for the shooting exercises, whenever necessary, if you own more than one glass.

(!) **Very Important Note for Beginners:** To perform the shooting exercises effectively, I strongly suggest you do the activities under bright light conditions, preferably outdoors when the sun is up. This will ensure that you won't get unwanted movement blur caused by slow shutter speeds as this is prone to happen when shooting under low light conditions.

However, if you must shoot under low light conditions, set your camera on a tripod and choose stationary subjects, preferably inanimate objects and background elements to avoid blur caused by motion. Also, make sure the light isn't too dark that you couldn't recognize the background elements anymore.

Alright. Are you ready? Let's start.

BACKGROUND BLUR FUNDAMENTALS

WHY CREATE BACKGROUND BLUR?

Aesthetically, background blur is pleasing to the eyes. It's unique in a way because we don't normally experience such an effect in the real world. I mean, sure, in reality as I am looking at my computer screen, everything behind it blurs out; and when I am talking with a friend, everything behind him will be blurry. But I don't really get to see the blur in both situations unless I intentionally take notice of the background using peripheral vision.

In a way, because we don't experience it much in the real world, there's a sense of novelty when we see the effect in photographs. Don't we all love seeing a portrait of a person with the background blurred out? I'm pretty sure you'd like to have your own portrait with that kind of effect applied too.

Technically and compositionally, background blur helps in highlighting your subject and de-emphasizing things in the background that can be distracting to the eyes. Images with fewer distractions are compositionally effective.

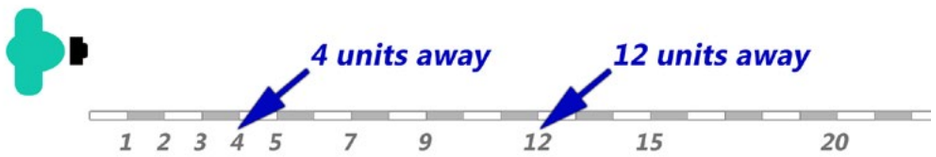
Before we discuss how to create background blur, let us first look at some fundamental concepts.

UNDERSTANDING OUT-OF-FOCUS BLUR

Let's imagine that we're living in an imaginary world where every area is either sharp or blurry. There are also different levels of blur and sharpness and this is determined by the distance of objects from your vision.

This imaginary world is easily observable from the top so we will use diagrams from a sky view perspective to illustrate this world.

Take a look at this first diagram. The blue-green icon on the left is you. The number markings are distance markers which means, like in the real world, the smaller the number, the closer the distance.

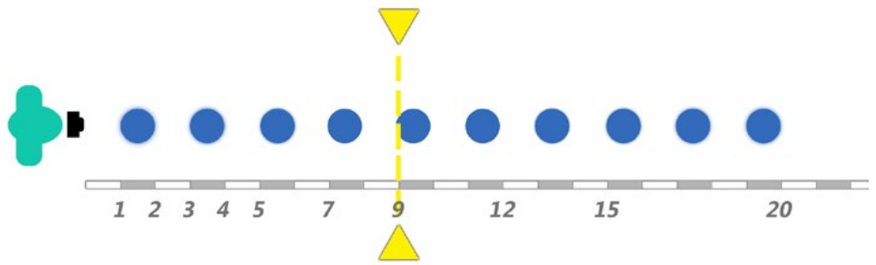


Important Note: If you look at the diagram, it's using the generic measurement '*units*' instead of a specific measurement like feet or meters. This is to avoid any confusion and also because it's irrelevant to our discussion.

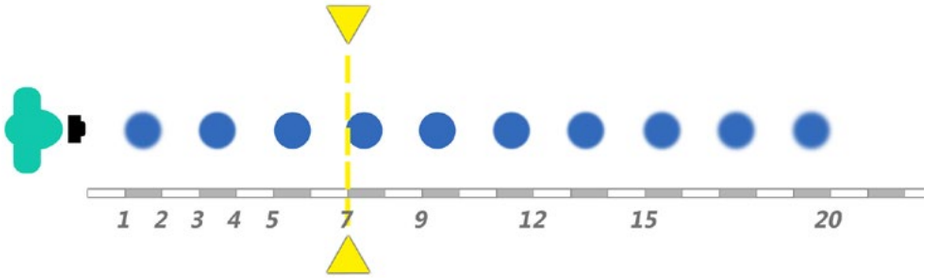
Now, in this world of yours, you can choose which would be the sharpest point measured by distance at a given time.

Let's imagine that you choose the sharpest point to be at 9 units away. When the sharpest point is chosen, the immediate surrounding area will be sharp while everything else in your vision will have a certain level of blurriness depending on the distance of that area from the sharpest point – front and behind. An object will blur out based on the blurriness or sharpness level of the area that it is in.

The diagram below will illustrate this. Unit 9 (where the yellow line and markers are) is your chosen sharpest point. The blue circles are objects placed at various distances. Observe the sharpness and blurriness of each object in relation to the sharpest distance.

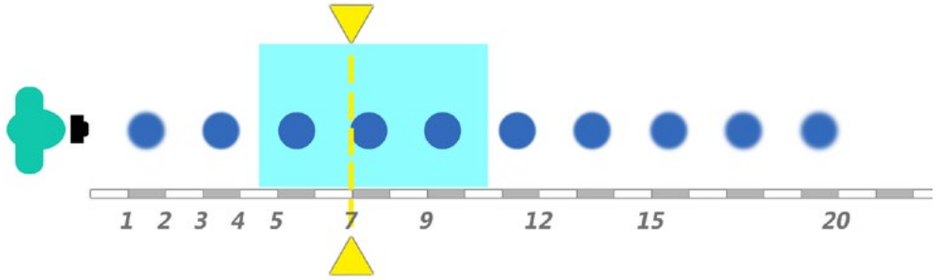


When you choose a different distance to be your sharpest area, the blurriness and sharpness of all other areas will again adjust relative to the distance of your selected area. The further an area is from the point of sharpness, the blurrier it gets. In this next diagram, we have moved to a new sharpest distance at unit 7. Again, observe the sharpness and blurriness of each object in relation to the new sharpest distance. Compare this with the previous diagram.

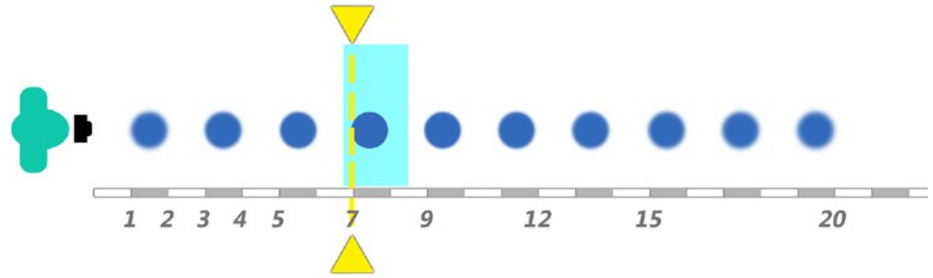


Now, within this blurry and sharp world that we've created is an area that is acceptably sharp. In our example, we've changed to a new distance and chose the sharpest point to be at unit 7. You will also see that the immediate surrounding area approximately between unit 4.5 and 9.5 is what's considered as acceptably sharp.

This diagram will illustrate this perception.



Aside from your ability to choose the sharpest point and area, you also have the ability to increase and decrease the coverage of sharpness. Let's decrease the coverage of acceptable sharpness in the next diagram.



As you can see, now the areas approximately within units 6.6 and 8.5 are acceptably sharp. Unit 7 is still your chosen sharpest point, but you've decreased the distance of acceptable sharpness to cover a narrower area. When you reduce or widen the sharp area, the blurriness and sharpness levels of the surrounding areas will also adjust relative to its distance to the area of acceptable sharpness.

Also, you will notice that the decrease or increase of coverage is not equal between what's in front and what's behind the sharpest point. The area of acceptable sharpness will always cover a wider span behind the focus point than before it. We will discuss this sometime later in the guide.

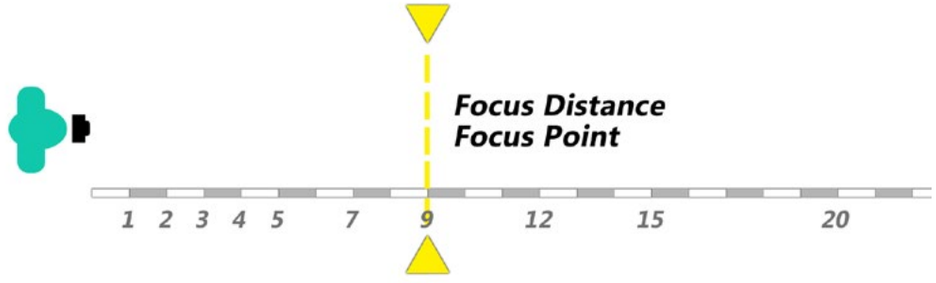
Now, let's use photography terms to understand this imaginary world better in terms of our craft.

Your ability to select the sharpest point based on distance is called ***focusing.***

Most of the time in photography, you would want to ensure that your subject is in focus. When you focus on a specific object in photography, you're selecting a specific point in your frame. This is called a ***focus point***. What you're actually doing, though, whenever you select a focus point is selecting a specific distance, and you're telling your camera, *'I want everything at this distance to be sharp.'* The term used for this is ***focus distance*** *or* ***focusing distance***.

When you're using your camera's autofocus system, you may opt to choose a focus point to indicate the sharpest point. When you're using manual focusing, you may not be able to choose an exact focus point. Rather, use your eyes to determine if your subject is already sharp.

In the example diagram, you have focused on an object in marker 9 so the focus distance is at unit 9.



Now, I've mentioned that within the blurry and sharp world is an area of acceptable sharpness. In photography, we call this ***depth of field***, or ***DOF***.

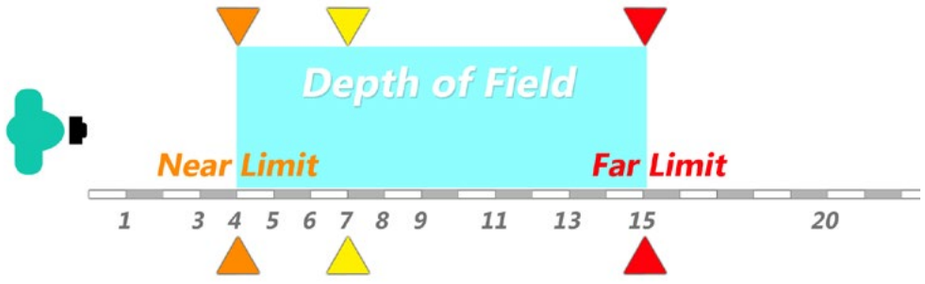
The term that we use to describe the blur created by depth of field is ***out-of-focus blur,*** simply because elements that are not in focus will be blurry.

> **Recommended Reading:** There are other types of blur in photography. If you're interested in learning about the types of blur and how to avoid it, I recommend reading this quick guide I've written for Photzy: How to Avoid Blurry Photographs.

The focus distance will be somewhere within the DOF. Like in the imaginary world we've created, everything in front of the DOF and everything behind it will be blurred out relative to the focus distance.

NEAR AND FAR LIMITS – DEPTH OF FIELD BOUNDARIES

In your depth of field, there is a ***near limit*** and a ***far limit***. These two are boundaries that determine where depth of field begins and where it ends. The near limit is the closest point of acceptable sharpness or simply, where acceptable sharpness begins. Everything in between that point and your camera will be blurry. The far limit is the furthest point of acceptable sharpness. Everything past that point will be blurry. Everything in between the near limit and far limit is your depth of field, or what is considered acceptably sharp.



Note: Although I've mentioned the near and far limits, we won't be discussing the dynamics of these limits here. We will be limiting our discussion of depth of field in detail only in relation to background blur, so I will be mentioning these two terms from time to time only when necessary. Also, the diagrams do not show exact blur measurements, but are true enough to provide a visual representation of the concepts.

Near and far limits are hardly ever discussed when pertaining to background blur, but it is an important concept in any discussion of depth of field.

Key Lesson: Alright! Now say this: "Sharp inside. Blurry Outside." Again: "Sharp inside. Blurry outside." This simply means that inside the depth of field limits, objects will be sharp, while outside the depth of field limits you have out-of-focus blur. Simple, right?!

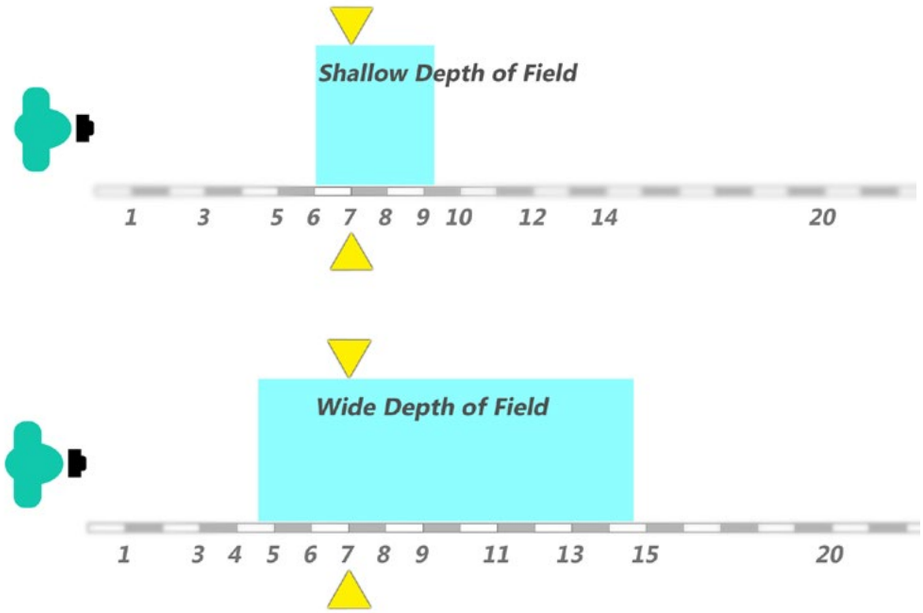
Note: Take note that the measurements I have shown so far via the diagrams are not absolute and are only there for the sake of illustration; although, I've tried my best to create the diagrams that would somewhat resemble what it will look like in the real world.

DEPTH OF FIELD – WIDE AND SHALLOW

Remember that you can adjust the coverage of your sharpness area to make it either cover a large area or a small area. When the area of acceptable sharpness is covering a thin/narrow area, this is called ***shallow depth of field***. When it's covering a large/wide area, this is called ***wide depth of field***.

These are two well-loved terms used in photography so you will encounter these terms as you pursue photography.

Here are two diagrams that show the difference between shallow and wide depth of field.



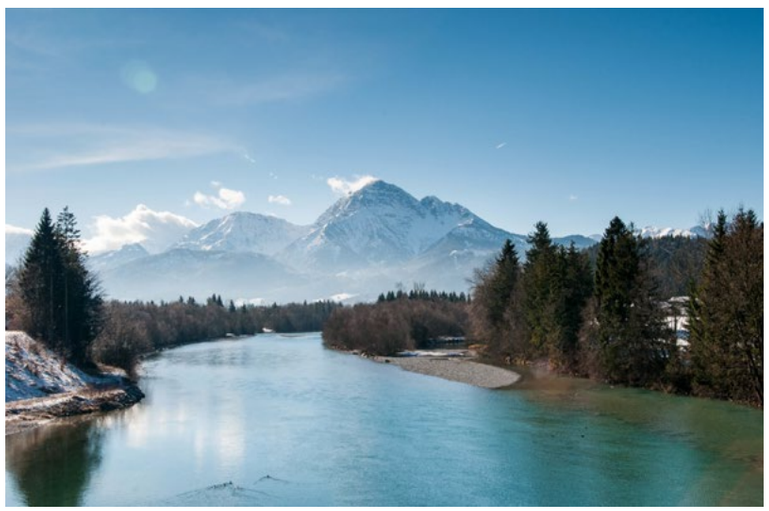
Okay. Let's do a quick review.

Self Check Quiz

1. What do you call the ability to select an area of sharpness?
2. What is the term used to refer to the area of acceptable sharpness?
3. When the area of acceptable sharpness is covering a large area, what is that called?
4. When the area of acceptable sharpness is covering a thin area, what is that called?
5. What do you call the sharpest point measured by distance?
6. What do you call the closest point of acceptable sharpness? How about the furthest?

Now, it's good to know the terms based on concepts, but it's better if you can recognize it in a photograph.

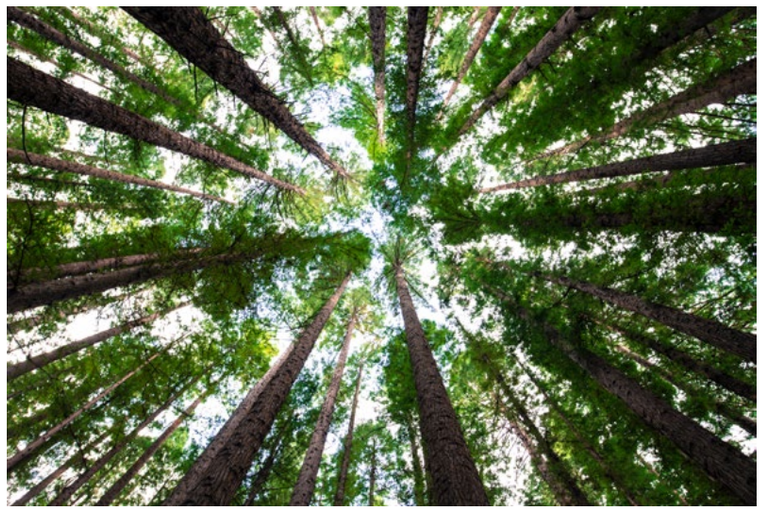
Take a look at these example photos. Zoom in closer to get a better view. Then, tell me which ones have a wide depth of field and which ones have a shallow depth of field.



1

2

3



4

5

6

Photo by Karlo de Leon

Here are the answers:

1. Wide
2. Shallow
3. Shallow
4. Wide
5. Shallow
6. Wide

Did you get it all correct? If you had trouble, what you can do is look for the near and far limits to determine if it's a thin or wide DOF.

Ok, take a look at this photograph. We will now enumerate the different parts of depth of field.

What you can do is determine an estimate as to the location of the near limit, which is the point closest to the camera that is sharp. Next you want to look for an estimate of the far limit, which is the point furthest to the camera that is still sharp.

Photo by Karlo de Leon

Ok, I've drawn two lines showing estimates of the near limit (orange line) and far limit (red line). By drawing these two lines, we have provided an estimate of the depth of field. Somewhere in between those two lines is the focusing distance.

Seeing that the distance between the near and far limits is quite narrow, we know that this shot has a shallow DOF. There are many photographs, however, where it's quite challenging to figure out where the near and far limits are because they're not visible in the frame.

Ok, how about these. Can you tell me if the next two photographs have wide or shallow depth of fields?

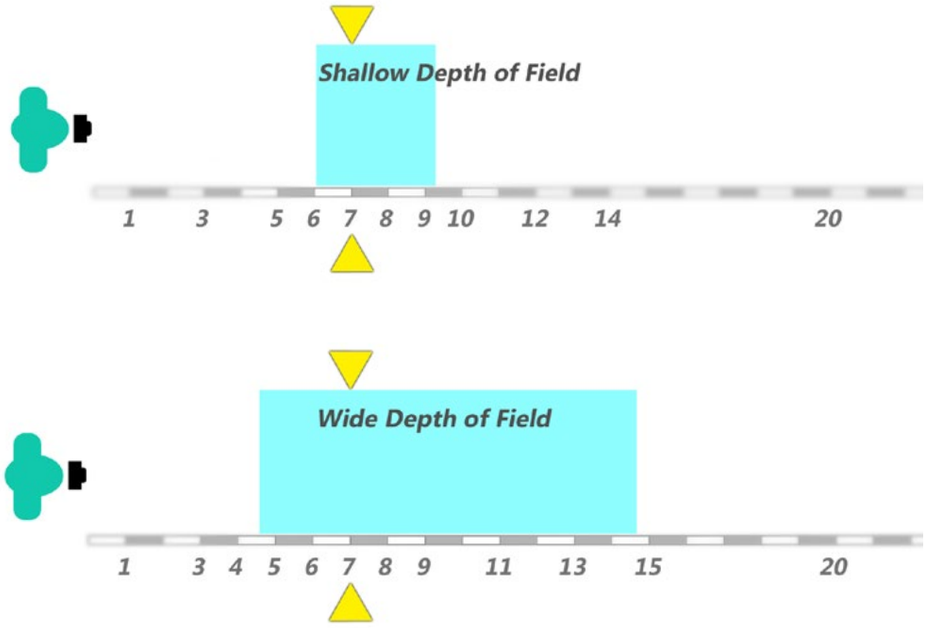
Tricky, isn't it? The thing is that measurements of DOF are relative. There's no real standard that you can use to say if it is wide or shallow unless you're at the extremes. A lot of photographers, though, recognize that when the background has some blurry area then it's shallow, and when it's all sharp, it's wide. This has, in a way, become a norm in photography-speak. Unfortunately, they didn't create a term for a not-too-shallow-not-too-wide depth of field.

My opinion, though, is that it doesn't really matter. Whether it's a wide depth of field or shallow depth of field, what matters is that you know how to create the effect that you want; that you understand how to intentionally create out-of-focus blur and what adjustments you can do so that it translates to a photo that is true to your vision.

Before we continue, I'd like to emphasize that using depth of field isn't the only way to create a blurry background. There are other ways. The image on the left shows one type. This technique (called panning) uses camera movement to create the blur. However, when photographers use the term background blur, it will almost always refer to out-of-focus blur or blur created using depth of field.

Since we're concentrating on out-of-focus background blur, we want to be able to use depth of field as a means to create this effect.

How do we do this? Let's again take a look at these two diagram comparisons between wide and shallow DOF and observe their blur patterns:



Shallow (left) vs. wide (right) depth of field. Can you see the noticeable difference in blur? In these diagram examples, I added a gradient blur on the bar markings to give a better illustration of how DOF blur looks like.

Based on our previous photo and diagram examples, which one do you think you will be using to create background blur? Yes! It's shallow DOF! Because a shallow depth of field produces more background blur, this is what we will use in our shots.

The question now is, how do we create a shallow DOF?

If you've noticed, we really haven't talked about camera settings yet. That's because I wanted you to understand the concept of creating background blur visually instead of simply relying on a memorized number that you can set on your camera to create the effect.

But now that we have part of that covered, we can talk about how to create shallow DOF using your gear.

If you're familiar with depth of field and your camera's settings, you're already probably thinking that the way to create a shallow depth of field is by adjusting your aperture. The truth is, this is only partly true.

Key Lesson: It is wrong to assume that there's only one way to adjust depth of field. Depth of field is a result, much like exposure is a result caused by a combination of things.

With exposure, we know that a combination of aperture size, shutter speed, sensor sensitivity (ISO), and the intensity of light determines exposure. If any of these four things change, exposure also changes, and the result would either be a darker or brighter image depending on the change that occurred.

Depth of field is quite similar. It is a combination of different factors. Adjusting one will affect the other.

Before we continue discussing the determinants of depth of field in detail, let's first talk about some camera preparations required to be able to create background blur effectively.

CAMERA PREPARATIONS FOR BACKGROUND BLUR

Lenses

I've already mentioned earlier that lenses are important in our discussion of creating background blur. This is because two of the three factors that affect depth of field have to do with lenses, making your choice of lens in creating background blur important.

Of course, I won't preempt our discussion by immediately telling you which is the best lens for you to use. That will happen later.

Will the lenses you use matter now as you're practicing? Yes and no. Having a variety of lenses would definitely help you understand the effects of optics in creating background blur, but it's also quite alright if you only have one (or if your camera doesn't allow you to change lenses). This is because limitations also provide some sort of learning that helps us in understanding things better.

For the purpose of practice and to maximize your learning experience, I will be mentioning the best lens for practice for each shooting exercise as we go along. If you're a beginner using a mirrorless ILC or DSLR camera, I'm assuming that you at least have a kit lens (the lens that came with your camera). If that's what you have, you're already good to go.

Exposure and Shooting mode

It is important to have proper exposure throughout our lessons without being distracted with the technicalities of settings. This is why at the beginning of the guide, I mentioned that it is better for you to take photos outdoors with bright light since it's easier to control exposure at this point.

> (!) **Important Note:** If you're still struggling in this area, you have two options. The first option is to grab these free guides and start reading about exposure and shooting modes:
>
> - How to Use your DSLR Camera
> - Understanding Manual Mode Tutorial Video
> - The Exposure Triangle
>
> The second option is to simply jump in and learn along the way. Don't worry, I'll give you instructions when we do the shooting exercises.
>
> You may also do both.

Manual and Aperture Priority are the preferred modes when dealing with background blur. This is because these three modes will give you full control over background blur. Although not too precise, Shutter Priority is the second choice when it comes to creating background blur.

I understand that there are different types of mode shooters reading this guide, so let me address each one of you according to your preferred shooting mode. Yes, Auto shooters are included.

- **Manual mode users** – You're good to go. I don't have much to say. If you know how to expose an image properly then you can go ahead and proceed to the next item

- **Aperture Priority mode users** – I understand that some aperture priority users have moved to this semi-manual mode without really understanding how the dynamics of this mode work. I know this for a fact because I have met several people like that – the first one being myself when I was starting out. If you're like that, use this guide as a means to understand how to use this mode effectively, understanding the dynamics of aperture and depth of field.

- **Shutter Priority mode users** – Shutter Priority users are mostly concerned with motion rather than depth of field. Just for the purpose of accomplishing the exercises in this guide, I suggest switching to either Manual or Aperture Priority. This is because with Shutter Priority, any changes in how the camera meters the scene can change the aperture settings that the camera chooses automatically. Although there is usually just a slight change with aperture, it would still be best to choose a shooting mode that would allow you to choose the exact aperture setting. Go ahead and switch to Manual or Aperture Priority – whichever you're more comfortable with. You may continue to use Shutter Priority outside the exercises that don't require exact aperture settings.

- **Program mode users** – Program mode does give you some control of your camera, enough for you to take quick shots, but it's not as versatile as Manual, Shutter, and Aperture Priority. Since you need to choose precise aperture settings when taking background blur images, the nature of Program mode may work to your disadvantage since settings can shift while you're prepping your shot.

If you're not familiar with any other shooting mode yet, I suggest using Aperture Priority as we're learning this lesson. It's really quite similar to Program mode. The only difference is that you get to choose the exact aperture settings and I will be giving you instructions on which one you need to use through this guide.

- **Auto mode users** – While you will survive learning how to create background blur even if you're using the Auto shooting mode, I urge you to take this chance to begin transitioning out of Auto and into either Aperture Priority, Shutter Priority, or Manual mode. Since Auto mode offers no control over aperture settings, you may have to skip some topics and exercises. Sure you'd still learn and be able to create background blur, but I'm sure you'd like to maximize your learning experience. You will realize this when we begin discussing the next section – determinants of depth of field.

If you're using either Auto or Program mode and would like to start using another mode, I suggest using Aperture Priority for the exercises. Just follow these initial steps:

Step 1: Switch your camera to Aperture Priority, or A, in the shooting mode dial.

Step 2: Ensure that you're using Auto White Balance. White balance affects the overall color rendition of your image based on the color of light. For us to get somewhat of a natural color every time, we'll use Auto White Balance. Setting your White Balance depends on your camera, usually either by holding down a button assigned to White Balance and changing the setting using one of the dials, or you can change it via your camera's LCD menu. You can refer to your camera's manual if you're not sure how to do this.

You may not exactly understand why I asked you to set all of those settings at this point, but it will definitely help you in the long run. Again, I won't be explaining these steps, but just trust that these are better than staying in Auto or Program mode.

Don't freak out, though, since the steps that you followed are the closest you can get to Auto mode but still having control over the basics. Take note, though, that I won't exactly teach you how to get off Auto mode since this premium guide is all about background blur. I will be walking you through other steps throughout the guide when the need arises.

The two things you need to know at this point, however, is how to adjust your aperture settings and how to change the focal length of your lens (if you have a zoom lens). You may refer to your camera's manual on how to do that.

Step 3: Set your camera to Auto ISO and set the maximum to ISO 800. You should find this in the ISO setting in your camera's screen menu. You may have to refer to your camera manual to do this.

Whenever you're shooting, be mindful of your camera's shutter speed. If you're starting to get camera shake, I suggest shooting with a tripod instead of increasing your ISO. ISO determines your camera's sensitivity to light, but increasing it too high will make digital noise visible, and this can look like blur. That's why keeping ISO at a minimum is important when doing the exercises.

> **Recommended Resources:** Check out these free resources to learn about camera shake and how to avoid it.

- How to Avoid Blurry Photographs
- The Correct Way to Hold Your Camera

> **Important Note:** Although I don't suggest that you shoot using Auto ISO for regular shooting since it can affect image quality, you may do so while practicing creating background blur.

Focusing

It won't really matter if you'll be using manual focusing or if you'll be relying on your camera's autofocus system. It is, however, important to note that choosing where you will focus will affect background blur. This is why it's a good idea to learn a little bit about focusing, especially being able to select specific focus points when you're using auto focus.

Photo by Karlo de Leon

If you have an iPhone or Android smartphone, you'll notice that when you use the camera, all you need to do is tap on the area of your screen that you want to focus on. With iPhones, it'll have a box indicating the area it will focus on.

That's essentially what we want to do. If we simply hit the capture button, you're essentially letting the phone choose which area to focus on. We don't want this. We want to be able to tell the camera which area we want to be the sharpest by telling it to focus on that specific spot. With these mobile devices, this is done by touching that part of the screen that you want to focus on.

Photo by Karlo de Leon

Photo by Karlo de Leon

If you're not quite familiar on how to do that with your digital camera, then this is a good time to find out. All you need to do is look for that option in your camera's LCD menu.

First, find the settings on *focusing mode* or *AF mode* and choose AF-S (for Nikon) or One Shot (for Canon). It may be called something else depending on your camera brand. You may need to refer to your camera's user manual. What you're looking to do is to switch to the AF mode which allows you to focus on subjects that are stationary and not in motion.

Next, look for *focusing area or AF point selection* in your camera menu. Use single area or manual selection – this is the ability to choose a single spot/focus point manually.

Try it out. You should be able to move the focus points by using your camera's arrow buttons or moving one of the dials after pressing an assigned button for selecting focus points. You'll see the focus area/ point change as you look through the

Photo by Karlo de Leon

Photo by Karlo de Leon

The AF/MF switch in this image is available in the camera body. You'll see the switch on the lens too.

viewfinder or on your camera's LCD when you're using live view.

To focus on your intended subject, just choose the focus point closest to that subject and align that point to that spot where you want to be the sharpest. Your camera will focus on that spot once you half-press on the shutter button.

As an alternative, you can also just use manual focusing by adjusting the lens's focus ring (image on the left) and let your eyes decide whether you've focused at the correct distance.

You may have to first switch to Manual Focusing or M/MF on your camera to be able to do so. The switch should be found at the front of your camera. It may also be on your lens.

Photo by Karlo de Leon

For this particular camera, there's no AF/MF switch available in the body. Only the lens has a switch.

Recommended Reading: If you'd like to find out more about focus settings in detail, read these free guides.

- Focus Modes
- Using Selective Focus for Better Images

Alright! Lenses. Check! Shooting Mode. Check! Focusing Mode. Check!

You are all set.

Let's now proceed with the discussion of the different factors that affect depth of field. Let's begin with the most well-known factor that affects DOF: aperture size.

DETERMINANTS OF DEPTH OF FIELD

APERTURE SIZE AND HOW IT AFFECTS DEPTH OF FIELD

Aperture size is simply the size of the lens opening. If you own either a mirrorless camera or a DSLR, you can peek through the front of the lens to see that hole in the middle. This image shows a hole that's pentagonal in shape. That's the aperture. When you set your aperture, you are essentially setting the size of that hole.

Changes in aperture sizes mainly affect exposure as it is one of the determinants of how much light enters the camera.

But aperture doesn't only affect exposure; it also affects depth of field. When the aperture hole is small, it causes the depth of field to expand and this creates a wide area of sharpness. But since we're aiming to create background blur, we therefore do not want this. If we want to make the area of acceptable sharpness smaller, we therefore need to do the opposite – making the aperture hole bigger.

How do we make the aperture hole bigger? It is by moving your aperture setting to the lowest f/ number. The higher the f/ number, the bigger the aperture size, and therefore, the narrower the depth of field.

Does this mean that we always have to choose the lowest f/ number? Not necessarily. It really depends on how much blur you'd like to create and what you want your photo to look like visually. There are times when you don't want to choose the largest size aperture because you're losing too much detail in the background, so you need to increase the f/ number so that the depth of field will adjust to create a more acceptable blur. We will be discussing this later.

Key Lesson: Let's talk about maximum aperture size.

Gear will always have limits. It is always best to know these limitations. When it comes to aperture size, your lens can only go as wide as it was designed to open up. Take, for instance, the lens on the previous page. That lens is 50mm and its maximum aperture is f/1.8. You will see this number as 1:1.8 written somewhere on the lens. This means you cannot set it to f/1.4 since that produces a larger hole than f/1.8.

Adjusting your depth of field using aperture size is limited by this setting. That is why a lot of times, beginners using kit lenses have difficulty producing background blur because apertures of most kit lenses only go as big as f/3.5. So if you need more blur beyond what f/3.5 can create, you won't be able to increase depth of field using aperture size because you're already maxed out.

This means you'll have more leverage in creating background blur with lenses with maximum aperture sizes of f/2.8 and lower. You'll also find that they are more expensive compared to similar lenses with a higher aperture size.

What, then, can you do when you've reached the limit? Let's look at another factor of DOF in the next section.

Self Check Quiz

Which of these statements are true?

1. The aperture is the only way to control depth of field.
2. The larger the aperture hole, the shallower the depth of field.
3. To make the aperture size larger, you need to increase the f/ number.
4. Given all things constant, an f/4 setting will create a blurrier background than an f/11 setting.

Shooting Exercise:

It's one thing to read about the effects of aperture and it's another to see it for yourself. In this exercise, you will be experimenting on how different aperture sizes render depth of field. You will be using just one lens for this activity.

If you have more than one lens available, choose the lens that has the lowest f/number.

If it's a zoom lens, set your focal length closest to 40mm. Make sure to always use the same focal length (mm) and shoot at the same distance from the subject.

Once you have your camera and lens ready, find an open space where you can freely take photos. Look for a subject where you can position yourself around 4-5 feet away from it. The conditions I've given you should allow you to see the difference in background blur once you accomplish the activity.

Take photos of your subject by focusing on it and using different aperture sizes. Try it at these settings: f/22, f/11, f/5.6, and finally, at the lowest f/ number that the lens can take. Observe the difference in background blur, especially between f/22 and the lowest f/ number.

If you do not notice a significant difference in depth of field, try using a focal length that is 10mm more than what you're already using or move closer to your subject.

Photo by Karlo de Leon

Shot taken with an f/4 aperture size and a 70mm focal length.

FOCAL LENGTH AND HOW IT AFFECTS DEPTH OF FIELD

Photos by amrufm

The second factor that affects depth of field is focal length.

Take a look at these comparisons. Both images are using an aperture size of f/2.8. One of the shots, however, is using a 17mm focal length and the other is using an 85mm focal length. Both photos were shot using the same camera.

Can you see the difference in the depth of field?

Did you notice that there's more background blur created when a longer focal length was used? This is because a shorter focal length creates a wider depth of field while a longer focal length creates a shallower depth of field.

Photo by Mark Sebastian

Settings are f/7.1 at 150mm on a full frame sensor.

This tells us that you can either replace your lens to use a longer focal length or if your lens has the capacity to zoom in closer to reduce the depth of field, then that's an option you can take.

Take a look at the image on the left and also the photographs on the next few pages. On each of the photos, you'll see that a relatively small aperture size was used and yet there's still a considerable amount of background blur.

Photo by Peter Gronemann

Settings are f/11 at 1000mm on a full frame sensor.

Photo by Florian Rogner

Settings are f/11 at 214mm on an APS-C crop sensor.

Important Note: Different cameras have different sensor sizes. The sensor is the digital camera's film. It is responsible for capturing light into the camera to produce the photograph.

Cameras with larger sensor sizes, like with full frames, have a wider field of view compared to their cropped-sensor cousins. Because of this wider field of view, you would have to use a longer focal length or move closer to the subject in order to match the same frame conditions of a camera with a smaller sensor size. And as we've learned, a closer focusing distance or a longer focal length produces a depth of field that is thinner.

This may not be relevant to most of you reading this, but it may be something you might consider later when you're already looking to upgrade to a full frame camera.

Recommended Reading: How Sensor Size Affects the Field of View

Self Check Quiz

Alright, let's have a quick review.

1. Background blur is created using _____ DOF.
2. Name two common factors affecting DOF.

So again, we want a shallow depth of field in creating background blur. Aperture and focal length affect DOF.

Did you get it all right?

Shooting Exercise:

In the last shooting exercise, we managed to experiment on the different aperture sizes and saw how each size affected depth of field. In a similar fashion, conduct a test utilizing different focal lengths.

For this particular activity, you may use as many lenses available to you. If you only have one lens available, that's alright – one zoom lens would do. Of course, you won't be able to do

this activity if your only lens available has a fixed focal length and cannot zoom optically.

Start with the lens with the shortest focal length (lowest mm number). Since aperture is also a determinant of depth of field, we want the aperture to be constant the whole time. For this shooting exercise, let's set the aperture to f/8 and make sure you're shooting at this aperture setting every time.

You will test a minimum of three shots using the shortest focal length, the widest, and the focal length in between those two. For the in-between one, it doesn't have to be exact measurements; just an estimate would do. For example, if your shortest lens can go up to 18mm, and the longest is at 200mm, the middle is at 109mm, so you may set your focal length at 100mm, 110mm, or the focal length closest to that number that's available to you.

You may go further and test other focal lengths in between. Like the previous exercise, observe and compare the depth of field and the amount of background blur for each shot.

Again, make sure you're shooting at the same subject and at the same distance, this time around 2-3 meters every time.

When you're done, repeat the process using a different aperture size. I suggest to try it out using f/22, f/11, and your maximum aperture size (smallest f number).

Note: Although not really essential in our discussion of background blur, I'd like to mention this because you may have encountered it while doing the last exercise depending on the lens you've used. If you use the smallest aperture size on most zoom lenses, you'll find that it will adjust to a higher f/ number as you increase the focal length.

Take a look at the lens on the next page. It's a zoom lens with a variable aperture. What that means is that the maximum aperture size changes depending on the focal length used. Take a look at the numbers on the lens. You'll see that it says 55-250mm 1:4-5.6. The numbers 4-5.6 are your maximum aperture size range. This means that when you're using the widest focal length – in this case 55mm – your maximum aperture size is f/4. This limit

Photo by Karlo de Leon

changes as you choose a longer focal length. For this particular lens, it'll be f/4 at 60mm, f/5 at 100mm, and f/5.6 at around 140mm and up.

Other lenses will have a fixed minimum aperture size. For example, if the lens specs are 24-70mm 1:2.8, that means that regardless of the focal length, the minimum aperture will stay at f/2.8.

Now, let's talk about the third and final factor that affects DOF.

Photos by Karlo de Leon

FOCUS DISTANCE AND HOW IT AFFECTS DEPTH OF FIELD

The final factor that affects DOF is focus distance (or focal distance/focusing distance). This should not be confused with focal length. Focal length talks about magnification while focus distance is all about how near or far in the frame you are focusing.

To better understand this, simply think of focus distance as the distance between the camera and the subject, because we normally focus on the subject so that it'll be sharp.

Compare the distance between the camera and the subject in these two photos. Notice that there's noticeably more blur behind the lady (right image) than the biker (left image). The line of trees seen in the photo on the left seems much further than the rooftops on the right photo and yet there is considerable difference in blur between the two photos.

Take note that the settings for the photos are f/4 and f/4.5 respectively in favor of the photo on the left. I took both images using the same camera at the same focal length: 115mm. The focusing distance makes a significant difference.

This diagram comparison on the right shows how the difference in focusing distance affects depth of field.

The focus distance is represented by the yellow arrows. You'll see that the closer the focus distance from the camera, the thinner the depth of field. The gap between the near and far limits are much wider when the focus distance is further from the camera. You'll also notice that the far limit dramatically adjusts further compared to the near limit. Take a look at the difference in blur in unit 20 where the tree is located.

All this means is that the closer your subject is to your camera (given that you're focusing on your subject), the blurrier your background will be.

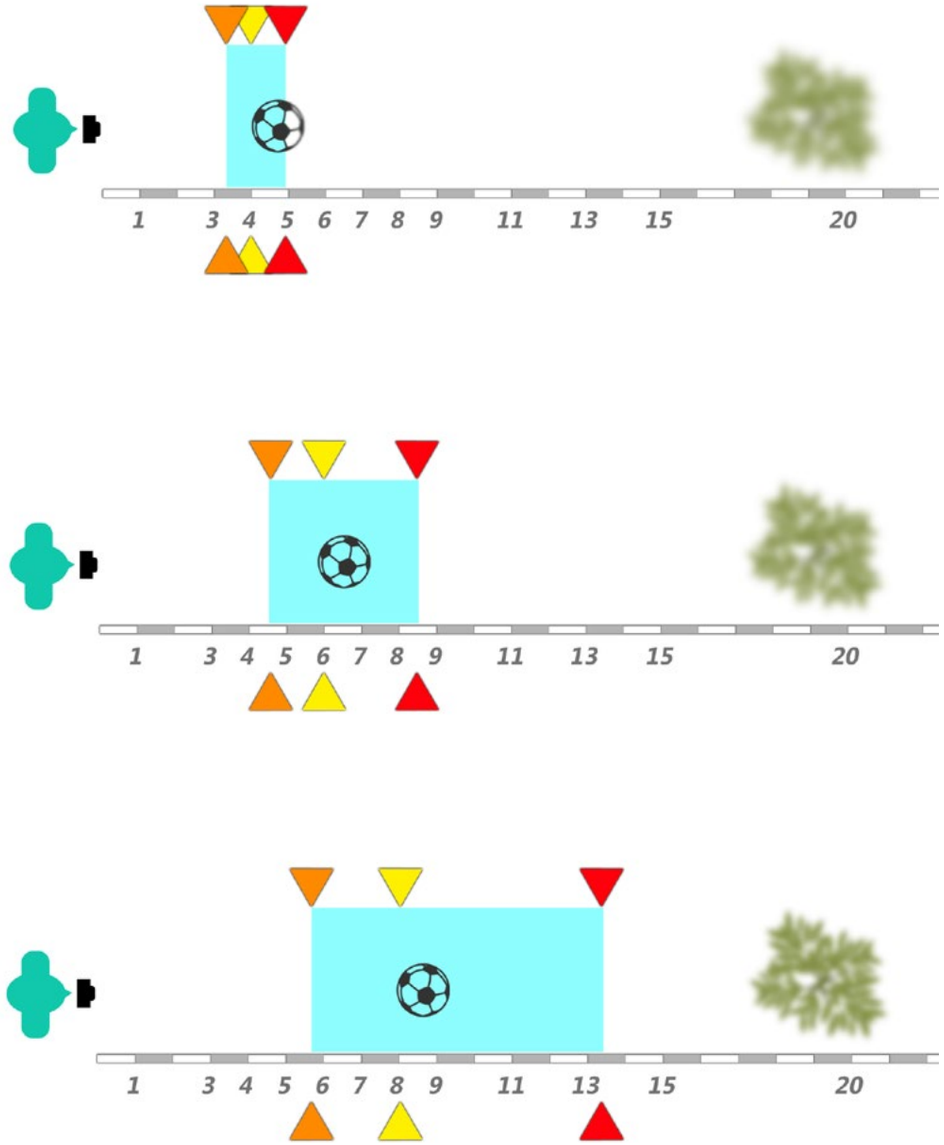


Photo by shirokazan

In this photo, the photographer is only using f/4.5 and a 32mm focal length on an APS-C cropped sensor. Notice that there's still a significant amount of blur and this is due to focal distance.

Photo by Guy Sie

Here's another photo. This is a macro shot. A special lens called a macro lens allows you to shoot at very close distances. With this kind of lens, you can create a really thin DOF.

The aperture setting for this shot is f/22 using an 80mm focal length.

Seriously, f/22? But that's an aperture setting used to create a wide DOF, right? Yes, that's not a typo. Even at f/22, a shallow DOF was created due to a very close focus distance.

Photo by Guy Sie

Compare that with this shot that's using f/22 at 100m. It's supposed to have more blur since it's using a longer focal length, but again, extreme close-ups create more blur even if the aperture is on a setting that would normally produce a wide DOF.

Self Check Quiz

Which of these statements are false?

1. The closer the focal distance, the thinner the depth of field.
2. The distance between the near limit and the far limits change as the focal distance changes.
3. You can create a wide depth of field shot using an aperture size of f/2.8.

Shooting Exercise:

In the same way we tested different aperture sizes and focal lengths, we will now work with different focal distances while keeping the two other factors constant.

Just use one lens and set the aperture at f/8. If you're using a zoom lens, choose a focal length closest to 40mm. You will now take two to three photos.

Take a photo of your subject as close as you can, usually about a couple of feet away. Unless you're using a macro lens, your camera won't allow you to take a shot and you won't be able to get a sharp subject when you're focusing too close.

Now, create some distance between you and your subject. You can either ask your subject to run back far away or you can focus on a different subject that's further back if the first option isn't possible. Using the same settings, take your second shot.

Experiment at other distances. How far back should your subject be? It's up to you – 10, 20, or even 40 feet away. Test it all if you'd like to.

After that, compare your photos.

Try a different aperture and focal length too. If you can't see a significant difference in blur, use a longer focal length or a slightly larger aperture size.

DEPTH OF FIELD FACTOR COMPARISONS

Now, before we end our discussion on adjusting depth of field, let's quickly take a look at this comparison chart. It shows how each factor affects depth of field including its limitations, pros, and cons.

Factor	How it Affects DOF	Limitation	Limitation Solution	Pros / Cons
Aperture Size	The larger the aperture (smaller f/ number), the narrower the depth of field	Limitation is dependent on the largest aperture the lens can take	Can be replaced by a lens with a larger aperture	(+) Increasing out-of-focus blur doesn't require reframing the shot (-) Lenses with large apertures are usually more expensive
Focusing Distance	The closer the focusing distance, the narrower the depth of field	Limitation is dependent on how near the lens can focus	Use macro lenses or cameras that can focus closer.	(+)A good way to increase out-of-focus blur when focal length and aperture size is limited (-) Increasing out-of-focus blur either requires reframing since subject will be closer to the camera (composition changes)
Focal Length	Longer focal lenghts produce narrower depth of field compared to wider lenses	Limitation is dependent on maximum focal length Affected by the size of the sensor	Can be replaced by a lens with a longer focal length	(+) Significant increase in out-of-focus blur even with average size apertures and subjects at a reasonable distance (-) Increasing out-of-focus blur requires reframing the shot (composition changes) or dealing with background compression

I really hope you did the shooting experiments in the previous sections since this will give you first-hand experience on how the factors affect depth of field.

If you'd like a visual reference, I've taken some photographs on my blog that will show you how one factor overrides another to create background blur. For these tests, I've used settings that you normally use to create a wide depth of field (lesser background blur), and adjusted one of the factors to create a shallow DOF. I've posted these comparisons over at my photography blog: Radical Shots.

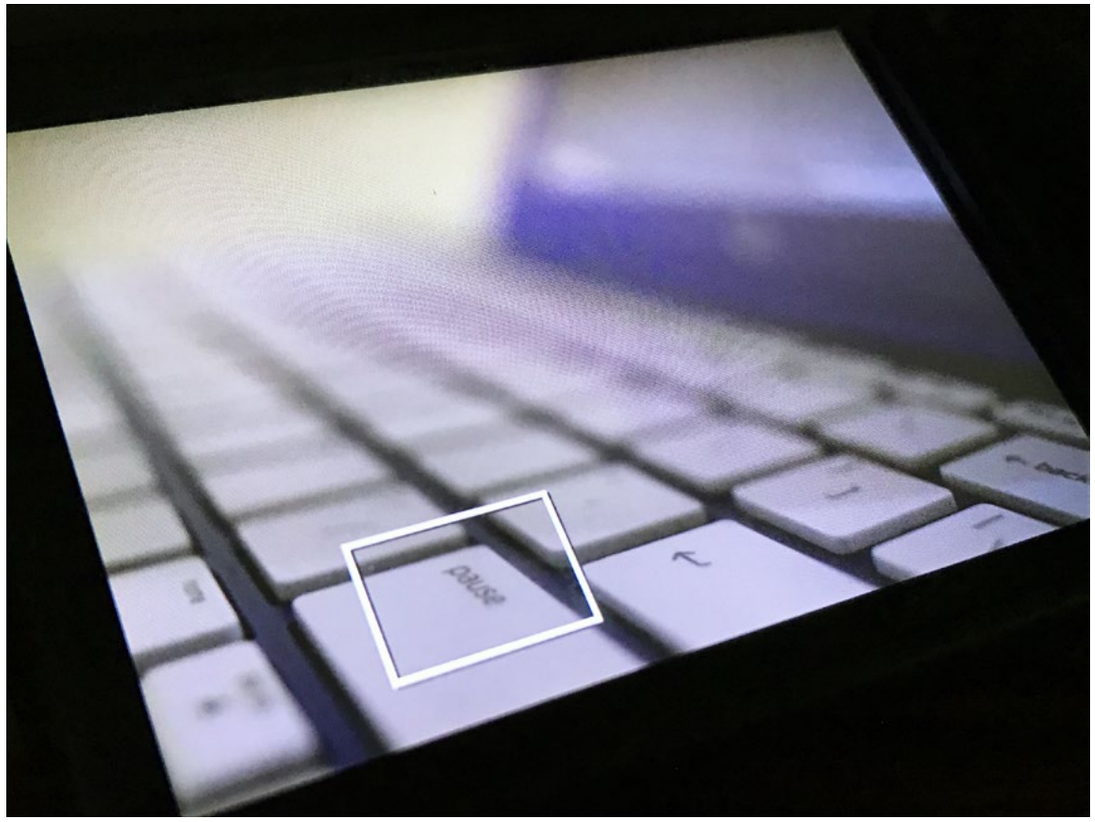
Key Lesson: When you were doing the experiments, you probably noticed that it's easier to create background blur when all three factors are at their optimum: a long focal length, a large aperture, and a closer focal distance. You would have also noticed that it's challenging to create background blur when at least one of the three factors is at the opposite extreme.

For example, it's hard to create background blur when using ultra-wide lenses. Ultra-wide lenses are those with focal lengths below 24mm for full frames, or 15mm for cropped APS-C sensors. Since no one is manufacturing macro lenses in ultra-wide focal lengths, you can't really go up close to even create significant background blur. The widest aperture you can go (to date) is f/2.8. So if you'd like to shoot using wide angles and still create background blur, stick to wide ones (not ultra-wide) closer to 35mm for full frames and 24mm for APS-C cropped.

Another example is when the focus distance is very far. For example, even if you're shooting at a very large aperture of f/1.4 and a long focal length of 300mm, but the focus distance is at 10,000 feet, then you'd still get a sharp background.

If two of the three factors are at least in the mid-range settings, then it's still possible to create background blur using the third factor.

Did You Know? DSLRs and Mirrorless ILC cameras (usually midrange and up) have a button near the lens mount called the DOF preview button, which allows you to see how the lens will render depth of field.



Photos by Karlo de Leon

Why do you have this button when I can already see blur in my shot? Because what you actually see in the viewfinder before you press the shutter button is the depth of field created by focal length and focal distance without considering aperture settings. This is because the aperture size doesn't go to its set size until you trip the shutter. An exception to this is if you're using the widest aperture size since that's the default size of the aperture before hitting the shutter button.

Take a look at these photographs above.

The one on the left is what the shot looks like through the viewfinder. I took a photo of the LCD screen while on live view.

There's pretty significant background blur, right?

The aperture setting I've used is f/22 with a focal length of 24mm.

Photo by Karlo de Leon

The arrow shows the location of the depth of field preview button on my camera.

The one on the right shows the actual shot. Where did the blur go? Take note that the settings are the same. Nothing was changed.

So essentially, what the DOF preview button does is reduce the aperture to the size that you've set. This will give a more accurate rendering of the depth of field. You will, however, see a dimmer screen when you choose a smaller aperture size since it will reduce the light entering the camera through the lens.

Try it out. It's pretty cool.

PRIORITIZING APERTURE SIZE, FOCAL LENGTH, OR FOCUS DISTANCE

By now, you would have noticed that I'm not the type to give you exact aperture settings and focal lengths that you should be using to create background blur. As I mentioned earlier, that's because it's better for you to experience your gear's limitations rather than memorize numbers that you'll either most likely forget or will prove to be useless in certain circumstances.

Again, if you performed the shooting exercises in the previous sections, you should have a better idea on which settings would yield a certain background blur look. So if you skipped the exercises, I urge you to go back and do them.

> **Key Lesson:** Try to answer this question: Which is better to use to create shallow depth of field? Is it focal length, aperture size, or focal distance?
>
> The answer to this question is: it depends. It doesn't mean that since you find it easier to create background blur using a specific factor, then that's what you should always use.

The scenario will always be different for every photographer. For example, even if focus distance can increase background blur, you may not want your subject to be too close to your frame. Or what if you're forced to shoot from a distance? Situations may also change and your perceived output will not always be the same.

I guess this is why many regard aperture size as the main determinant of exposure, since in most cases, we try to determine DOF after we've framed the subject.

Let's say I'm only carrying two lenses in my bag – a 70-200 f/4 lens and a kit lens 18-55mm f/3.5-5.6 – and my goal is to create a headshot with maximum background blur. Which lens would you use?

I would use the 70-200 because I will get more blur shooting beyond 100mm at f/5.6 compared to 55mm at f/5.6 (take note that it's not f/3.5 because with this type of zoom lens using variable aperture, at the longest focal length of a lens, the largest aperture also adjusts).

But if I have the same 70-200 zoom lens, and a 50mm f/1.4 prime lens, my decision may now change based on the field of view and compression I want to achieve.

What if I'm carrying only the 50mm prime? Then obviously I won't be able to adjust depth of field using focal length.

What if I'm only carrying the 18-55mm f/3.5-5.6 kit lens? The best I can do in terms of focal length is 55mm f/5.6, and the best for aperture size is f/3.5 at 18mm; both I think is not enough to create that shallow a depth of field. In this case, I can only take advantage of focal distance and background distance to create background blur.

But my focal distance will also be limited by what I can include or should exclude in the frame. Even if I want to go closer, I will restrain myself from adjusting further because it will change the composition of elements in my frame.

The best way to actually find out is to experiment on different lenses and use a variety of aperture size and focal length combinations.

This is also why it's difficult to simply ask: "What settings did you use to achieve that shot?" More often than not, you may not be able to obtain the data required to replicate the shot anyway. This information includes (1) aperture size, (2) focal length, (3) sensor size, (4) distance of camera to subject (focal distance), (5) distance of background to subject, (6) lens used, and (7) background details.

Shooting Exercise:

This exercise is a culmination of all three determinants of depth of field.

Experiment on creating a variety of depth of field distances using different combinations of aperture sizes, focal lengths, and focal distances. Let's say you have an 18-55mm lens; try different aperture size settings at 18mm while focusing on a single fixed distance. Now do the same at 55mm. When you're done, do the same with different focal lengths while the other two are constant. Then do the same with different focal distances while the other two are constant.

Photo by Karlo de Leon

Used a 95mm focal length and an f/4.2 aperture size. Focal distance is probably around 5 feet.

If you have more than one lens, go ahead and do this activity with the different lenses that you own. It would be good to try this activity given a variety of subject-background distances. This should help explore the limitations of your gear when it comes to DOF and background blur.

Alright, so let's say we've maxed out all our options. We've reached our depth of field limits and can no longer adjust the depth of field. Is there any other way we could still increase background blur?

The answer is YES! This is done by managing the distances of elements.

MANAGING DISTANCES

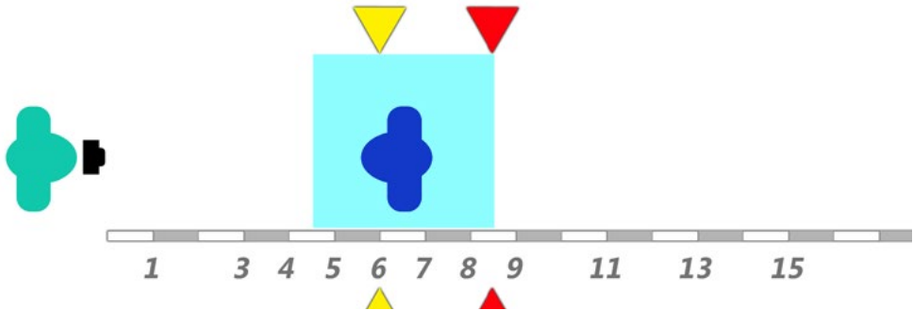
Let's go back to our imaginary world and create a shallow depth of field.

To make it easier to visualize, let's add some objects into the scene: a subject and a background.

For our subject we will use a figure of a person. For our background we will use a brick wall.

Now, we will be placing these objects in our imaginary world.

Let's first place another person as our subject at the unit 6 marker. We will then focus on the subject; this will make the focus distance set at the unit 6 marker.



Let's assume that the depth of field spans from about 4.5 to the 8.5 mark. Imagine that this is already maxed out because you're already at the maximum aperture limit and we can no longer adjust focus distance and focal length because we want to achieve a certain look. We therefore can no longer make the DOF shallower than it already is.

We will then place our background behind our subject.

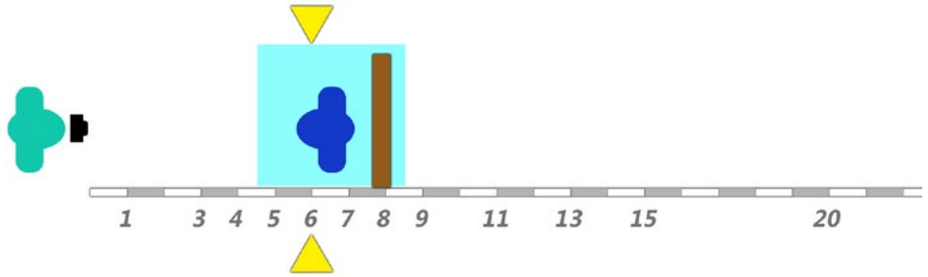
Question: does it matter which location behind the subject (from units 7 to 20+) the background will be placed?

Let's try.

If we place the wall right behind the subject within unit 7 to 8.5, what would that look like?

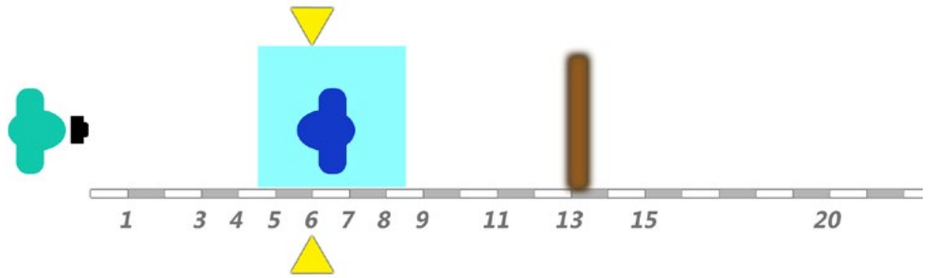
Photo by oddmenout

Take a look at the diagram and an actual photo. As the background is still within the acceptable area of sharpness, background blur wasn't created, even if the DOF is relatively narrow.

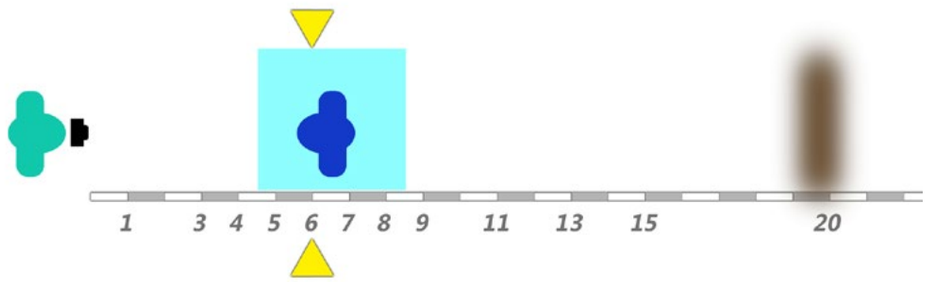


Now let's see what happens if the wall is located far behind the subject at the unit 13 marker. What would that look like? Take a look at the diagram and the photo on the next page.

Photo by Sam Wolff



As the wall is placed further away where it is obviously blurrier, background blur is created. As you can see, the amount of background blur is also dependent on the distance between your background and your subject. It also follows that the further the wall is from that area of acceptable sharpness, the blurrier it becomes. This next diagram shows the wall increasing in blur as it's placed further



Photos by Karlo de Leon

In the first photo where the wall is right behind the subject, a photographer may have been using a shallow depth of field, but since the background is also within the acceptable area of sharpness, it will look like the photographer used wide DOF settings.

Above is a photo comparison that shows this exactly.

I shot all three photographs at a focus distance of four feet and used f/5.6 at 55mm for my settings.

The only thing that's different between these three shots is the distance of the focus point (where the subject is) from the background. I used my large hard case luggage as our makeshift wall so I could easily move it further back. Take a look at the difference in background blur in the second (center) and third (right) shots compared to the first (left) shot.

Although the depth of field distance is the same for all three shots, in the first image, our makeshift wall was well within the depth of field. I know this because I used a depth of field calculator to make sure I'm shooting within the DOF for my first shot. With the settings I used, my far limit is at 4.17 feet so I just made sure the wall was within that distance. With the other two photographs, the background was farther than the far limit.

Photo by Olli Henze

Important Note: I know I said not to rely on exact measurements, but I've used a DOF calculator for the purpose of creating an example. This is the measuring tool that I told you about earlier that you can use later should you wish to explore the subject of depth of field further. There are many out there available online. Just Google the search term 'DOF calculator.' The one I used is DOF Master.

The reason why we're not really discussing it here is that it's normally used by landscape photographers who want to make sure they're shooting at a hyperfocal distance, which is the closest focal distance that would achieve a wide depth of field background that goes up to infinity. Since we're in the subject of creating background blur, we'll hardly ever need it in actual shooting.

If you'd like to explore it, though, just for learning and also for fun, then go ahead. It's pretty straightforward, and after going through what we've already discussed, you should already be familiar with the terms and be able to input the required information.

The photo on the previous page is another illustration that shows how distance affects blur. See that black chess pawn on the black square position? That's pretty sharp, right? The pawn right in front and the one right behind it are somewhat blurry, but not as blurry as those further back or way upfront. The further from the DOF, the blurrier it becomes and the less detail you see.

Quick Review

Now, let's do a quick review. Background blur is created mainly by two things. What are they?

The answers are (1) shallow depth of field and (2) distance of the subject from the background. This means that creating background blur considers the placement and distance of objects within the depth of field in relation to the area of focus.

But what if you cannot change the distance between the subject and you can no longer adjust DOF? Let's take, for example, when you're shooting events; asking your subjects to move is not always an option. In most cases, you don't have that luxury. In other cases, moving inanimate subjects, like a tree or a large boulder, to increase the distance from the background will prove to be impossible. This is the time to consider getting new gear, usually an additional lens, since you've already exhausted any means to create background blur, and especially if it's essential to your regular shooting activities.

MANAGING BLUR

Photo by 3dpete

HOW MUCH BLUR DO YOU NEED?

While background blur can be beautiful, there is such a thing as too much blur.

You always want to consider the amount of detail you want in your background even as you achieve background blur because blur reduces detail.

In some cases, you would want everything in your background to be totally unrecognizable either because it's irrelevant to the message of the shot or to be able to reduce distractions. In other cases, you would still want some detail to show so that it works well with the story you're trying to convey.

Take a look at the following two images:

Photo by L. Andrew Bell

With the amount of background blur in the image on the previous page, you can still recognize that the background is of a beverage fridge. This detail is essential to the story. The blur is enough to emphasize that the focus is on the woman. If the photographer blurred out the background a bit more, making the fridge unrecognizable, it may have been less effective.

In the photograph on the left, the photographer chose a background that is fully blurred out. You cannot recognize any detail at all. We can only guess what the background could be – possibly foliage, but it can also be something else.

If you want more background detail, you would want to lessen the distance between the subject and the background, widen the depth of field instead, or both. These strategies will work to a certain extent.

Photo by Karlo de Leon

Since travel is one of my main genres, I'm always mindful of the amount of blur I'm creating. This is because most travel shots involve a good amount of background elements to tell a story but at the same time, background elements can be distracting. A bit of background blur can balance things out.

The sharpness or blurriness of an element in a frame affects the information you provide in a photograph, but also affects composition.

Take a look at this example on the right. The boat provides a better background of the sea compared to just having a flat, empty seascape. Without it, it'll make the scene a bit flat and boring.

The more significant and prominent the information in the scene, the more your eyes are drawn toward that spot. That's why it was important to me that the boat was less prominent than the actual subject of the story (the people).

Photo by Lachlan Hardy

If the boat is too sharp, then it disrupts the eye flow and therefore makes the composition less effective. On the other hand, if it is too blurry, it removes its importance and changes the story.

Take a look at this photo on the left. Do you think it needs more blur? Will more blur cover the man in the background since he can be quite distracting or will you already lose important background detail when you do? Or would you just reframe the shot instead of adjusting blur to avoid the distraction? These are decisions you need to make as you consider using background blur.

Recommended Reading: Having good storytelling skills will help you decide how much background blur you need. Although it doesn't cover blur, I recommend this Photzy Premium guide by award-winning photographer Mitchell Kanashkevich for developing your storytelling skills: Powerful Imagery.

Photo by Karlo de Leon

CREATING FOREGROUND BLUR

Another option you can try is using foreground blur. I know our topic is all about background blur, but I'm sure foreground blur can be just as fascinating so I'm adding it here as a bonus. It will also give you further insight about depth of field.

The dynamics of foreground blur are pretty much the same with background blur except that you're using the out-of-focus area found between your camera and the near limit to be able to create foreground blur. This makes it easier to create than background blur. Why is that? Because you don't need a shallow depth of field to create foreground blur.

Wait, what?

Yes, it's true.

You're probably thinking, "But I thought you needed a shallow depth of field to create background blur?" Yes, that's also true, but we're not creating background blur. We're creating foreground blur. Let me explain.

Do you remember this photo on the left?

Photo by Karlo de Leon

What was your answer to the question, is this a wide or shallow depth of field?

If you answered *wide depth of field*, then you were correct.

Before Team Shallow Depth of Field starts protesting, let me explain why.

The only reason why you'd think this has shallow depth of field is due to the presence of foreground blur which is the out-of-focus blur near the camera.

Key Lesson: Wide depth of field is not the absence of out-of-focus blur in your photograph. Wide depth of field is the idea that the depth of field or area of acceptable sharpness is wide. Of course, the obvious common result of this is that there is no out-of-focus blur that is evident in the shot. But this is not always the case.

There is an important clue that tells me that this is a wide DOF shot. Do you know what it is?

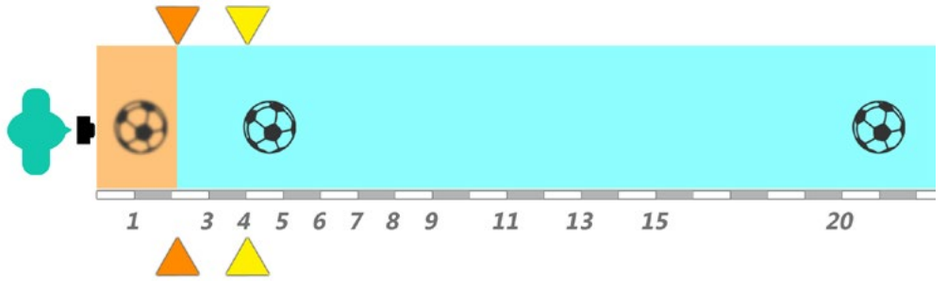
It's the distance of the near and far limits. I've mentioned this earlier, but just to review, the near limit is the point where depth of field begins while the far limit is the point where depth of field ends.

I've added an arrow on the photo to show the blade of grass where I think the acceptable sharpness seems to begin. It may not necessarily be exactly at that distance, but it's possibly around that area. Still, it tells us that the near limit is found only a few feet away from the camera.

Now, take a look at the trees at the back. The leaves on the trees are pretty sharp. If you look further back and up, you'll see that the furthest elements – a few cloud formations – are also sharp, and these clouds are the furthest elements in the background that you can see. If those elements are sharp, this means that the far limit reaches that far and even possibly to infinity. This distance between the near and the far limits is a good enough indicator that the depth of field extends into a very wide area.

Why then do we see out-of-focus blur in the foreground? Because there will always be out-of-focus blur since all lenses have distance limitations.

Let me illustrate this idea using a diagram.



The only reason why you don't see the out-of-focus blur in your common wide depth of field shots is that you don't have any element that's within the frame that falls before the near limit.

Photo by Karlo de Leon

Take a look at the photo on the left. In this shot, I simply stood up and moved my camera perspective away from the low level shot and into a normal standing perspective. I didn't change any of the settings nor the focus distance, but the elements that were falling within the out-of-focus area in the first shot (which is before the near limit) was not included in this second shot.

Did the out-of-focus area magically disappear when I took the second photo? Not really. It was still there, but because there is no element falling in that area that's within the frame, you don't get to see it. All you'd see are sharp elements. The change in composition will make it look like everything is absolutely sharp to infinity.

I hope that this lesson gave you a new perspective not only on out-of-focus blur but depth of field in general.

Shooting Exercise:

1. Create an out-of-focus blur that has both a foreground and background blur.
2. Create an out-of-focus blur in a standing position while using a wide DOF.

That was such a long introduction to the topic of foreground blur, but I added this for you to understand the nature of depth of field and how you can use it to your advantage – whether you're using it for background or foreground blur.

Now, the way it works is similar to background blur. There are three simple guidelines:

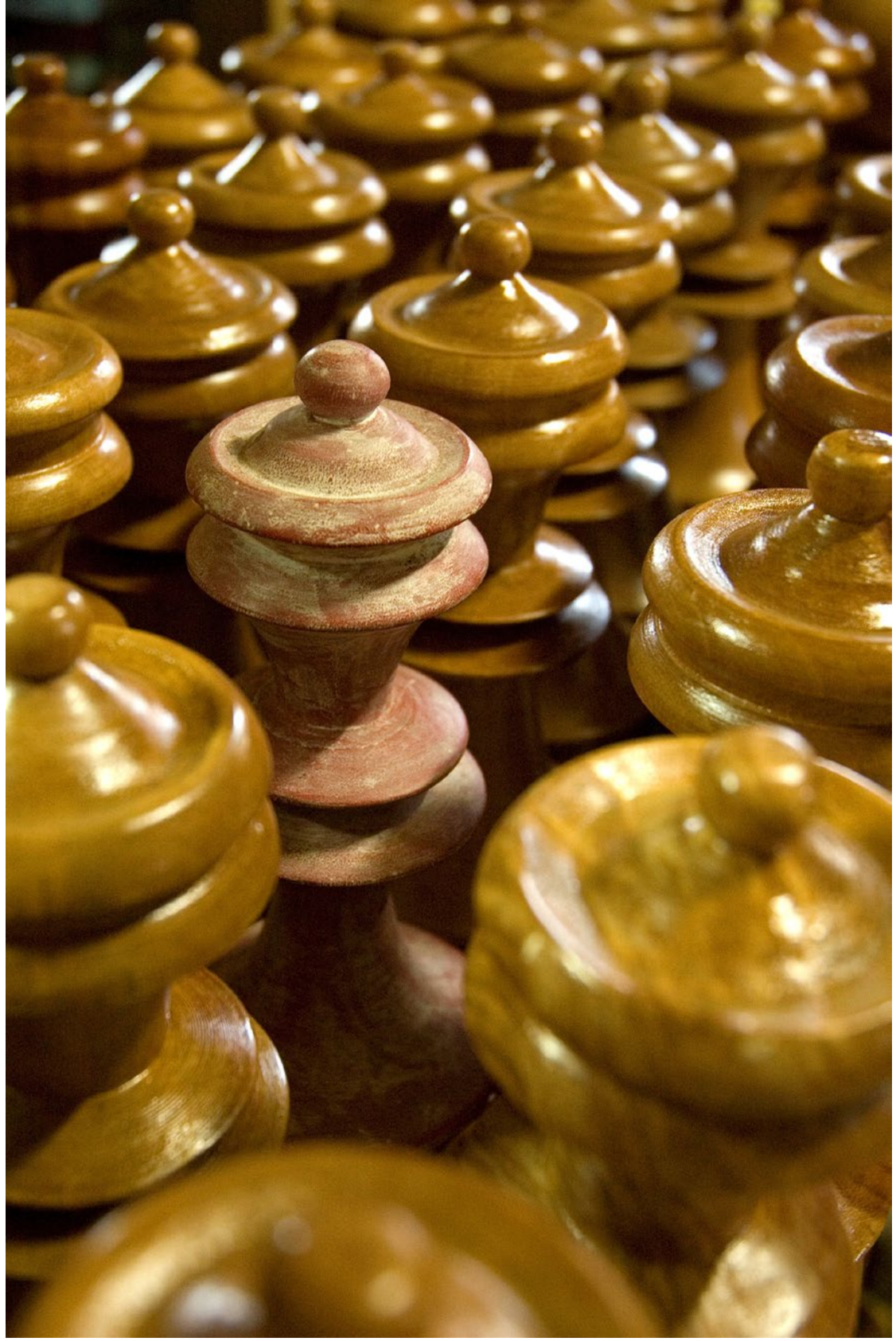
1. It is blurrier closer to the camera than the near limit.
2. The maximum near limit distance is dependent on the lens you're using. Macro lenses will have a closer near limit limitation.
3. You can always have foreground blur regardless of the size of your depth of field as long as an element in the frame is located before the near limit.

Non-Shooting Exercise: If you're still skeptical, here's a little challenge. You can do this with or without a camera. Lift your finger up a couple inches in front of your lens, face, or one of your eyes. Now try to make your finger sharp.

Impossible, eh?

With the exception of certain macro lenses, it is impossible to focus up close. Macro lenses will also have that point where you can't get that close to get sharp focus. This is what we can use to create foreground blur.

Here are some example photos:



Photos by Karlo de Leon

The odd colored chess piece is the subject in focus in this shot. Compare the difference in the amount of blur in the foreground and the background by looking at one chess piece before and after the subject. You'll see that the chess pieces in the foreground are blurrier compared to the background pieces. Settings for this shot are f/4.5 at 31mm.

Photos by Karlo de Leon

Here, you'll see foreground blur used to frame the subject on the left side of the image. Notice that the foreground blur is the blurriest part of the photograph. This shot was taken using an aperture size of f/5.6 and a focal length of 110mm.

THE QUALITY OF BACKGROUND BLUR

Photo by Anne Worner

UNDERSTANDING BOKEH

If you've been exploring how to do background blur prior to reading this guide, you've probably heard of the term 'bokeh.' Bokeh is simply the quality of blur created by depth of field. This tells us that not all blur is created equal. Some simply look better than others.

The quality of blur you'll produce depends mostly on the quality of glass you'll be using. Prime lenses are better in quality compared to zooms and therefore create better bokeh. Professional-grade zoom lenses also use quality glass, and that's one reason why they're more expensive.

Some photographers, though, are not too particular about it while others are. It will all depend on personal preference. Let's take a look at several examples on this section, including the image on the left. Which photos have better bokeh in your opinion?

Photo by Peter McConnochie

Photo by talam0nal

So how do we know which ones are good-quality lenses and which ones aren't?

I should honestly say that I am not an expert when it comes to lenses because, first, I am clueless about the physics of glass, and second, I have not tried enough lenses to even claim to be an expert. Like many other pros and enthusiasts, I too rely on lens experts' opinions as to which lenses are of better quality than others. A lot of times, because most photographers are not really intentional on studying the physics of lenses, we either figure out which lenses are better based on our own comparisons or based on the experiences of other people.

For more than a decade now, I've been going to www.kenrockwell.com before I decide whether or not I should get a specific lens. I also check out forums for lens alternatives and comparisons from actual users. If you're not looking to turn into a lens guru, I suggest you do the same.

WHAT ARE THE BEST LENSES FOR BACKGROUND BLUR?

Since we're already on the subject of lenses, let's answer the ultimate question: What are the best lenses for background blur?

You may be wondering why I opted to talk about this subtopic only towards the last part of this guide. That's because I didn't want you to get caught up with gear.

I see many beginner photographers ask about the best lenses and immediately, they look into buying that lens without really considering whether it would really be useful to them. It also helps one to be versatile when you first understand the concepts before digging into the merchandise.

Unless you're the collector type or if spending a lot on possibly useless gear doesn't really matter to you, I suggest holding off on the urge until you're pretty sure it's what you really need for your regular shooting needs.

Personally, I only own 2-3 lenses at a time. During a shoot, I use one or two. You will probably use your best lens 75-80%of the time, your second lens 15-25% of the time, and the rest 5% or perhaps rarely ever. This is the reason I only keep a handful.

Let us now talk about what type of lenses are good to use when it comes to creating background blur. I will also include some examples, but do take note that they are by no means recommendations as I have not personally used most of these lenses. It's always still best to do your own research when it comes to specific gear.

So here we go.

Telephoto Lenses

Telephoto lenses are lenses with a focal length above 50mm for full frame cameras and above 35mm for cropped sensor cameras. The more compact ones can probably start off with 24mm. Anything that goes lower than those numbers for their respective sensor sizes becomes a wide angle lens.

If you still recall the section on focal length and how it affects depth of field, we know that the longer the lens, the more background blur is created.

These lenses can either be zooms (more than one focal length) or primes (fixed focal length). Some notable zooms include the Canon and Nikon's 70-200mm f/2.8 lenses. There are also f/4 counterparts, which are much cheaper,

but can also do a good job in creating out-of-focus blur, although the f/2.8 versions will usually have better bokeh.

For primes, I'll mention some when I discuss primes.

Fast Lenses

Lenses with aperture sizes of f/4 and below are what we call fast lenses, but nowadays, shooters find an f/4 setting as quite slow given the abundance of f/2.8-f/1.4 lenses.

Fast lenses are primarily used by many to combat motion blur and camera shake in low light situations, but because fast lenses also create narrow depth of fields, they're perfect for creating background blur images. This will also work for you if you'd like wider shots. For a wider field of view, fast lenses are your best bet since you don't have the benefit of a narrow depth of field created by longer focal lengths.

They're really fast because it gives you around two to four stops worth of speed than other lens counterparts.

I've already mentioned some examples of fast lenses on the previous page. For wide angle fast lenses, examples are the Canon 24mm 2.8, Tamron 15-30mm f/2.8, and Nikon 14-24mm f/2.8 lenses.

As I mentioned earlier, it's harder to create background blur when using ultra-wide lenses so make sure to use focal lengths that are a little under normal, usually up to 10mm-15mm below the normal focal length sizes. Again, normal sizes are 50mm for full frames and 35mm for cameras with APS-C sensors. Examples are 40mm and 35mm lenses for full frames and 20mm and 24mm lenses for cameras with APS-C sensors.

The biggest advantage of fast lenses when it comes to creating background blur comes in the form of quality bokeh mostly due to fairly large apertures. Manufacturers also seem to use higher grade glass on fast lenses. Most of these fast lenses create gorgeous creamy soft blurs and light circles. We will be discussing light circles in another section.

Macro Lenses

I mentioned this in our focal distance discussion. Macro lenses have the ability to take you up really close to any subject. They're quite commonly used for really tiny subjects like insects and flowers, but you could also use it for portraiture, food, and still life because they're pretty sharp to use and their background blur quality is usually top notch. Some notable macro lens examples are Nikon's 60mm f/2.8, Canon's 100mm f/2.8L, and 50mm macros across most brands.

Recommended Gear: If you're a bit out of budget or don't want a dedicated macro lens, you may opt to get a macro extension tube. There are some drawbacks, but it will allow you to get in closer to your subject.

Prime Lenses

Primes are lenses with a fixed focal length. The quality of its optics are expected to be far superior than zooms due to the fact that the optics of prime lenses are built specifically for a given focal length, unlike zooms where the glass elements compensate for changes in focal length.

Most primes are fast lenses. The 50mm f/1.4 lenses are the primary favorites in this category across all brands for creating background blurs. If you'd like something cheaper, the 50mm usually has an f/1.8 counterpart, although take notice of the number of aperture blades as this affects the shape of the light circles. Again, more on light circles later.

The 50mm's are considered normal lenses for full frame cameras (35mm for cropped sensors) so it's the closest you can get to what the human eye sees in the real world (as compared to distortions caused by wide angles and compression from using telephotos).

Canon and Nikon's 85mm f/1.4 lenses and even the f/1.8 lens counterparts are said to be pretty exceptional. They are perfect for portraits.

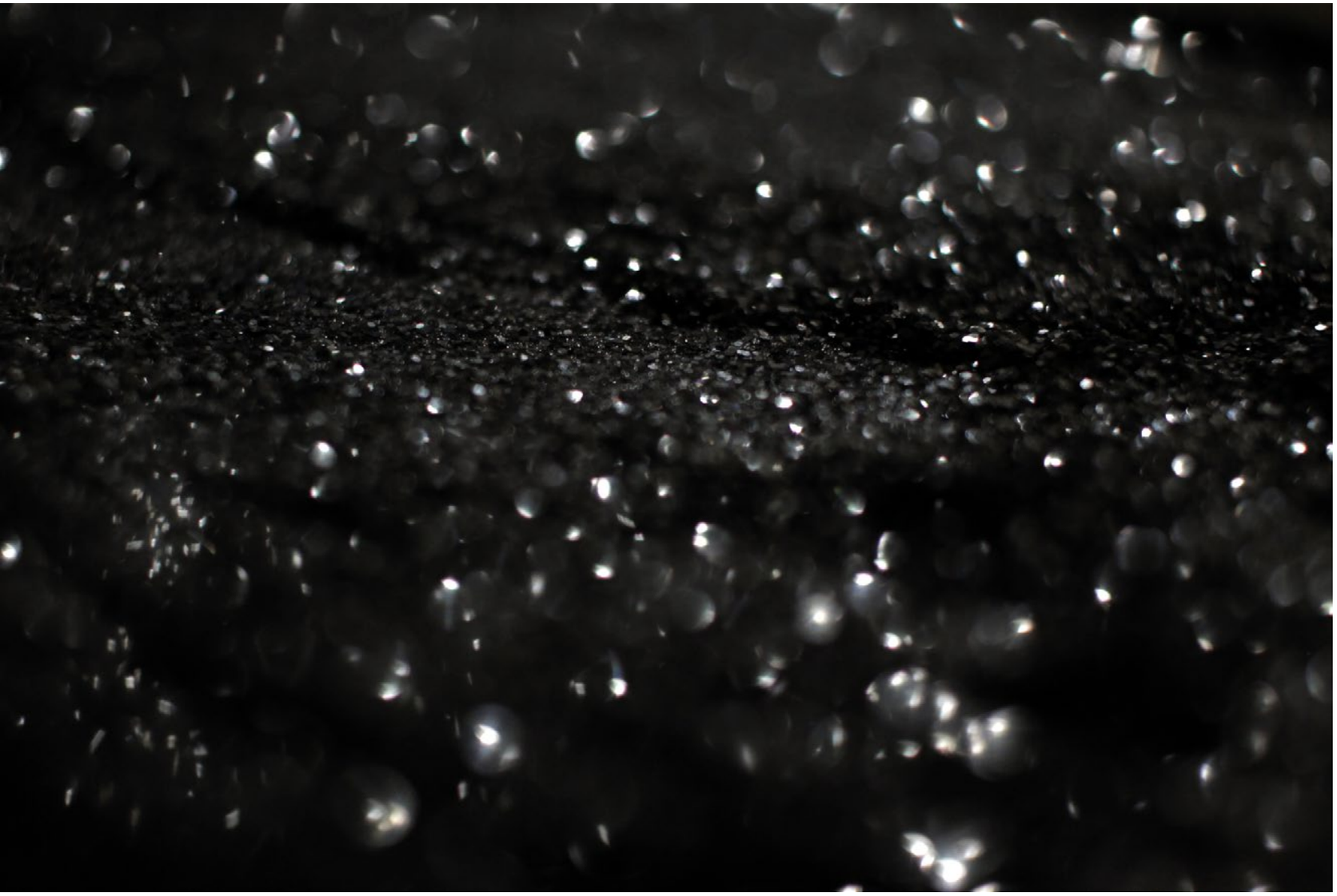
Combination Lenses

Don't go out searching Google for *combination lenses*. There's no such term since I just made it up. What I mean by combination lenses is that you can have a combination of what's listed above. A macro prime lens with a telephoto focal length, a fast telephoto, or a fast prime lens are examples.

For example, the Nikon 105mm f/2.8G and Canons EF 100mm f/2.8L lenses are both prime, macro, telephoto, and fast lenses.

If you're wondering about what gear I use, my current lens arsenal includes the Canon 24mm f/2.8 STM lens and the Canon 55-250mm f/4-5.6 IS STM lens for my current regular shooting needs. I'm looking at getting a 10-22mm lens for video shooting, but that's about it.

When I was using Nikon, I used the 50mm f/1.8 lens, 60mm f/2.8 macro, 70-210mm f/4-5.6, and the kit lens 18-70mm f/3.5-5.6. I used my kit lens 70% of the time, and the 70-210mm 30% of the time for awesome sharp background blur portraits. I've used the 60mm macro lens for food shots with nice background blur, and I hardly used the 50mm.



Photos by Karlo de Leon

This is what a pack of glitter, spread around a surface, looks like up close. Can you see the area of acceptable sharpness? As you can see, light circles are created around the DOF. The closer the light circles are to the DOF, the smaller and more prominent the circles.

CREATING LIGHT CIRCLES

Finally, to complete our discussion on creating beautiful background blur, let's talk about those nice light circles (also called blur circles or bokeh circles) and how to create them. It's actually pretty simple.

Those points of light that look beautiful when blurred are actually small light sources captured in the frame. You will notice that it's more evident in photos taken at night rather than daytime since small, artificial light sources like street lights, car lights, light bulbs, and pin lights are more available during the evening. It can also be created by really small reflective surfaces like mirrors or metallic objects.

The light intensity and size of the light source or highly reflective surface matters. The smaller and more intense the light source is, the sharper the circles seem to be. The circles also seem to be sharper when closer to the DOF. Obviously, the distance also affects the size. The quality

Take a look at the light circles in this photograph. They look like donuts, don't they? An older type of lens, called the mirror reflex lens, has circular mirrors in the middle of the lens that causes the donut hole light circles. Do you find this type of aperture shape appealing, or do you find it too unnatural?

of lens also affects this. Remember, glass quality affects blur quality.

So how do you make them? All you need to do is create background blur, like we've already discussed, and make sure your background has small light sources. One small light source equals one circle. The more the merrier.

The type of lens you're using also affects light circles. Fast lenses are seen to be more desirable when creating these light circles. Sure they're more expensive, but the quality of bokeh makes for beautiful light circles.

Holiday lights turn into bright light circles.

Key Lesson: The shape of these circles take the form of the aperture hole. The lens aperture is made up of blades that overlap each other in a circular order to create the aperture hole. The shape of this hole will be the shape of the light circles formed. Some of the cheaper lenses will only have five blades, making the shape of the aperture and evidently the light points pentagonal. Many photographers find this ugly. Lenses with more blades will look more roundish and natural looking.

Recommended Reading: Did you know that because light circles take the form of the shape of the lens aperture, you can shape them into anything you'd like? You could create a heart, a fish, or even your favorite logo. Read this to find out more: Bokehlicious Valentine.

Now let's take a look at these examples of light circles.

Daytime light circles created by light passing through leaves.

Night time. Red circles are from brake lights. Longer red lights at the bottom are from street reflections, possibly due to rain. Light circles on the top right are possibly pin lights from a ceiling, and the two bright circles on the left edge near the middle part are car headlights. You'll see the light beams right below too.

Shooting Exercise:

Try to replicate the light circle effects on the photo on the left by creating a fully blurred shot with light circles. You may choose to do this at night since it'll be easier to do so.

1. Look for a place where you'll find a lot of small light sources. The photo examples I've shown you should give you some ideas.

2. Switch off autofocus on your camera and/or on your lens. You may not be able to do this activity if your camera doesn't have manual focusing.

3. Point your camera towards the small light sources.

4. Using your lens's focus ring, manually set your lens out of focus. To do this, just turn the ring until it blurs out and the light sources turn into light circles.

That's it, you should now see the light circles through your viewfinder.

Don't forget to turn autofocus back on if you've turned it off during the exercise.

FINAL

Remember those three questions I asked at the beginning of the guide? Can you confidently answer them now?

1. Is it possible to use an aperture size of f/2.8 and not have background blur?
2. Is it possible to use an aperture size of f/22 and still produce significant background blur?
3. Can a 200mm lens create a beautiful background blur effect at f/16?

If you can confidently answer YES for all three questions, then you're good to go!

Self Check Quiz

1. Creating light circles require _____ light sources.
2. Which type of lens has a focal length above what is considered normal?
3. What type of lens allows you to focus really close to your subject while other lenses cannot?
4. What type of lens has a fixed focal length?
5. What is the term used to describe the quality of blur?
6. True of False. When creating wide depth of field, out-of-focus blur is completely eliminated.
7. True of False. Focus distance should be prioritized in creating background blur since it overrides the other two depth of field factors.
8. What are three determinants of depth of field?

Photo by Karlo de Leon

Final Shooting Assignment: Alright! As a final assignment, take some time out around your neighborhood or some other place of choice to create shots with interesting subject-background combinations. Use the knowledge that you've gained on how to create beautiful background blur and incorporate them into your shots. Keep an eye out for that beautiful winning background blur piece!

Extra Shooting Challenge: Create a night shot with light circles in your background similar to the shooting assignment in the Light Circles section, this time, though, with a proper subject in place.

a. Find a background you can use that will produce the light circles. You may use the same scene in the last activity as long as you'll have good lighting for your subject.

b. Using the knowledge that you've gained on how to create background blur, take a photo of your chosen subject. The small light circles should show up behind your subject.

Alright, we're done. You are now ready for battle. Take as much background blur images as you wish.

Remember, creating background blur is an exercise of both creativity and technical knowhow, so practice as much as you can.

If you'd like to grow further in your photography to become a creative genius, try these two Photzy creative guides: The Creativity Catalog and our newer guide Producing Top Photography in Bad Weather (because photography in bad weather allows you to exercise your creative juices)**.**

Answer key to Self-Check Questions:

If you'd like to see the explanation, just review the section specific to the Self Check Quiz. For certain answers, the explanation may be found in a previous section.

Depth of Field - Wide and Shallow

1. Focusing
2. Depth of Field
3. Wide Depth of Field
4. Shallow/Narrow Depth of Field
5. Focus Distance or Focusing Distance
6. Near Limit, Far Limit

Aperture Size and How It Affects Depth of Field

1. F – also Focal Length and Focus Distance
2. T
3. F – decrease the f/ number
4. T

Focus Distance and How It Affects Depth of Field

1. T
2. T
3. T

Final Self-Check Quiz

1. Small
2. Telephoto
3. Macro
4. Prime
5. Bokeh
6. F
7. F
8. Aperture Size, Focal Length, and Focus Distance

About the Author

Karlo de Leon is a travel & lifestyle photographer and small business consultant. He has extensive experience in technical training and coaching and has given talks, workshops, and classes on photography to companies, organizations, and the academe.

He also has special interests in lifestyle design and pursuing a positive prolific life.

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