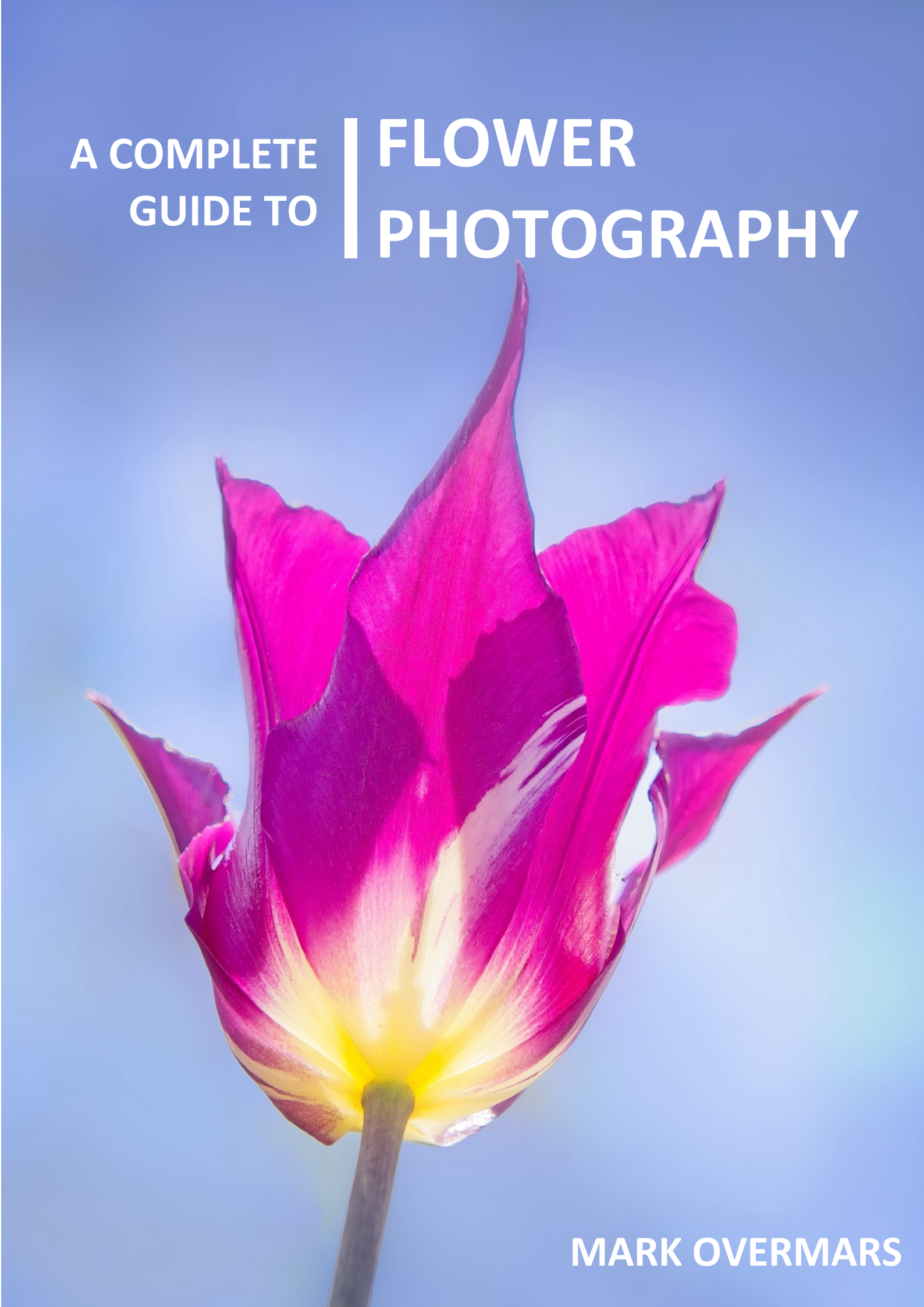
A COMPLETE GUIDE TO FLOWER PHOTOGRAPHY



MARK OVERMARS

A Complete Guide To

Flower Photography

Mark Overmars

2026

First electronic edition, April 2026

An electronic version of this book can be downloaded for free from

https://www.insectenfotograferen.nl/book

For inquiries, contact us through https://www.insectenfotograferen.nl/contact.

Preface

During 2022-2024 my main photography focus was insects. This led to two books: *My Journey into Insect Photography* and *Photographing Butterflies and Dragonflies*. Both books can be downloaded for free from my website https://www.insectenfotograferen.nl/book. Photographing insects is very rewarding but it can also be rather frustrating. You have little control over the subject and light, and you must always act quickly, before they are gone.

So, in 2025 I decided to pick a new topic: flower photography. Flowers can be found everywhere, and they come in many different shapes and color. Flowers don't move, so you have ample time to photograph them. Creating a desired composition is easier, the light can be manipulated, and you have more opportunities to play with the mood of the image.

Flower photography may sound easy, but the contrary is true. You can find huge numbers of flower images on the web but many of them suffer from various issues. The background is a major concern. Because flowers often grow close to the ground or in bushes, the background is often close to the flower. This makes it busy and distracting. Flowers also have a large depth, that is, the distance between the closest and furthest point from the lens is large. This makes it hard to get the entire flower in focus. We will discuss these and many other challenges to creating beautiful and original flower images.

A flower, shot in a botanic garden. 100 mm lens, 1/350 s shutter speed, aperture f/6.7.

This book provides all the information you need to produce wonderful flower shots. I will discuss the best equipment to use, important photography techniques, composition, the use of light, editing

your images, and a lot more. The book contains some 300 shots of flowers to help explain the concepts and provide inspiration. These images were taken in the Netherlands, but you will find similar flowers everywhere. For each shot, the focal length of the lens, shutter speed, and aperture are given. When a flash was used this is also indicated. (I decided not to include the ISO value as for modern cameras this is not much of a concern anymore, except in low-light conditions.)

Equipment and software

Unless indicated otherwise, for this book I used the following equipment:

- Camera: Canon R7 mirrorless APS-C camera.
- Canon lenses: An RF 100 mm macro lens, an RF 100-400 mm telephoto lens, an RF-S 18-150 mm kit lens, and sometimes a Canon RF 50 mm f/1.8 lens for a wide-open aperture.
- Flash: Godox V350 speedlight.

The images in this book have been processed using ON1 Photo RAW (www.on1.com). This is a photo editor with functionality similar to Adobe Lightroom plus the most important elements from Adobe Photoshop, like the use of layers.

Contents

The book has six chapters, each consisting of several sections discussing particular topics.

- In **chapter one** I provide some basic knowledge and background information to get you going. I recommend that you try some flower photography after reading this chapter. That will make it easier to appreciate the other chapters where we delve deeper into many relevant topics.
- **Chapter two** discusses the photographic process in more detail. I describe the best cameras and lenses for flower photography, exposure settings, focusing, dealing with the background and foreground, and special situations, like photographing flowers with dew, shooting indoors, and working in greenhouses.
- Composition is important for all pictures, and flowers are no exception. In **chapter three** I discuss basic composition principles. Where do you place the flower in the frame? How to achieve a harmonious image, or a strong contrast? What is the role of the foreground and the background, and how can symmetry and repetition be used?
- Without light it is impossible to take pictures. With the correct lighting, flowers become considerably more beautiful. In **chapter four** I discuss the use of ambient light, flashes, torches, backlight, and under- and overexposing images.
- Flowers have beautiful details. To photograph such details, techniques from close-up and macro photography are required. This is the topic of **chapter five**. I discuss the underlying concepts, the best equipment, and techniques like focus stacking.
- Images can be improved by processing them with photo editing software. Many people are reluctant to do this, but modern photo editors are rather easy to use, and it is possible to enhance shots with just a modest investment in editing. **Chapter six** discusses the most important techniques and how to apply them to flower shots.

I hope you will enjoy photographing flowers as much as I did when preparing this book.

Mark Overmars, April 2026

Table of contents

1. Getting started

In this chapter we treat the bare minimum you need to know to take nice flower shots. We will discuss finding flowers, equipment, the best settings, composition, light, and various other topics. After reading this chapter, you are recommended to go outside with your camera or mobile phone and start shooting flowers. In the later chapters we will explore all these aspects in more detail and discuss more advanced topics.

Where to go?

What is the best place to take flower shots and what should you take along?

Most of the year (depending on where you live) there are flowers to be found in many places. People who like to photograph flowers often have flowers in their garden. This is the most convenient place to photograph them. You have all the time in the world, any equipment and lights can be used, and you can pick some flowers if that helps to photograph them.

If you don't have a garden, plant some flowers in pots on your balcony. It might be a bit harder to photograph them at such a location as there might be little room to maneuver on the balcony. But to get the best shot the pots containing the flowers can be moved. The pots can even be taken inside to photograph the flowers there.

Flowers can also be found in other people's gardens. I regularly go to neighborhoods where people have gardens in front of their houses. There is a large variety of flowers to be found in such gardens. Of course, you cannot enter the gardens without permission. But often there are enough flowers near to the walkway that can be photographed. And by using a telephoto lens, flowers that are a bit further away can be shot as well. In such a place it works best to shoot handheld. Setting up a tripod next to a person's garden might look suspicious. Sometimes people ask what you are doing but their reactions are usually positive when you explain that you are photographing the beautiful flowers in their garden.

Another option is to visit a park or a special flower garden. Public flower gardens can be found at many places. Often entrance is free but sometimes a fee must be paid. It is (almost) always allowed to photograph the flowers but better check whether a tripod is allowed. Some gardens don't like that. And, of course, you must stay on the walkways.

The castle gardens in Arcen are beautiful (paid) gardens in the south of the Netherlands. 18 mm, 1/350 s, f/11.

Botanic gardens are especially interesting as they contain flowers that don't occur naturally in your environment. In the U.S. alone there are close to a thousand botanic gardens. Also in the Netherlands, where I live, there are several amazing botanic gardens. Some of these gardens have greenhouses to showcase tropical flowers, which can produce great images.

And, of course, you can go into nature to find and photograph flowers in their natural habitat. The variation of flowers might be a bit smaller, but the surroundings can be a lot nicer.

Amazing flowers can be found in botanic gardens. 100 mm, 1/350 s, f/8.

Season

Spring is always considered the best time for flowers, but there are flowers most of the time. This depends a lot on where you live. In the tropics there are flowers all year round. In temperate regions there will be less flowers in winter while in colder regions flowers only appear during a short period.

In my country flowers can be found in almost every season. In the middle of the winter this can be hard, but it is also possible to buy some cut flowers and photograph them at home. At the end of January the first snowdrops appear, soon followed by other bulb flower species, like crocus and daffodil.

Bulb flowers are great for photography. I happen to live in one of the areas in the Netherlands where there are many flower bulb fields. April is the month in which they bloom, and when you are lucky with the weather, they can be photographed. Soon, the flowers will be removed because the bulbs are the important parts and the flowers take energy away from them. So, there are normally just two weeks to take your shots.

Taking nice shots of flower bulb fields is harder than it might seem. The individual flowers quickly blend into colored regions without much contrast, which is not very nice. It is often better to concentrate on one flower or just a few. By taking a low point of view, the other flowers can be used as background, like in the righthand image below.


Two shots of a flower bulb field. Left shot 40 mm, 1/350 s, f/18. Right shot 55 mm, 1/500, f/8.

Tree blossoms are a great subject for flower photography early in the year. Everybody has seen pictures of the well-known cherry blossoms that can be found in many gardens. But many trees and shrubs in the wild have wonderful blossoms as well. And because the blossoms are often higher up you can photograph them against a nice, blurred background.

Different plant species bloom in different periods. So, you are strongly advised to visit garden multiple times in different seasons. There is always something new to photograph. You can photograph flowers that are still in the bud, flowers that are young and only partially open, flowers that are completely open, and flowers that start to die. The light will also be different, and the background color will change throughout the year.

Blossoms can lead to wonderful shots. 100 mm, 1/350 s, f/8.

The weather

Many people go out shooting flowers when it is sunny. The flowers have bright colors when they are in the sun, and the images look joyful. But sunny weather does not give the best flower shots. The main problem is that there will be harsh shadows. Some shadows can be nice but if they get very dark, they will hamper the image. Even though our eyes can easily adapt to these shadows, the sensor of the camera is unable to do that. Also, the contrast between light and dark is exaggerated which can be distracting. When the flower or the leaves are shiny, direct sunlight can result in overexposed areas where there is hardly any color left. There are ways to reduce these problems, using diffusers, a flash, or HDR photography, but they might not produce the result you're after.

It is better to shoot flowers when there are some thin clouds. This will result in diffuse light that comes from all directions. This will remove the harsh shadows, and the flowers will look nicer and more delicate. The colors can become a bit dull, but this can easily be corrected when editing the image. We will discuss light conditions in more detail in chapter 6 on light.

A major problem when photographing flowers is wind. Many flowers are delicate and grow beyond the rest of the plant. As a result, flowers catch a lot of wind. And once a flower starts moving in the wind, it is very difficult to photograph it. It will be hard to create the preferred composition and focus on the desired position. The movements can also lead to motion blur. Try to use something or your body to block the wind.

What to take along?

My general advice is to carry as little as possible, unless it is required for very specific shots.

You obviously need a camera and a lens. Any modern camera will do, although there are some camera features that can be useful for certain types of flower shots. We will discuss these in chapter 2 on page 22. A mobile phone can produce nice flower images as well, as we will see on page 8.

There are many different types of lenses, and the choice depends on the shots you want to take. In most situation a basic (zoom) lens works great, but a telephoto lens has its use as well. And for close-up shots of small flower details a macro lens is useful. We will discuss lenses in chapter 2 on page 26.

So, there are many options, but for now any camera with a lens with a focal length of around 50 mm will be fine. Most of the time there is enough light, but when shooting flowers in the evening or indoors, a flash can be useful.

Many photographers like to use a tripod for their flower shots. It enables them to carefully create the best composition for their shots. I recommend initially not to use a tripod. It is a lot of extra weight to carry around, tripods are not allowed everywhere, and each shot takes a lot longer. Find out how well you can shoot handheld. If you conclude that a tripod would help you, then start bringing it along.

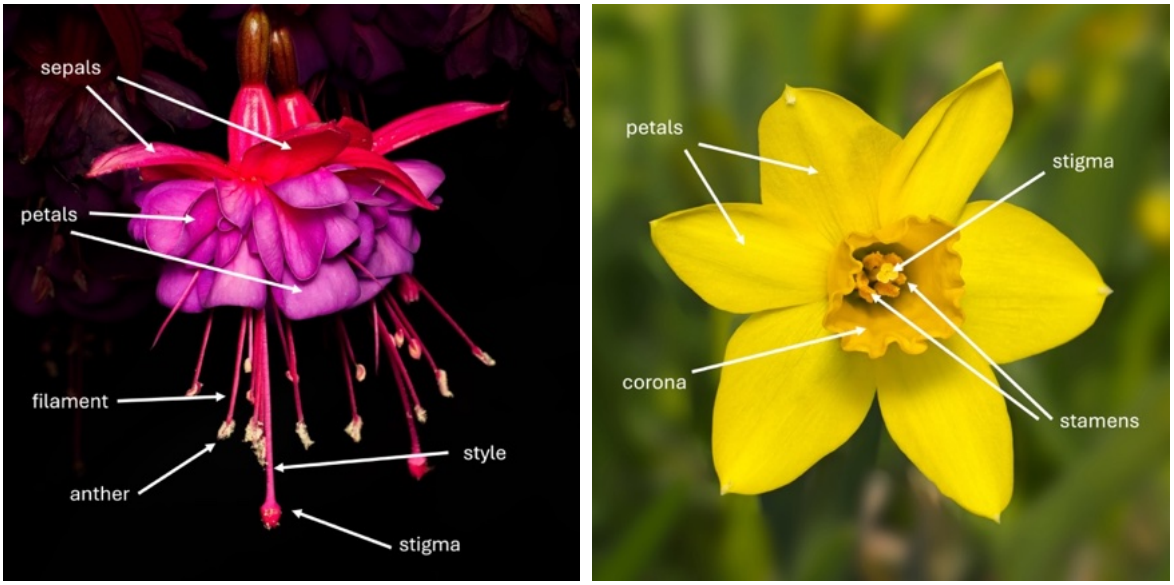
There are lots of other accessories that can be used for flower photography, like various clamps, diffusers, reflection screens, backgrounds, and so on. We will treat them all later in this book. They all have their use, but none of them are necessary to take great flower shots. I do recommend bringing a large plastic bag that you can kneel on, to take shots from a low viewpoint. I always wear kneepads for this reason, but that might be a bit of an overkill.

Anatomy of a flower

Flowers consist of several different parts, and it is useful to know the most important terms.

The anatomy of a flower is rather complex, and it is not the same for all flowers. Knowing the most important parts helps to understand what you are photographing. Also, we will refer to these parts throughout this book.

- **Petals**. The petals are the colorful parts of the flower that extend in all directions. These are designed to attract insects to the flower. In many flower shots, the petals attract all the attention. The number of petals can vary. Many flowers have numbers from the Fibonacci sequence: 3, 5, 8, 13, 21, and 34. Odd numbers tend to be more attractive, especially 5.
- **Sepals**. These are small, often green, leaf-like elements at the bottom of the flower. When the flower is still a bud, they protect it and can look nice in images. But when the flower is blooming, the sepals are not the nicest parts of the flower because they are old and often damaged. But sometimes they look great, like in the fuchsia photo below. For some flowers the sepals are prominent while for others they are hardly visible. You might not look at the sepals when taking a shot, but they can enhance or hamper the image.
- **Stamens**. These are the male parts of the flower that produce the pollen. Sometimes they lie deep inside the flower but for other flowers they are clearly visible. For most flowers there are several of them that extend in different directions. They form interesting subjects for close-up and macro photography. A stamen consists of the **anther** on top that is connected to the flower with the **filament**.
- **Pistil**. This is the female part of the flower. It consists of the **stigma** at the top that collects the pollen. The stigma is connected to the flower with the **style**. For many flowers there is just one pistil. For other flowers there can be three or more pistils. When clearly visible, the pistil is a good focus point in a flower and, together with the stamens, a great subject for macro photography. Most flower have both stamens and pistils, but some flowers are female and only have pistils while others are male and only have stamens.



The anatomy of a fuchsia and a daffodil.

- **Corona**. Some flowers, like the daffodil, have a crown-like structure between the petals and the stamens, called the corona. This will help the insects collect the pollen. It can look very

nice when photographing from the side. Or you can shoot into the corona to show the stamens and stigma.

Many flowers direct themselves towards the sun as it moves across the sky. You can easily photograph such a flower from above or from the side. Make sure you keep enough space in the image in the direction the flower is “looking”. Other flowers hang down. Such flowers are best photographed from the side, although there are also ways to shoot them from below, which we will discuss later.

Many flowers have a long stem that is the tallest part the plant. This makes it easy to photograph them in a way that separates the flower from the background. Other flowers grow from the side of branches, especially flowers from shrubs or trees. In such a situation you must carefully position your camera such that the branch forms a nice, often diagonal, line in the image.

Composite flower

Composite flowers appear to be a single flower but really consist of many smaller flowers. Typical examples are daisies and sunflowers. They have the following elements:

- **Ray flowers**. These are the large petals on the outer edge. They can be simple petals, but they can also have a stigma to collect pollen. Some composite flowers have no ray flowers at all. For example, a thistle is a composite flower, but it has no ray flowers.
- **Disk flowers**. The center part of a composite flower is called the **disk**. It consists of many small flowers, sometimes in a spiraling pattern. They can be tubelike, or they can be complete flowers with their own petals. They contain the stamens and stigmas. Because they are so small, they are also called **florets**.

You can photograph a complete composite flower, but it is also interesting to zoom-in on the disk or even try to take macro shots of individual disk flowers.

A composite flower. If you look carefully, you can see all the florets in the disk at the center. 50 mm, 1/1500 s, f/1.8.

Not all concentrations of small flowers are composite flowers. For example, the onion flower at the start of this chapter has many small flowers, but these do not form a disk. Their stems radiate from a common point. Such a flower cluster is called an **umbel**.

Using a mobile phone

Mobile phones can produce nice flower shots, but they have some limitations.

There is a saying: “The best camera is the one you are carrying with you.” And for most people, that is their mobile phone. When you see an interesting flower but don’t have your camera at hand, the mobile phone is the obvious device to use. So, before we delve into the use of cameras, let us briefly discuss the use of mobile phones for flower photography.

The quality of the cameras in mobile phones has improved considerably over the past years. They can produce beautiful pictures in high resolution. The camera software is designed in such a way that it is very easy to use. Most camera apps included with the phone default to the easiest, most automatic settings. All you have to do is point the camera toward the flower and click the shutter button. The device is pretty good at choosing appropriate settings, and it uses software to improve the image further. Pictures tend to be rather bright with saturated colors. For flowers this can look nice, although it is sometimes a bit too much.

A flower shot with an iPhone. It has rather saturated colors.

Control

To get the best flower shots, more control over the settings is desired. This is possible on mobile phones. In the standard iPhone and Android camera apps, you can click on the image to determine the place to focus on. By sliding your finger up or down the exposure can be changed. But the control possibilities are rather limited. On Android phones, the camera app has a Pro mode. When switching to that mode, many settings can be controlled.

There are other camera apps available for mobile phones. On iPhones *Project Indigo* by Adobe is an interesting, currently free, app. It provides a lot more control over the various settings. By clicking the Pro button, the shutter speed, ISO value, focus distance, and white balance can be changed. The app currently only works on modern iPhones and is not yet available for Android. There are also various paid camera apps available.

A flower, shot with the camera app Project Indigo on an iPhone.

Mobile phones normally produce images in JPG format. These are the easiest to use, but as they contain only limited color information, they are not well suited for editing the images later. Modern phones have the option to save in RAW format. For example, on the iPhone Pro devices you can use ProRAW, which saves the images in DNG format that all photo editing apps support. Check out the camera settings for this.

Aperture

There is one setting that cannot be changed on mobile phones, and that is the aperture. The reason is that all mobile cameras have a fixed aperture. And unfortunately, the aperture is a very important setting when photographing flowers, as it controls the depth of field. (There are rumors that future mobile phones will get a changeable aperture. That would make a huge difference.) Some camera apps have an advanced aperture setting (on the iPhone only in portrait mode) but this tries to simulate the effect of the aperture in software. It does not work well for flower shots.

The depth of field indicates the range of distances at which the image is sharp. You normally control this with the aperture. The smaller the depth of field, the blurrier the background becomes. And flower images with a blurred background look great. When there is too much detail visible in the background, this is distracting. We will discuss depth of field in detail in chapter 2 on page 40.

Because mobile phones have a fixed aperture you cannot control the depth of field. And because mobile phones have a very small sensor, the depth of field is large. For many types of photography this is great. For example, when shooting landscapes or buildings most people prefer that everything is sharp. But when shooting flowers this is not the case. The background will not be blurred enough and contains too much detail. This is the main problem with flower photography on a mobile phone.

Because of the large depth of field, too much of the background is visible in this shot taken with an iPhone.

Modern mobile phones allow you to take flower shots from very close range. And for older phones there are inexpensive solutions for this. We will discuss macro photography with mobile phones in detail in chapter 5 on page 179.

Picking a flower

There are many different flowers that can be photographed, so how to pick the best one?

When you go out to photograph flowers, there are huge numbers of potential candidates to shoot. Rather than taking pictures of lots of different flowers, better first carefully inspect some flowers and decide which ones are the most promising to result in nice images.

Which of the many flowers on this shrub should you photograph? 100 mm, 1/350 s, f/8.

The perfect flower

Normally, the flower should be complete and have no dirty spots, spider webs, or dust. This is particularly important when taking a close-up shot of the flower or a macro shot. So, best look around for the perfect specimen. When required, some dirt can often be removed. For this, you can use a brush or a blower that is normally used to clean the lens. However, be careful that you do not harm the flower. Sometimes it is also possible to remove certain blemishes when editing the image afterwards, but it is always better to start with the best possible flower.

Below you see an example. This should make for an interesting shot with all the petals and the yellow stamens in the center, but the hole in the top petal draws all attention away from the center. Such a hole is also very difficult to retouch in post-processing.

A hole in a flower can be distracting. 80 mm, 1/500 s, f/8.

The type of shot

There are a lot of different ways in which you can photograph flowers. A picture can contain a group of flowers with a nice background, or it can focus on a single flower. And macro shots can be taken of the details of flowers. Each of these types of shots requires a different flower to work with. For example, when shooting a single flower or a macro detail, a solitary flower is preferred. But for a more interesting composition, you might want to have multiple flowers in the frame.

A group of flowers gives a completely different shot than one or two of them. Both shots were taken from the shrub above. 100 mm, 1/350 s, f/13.

The background

The background plays a crucial role in creating a nice image and we will talk a lot about it in this book. Most of the time, the background should clean without distracting elements. The further the background is away from the flower, the blurrier it becomes, which is often a good idea. So, try to

find a flower that can be shot from a position where the background is uncluttered and far away. This usually requires a low point of view, so the flower should not be too close to the ground. It helps when the flower is directed in such a way that a shot from a low point is interesting. Using a wide-open aperture (like f/2.8) will help to make the background blurrier but it will reduce the sharpness of most of the flower.

The colors or patterns in the background have an important effect on the image. It often helps when the colors in the background are monotone and somewhat contrasting with the color of the flower. For example, a flower shot against a (blurred) background of sand or rock can be more interesting than the usual green background caused by leaves or grass. But it can also be nice if some of the color of the flower is visible in the background, typically in the form of blurred flowers, like in the righthand image above.

Also consider the light. It helps when the flower is lit differently than the background. When the flower is in the sun while the background is in the shade, the flower will stand out much better in the image. Sometimes you can shoot towards the light to get interesting transparency effects in the flower. We will discuss light extensively in chapter 4.

Another shot of flowers from the same shrub. The water behind the flowers provides a clean background. 100 mm, 1/500 s, f/2.8.

Distracting elements

Distracting elements in your image should be avoided as much as possible. So, try to pick a flower where such elements are absent. Distractions can lie to the side of the flower, behind it, or in front of it. Sometimes you can remove some of these distractions. For example, you can remove some dead leaves. Or you can bend away some stems. Bring some clothespins to temporarily fix such objects away from the flower. It is also possible to cover part of the surrounding elements, for example, with a dark cloth.

It is normally acceptable to cut away some pieces of grass. Photographers often refer to this process as “gardening”. Be careful, though, and don’t destroy nature.

Note that it is nowadays easy to remove certain distractions during post-processing. Take this into account when selecting a flower. Elements that are separated from the flower can easily be removed, but elements that touch the flower or run behind it are much harder to get rid of.

Circumstances

Finally, take the circumstances into account. When there is wind, it helps to select a flower that is sheltered. Otherwise, it will move a lot, making it harder to focus.

Also think about where you can stand, sit or lie down to take the shot. Take care not to squash other nice flowers. If you want to use a tripod, find a flower where the tripod can comfortably be placed.

An interesting but dark background enhances the flower. 150 mm, 1/350 s, f/9.5.

Photographing

Photographing flowers is not difficult, but it helps to have some knowledge of the most important camera settings.

Modern cameras can be rather complex with a ton of different settings. Most of these settings are not relevant for shooting flowers, unless you want to take some very special shots. But some settings are important and can make the difference between a mediocre and a great shot. Here we only treat the basics. We will delve much deeper into the topic in the next chapter that is completely devoted to photographing.

Exposure

When photographing a flower, enough light should reach the sensor to correctly expose the shot. This is controlled by three settings. The shutter speed determines how long the shutter stays open. The shorter, the less light reaches the sensor. The aperture determines the size of the opening in the lens. The smaller the value, the larger the opening and the more light reaches the sensor. Finally, the ISO-value determines the sensitivity of the sensor. The larger the value the more sensitive the sensor is and the less light is required for a correct exposure.

Shutter speed and ISO-value are not very important for most flower photography. But the aperture has a large influence on the image because it also determines the depth of field. When using an open aperture, like f/2.8, only a small part of the flower will be sharp, while with a narrow aperture, like f/11, the complete flower will be sharp. But with a large value also the background becomes less blurred, which can be distracting. The image below shows the difference.

In the shot on the left aperture f/2.8 was used and in the shot on the right f/11 was used. 100 mm, 1/90 s.

Modes

Most cameras have a dial on the top to select the exposure mode. The mode determines which exposure settings can be set by the user and which ones the camera decides. All cameras have an automatic mode, indicated with a green AUTO sign or A. When using this mode, the camera determines all the settings automatically. Simply point the camera to the flower and press the shutter button. When getting started, this mode is fine, but it will limit you in many ways.

Cameras also have a Program mode, indicated with a P. In this mode the camera automatically determines the exposure settings as well, but other settings, like where to focus, can still be determined by the user.

Because aperture is so important, I recommend shooting in A or Av (aperture) mode. In this mode you can set the aperture with a dial, controlling the sharpness and depth of field in the image. The camera will determine the best shutter speed and ISO-value for a correct exposure.

Many cameras also have a mode indicated with a flower symbol. You might think that this mode is for flower photography, but the mode is meant for close-up shots. When taking a close-up shot of a flower this mode can work well, but for flower shots from a larger distance, this is not the correct mode to use.

Focus

In automatic mode the camera determines what to focus on. When photographing a flower from a distance, this is normally correct. But when getting closer, you want control of the focus position. Because it is often impossible to get the complete flower in focus, the precise focus point is important. Often the stamens or stigma are the best focus position.

To focus precisely, manual focus can be used, but this is not necessary, and difficult to get right. It works better to use the autofocus of the camera, but select a small focus area, preferably spot focus. With spot focus the focus position can be indicated exactly.

I recommend setting the autofocus to continuous (called servo in Canon). Otherwise, the camera focusses only once when pressing the shutter half down. Because of tiny motions of the camera or the flower, this may no longer be correct when taking the shot. In continuous mode, the camera keeps adapting the focus till the shot is taken.

It is important to determine the position to focus on. In this case, the flower at the front was used as focus point. 100 mm, 1/350 s, f/13.

Light

Light is crucial for photography. When photographing, always be aware of the light. Consider what type of light there is, and where it comes from. Flowers can look completely different when shot in bright sunlight or on a cloudy day. And it is important to consider both the light on the flower and the light on the background.

Light produces shadows. Shadows are harsh when there is a single powerful light source, like the sun. Shadows are much softer when the light is more diffuse and comes from multiple directions. As indicated earlier, it is often better to photograph flowers on a day with thin clouds than on a sunny day. The light will be more diffuse, and the shadows will look nicer. On a sunny day, photograph flowers in the shade or use your own body to cast a shadow on the flower.

When photographing in the sun, the direction of the sunlight has a strong influence on the resulting picture. When the sun is behind you, most of the flower will be equally lit, but when the sunlight is coming from the side, parts of the flower will cast shadows on other parts. This leads to strong contrasts but also adds more depth to the image.

When the flower is in the sun, try to find a direction such that the background is in the shade. This will draw more attention to the flower. The reverse, where the flower is in the shade and the background is in the sun can give some special effects, but it is difficult to produce a balanced shot, so initially you better avoid this. Backlit flowers, shot against a very light background or against the sun can be beautiful though, and we will treat them in chapter 4 on page 115.

When the flower is too dark, a flash can be used to lighten it up a bit. When your camera has a built-in flash, try it from time to time. A flash will make the flower lighter and the background darker, but it can also introduce harsh shadows. We will discuss the use of flashes on page 124.

A flash puts more light on the flower and makes the background darker. 100 mm, 1/320 s, f/13.

Composition

Composition deals with the way in which the parts of an image come together to form a whole. Where is the flower in the image and what other elements are present that contribute to the composition? When composed correctly, the elements in the image lead the viewer to the most important part of the image. Composition is an important topic in photography, and we will devote chapter 3 to it. Here we briefly mention some of the important aspects.

When shooting a flower, you must determine where the flower is in the image. Many people tend to put it in the middle of the image. This works fine when shooting a flower straight from above or when you want to put the emphasis on certain details. But in many situations the center is not the most effective spot. When placing the flower at a third from the left or right, this often puts more emphasis on it. This is called the rule of thirds. This means that there is more background visible on one of the two sides of the flower.

A flower placed according to the rule of thirds. 400 mm, 1/350 s, f/8.

Color and texture are also important elements. To put the emphasis on the flower it helps when it is colorful or has an interesting shape or a lot of interesting details. The background on the other hand should attract less attention. Lines and other elements can be used to lead the viewer to the flower.

Editing images

By spending a little time editing images, they will improve considerably.

Once you have taken some shots of flowers, there is more work to be done. The images must be saved in a safe place, they must be organized for easy retrieval, and the poor shots must be removed. It also helps to spend a little time on editing the images.

All cameras can produce JPG images. The more expensive ones can also produce RAW images. RAW images store all the information recorded by the sensor in the camera, while converting to JPG simplifies or deletes some information. For the best results, the RAW images should be used. But these must always be edited prior to sharing. We will discuss editing RAW images in detail in chapter 6.

JPG images are a lot easier to deal with. The camera has already applied some processing to sharpen them, remove noise, and make the colors more vivid. The camera also applies settings like white balance and creative filters to the images. JPG images are considerably smaller than RAW images and can immediately be used on social media or sent to a printing service. But the quality of JPG images is somewhat less.

This unedited JPG image produced by the camera is ready to be used, even though ISO 4000 was used. 70 mm, 1/350 s, f/22.

You are recommended to also spend a little bit of time editing your JPG files. This can considerably improve the images. Both Windows and MacOS contain a Photos app that can be used for this. No additional software is required. These apps are easy to use and more powerful than you might think. Here are some of the edits you might want to apply.

- **Cropping**. Cropping means remove part of the image. Cameras produce images that are considerably larger than needed for most purposes, so there is no problem in removing part of them. You can keep the aspect ratio the same or change it to, for example, produce a

square image. Cropping has many uses. By removing a large part, the flower becomes larger in the image, showing more detail. Cropping can also be used to determine the best composition. And by cropping distraction close to the border can be removed.

- **Tone and color**. Using several sliders, the tone and color can be adjusted. The tone (also called light) indicates the intensity of areas in the image. For example, it can help to make the shadows lighter or the highlights darker. With color sliders the saturation and vibrance of the colors can be changed. The sliders give you full control, but the app can also automatically determine the best settings.

Changing the tone and color can improve the image considerably, as can be seen in the righthand image. 250 mm, 1/350 s, f/8.

- **Filters**. Various filters can be applied to the image to change the overall appearance. It is also possible to convert the image to black and white.
- **Retouching**. Small distracting elements in the photos can easily be removed using retouching tools.
- **Noise and sharpening**. If there is still noise in the image the software can remove it. The image can also be sharpened to make all the little details more visible.
- **Vignette**. A vignette lets the image get darker towards the edges. When applied subtly it is not noticeable but still draws the attention of the viewer towards the center of the image.

Once you get the hang of it, editing images is very little work and will turn a good photo into an excellent one. All images in this book have received some form of editing. For most of them, this took one or two minutes; not more.

Below is an example of what some simple editing can do. The original image is at the top. This is a rather poor shot. The image is crooked, it is too dark, and the flower is too small. In the edited image at the bottom, the image was rotated a bit, it was cropped into a vertical image to put all focus on the flower. It was made a bit lighter, and colors were made more vibrant. By applying a bit of sharpening, the dew drops are more visible. Also, the wind turbine was retouched from the image. In total just two minutes of work.

The original image has rather poor quality. 14 mm, 1/30 s, ƒ/6.7.

The result after minor editing.

2. Photographing

To take nice flower shots the right camera and lenses are required. Different types of cameras and lenses will produce different types of pictures. Some knowledge is needed about photography concepts, like depth of field, exposure settings, and focusing techniques, which we will provide in this chapter. Flowers can be photographed in many ways and from many directions. This will have a large effect on the resulting image. A flower image normally consists of a foreground (the flower) and a background. Both play a crucial role, and we will discuss them in this chapter. We also examine some specific situations, like photographing indoors or in greenhouses.

The camera

What is the best camera for flower photography?

Interesting flower shots can be taken with any camera, even simple compact cameras and mobile phones. But for the best results a camera is required that gives control over various settings, allows for different lenses, and can be used with a strong flash. Also, it helps to process the flower images afterwards. For this, the camera should be able to store the images in RAW format at high resolution.

For a long time **DSLR cameras** were the prime choice for serious photographers. These cameras have a mirror that reflects the light that comes through the lens into the viewfinder. So, the viewfinder shows exactly what the sensor sees. When taking a shot, the mirror moves away, and the sensor records the image.

But all brands now focus on **mirrorless cameras**. As the name indicates, these cameras have no mirror and, hence, no optical viewfinder. Instead, they use an electronic viewfinder that displays the image as seen by the sensor. An optical viewfinder is a small screen with a very high resolution. The quality of electronic viewfinders has improved considerably over the years and, hence, there is no advantage in using an optical viewfinder anymore. Mirrorless cameras have many advantages. They show exactly what the sensor registers, they make less noise, they can focus on many more points, they have a faster burst rate, and so on. When considering a new camera purchase, I strongly recommend a mirrorless camera, but there is no need to replace a modern DSLR. Here are some aspects to consider when selecting a camera for flower photography.

Resolution

Each camera has a sensor that consists of many tiny pixels that record the amount of light. The **resolution** of a camera indicates the number of pixels the sensor contains. Most modern cameras have a resolution of 24 MP or more, that is, 24 million pixels in total. This is more than enough for almost all types of photography. But some cameras have a considerably larger resolution. The main advantage of this is that the images can be cropped without losing details. For flower photography this is normally not required, unless you want to show very small details of the flowers.

A disadvantage of a camera with a large resolution is that the pixels are smaller and, hence, can record less light. This can lead to noise at higher ISO values. Modern sensors have improved considerably in this respect, and software has become good in removing noise, but there is still a difference.

So, for flower photography a camera with a resolution of 24 MP is somewhat better than a larger resolution. More pixels are not needed, and the image quality is slightly better. But, especially with modern cameras, the difference is small. All images in this book were shot with a 32 MP camera.

Sensor size

Cameras come with different sensor sizes. A **full-frame** camera has a sensor size of 36x24 mm. **APS-C** cameras have a sensor of approximately half the size (24x16 mm), while **micro four-thirds sensors** have one quarter of the size of a full-camera (17x13 mm). A large sensor produces better quality images. With the same resolution, the size of a pixel is considerably larger on a full-frame camera than on an APS-C or micro four-thirds camera. Compact cameras have an even smaller sensor size, and mobile phones have a very tiny sensor (around 8x5 mm, depending on the model).

The same flower, as it looks on a full-frame camera and on an APS-C camera from the same distance with the same lens. 400mm, 1/350 s, f/8.

As indicated above, the larger the pixels, the better the image quality and the less noise there is in your image. So, a large sensor is in general better. Also, when the sensor size gets smaller, the depth of field (sharp area in the image) gets larger. This might sound positive, but it is not. When the depth of field increases, the background gets less blurry, leading to less appealing pictures. This is the main reason why flower photography with compact cameras or mobile phones does not give very good results.

Smaller sensors are sometimes called **crop sensors** as they crop the image produced by the lens down from its usual full-frame size. As a result, a smaller part of the scene is shown in the resulting image. In the image above you see the difference between a full-frame sensor and an APS-C sensor. Cropping the image is great for macro photography when showing small details. It also helps when photographing subjects that are far away, like birds, but this is not very relevant for flower photography.

So, I recommend using a camera that has a full-frame sensor or an APS-C sensor. All images in this book were produced with an APS-C sensor camera, because I also like to do macro photography (see chapter 5). Keep in mind that full-frame cameras and their lenses are more expensive and heavier than APS-C cameras.

Focusing

Cameras can, with the correct lens, automatically focus on a subject. The autofocus of cameras has improved considerably over the past couple of years and has become a lot faster. When photographing handheld, fast and precise autofocus is important. Because the flower is close to the camera, any small motion of the camera or the flower will change its distance to the camera and the focusing system must adapt immediately to that.

Focusing on flowers is not always easy, as we will see below on page 45. Sometimes manual focus is required. In such situations, good focus support tools in the camera are a great help.

Image stabilization

Modern cameras often have **image stabilization**, called **IBIS**, which stands for In-Body Image Stabilization. Some lenses also have built-in image stabilization. These two types of stabilization work well together, especially when camera and lens are from the same brand. Image stabilization considerably reduces the risk of motion blur due to motion of the camera. When shooting from a small distance, small changes in the camera position have a large effect on the image. If the camera

(or lens) does not have image stabilization, either a tripod should be used or a fast shutter speed, especially when using a telephoto lens. So, image stabilization is a plus for flower photography.

Focus stacking

Focus stacking is a technique to increase the depth of field, especially when shooting close to the subject. The technique takes multiple images from the same position, each with a slightly different focus distance. The sharp parts from these images are then combined to create a single image where everything is in focus. Focus stacking can be useful when photographing flowers, to get the complete flower in focus. In the past, focus stacking was a complicated technique. But modern cameras have functionality to create such series of images automatically (called focus bracketing) and some cameras can even combine the images in the camera. When you want to use focus stacking, such functionality makes life considerably easier. We discuss focus stacking in more detail in chapter 5 on page 182.

I used a Canon R7 APS-C camera with a resolution of 32 MP for this book. The camera has great auto-focus, IBIS, and functionality for focus stacking.

Lenses

A good lens is even more important than a good camera. What lenses can be used for flower photography?

There are many different types of lenses available. Each of these lenses has its advantages and disadvantages. It is certainly not the case that the most expensive lens is always the best. Depending on the type of flower shot a different lens might be needed. But, as we will see, a standard kit lens is suitable for most types of shots.

Focal length

Each lens has a **focal length**, indicated in millimeters. A standard lens often has a focal length of 50 mm. A telephoto lens has a focal length of 100 mm or more, while wide-angle lenses have a focal length of less than 35 mm. A lens with a large focal length is often called a **long lens**.

The **focal point** of a lens is a point in the lens through which the subject is projected onto the sensor. The focal length is the distance between the sensor and the focal point. This explains why telephoto lenses are so long. The distance between the sensor and the focal point is large. Wide-angle lenses on the other hand can be very short.

Increasing the focal length zooms into the subject and shows a smaller part of it. Stated differently, when the focal length is small you need to get much closer to the subject. For flower photography this is hardly ever a problem. Still, there are reasons to use a telephoto lens that we will discuss below.

A **zoom lens** has a variable focal length, for example between 24 mm and 105 mm. For flower photography this is not very important as it is easy to move closer or further away from the flower. A zoom lens is convenient, however, especially when working with a tripod.

The four Canon lenses I use. From left to right a fast 50 mm lens, a 100 mm macro lens, a 18-150 mm kit lens, and a 100-400 mm telephoto zoom lens.

When using an APS-C camera you must multiply the focus distance by 1.5 or 1.6, depending on the camera brand (the crop factor of the sensor), meaning that with the same lens you can/must stay farther away from the subject than when using a full-frame camera. For a micro four-thirds camera this factor is 2.

Maximum aperture

The **maximum aperture** is another important property of lenses. The larger the aperture (small f-value), the more light can reach the sensor. The depth of field also becomes smaller, as we will discuss below on page 40. A lens with a large maximum aperture is also called a **fast lens** because it lets in more light and allows faster shutter speeds. Having a larger aperture range, gives more flexibility in the type of shots and gives more control over the sharpness in the image. But lenses with a large maximum aperture are bigger, heavier, and more expensive, especially when they are zoom lenses or telephoto lenses. For shots where I want a very small depth of field, I use a 50 mm lens that has a maximum aperture of f/1.8.

Focus and image stabilization

It is important that the lens can focus quickly and precisely. There is a big difference between lenses in terms of the speed of the focusing motors, so pay close attention to these factors when considering which lens to use. For this information, search the Internet for reviews of the lens, or borrow/rent the lens and try it out. If focusing is too slow, it will be very difficult to get sharp pictures.

All lenses have a **minimum focus distance**. The subject must have at least this distance to the camera to be able to get it sharp. This can be a problem when shooting flowers. With certain lenses, this distance is too large, and it is impossible to get close enough for a nice shot, especially with smaller flowers. The minimum focus distance is closely related to the maximum magnification that we discuss in chapter 5 on macro photography on page 166.

Some lenses have **image stabilization**. This is important when the camera does not have IBIS. As discussed above, because you often shoot flowers from a small distance, camera motion easily leads to motion blur. So, image stabilization is important. The longer the lens (larger focal length) the more important image stabilization becomes.

A kit lens

Every camera brand has a relatively inexpensive kit lens available. And when buying a new camera, there is often a package deal including the kit lens for a lower price. Kit lenses are zoom lenses with a rather long range. Canon has a 24-105 mm kit lens for full frame cameras and an 18-150 mm kit lens for APS-C cameras, which I use. Sony has an 18–135 mm kit lens, and Nikon has an 18–140 mm lens. These lenses have image stabilization. The image quality is slightly less than the more expensive lenses, but this is hardly noticeable. They are versatile and can be used for many different types of pictures. For flower photography, they have the ideal zoom range.

The main disadvantage of kit lenses is that the maximum aperture is worse than for the more expensive lenses, that is, the minimum f-value is larger. For my kit lens, this ranges from f/3.5 to f/6.3, depending on the focal length. For most flower photography this is fine, but you lose some creative possibilities offered by a very small depth of field.

Kit lenses are suitable for close-up photography. The minimum focus distance is small for most kit lenses. Hence, it is possible to photograph flowers from close range. And if you need to get even closer, there are low-cost solutions to turn such a lens into a macro lens, which we will discuss in chapter 5 on page 169.

This flower was shot with my kit lens at 65 mm focal length. 1/350 s, f/8.

Using a kit lens for flower photography is convenient, especially when shooting handheld. The lenses are relatively small and, hence, easy to handle. Because of their zoom range, the desired composition can be obtained without the need for moving back and forth. Auto focus works well (with a modern camera), and image stabilization helps to avoid motion blur. So, when aperture is not a problem, a kit lens is a good and inexpensive solution for most flower photography.

Prime lenses

A lens with a fixed focal length is called a **prime lens**. There are prime lenses with many different focal lengths. Prime lenses are less expensive than equivalent zoom lenses. They are also smaller and lighter. But the main advantage is that they have a larger maximum aperture (smaller f-value). This means that you can take shots with a very small depth of field. This puts all focus on a particular part of the flower and produces dreamy images with nice, blurred backgrounds. For more information, see the section on depth of field on page 40.

Prime lenses are well suited for flower photography. Most brands have an inexpensive prime lens with 50 mm focal length and a maximum aperture below 2. I always carry a Canon RF 50 mm f/1.8 lens with me for these dreamy shots. There are also zoom lenses with a large maximal aperture, but these are very expensive and not necessary when shooting flower.

A dreamy flower, shot with a wide-open aperture. 50 mm, 1/500 s, f/1.8.

Telephoto lenses

It may sound strange to use a telephoto lens to photograph flowers. Telephoto lenses are mostly used to photograph objects that are far away and cannot easily be approached, like wildlife and birds. They are bulky and heavy, and most flowers can easily be approached and photographed at close range. Still, there are situations in which a telephoto lens is the best choice for flower shots.

Of course, there are the rare situations where you cannot get close enough to flowers, for example when they are high in a tree, or on the opposite side of a fence. But using a telephoto lens is all about compression.

When the focal length of a lens increases, the viewing angle decreases. This means that the subject fills a larger part of the frame. But it also means that the part of the background that is visible behind the subject gets considerably smaller. It looks as if the subject and the background are pulled towards each other. This is called **compression**. The foreground and background are compressed together.

The following photos show this effect. The shot on the left was taken with a 50 mm lens. The righthand image was shot with 400 mm focal length, from a larger distance to keep the size of the flower the same. Because of the larger focal length in the righthand shot a much smaller part of the background is visible. While the background in the left image is distracting, that is no longer the case in the compressed shot. The attention is drawn towards the flower.

The same flower, shot with 50 mm focal length on the left and 400 mm focal length on the right (from a larger distance). Both shots 1/250 s, f/13.

To get the best effect, use the largest possible focal length to get the most compression. Also, the background should be reasonably far away from the flower. Otherwise, the effect of the compression is small. It can help to take a low viewpoint. Funny enough this is easier with a telephoto lens. The farther you get away from the flower the lower the viewpoint becomes.

When photographing flowers with a telephoto lens, it helps to have a zoom lens. Otherwise, it might be difficult to get to the correct position for the desired composition. Image stabilization is very important when using telephoto lenses. Very small changes in the camera position will result in large movements in the image. For the same reason a fast shutter speed is required (unless you use a tripod).

Another flower shot with a telephoto lens at 400 mm, to get a nice, blurred background. 400 mm, 1/500 s, f/8.

Not all telephoto lenses are suited for flower photography! You still want to be able to get reasonably close to the flower. So, the minimum focus distance of the lens should be small. My Canon RF 100–400 mm lens has a minimum focus distance of less than a meter. That works great. But some other telephoto lenses can only focus on subjects that are more than two meters away. That is too far for many flowers.

Special lenses

There are many other types of lenses. **Wide-angle lenses** have a very small focal length. They achieve the opposite effect of a telephoto lens. A very large part of the background is visible in the image. There are situations in which this is desirable, for example, when the background is important in the image or when you want to show the flower in its environment. But my experience is that you rarely need a wide-angle lens.

Using a wide-angle lens shows more of the background of this flower. 18 mm, 1/350 s, f/16.

Another type of lens is a **macro lens**. With a macro lens you can get much closer to the subject. In this way tiny flowers or small details of flowers can be photographed. This creates very nice images, but it requires some special techniques. There are also low-cost alternatives to macro lenses. We will discuss macro lenses and how to use them in more detail in chapter 5 on macro photography.

Tripods

Tripods are useful to create the desired composition and to avoid motion blur.

Many photographers like to use a tripod when they photograph flowers, but I am not one of them. I like to carry as little gear as possible, and I don't have the patience to set up a tripod when I see an interesting flower. But using a tripod has its advantages and, hence, I discuss them here.

Flowers don't move away, so you have all the time in the world to photograph them. First, carefully inspect the flower to find the best direction from which to photograph it. Then place the tripod there and create a nice composition for the shot. Put the focus on the exact point you want, either using autofocus or manual focus. After that, adapt the exposure settings and the light to get the desired image. You have your hands free to hold other accessories, like a light or reflector screen. We will discuss those in chapter 4 on light. Or you can use your hands to push distracting elements out of the way. With a tripod, many different shots can be taken with the exact same composition to see what works well.

An advantage of a tripod is that longer exposure times can be used without the risk of camera motion blur. But for flower photography this hardly ever works, except when photographing indoors. There is almost always a bit of wind that moves the flowers. A fast shutter speed, like 1/250 s, is needed to avoid blur caused by movement of the flower.

The tripod

Tripods come in many varieties and prices. Here are some aspects to consider when using them for flower photography.

- Few flowers are high up. Hence, a tall tripod is not required. Shorter tripods cost less and are lighter.
- When using a kit lens or prime lens, the total weight of the camera is small. But when using a telephoto lens, the weight is considerably larger, and a sturdier tripod is needed.
- There are tripods with and without a center column. A center column makes it easier to position the camera at the desired height and is recommended for flower photography. (Tripods without a center column are sturdier and work better in rough circumstances, like when there is a lot of wind.)
- For some flowers you need to get close to the ground. This is not possible with all tripods. For some tripods you can reverse the center column. That makes it possible to position the camera very close to the ground. So, a small tripod with a reversable center column is preferred.
- Carbon is better than aluminum because it is lighter, but it is also more expensive.

When working on a tripod it is important to switch off image stabilization of the camera and lens, especially with older cameras. When using long exposure times image stabilization can lead to motion blur because the camera tries to correct a position that does not need correcting.

Also, when working on a tripod, it helps to use a remote control or mobile phone to press the shutter button. Otherwise, you might introduce camera shake. An alternative is to use the built-in timer to take the shot after 2 or 5 seconds.

The head

There are different types of heads for tripods. I recommend using a **ball head**. When photographing flowers from many different directions and in different orientations, a ball head makes this easy.

I recommend using a **focus rail** on top of the ball head. These rails allow you to move the camera forwards and backwards. This helps with focusing and with getting the desired framing. Moving the whole tripod back and forth is very inconvenient.

When using an **Arca-Swiss plate** (also called a **quick release plate**) on the camera you can easily put the camera on the tripod and take it off again. An alternative is to use an **L-bracket**. The advantage of an L-bracket is that it also allows for fixing the camera in vertical position on the tripod. This is useful for flower photography to take shots both in landscape and in portrait orientation.

A ball head with a focus rail.

Alternatives

A tripod is large and heavy to carry around. There are some alternatives that can be used.

A **monopod** is a kind of tripod but with one rather than three legs. The monopod carries the weight of the camera and lens and ensures that it moves much less. The monopod usually has a ball head to which the camera is attached. Keep the ball head slightly loose so that it is still possible to rotate the camera. That allows you to easily point the camera at the flower. Place the monopod at an angle backwards. Grab the camera with both hands and push it towards the ground. This results in a very stable situation. You will need your hands to hold the camera so they cannot be used for holding lights or accessories.

When working close to the ground, a **mini tripod** (or **macro tripod)** can be used. These are much smaller and lighter than normal tripods and rather inexpensive. Depending on the type, the camera can be placed at a height between 10 and 50 centimeters from the ground. This works well for many flowers. They are highly recommended.

A mini tripod.

To get even closer to the ground a **bean bag** can be used to support the camera. This is a simple bag filled with dried beans or rice. You put it on the ground and place the camera on top of it. On a beanbag the camera can easily be moved in different positions and orientation. A disadvantage is that a filled bean bag is rather heavy.

Working indoors

When shooting flowers indoors, a tripod is a must. Because there is a lot less light (unless a flash is used), longer exposure times are necessary. Also, because there is little light, autofocus can be slow, so the camera must be fixed. Because the flower can be placed on a table, a normal sized tripod works well in this situation. While I hardly ever use a tripod in the field, I use it indoors all the time.

Indoors you also might want to use a second (mini) tripod to hold a light source, like a torch or LED panel. We will discuss this and other aspects of indoor flower photography further in the section on page 68.

Exposure

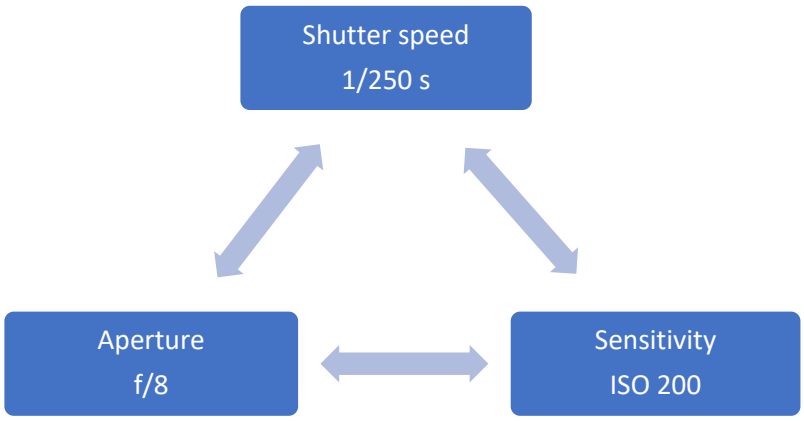
To properly expose a photo, the correct shutter speed, aperture and ISO are required. Which values work best when photographing flowers?

It is important to expose photos correctly. Current photo editing software can correct a good deal of under- or over-exposure, but the results are always better when starting with a correctly exposed image.

The camera can set the exposure automatically, but for the best shots it helps to know the parameters that influence the exposure and what their effects are.

Three exposure parameters

To expose a shot correctly, enough light must reach the sensor. Three settings are important for the correct exposure: the shutter speed, the aperture and the sensitivity of the sensor, indicated by the ISO value. These form the **exposure triangle**. Together they determine the exposure of the photo. When changing one of the settings, to maintain a consistent exposure, this must be compensated by adjusting one or both other settings as well. We will discuss these three settings in more detail below.



The exposure triangle with some values I often use.

When discussing exposure, the term **stop** is often used. Adding a stop of light means doubling the amount of light, while subtracting a stop means halving the amount of light. For example, when changing the shutter speed from 1/250 s to 1/125 s, twice as much light reaches the sensor, so one stop of light is added.

Exposure modes

Cameras have different modes for determining the exposure. They usually have a dial on the top for setting this mode.

- **Automatic exposure**, often indicated in green. In automatic mode, the camera determines the exposure all by itself, along with several other settings. This is strongly discouraged because the settings are usually not ideal for photographing flowers.
- **Program (P)**. In this mode the camera determines the complete exposure as well. But other settings, like how to focus, can be set by the user. This is better than automatic mode, but it gives you very little control over the resulting image.

- **Shutter priority (S or Tv).** You choose the shutter speed, and the camera determines the best aperture and ISO value. This can work if the shutter speed is very important, but for photographing flowers this is normally not the case.
- **Aperture priority (A or Av).** You determine the aperture, and the camera chooses the best shutter speed and ISO value. As we will see in the next section, the aperture is very important in flower photography as it determines the depth of field and the blurriness of the background. Aperture priority mode is recommended if you do not want to work in manual mode.
- **Manual (M).** In this mode, you can adjust all three settings independently. Usually, one dial is used to change the shutter speed while another dial changes the aperture. The ISO value is selected with a button or with a third dial. Setting all three values manually takes a bit of practice. When half-pressing the shutter button, the camera shows a bar that indicates whether the shot is over- or underexposed. Because there is plenty of time when photographing flowers, it is easy to determine the correct exposure.

I recommend learning to work in M mode. It might help to set the ISO value to automatic. This is possible in every camera. This way, you have control over the two most important settings, shutter speed and aperture, and the camera ensures that the exposure is always correct by adapting the ISO value. Keep an eye on the ISO value the camera selects automatically and make sure it doesn't get too high. At some values for shutter speed and aperture, the camera can no longer find a good ISO value. The ISO value will then flash on the screen. In that case, it is preferable to adjust the shutter speed and not the aperture.

Exposure compensation

The more settings the camera determines, the less control you have over the final exposure. For example, when photographing a light flower against a dark background, the camera tends to overexpose the shot, which makes the flower too bright. In such a case the exposure can be corrected using the **exposure compensation**.

Exposure compensation allows you to under- or overexpose the image up to 3 stops in small steps. Some cameras have a separate dial for the exposure compensation, while other cameras use a dedicated button. This is usually indicated by the **+/-** symbol. It is important to know how this works on your camera, because you often need to change the exposure compensation when photographing flowers. With a mirrorless camera, the effect of exposure compensation is directly visible in the viewfinder, making it easy to choose the desired value.

A light flower against a dark background often requires some underexposure, using a negative exposure compensation. 300 mm, 1/350 s, f/8.

Shutter speed

Each camera has a shutter. There are different types of shutters. **Mechanical shutters** use two curtains. The first curtain opens the path of the light to the sensor while the second curtain closes it again. The faster the curtains move one after the other, the faster the shutter speed. Mechanical shutters make noise and can also cause camera movement. **Electronic shutters** set the values in the sensor to 0, wait a short time, and then read the new values. They are silent and can achieve very fast shutter speeds. But they are usually incompatible with a flash, and they can distort fast-moving subjects. (The reason is that not all pixels in the sensor are read at the same time.) However, modern (expensive) cameras use a **stacked sensor** or a **global shutter sensor** that solves this problem. The **electronic first curtain shutter** combines these techniques by starting the exposure electronically and ending it mechanically.

For flower photography the type of shutter is not important, except when using a flash. I recommend using the electronic first curtain shutter (unless the camera has a stacked sensor or global shutter sensor).

The **shutter speed** determines how long the shutter stays open. This is expressed in fractions of a second, for example 1/250 of a second. This is also called the **exposure time**. The longer the shutter remains open, the more light falls on the sensor. Each time the shutter speed is doubled, the amount of light that reaches the sensor is halved, so one stop of light is lost.

When using a long exposure time, like 1/50 or longer, there is a chance that the flower or the camera moves during the exposure. This will lead to **motion blur** and a loss of sharpness of the image. Image stabilization in the camera or lens prevents motion blur caused by camera motion. With my camera and 100 mm lens that both have image stabilization, I can shoot handheld with a shutter speed of about 1/4 s without risking camera motion blur.

But when shooting flowers outside there is almost always a bit of wind, and flowers are very sensitive to wind. This will cause motion blur at longer exposure times. This effect is worsened because flowers are shot at close range. Hence, for flower photography I tend to use a rather fast shutter speed of 1/250 s or more. When using a long lens, I often use 1/350 s. This might require a somewhat higher ISO value for a correct exposure, but modern cameras have no problem with that.

Poppy flowers in the field are very sensitive to wind due to their long, slender stems and broad petals and, hence, require a fast shutter speed. 350 mm, 1/350 s, f/8.

Aperture

The aperture determines the size of the opening in the lens. The larger the opening, the more light falls on the sensor. In that respect, the aperture controls the exposure. A large, open, or wide aperture describes a large opening. A small, closed, or narrow aperture describes a small opening. But aperture has an important second effect; it largely determines the depth of field in the shot. Because depth of field is a very important topic in flower photography, we will discuss it in a separate section on page 40.

The aperture is indicated by the f-value. This number is a bit strange. A small value corresponds to a large aperture and vice versa. Typical f-values are 2.8, 4, 5.6, 8, 11, and 16. Each next value reduces the amount of light by one stop. So, when going from f/4 to f/8 two stops of light are lost, not one! Very narrow apertures (f/16 and higher) have a negative effect on the image quality due to refraction, so I recommend avoiding them as much as possible.

The f-value is the diameter of the opening in the lens, divided by the focal length of the lens. An opening with a diameter of 50 mm with a 400 mm lens corresponds to an aperture of 50/400 = 1/8, or f/8. Hence the **/** sign in the value indication. That's why fast telephoto lenses are so big and heavy; they need very large aperture openings.

ISO value

In the analogue era, a roll of film was used to record the photos. There were rolls of film for sale with different sensitivities to light. This sensitivity was indicated by the ISO value of the film, with rolls of

high sensitivity offering the possibility of photographing in low light at the cost of increasing the graininess of the image.

Today, the ISO value is a setting that indicates the sensitivity of the sensor to light. But unlike film rolls, this value can be set for each shot separately. At a high ISO value, the sensor amplifies the intensity values recorded by the sensor such that less light is needed. Most sensors have a base value of ISO 100. Each time the ISO value is doubled, the amount of light the sensor requires halves and a stop of light is gained. This results in values like ISO 200, ISO 400, ISO 800, et cetera.

If the ISO value increases, the image quality decreases. There is more noise in the image, and the dynamic range becomes smaller. In the past, the quality of photos with an ISO value above 400 was rather poor. But sensors have improved considerably and values such as ISO 6400 can be used with good modern cameras without introducing too much noise. Much depends on the size and resolution of the sensor. In addition, the software used to remove the noise has become better. The camera uses this software when it creates JPG images, but when shooting in RAW format, you will have to remove the noise yourself afterwards (see chapter 6 on page 207).

When using a high ISO value (6400 in this case), RAW files can contain noise, especially when you zoom-in, which must be removed in post-processing. 300 mm, 1/350 s, f/8.

Because sensors have improved so much, the ISO value is something you don't have to worry about most of the time, except when photographing in low-light conditions. Hence, to make sure that the photos are well exposed, I recommend setting the shutter speed and aperture yourself and letting the camera determine the ISO value. When possible, I try to avoid ISO values above 2000, but sometimes that is necessary to get the desired aperture and shutter speed.

You can set the range of allowed ISO values. For example, for my camera, I set the maximum allowed value to ISO 6400. If with automatic ISO the shot is still not correctly exposed, use the exposure compensation discussed above.

Depth of field

Controlling the depth of field is crucial when shooting flowers, because it determines the sharpness of the flower and the blurriness of the background.

The depth of field is the range of distances that are in sharp focus to a viewer. A large depth of field can make a complete flower sharp, while a small depth of field will put focus on just a small part of the flower. But the depth of field also affects the blurriness of the background. By varying the depth of field, you can obtain rather different images of the same flower.

In each photograph there is just one distance from the camera where the image is completely sharp. This is the **focus distance** you choose. But an area in front of and behind that distance is still experienced as sharp. The length of this area is called the **depth of field**, or **DOF** for short. The part in front of the focus point is smaller than the part behind it (about 1/3 in front and 2/3 behind). So, if you want a flower to be completely sharp, it is best to focus on a position near the front of the flower. But complete sharpness is not always the best. Using a smaller depth of field can lead to beautiful flower images with a dreamy atmosphere.

The depth of field is determined by several parameters, the most important being the aperture, the sensor size, and the distance to the flower. The aperture is the primary setting used to control the depth of field.

This flower has a large depth and requires a large depth of field to be completely sharp. 400 mm, 1/350 s, f/19.

Aperture

Many flowers have a large depth, that is, the distance between the front of the flower (as seen from the camera) and the rear of the flower is large. This is especially the case when photographing flowers from the side. To get such a flower completely sharp, a large depth of field is required. To that end, a narrow aperture should be used. For example, in the image above an aperture of f/19

was used to increase the depth of field. However, such a narrow aperture can have a negative impact on the image quality, especially when using budget lenses.

As a rule of thumb, doubling the aperture will double the depth of field. For example, assume at f/4 the depth of field is 2 centimeters. Using f/8 instead gives 4 centimeters depth of field, and f/16 gives 8 centimeters. This is the difference between a tiny part of the flower being sharp, and the complete flower being sharp.

Whether to choose a narrow aperture or a wide-open one depends on the type of image you are looking for. A narrow aperture gives a large depth of field and, hence, a strong, sharp image. A wide-open aperture gives a shallow depth of field and, hence, a soft, dreamy image. The image below was shot using f/1.8 to achieve this dreamy look. Choosing the best aperture is not always easy. It can help to take a few shots with different apertures and pick the best shot later.

A small depth of field gives the image a dreamy look. The shot was overexposed a bit to enhance the effect. 50 mm, 1/500 s, f/1.8.

Note that the range of possible apertures depends on the lens. Some lenses allow for a wide-open aperture, like prime lenses with a small focal length. My 50 mm lens can go up to f/1.8 and there are lenses with even wider aperture. Telephoto lenses and zoom lenses on the other hand often have an aperture of f/5.6 or above, unless you buy very expensive (and large) ones.

When modern cameras focus or measure the amount of light, they open the aperture to the maximum. Because more light reaches the sensor, they can more precisely determine the focus distance. As a result, the image visible in the viewfinder does not show the correct depth of field. Most cameras have a **DOF preview** button with which you can temporarily close the aperture to the selected value to inspect the correct depth of field in the viewfinder.

Here is another example, showing the difference between a shot with a narrow aperture (f/22 in this case) and an open aperture (f/2.8 in this case). In the left image several flowers are sharp, while in the right image all focus is put on one of the flowers.

Changing the aperture will change the sharpness of the image. Left image 100 mm, 1/350 s, f/22. Right image 100 mm, 1/1000 s, f 2.8.

Focus distance

When getting closer to a flower, the part of the flower that is visible is reduced, and the depth of field becomes smaller. The same happens when using a lens with a larger focal length. When the width of the visible area is halved, the depth of field is reduced by a factor four. Especially when using macro photography to show small details of flowers, the depth of field becomes very small, in the order of millimeters. A much narrower aperture is needed to correct for this, but there is a limit on the aperture you can use. Most of the time, I use f/13 or even f/16 for such shots.

But for certain scenes, a much wider aperture can be used to get the desired effect. In the image below, I decided to use f/2.8 to only have some of the anthers sharp. The flower petals become a blurred background with contrasting colors. Had I picked a narrower aperture, the petals would have been too sharp and would attract too much attention.

In macro photography the depth of field becomes very small. In this shot f/2.8 was used such that only a tiny part of the anthers is sharp. 100 mm, 1/350 s, f/2.8.

There is a technique called focus stacking that can be used to increase the depth of field by combining multiple images. We will discuss focus stacking in chapter 5 on page 182.

Cropping

When cropping an image in post-processing, a smaller part of the world is visible. But the depth of field obviously stays the same. This can be used to increase the depth of field without using very narrow apertures. Simply photograph the flower from a larger distance and then crop the image afterwards. The resolution of cameras nowadays is large enough to allow for a considerable crop, without loss of quality.

The same happens when using a camera with a small sensor, like an APS-C sensor or micro four-thirds sensor. Such cameras crop the image that is projected on the sensor and, hence, show more detail of the flower without reducing the depth of field.

The reverse is also true. When a small depth of field is required, you should not crop afterwards, and a full-frame camera is more suited for such shots.

Effect on the background

The depth of field also influences how sharp or blurred other parts of the image are. When using a large depth of field, the unsharp parts will be less blurred. With a small depth of field, the background and foreground elements will become more blurred.

A blurred background is often desirable. When the background is far away, the depth of field does not influence it much. But when the background is near to the flower, a shallow depth of field is often used to avoid too many distractions in the background.

Below you see an example of the effect of the aperture, and, hence, the depth of field, on the background. The first image was shot with aperture f/16. The flower is completely sharp, and the flowers in the background are also rather sharp. This makes the image too messy, distracting the viewer. In the second image, f/8 was used. The flower is still sharp, and the background flowers are a bit more blurred. The third image uses f/4.5. I think this shot has the best balance between the sharpness of the flower and the blurriness of the background. The final image uses f/2.8. The flower is no longer completely sharp, but that is fine. The background is much more blurred, making it hard to distinguish the individual flowers.

The effect of aperture and depth of field on the background. All shots used a 100 mm lens and 1/350 s. Apertures f/16, f/8, f/4.5, and f/2.8.

Focus

What is the best position in a flower to focus on? And how are autofocus and manual focus used?

When photographing a flower, there are many different positions that can be used as focus points. Do you use the stigma in the center, the petals at the front, the petals at the back, or another position? Each of these positions leads to a completely different result, especially when using a wide-open aperture.

Focusing on the correct position is key to creating nice flower images. Focus leads the gaze of the viewer to the most important position. But focusing when photographing flowers can be challenging, especially when using a small depth of field.

The focus point

Flowers often have a lot of depth, especially when photographed from the side. That makes it impossible to get the whole flower sharp, except when using a very narrow aperture (like f/16). So, an important decision is which part of the flower should be sharp, and which parts can become a bit blurry. When there are multiple flowers, you must also pick the best flower to focus on.

The camera can determine the focus point automatically, but that often does not give the desired effect. I recommend using the smallest possible focus area, often called spot focus, and place this at the correct location in the image.

When there are multiple flowers, picking the focus point is difficult. 80 mm, 1/350 s, f/13.

Most of the time, the stigma or stamens of the flower are the natural focus points, especially when choosing an open aperture. But sometimes focusing on a different part of the flower can give more creative effects, for example, when aiming for a more abstract image.

When the goal is to get a large part of the flower in focus, you should proceed differently. As indicate before, the sharp area lies partially in front and partially behind the focus point. This range should overlap with the flower as much as possible. When you focus on the nearest point in the flower, the sharp part in front of the focus point is “lost”. Instead, focus on a point a bit further back to get a larger segment of the flower in focus.

Most people tend to focus on the stigma. But when photographing from above, the stigma is often the nearest position and, hence, not the correct one to focus on. When shooting a flower from the side, the stigma is halfway through the flower, which is again not the best focus point because the sharp area behind the focus point is larger than the area in front of it. In this case, focus on a point in the flower that is a bit closer.

For a flower shot like this, don’t focus on the nearest point in the center, but use a point that is a bit further back. 70 mm, 1/350 s, f/8.

Autofocus

Using the camera’s autofocus is the easiest way to focus. To have as much control as possible over the focus point, select the smallest possible focus area, often called spot focus. Most cameras have a joystick with which to position the focus point. Set the autofocus to continuous (servo in Canon terminology). The camera will then continue to correct the focus when moving the camera slightly, or when the wind moves the flower.

When shooting a flower with a distant background, like in the image below, the camera sometimes refuses to focus on the flower and keeps focusing on the background instead. There are a few ways to remedy this. Some lenses have a focus delimiter. My macro lens, for example, has a setting that limits focus to between 25 and 50 centimeters. Setting this to the correct distance can help.

In some cameras the focus ring on the lens can still be used in autofocus mode. In this way, you can focus manually on approximately the correct distance and then let autofocus do the final focusing. (In my camera, this only works when using back-button autofocus, where a separate button is used for focus, and the shutter button no longer activates autofocus.)

If this all fails, you can try to focus on another position that is approximately at the correct distance, for example, the ground. Release the focus button, point again at the flower and press the focus button again. The focus now often stays on the flower.

The camera might focus on the background instead of the flower. 150 mm, 1/350 s, f/8.

Manual focus

When using an open aperture or a short focus distance, the depth of field becomes very small, and it becomes difficult to focus on the correct position. As an example, consider the two images below (these were cropped considerably). These shots were taken with the same wide-open aperture. The focus point in the second image is just two millimeters closer to the camera, resulting in a much better image.

A minor shift in focus point can have a huge effect. Both shots 50 mm, 1/3000 s, f/1.8.

The autofocus of the camera is often unable to choose such a position. It detects contrast at all the different stamens and will probably alternate between them, even when using a small focus area. So, manual focus is required to get the focus position correct.

Another situation in which autofocus fails is when there is little contrast in the flower, for example, when you want to focus on the middle of one of the petals. In such a situation, the camera might not be able to detect enough contrast to focus correctly. Again, manual focus is the solution.

Manual focus for flower photography is not difficult, although it does require some practice. There are two different ways to use manual focus, depending on whether a tripod is used.

When shooting handheld, set the focus distance to approximately the correct distance, using the focus ring on the lens. Now slowly move the camera forward and/or backward until the correct position is in focus and press the shutter button.

When using a tripod, use the focus ring on the lens to focus on the desired position. My experience is that this does not work when there is wind. Even though there are always pauses in the wind, the flower never returns to exactly the same position, which means you must manually focus again and by that time the wind has picked up again.

For a shot like this, autofocus often fails because there is little contrast. (Contrast was increased a bit in post-processing.) 100 mm, 1/320 s, f/13, flash.

Manual focus support

Cameras have a magnification tool to help focus manually. The image can be magnified 5 or 10 times. The part of the image that should be enlarged can be selected. In this way, it is easy to verify that the important part of the flower is in focus. (Note that on a DSLR, this only works in Live View mode, using the display on the back of the camera.)

My experience is that magnification does not work when shooting handheld. Every slight movement of the camera is also magnified, making it impossible to focus correctly. Also, with wind, it does not

work because of the motion of the flower. But when working with a tripod with little wind, magnification can be useful.

Most cameras also support focus peaking. When switched on, the camera shows the positions that have high contrast and are sharp, often using a red color. By moving the camera or rotating the focus ring, these positions shift. This helps a lot, and I always switch it on when using manual focus. (For red flowers, you can change the color used.)

If everything fails, use the burst mode of the camera. Make a series of shots in quick succession while slowly moving the camera forward or backward. Check the images and pick the one that is correctly in focus. This can also work when there is a lot of wind.

Focusing on the stamens often works best. 400 mm, 1/350 s, f/8.

Types of shots

Flowers can be photographed in many ways and in many different orientations.

When you visit a garden or field with flowers, there are lots of possible ways to take pictures of them. You can, for example, take an overview shot of the complete garden or a part of it. You can photograph a group of flowers, a single flower or a detail of a flower. Each of these type of shots has its own challenges. And the flowers can be photographed from many different directions.

Groups of flowers

When shooting a large part of a garden, the result is often disappointing. It is almost impossible to capture the atmosphere of the garden in a picture. There is so much color and detail, which does not fit on a small image. (And there is of course also the smell, the sound, the flying insects, and so much more that you cannot capture.) To get at least a bit of the same feeling, some post-processing of the image is required. I normally increase the vibrance of the colors and sometimes add a bit of saturation to make them more prominent. And I reduce the saturation of the green colors to make the flowers stand out a bit more. It also helps to increase the contrast and clarity in the image. All these techniques will be discussed in chapter 6 on editing your images.

When shooting a complete garden, it is hard to capture the same feeling as when visiting the garden. 18 mm, 1/350 s, f/8.

Photographing a group of flowers also has its challenges. It often turns into a large blob of colors without any clear focus point. The gaze of the viewer will float aimlessly around without any place to land. Look, for example, at the image below. Your gaze will probably start at the left-top and then move towards the center of the image, but it is not clear where to go next. There is too much color and detail in the image. (For more information on the structure of an image and the way a viewer looks at it, see the next chapter on composition.)

A group of flowers with two different colors. 100 mm, 1/350 s, f/8.

Individual flowers and details

Photographing individual flowers is a lot easier, but you must carefully pick the flower to use. There normally are lots of possibilities, and, as we discussed in chapter 1, it is important to carefully inspect the flowers before taking the shots. Check whether the flower is clean without any major flaws. Have a good look at the background to make sure it is not distracting. Make sure the flower is properly lit and that there are no shadows running over it.

Think about the composition. Where do you place the flower in the image? When there is a lot of symmetry in the flower, you might want to place it in the center. But when the flower is “looking” into a direction, place it more towards the side and let the flower look into the frame. Check out any other (blurred) flowers in the shot. Do they support the main flower or distract from it?

Flowers can have amazing details that can be shown by photographing them from close range. Such macro shots require special equipment and techniques. We will devote chapter 5 to macro photography of flowers.

A background flower can enhance the shot or distract from the main flower. Both shots 100 mm, 1/180 s, f/8.

Different directions

Once you have decided on the flower to photograph, a direction must be chosen from which to take the shot. There are many possibilities here. By varying the angle, completely different results are obtained. It helps to experiment with this and to try a more unusual angle from time to time.

When photographing flowers, many people shoot them at an angle from above. This is the easiest way because most of the time the flower is at an angle below you. Just point and click and the flower is photographed. No need to crouch down or sit on the ground. But this does not result in the most interesting shots. Also, the background tends to be close to the flower and, hence, will not be blurred enough.

It is often more interesting to get down a bit and photograph the flower at an angle. This adds more depth to the image. Let the flower “look” a bit to the side. Make sure there is enough empty space in the direction the flower is looking. The background will be further away in such shots. Because the flower has more depth, a narrower aperture will be needed to get it completely sharp. But, as discussed before, this is not always required, as long as the prime focus point is sharp.

When the flower has a nice outer shape, you can also take a shot straight from above. This emphasizes the symmetry in the flower, which is pleasing for the eye. All the different elements of the flower are visible in such a shot: the petals, stamens, and stigma. The details are clearly visible. A problem with a shot from above is that the background is often very near to the flower. Hence it will be rather sharp with many details visible. This can be remedied by using an open aperture. When the flower is rather flat, like in the righthand image below, only a small depth of field is required to get the whole flower sharp. However, still some post-processing is often required to blur the background.

In the left image the flower is shot at an angle, while in the image on the right it is shot straight from above. Both shots 300 mm, 1/350 s, f/8.

More creative directions

When crouching down or lying on the ground, you can photograph the flower from the side. This will result in a rather different shot. Try to take the shot in such a way that part of the stigma and stamens is still visible, as these form good focus points in the image. To get the flower to be completely sharp, a narrow aperture is required. If there is a focus point in the middle of the flower, the front and back of it don't need to be completely sharp.

When the flower is a bit above the ground, it is also nice to take a shot from below. To this end, place the camera close to the ground and point it upwards. You can no longer look through the viewfinder, but for most cameras the screen at the back can be tilted in such a way that the image can be seen when looking down at the camera. This helps to create the desired composition.

An unusual image of a passionflower shot from below. 100 mm, 1/250 s, f/22.

Sometimes it is impossible to get under the flower. In that case you might need to pick a flower and hold it in your hand while taking the shot. This approach was used in the image above. Only do this with your own flowers and when there are plenty of them.

An alternative is to use a **mirror**. Place a mirror on the ground below the flower and position it such that the flower is visible in an interesting way. Now take the shot through the mirror. Because you shoot the flower against the sky, it often becomes too dark, and I recommend using a flash. To get the light from the flash onto the flower from below, place some piece of white cloth next to the mirror and direct the flash toward it, like in the image below. The light will be reflected onto the flower.

In the left image the flower is reflected in the mirror. The image on the right is the resulting shot. 100 mm, 1/320 s, f/8, flash.

Some mirrors can result in halos or ghost images when both the front and the rear of the glass reflect the flower. It is difficult to remove this, so use a good mirror (and make sure it is clean).

Background

In flower shots, the background plays a crucial role and can make or break the resulting image.

As has been discussed before, the background is very important in flower photography. For example, when flowers are near to the ground or in a bush, the background tends to be near to the flower. As a result, details in the background become clearly visible, and these details might distract the viewer. So, when shooting flowers, it is crucial to always look at the background and how it affects the image.

A small change in camera position can have a large effect on the background. In the image below you see an example. In the righthand shot the position of the camera was shifted down just slightly. As a result, the blurred white areas in the background are in a more pleasant location. The top left of the image is no longer empty, and the flowers are surrounded by the background.

A very small change in the camera position can shift the background considerably, which has a large impact on the image. Both shots 200 mm, 1/350 s, f/8.

The way the background is lit has a big effect on the image as well. When the background is in the shade, it is darker and there will be more emphasis on the flower in the shot. When the background is lit by the sun, it normally attracts too much attention, as can be seen in the images below. There are ways in which you can influence the lighting of the flower and the background, which we will discuss in chapter 4.

In the left shot the background was in the shade, while in the shot on the right it was lit by the sun. Both shots 100 mm, 1/200 s, f/13.

No background

The easiest way to make a background non-distracting is to have no background at all. You can take shots from such close range that the flower covers the entire image. This requires cutting off parts of the flower in the image. This can work when there are enough interesting things to see in the details of the flower, for example nice stamens. We will see several such shots when discussing macro photography in chapter 5.

If the flower is not too close to the ground, the sky can be used as background for the flower. It might be required to bend the flower a bit such that a nice part of it is visible. Be careful not to break the stem. Also, it might be necessary to push some other flowers out of the way. Again, be careful not to break them. If that is not possible you might need to pick a flower or use a mirror, as discussed above. When photographing against the sky the flower can become too dark or the sky too light. We will discuss ways to solve this in chapter 4 on light.

A flower, shot against the sky. 100 mm, 1/320 s, f/13, flash.

Another option is to use a piece of cloth or a diffuser screen. You can buy such screens in different sizes. They normally have a white and a black side. Place or hold it behind the flower and you get a white or black background for the flower.

A black background can also be obtained by using a flash. When the background is far enough away you can use a flash to illuminate the flower while the background remains dark. This effect can be enhanced in post-processing. We will discuss the use of flashes in detail in chapter 4 on light.

Using a flash in combination with the right exposure settings can create a black background. 100 mm, 1/320 s, f/13, flash.

A blurred background

When there is no background, all focus is put on the flower. But it can look unnatural. Often a better solution is to create a blurred background. There are several ways to achieve this. Somewhat muted colors should be used that flow smoothly into each other, and there should be as little detail as possible with few distinguishable elements.

There are four factors that determine the blurriness of the background: the distance between the subject and the background, the distance between the camera and the subject, the aperture, and the focal length of the lens.

The further away the background is, the more blurred it becomes. Pay attention to this when composing the shot. Try to select an angle or position such that the background is as far away as possible. A lower viewpoint normally results in a larger distance to the background. In many cases, a large background distance can be difficult to achieve. Flowers are connected to their plant, and sometimes the distance is very small. If there are many flowers and it is a common plant, you might want to cut off a flower and hold or fix it in such a position that the background is far away.

As we discussed in the section on depth of field on page 40, the aperture and the focus distance determine the depth of field, and this influences the blurriness of the background. So, to blur the background, use an aperture value that is as small as is possible for the shot. Also, shoot from close

range and don’t crop the image afterwards. If possible, use a full-frame camera. For a small flower, it is normally easier to get a blurred background than for a large flower, as small flowers require a smaller focus distance resulting in a smaller depth of field.

As we discussed in the section on lenses on page 29, the larger the focal length of the lens, the more blurred the background appears. This is due to compression. A smaller part of the background is visible and therefore it appears blurrier.

If it is impossible to make the background blurry enough while photographing in the field, you can also try to blur the background when processing the image. Modern photo editing software has extensive masking options, and these can be used to select only the background. Various effects can then be applied to the background to make it less prominent. I normally reduce the (dynamic) contrast or clarity of the background. Sometimes I darken it a bit or apply blur to the background only. We will discuss these techniques in chapter 6.

When using a large focal length, the background appears more blurred. 400 mm, 1/350 s, f/8.

Background flowers

A blurred background often consists of various shades of brown or green, like in the image above. Such a uniform background makes the image cleaner, but it can also be a bit boring. Colorful flowers in the background can make the image more interesting, and, when done right, they will not draw attention away from the main flower.

In nature, flowers are seldom found alone. They tend to grow in larger groups. By showing some of those other flowers in the background, you can create a more balanced image. The other flowers add context. However, it is important that they enhance the image and do not distract from the main subject. This requires a careful balance between vagueness and visibility.

When the flowers have a clear, contrasting color or a prominent shape, it is easy for the viewer to recognize them, like in the image below. To achieve this, don’t blur the background too much. Try to take such a viewpoint that the main flower does not overlap with the background flowers and that

the background flowers themselves also stand apart; otherwise, they become indistinguishable blobs of color, and the outlines of the subject may become more difficult to see.

Similar flowers in the background can enhance a shot. 120 mm, 1/350 s, f/8.

Flowers in the background provide more color and it is important that these colors have the desired effect. To create a harmonious image, have flowers in the background of the same color as the main flower. Recognition of the background flowers is not important in this case. So, make them as blurred as possible, using an open aperture.

The blurred flowers in the background create a harmonious image. 100 mm, 1/250 s, f/4.5.

When the background colors contrast with the main flower you get a very strong image. Care must be taken that the emphasis is still on the main flower(s) and not on the background. This is determined by the visual weight of the colors and the size of the flowers. We will discuss colors and their effect in more detail in chapter 3 on composition, on page 97.

Colorful flowers in the background can also provide additional structure to your image, avoiding the feeling that the main flower just floats in space. For example, a landscape aspect ratio can lead to a lot of empty space on both sides of the flower. By surrounding it with some (blurred) background elements, this space is filled.

Flowers in the background can also form patterns, like a triangle or circle surrounding the main flower. This can frame the subject. This approach is most effective when the flower is placed in the center of the image. Other interesting possibilities for background elements include arcs or lines of color.

The orange flowers in the background fill the empty space and form a triangular pattern. 100 mm, 1/250 s, f/6.7.

Foreground

By shooting through leaves and flowers in the foreground, interesting effects can be obtained.

Most of the time, the flower will be the nearest object in the shot. But you can create interesting images when there are other flowers or leaves close to the camera. Such objects will become blurred and can give a soft look to the image because they add color around the main flower. This technique is referred to as **shooting through** or **looking through**. The main subject is shot through other flowers or leaves.

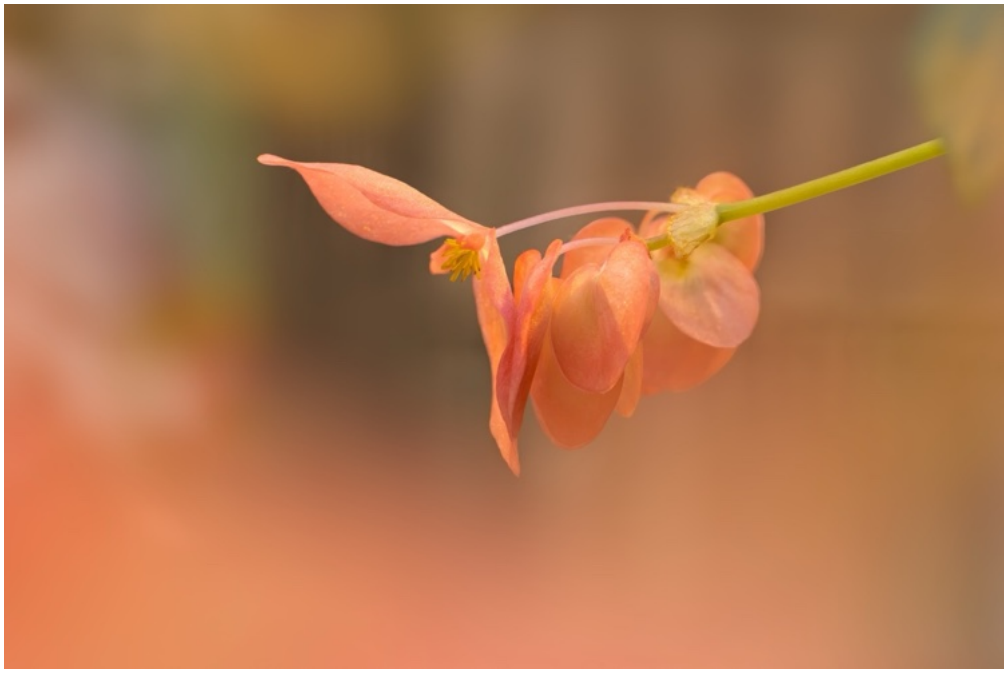
Shooting through leaves with a wide-open aperture gives a dreamy image with a washed-out background. 100 mm, 1/350 s, f/2.8.

To achieve this, proceed as follows. Once you have selected a flower to photograph, look for other flowers or leaves that can be used. These objects should not be too close to the main flower, otherwise they will not appear blurred enough. The larger the focal length of the lens, the further away the foreground objects can be. Find flowers that have a similar color to the main flower as these will result in a harmonious image, or use leaves that have a contrasting color.

Position your camera very close behind these foreground objects and find a position and orientation such that the main flower is still largely visible, and the other flowers and leaves fill the area around it. The surrounding objects should almost touch the lens for maximal blurriness. Consider using a tripod because very small changes in position can ruin the effect.

Use an open aperture to reduce the depth of field as much as possible. Focus on a part of the flower that is visible. The autofocus of the camera might fail because it wants to focus on the foreground objects, so manual focus might be required. Take several shots from slightly different positions to find the most interesting effect.

You can use the foreground objects in many ways. They can surround the main flower completely, or just cover part of the image, like the top or the bottom. It can look nice to also cover part of the main flower with the foreground objects.



Shooting through flowers of the same species results in a very harmonious image. 100 mm, 1/90 s, f/4.5.

When the main flower is close to the ground you can also use grass to shoot through. This adds some blurred green color to the image. When in your own garden and it is hard to find a good position to shoot through, you can pick some flowers or leaves and hold them in front of the lens. You can move the foreground object around to get the best composition.

Another example of shooting through leaves. 100 mm, 1/125 s, f/5.6.

Rather than using flowers or leaves, you can use other colored materials that are placed close to the lens. For example, some colored (tissue) paper or plastic can give interesting effects. Wrap it around the lens such that it extends from the front. Wrinkle it a bit such that it is not the same on all sides. You can fix it with a rubber band. Now simply point the camera at the flower and take the shot. Use an open aperture to make the paper blurred enough.

Shooting through can also be used when photographing indoors. Pick some extra flowers or leaves and place them in front of the main flower. Hold them in place with some clamps. In this way you also have control over the background, and you can, for example, make it completely black, as in the image below. When using a long exposure time, the foreground flowers can be moved around a bit to create even more blur.

Indoors is the ideal environment for positioning foreground and background elements. 100 mm, 1 s, f/4.5.

Dew and frost

Early in the morning, flowers are often covered with dew. And in winter there can be frost on flowers. Both make for excellent photo opportunities.

Flowers look rather different when you get up early. Often, they will be covered with dew. And in winter, they might be covered with frost. Photos of flowers with dew or frost are appealing and interesting. There is a lot to look at. Taking such shots required some care though.

Dew

When there are clear nights with little wind, flowers and other surfaces cool rapidly. When they reach a temperature where water vapor in the air condenses on the surfaces, **dew** is formed. These are tiny droplets everywhere on the surface. Depending on the amount of dew, droplets may merge into larger droplets.

Many nature photographers love shots of flowers and other objects covered with dew. It adds some sparkling to the image and can make dull flowers very interesting.

A somewhat dull white flower (left) becomes more sparkling with water droplets (right). Both shots 100 mm, 1/320 s, f/13, flash.

When photographing a dew-covered flower, it is important that the droplets are as prominent as possible. There are several ways to achieve this. First, pick a flower that is nicely covered with droplets. Don't touch the flower! When the flower moves the droplets can merge or fall off. Take a point of view where the droplets are clearly visible.

Use a narrow aperture to get a large depth of field and, hence, a lot of sharpness in the image. I recommend using a diffused flash (see page 129) or a large LED panel to illuminate the flower from the front. The droplets will reflect the light and become more visible, as can be seen in the image above. You might want to enhance this effect by adding more contrast when editing the image.

After rain, there are droplets on flowers as well. But these are considerably larger (unless the rain was a drizzle). They can be photographed in a similar way as dew.

A flower covered with dew. 100 mm, 1/320 s, f/13, flash.

Simulating dew

Dew is not always available, especially in summer, and it comes with some inconveniences (like getting up early and kneeling in the wet grass to take a shot from a low viewpoint). It is, however, easy to simulate dew during the day or in the evening. Any simple plant sprayer can turn a flower into a dew-covered jewel. I always carry a small spray bottle with me when photographing flowers. These can be bought cheaply online.

Using a plant sprayer has some advantages over normal dew. You have much more control over what parts to cover with water droplets. For example, with real dew there often are shiny water droplets on leaves and in the background. This might distract attention from the flower. When using a plant sprayer, this can be avoided. On the other hand, you can also deliberately add droplets to the background to create an interesting bokeh.

It is easy to vary the number of water droplets and the size. By spraying multiple times, the droplets will merge into larger drops. But be careful that they stay in place. When they get too large, they will roll down the petals, destroying the effect. With a large flower, you normally want larger droplets than with a small flower.

The same flower with no droplets, a few droplets, and many droplets. All shots 100 mm, 1/320 s, f/13, flash.

When photographing during the day, be careful with the light. To make the droplets visible, it is important that some light is reflected in them. Water droplets on a flower in the shade are hardly visible. So, try to have the sun reflected in the drops. Working with a diffused flash gives even better results. During the day there might be too much light for this. When photographing in the evening, the flash is the only light source, leading to better reflections.

Frost

Even in winter there are flowers. And when you are lucky and live in an area with the right climate, it might be possible to shoot the flowers covered with **frost**. These are small ice crystals that are formed when water vapor in the air freezes onto the flower. Frost gives flowers a very special look, as can be seen in the image of winter heather below.

When photographing frost-covered flowers, there are a few things to consider. Pick a flower that is not completely covered with ice, such that the flower can still be recognized. Take a low point of view and photograph the flower from the side. That shows the ice crystals most clearly.

The photos are normally nicest when there is a lot of sharpness in the ice crystals. So, a large depth of field is required. I typically use aperture f/13 and photograph from a bit larger distance and crop the image later. Using a (diffused) flash can help to bring out the ice crystals even more, as in the image below.

A flower (winter heather) shot in the middle of winter, covered with frost. 100 mm, 1/320 s, f/13, flash.

Frost-covered flowers can also be shot using backlight. When the sun illuminates the flower from behind, the ice crystals around the boundary of the flower light up, while other aspects of the flower remain darker. In this case, don't use a flash. Below you find an example. We will discuss the use of backlight in detail in chapter 4 on page 115.

Using backlight can give interesting shots of frost. 100 mm, 1/90 s, f/13.

Indoors

In winter or when the weather is bad you can photograph flowers indoors. This gives complete control over the composition, light, and background.

Photographing flowers outside is wonderful, but sometimes this is impossible due to the weather or the season. In such a situation you can photograph the flowers indoors. An extensive studio is not required. With some simple tools an effective setup for such shots can be created.

Photographing indoors is also great for learning and for trying out new settings and techniques. I recommend to always try out something new at home before applying it in the field.

When photographing indoors, flowers from a florist can be used. 100 mm, 0.7 s, f/13.

Getting flowers

When there are flowers outside, you can pick some. Obviously, only pick very common flowers and never from a garden, unless it is your own or with permission. It is important to keep the flowers fresh and undamaged when bringing them home. Carry them in a plastic box.

To keep the flowers moist, wrap wet cotton wool around the end of the stem, and wrap this with aluminum foil. There are also special tubes with a rubber cap, often called orchid tubes. These can be filled with water, and the stem of the flowers is inserted through the cap. This should not leak, but it is always better to check.

Flowers can also be bought from a florist. Rather than a bouquet, it is better to buy some individual flowers as you need only one of each species. Flowers from a florist are normally somewhat sturdier than the flowers found in nature, so they can be transported more easily.

Once home, clean the flower. For flowers bought from a florist this is probably not necessary, but flowers brought from outside often have small bugs, spider webs, and dirt spots. A blower (the one

used for cleaning lenses) can be used to blow away most dirt and bugs. Tweezers are also useful to remove webs and dirt. Be careful not to damage the flower.

Put the flowers in water while you are not photographing them. It is important to keep them fresh. Before putting them to use, cut off most of the stem, keeping a piece of some 20 centimeters. This makes it a lot easier to manipulate the flower. Make sure everything is ready before taking the flower out of the water. Without water, flowers limp quickly and, as a result, they start to bend. Even though the bending goes slowly, when using long exposure times, it can lead to motion blur. When a flower is very soft, keep it in a little vase with water while photographing it.

Once you are done photographing a flower, put it back in the water. Flowers will change over time, and it can be interesting to photograph them in different stages. Eventually they start to die, which gives additional special photo opportunities. Decaying flowers can be very interesting, as in the image below.

A decaying flower can create an interesting image. 100 mm, 1/3 s, f/11.

A simple setup

You don't need a lot of equipment to photograph flowers inside. Just use a table in the living room and place the flower on top of it, in a small vase. Rotate the vase and look at the flower from different directions to determine the nicest shot.

Preferably, place the camera in a position where there is a window behind the camera or to the side. This shines enough natural light on the flower to take the shots. Put the camera at the same height as the flower or slightly above it. You also need a background, like a piece of cloth, a pillow, or a large piece of cardboard. I often use a large black folder.

A simple setup with a flower in a vase, the camera on a tripod, and a black folder as background.

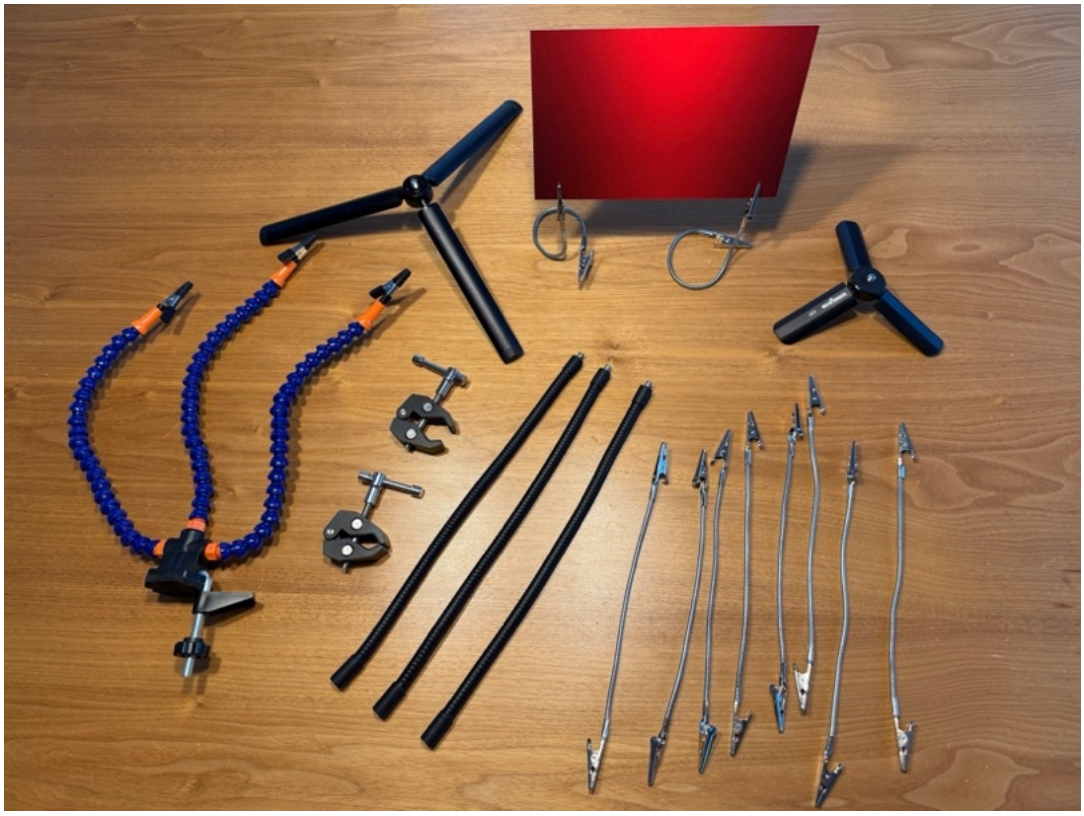
Positioning the flower

The flower can be put in a little vase, but that is not the best solution. It limits you in the directions from which it can be photographed. For example, it becomes very difficult to photograph the flower from above.

A better solution is to use floral foam that is used for floral arrangements. The flower can be put into the foam from any direction. (Place something heavy on top of the foam to avoid it from tilting over. You can also use a small tube to insert in the foam and put the flower in the tube. (There are special flower tubes used for cakes that work great.)

The most flexible solution is to use a **third hand**. These are normally used for soldering and for needle work. They consist of a few flexible arms with a crocodile clip at the end. These are connected to a weighted base that is placed on the table, or to a clamp that can be fixed to the side of the table. Third hands are inexpensive and very useful, not only for the flower but to hold other objects as well, like background cards.

The stem of the flower can be placed in one of the clips and the flexible arm can then be used to orient the flower in any way you like. The other arms can be placed on the table for extra stability. Depending on the weight of the flower and the strength of the clip, you might need to hold the stem close to the flower. Take care that it does not show up in the photo.



$50 worth of tripods, tubes and clamps I use indoors. The third hand is on the left.

Photographing

For indoor flower photography, the same camera and lens can be used as when shooting flowers outside. You can photograph handheld but, as exposure times can often increase, I recommended placing the camera on a tripod. When using a tripod, switch off the image stabilization of the camera and lens, as on some (older) cameras, this can lead to motion blur when using long exposure times.

Preferably, use a rather long lens to take the shots. Because of the compression a smaller part of the background will be visible. I use a 100 mm lens for most indoor shots. When using a lens with a smaller focal length, a much larger background is required, or it must be placed closer to the flower, making it less blurred.

As exposure settings, I recommend using ISO 100 for the best image quality. Pick an aperture to get the depth of field you like for the shot. I like to take photos with a lot of sharpness, so I often use a narrow aperture of f/13 or f/16. If the camera allows this, put the shutter speed on automatic to let the camera determine the required value for the best exposure. Alternatively, the shutter speed can be set manually. Because the camera is on a tripod and there is no wind, long exposure times are no problem.

To avoid any camera motion blur, use a remote control to operate the camera or use the timer to take the shot after 5 or 10 seconds. Don't touch the table or breathe towards the flower. Take many shots from different directions. Note that it is often easier to position and orient the flower rather than changing the position of the camera.

Below you see the shot taken with the setup in the image above. The required shutter speed was half a second.

The resulting flower shot, using the setup shown above. 100 mm, 1/2 s, f/16.

Background

As we discussed before, in flower photography the background plays a crucial role. Indoors, you control the background by placing something behind the flower. One approach is to use a black background to put all focus on the flower. For this I use a large **folder**. These can be bought in any art store. They are normally used to transport photos and drawings. By leaving the folder partially open, it stands by itself on the table. Other backgrounds can be attached to the folder using clothespins.

For example, to get a light background, fix some light paper or cloth to the folder. Light backgrounds create softer images. **Wallpaper** can create a great background due to its color, texture and pattern. If you go to a store where they sell wallpaper, they might have some old sample books that you can get for free or for a small fee. Cut the desired page from the book and fix it to the background folder using clothespins. Place the background at such a distance behind the flower so that the texture is blurred just right.

A light background results in a softer image. 100 mm, 1/8 s, f/16.

There are also special **macro background cards** for sale. These are typically A5 size and have different color gradients. The cards are small and must be placed close behind the flower. But because of the color gradients, no blurriness is required. Aim the light(s) carefully to avoid the flower casting a shadow on the background card. Depending on the color of the background card, you obtain rather different images. You can use a neutral color, like white or gray, a contrasting color, or a more harmonious color. Below you find some examples.

The background has a huge effect on the resulting image. All shots 100 mm, 1/125 s, f/8.

It is easy to make such background cards yourself. With any drawing program (or a program like PowerPoint) you can create an image with a color gradient. Print it on thick, matte paper, and you are ready.

Natural backgrounds

For a more natural background, you can place some other flowers or leaves at a distance behind the main flower, using some additional clamps. Care must be taken that they appear blurred enough and

that they are adequately lit. It is not easy to create a natural looking image this way. It is also possible to add some leaves or flowers close to the lens and shoot through them, as we discussed on page 61.

A simpler alternative for creating natural looking background is to use an image. When outside, put the camera on manual focus, focus as close as possible, and take some shots of flowers, trees or skies. This results in blurred images that work perfectly as backgrounds. Create a collection of such background shots of all sorts of colors and textures. Whenever you need one as a background for indoor photography, you can print it. High-quality photo paper is not required. Because the image will be placed in the background and will be blurred, a print with a normal inkjet printer on normal paper will do. Here are some of the backgrounds in my collection.

Some blurred pictures that can be used indoors as backgrounds.

You can also use free images found on the web, but they must be blurred a lot. For example, images from Unsplash (https://unsplash.com/) can be used and modified for free without the need to credit the original creator. In this way backgrounds can be found that have the right colors and gradients. (One can argue whether it is still your shot. But when only using a blurred version of another image as a background, I personally do not consider that a problem.)

Rather than printing the background images, it is also possible to use a monitor to display them and place the monitor (far) behind the flower. When showing the background image in a photo editor, it is easy to zoom-in or zoom-out, add blur to the background, change the intensity and even the

colors. This provides all the flexibility to get the perfect background for the shot. Make sure the illumination of the flower matches the background.

A rose, shot in front of a background displayed on a monitor. 100 mm, 1/10 s, f/8.

Light

Light is crucial to create interesting photos. When working indoors, you can use the light that comes through a window, but this can be enhanced or replaced with artificial light. By controlling the light, you control the look of the image.

You can simply switch on the lights in the room to get a different type of light. A desk lamp can be used to create a more directed light source. But for further control, LED panels, torches, or flashes are required. We will discuss light extensively in Chapter 4. Here we focus on those aspects that are most pertinent to indoor photography.

When thinking about the light to use, it is important to consider both the flower and the background. A dark background should receive as little light as possible, while a light background should be illuminated in an appropriate way and from the correct direction. For example, it looks unnatural when the background is lit from below.

An important aspect of light is that it produces shadows. Depending on the size of the light source and its distance from and direction to the flower, different types of shadows are cast. When the light source is large or close to the flower, it produces soft shadows. But a small light source, like a flash, results in hard shadows and high contrast.

Both the flower and the background should be carefully lit, without harsh shadows. 100 mm, 1.5 s, f/16.

For example, when using a large window as light source, the shadows almost completely disappear. This can create nice soft images, but they might lack contrast. With artificial light, multiple light sources must be used to get the same effect. But if you want to accentuate the small details, a small light source from the side produces more contrast.

Torches (flashlights) are low-cost light sources. They are relatively small. When placing them far away from the flower, they produce hard shadows, but when using them at close range, the shadows will be considerably softer. Place the torch on a small tripod, either directly when it has a screw hole, or using a clamp. Flexible arms exist that can be attached between the tripod and the torch. That gives more flexibility to direct the light, and the light source can be placed higher, which is more natural.

Often, multiple torches are required to properly illuminate a flower. For example, one torch can be used for back lighting while using another to lighten up the front a bit. (The second torch you can hold in your hand, close to the camera.)

You can also use **LED panels**. There are special LED panels for photography. These can show different colors in different intensities. They can be attached to a tripod or the camera's hot shoe. LED panels are considerably larger than torches and, as a result, produce more diffuse light, leading to soft (or no) shadows.

Make sure that a light source never shines directly into the camera lens. Even though it might not be visible in the shot, it will affect the image's quality because light will bounce and reflect inside the lens, producing flare. So, when lighting a flower from the side or from behind, put something between the light source and the camera, like a black piece of cardboard.

Illuminating a flower from behind produces nice translucency effects. 100 mm, 1/4 s, f/16.

Special effects can be obtained using colored light. Many LED panels can produce light in any color, and some torches can also produce colored light. Using just one colored light source does not produce a nice effect. The flower becomes red or green or blue. But combining colored light with white light can lead to interesting effects, and you are encouraged to experiment with it. As an example, consider the image below. For this pink rose, a white light was used to illuminate it from the back. A blue light was used on the front. This turned the widest petals purple, while the petals closer to the center, which did not catch backlight, became blue. Finally, a small directional white light was used to lighten up the center of the flower.

Using three light sources to illuminate a pink rose. 100 mm, 1/2 s, f/22.

You can also use a flash. I recommend using a trigger on the camera such that the flash can be placed at any position. We will discuss flashes and triggers extensively in chapter 4.

A light box

A **light box**, also called a **mini studio**, is a cube with one open side. It often comes with one or more LED strips attached to different sides. The inside is white or reflective. Light boxes come in different sizes. For flower photography, a small one works fine. I use a Godox LSD40 that measures 40x40x40 centimeters and has three light strips that can be controlled individually.

A Godox light box with a flower in it.

Light boxes are often used for product photography, but they work well with flowers. Place the flower in a vase or with a clamp inside the light box. You can also put some background behind it. The LED strips and reflective sides of the box provide strong, even lighting for the flower, which can be photographed through the open side. If light is required from a particular direction, you can lower the intensity or turn off one or more light strips.

Below you see the image produced with the setup above. Because the light comes from three different directions and is also reflected from the sides, the flower is evenly lit, which works great for macro shots.

A light box is very well suited for macro photography because the light comes from all directions and there are no hard shadows. 100 mm, 1/6 s, f/16.

Greenhouses

When the weather is bad you can photograph in greenhouses where amazing tropical flowers can be found.

In the Netherlands, very few tropical flowers grow outside. Some people grow exotic flowers indoors (like orchids), but I don't have access to those. However, there are several tropical greenhouses that can be visited, which contain lots of amazing flowers. Botanic gardens often have greenhouses with interesting flowers. The shots in this section were taken in the botanic gardens in Utrecht. These are the largest academic botanical gardens in the Netherlands, with a size of 100,000 m2. There are more than 10,000 plant species from all over the world. And there are several greenhouses with tropical plants and flowers.

Greenhouses can contain amazing tropical flowers. 100 mm, 1/320 s, f/13, flash.

Photographing flowers in greenhouses has advantages. There is no wind, so you don't need to worry about motion blur of the flowers. With a camera and/or lens with image stabilization, long exposure times can be used without needing a tripod. (Tripods are often not allowed in public greenhouses.) Also, you have all the time of the world to take the shots.

But there are also many challenges. It can be humid in a tropical greenhouse, and the lens might fog up. The fog will normally disappear after a couple of minutes. Don't change lenses inside a greenhouse as fog might get inside the camera. So, think carefully about the lens you want to use.

Composition

Although the flowers look amazing, it is often not easy to create a nice, balanced image of them. Sometimes there are too many flowers clustered together. In other situations, there are leaves partially in front of the flowers. It might be impossible to shoot the flower from an interesting angle, because you must stay on the walkways. And the background is often not nice because many different plants are cramped together in these greenhouses. It is also not possible to photograph

against the sky, as the greenhouses have a roof. And, of course, it is not allowed to touch the flowers to move them into more interesting positions or orientations.

Flowers are often clustered, making it harder to create a nice composition. 100 mm, 1/320 s, f/13, flash.

So, think carefully about focus and depth of field, to get enough of the flower in focus, while avoiding a distracting background. While taking the shot, it helps to already think about how distraction can be removed when editing the image later. When there is an annoying object in the background, it is easy to remove it if it does not partially lie behind the main flower. It helps to take such things into account when determining the position and orientation for the shot.

Tropical flowers are large. Often there is a considerable distance between the nearest point on the flower and the furthest point. This makes it hard to get the complete flower in focus. A large depth of field is necessary, which requires a narrow aperture, which in turn hampers the blurriness of the background. Focus stacking (see page 182) might solve this but is hard to do without a tripod.

Light

Greenhouses are often rather dark. Because there is no wind you do not have to worry about motion blur of the flower. Hence, rather long exposure times can be used, especially when the camera and/or lens has image stabilization. Keep in mind that the effect of image stabilization becomes smaller when you get closer to the subject. Even with a long exposure time you might still get high ISO values. Fortunately, modern cameras can deal with high ISO values and there is excellent software to remove noise later.

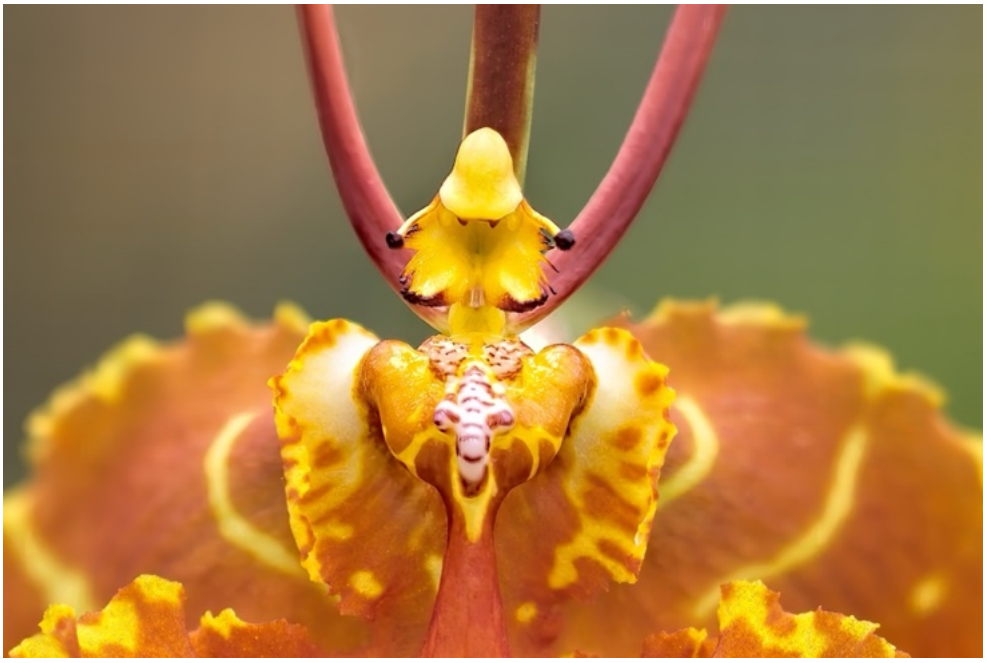
There is, however, another problem with the low light in greenhouses. It makes the flowers look a bit dull. It is recommended to use a flash or bring a torch to add extra light to the flowers. By using a flash with a diffuser, the flowers can be illuminated evenly without harsh shadows. An important additional advantage of using a flash is that the background becomes much darker, hiding many of the distracting elements. We will discuss the use of flashes and torches extensively in chapter 4 on light.

Using a flash, the background becomes dark. 100 mm, 1/320 s, f/13, flash.

Photographing details

Tropical flowers often have amazing details. Always be on the lookout for this. Instead of only shooting whole flowers, you can also photograph their small details. In this way, distracting backgrounds can also be avoided. Photographing flower details is part of macro photography, and we will devote chapter 5 to the equipment and techniques for this.

Below you find an example of a detail of an orchid. You might wonder why f/2.8 was used. This had two reasons. I wanted to put all focus on just a small part of the flower. Because the flower was rather large, that required a small depth of field. Second, the flower was behind some netting. It was impossible to shoot between the wires. But by using a wide-open aperture and placing the camera against the netting, the wires are blurred so much that they become invisible in the image.



Macro shots can show amazing details of tropical flowers. 100 mm, 1/125 s, f/2.8.

Insects

Flowers are frequently visited by insects, and such insects can provide a nice focus point in the image.

Photographing insects is a separate topic and I have written two books about the best techniques[1]. Here we will only discuss photographing flowers with an additional insect. In such a situation, the right balance must be found between the insect and the flower. When the insect is too large it attracts too much attention and becomes the main subject in the image. On the other hand, when the insect is too small it will be considered more as a distraction.

In this shot the insect is large and colorful, so it attracts a lot of attention. The flower is no longer the main subject. 100 mm, 1/320 s, f/13, flash.

The shot must remain a flower shot, but the insect should be clear enough to make the image more interesting. I recommend taking a shot of the flower without the insect as well. This allows you to determine afterwards whether the insect is indeed an interesting addition to the flower shot.

Shooting insects is not easy. Especially when they visit flowers, insects are often active and will move around or fly away. There is very little time to take the shot. Also, the insect should sit in an interesting position, such that it can be photographed (at an angle) from the front. That gives the impression that the insect is crawling towards you or looking at you. An alternative is to take the shot from the side to show the complete insect.

Here is an example. This bee (a Blood Bee) gives a nice contrast in the flower image. Without it, it would just be a very yellow image. The fact that the bee is covered with pollen tells a bit of the story of how flowers and bees work together.

[1] *My journey into insect photography* and *Photographing butterflies and dragonflies*. Both can be downloaded for free from https://www.insectenfotograferen.nl/book.

This pollen-covered bee provides a nice addition to the flower. 100 mm, 1/320 s, f/13, flash.

Focus

Because you are taking a flower shot, focus should lie on the flower. Autofocus might focus on the insect instead, because that is the location with the largest contrast. When the insect is in the middle of the flower this is acceptable, but when the insect sits on the front or the rear of the flower, the flower may no longer be entirely in focus. By using a very small focus area (spot focus), the correct focus point can be chosen.

Most butterflies attract too much attention, but this small skipper provides a nice addition to the flower. The flower is placed at the most prominent spot in the image. 400 mm, 1/350 s, f/8.

Even though the flower is the most important part of the image, it is important that the insect is sharp as well. This might require a large depth of field. You can also try to compose the shot such that the insect is at the same distance from the camera as the main part of the flower.

To give the flower the most prominence, it should be placed according to the composition rules we discuss in chapter 3. For example, in the image above, the flower is placed according to a composition rule called the rule of thirds (see page 87).

To take the shot, keep the shutter button half-pressed and wait until the insect it in the best position. Take multiple shots. If the insect moves quickly, burst mode can be used to take many shots in quick succession.

Exposure

Exposure can be a problem. Often, the insect is much darker than the flower. Because the flower is larger, automatic exposure will make the insect too dark. You can overexpose the image, but then the flower might become too bright. In such a situation the only way to get a balanced shot is to lower the brightness of the flower in post-processing. (It is better to slightly overexpose and darken the flower, rather than to try to brighten the insect later.)

A (diffused) flash can be used to add some additional light to both the insect and the flower. This tends to bring out the colors in the insect better.

To show the colors of the insect, I used a diffused flash for this shot. 60 mm, 1/320 s, f/13, flash.

3. Composition

Composition deals with the way in which the parts of an image come together to form a whole. Where is the flower in the photo, and where are other background or foreground elements located? Composition is an important part of photography. If an image has a good composition, it will keep the viewer's attention longer. Composition includes the structure of the image, the positioning of the elements, the use of lines, patterns and colors, the overall atmosphere, and more.

Structure of an image

What is the best way to structure an image of a flower? Where do you place the flower and all other elements in the image?

If you look at the photo at the beginning of this chapter, you will see that the main flower is not placed in the middle, but more towards a corner. The top left corner of the image is a bit lighter than the other corners, and there is a lot of empty space on that side of the image. This is all not a coincidence but deliberate. Several composition guidelines have been applied in this image, which we will discuss below.

When people look at a picture, their gaze usually starts in the bottom left corner or top left corner as this is the way most of us are taught to read. Because the top left corner in the example is a bit lighter, the gaze will start there. From there, their gaze moves over the image. In this example, it will follow the lighter area and reach the flower buds at the bottom. Then it will travel to the right to the main flower. The insect on it will keep the attention to that spot for a while. Alternatively, the gaze might move along the top edge, reach the flower buds there, and move down to the main flower.

Good composition depends on guiding the audience's attention and engaging their interest in multiple areas of the photo. The best photos draw the audience into the scene and spark their imagination. In the photo at the beginning of this chapter the shapes of the flower's stems evoke wonder about the overall shape of the plant and how the insect interacts with the flower.

Rule of thirds

In the image at the start of this chapter, the flower and the buds are placed according to the **rule of thirds**. This is an important composition guideline. When dividing the image horizontally and vertically into three equal parts, the lines intersect in four positions that are always at 1/3 or 2/3 of the length and width. These are the best positions to place the main element of the photo. In the image below, the flower is again placed according to the rule of thirds. This time, the stem guides the gaze of the viewer towards the flower.

When using the rule of thirds, there is much more space on one of the two sides of the flower. When the flower is "looking" towards a side, like in the image below, it is important that the empty space is on that side, otherwise the flower will look out of the picture. (There are situations where this causes tension, but this is usually not the case with flowers.) It is slightly preferable that the flower looks to the right because our gaze moves from left to right over the image, but this is certainly not always important.

This flower is placed according to the rule of thirds. A lot of open space has been left in the direction in which the flower is "looking". 400 mm, 1/250 s, f/8.

Although the rule of thirds is an important composition rule, you don't always have to stick to it. When photographing a flower straight from above, there is a lot of symmetry in the shot. In that case, that symmetry can be strengthened by placing the flower exactly in the middle. (Making the image square is also effective when there is a strong symmetry.) Below you find an example.

In a shot from above you often break the rule of thirds to emphasize symmetry. 400 mm, 1/250 s, f/8.

Negative space

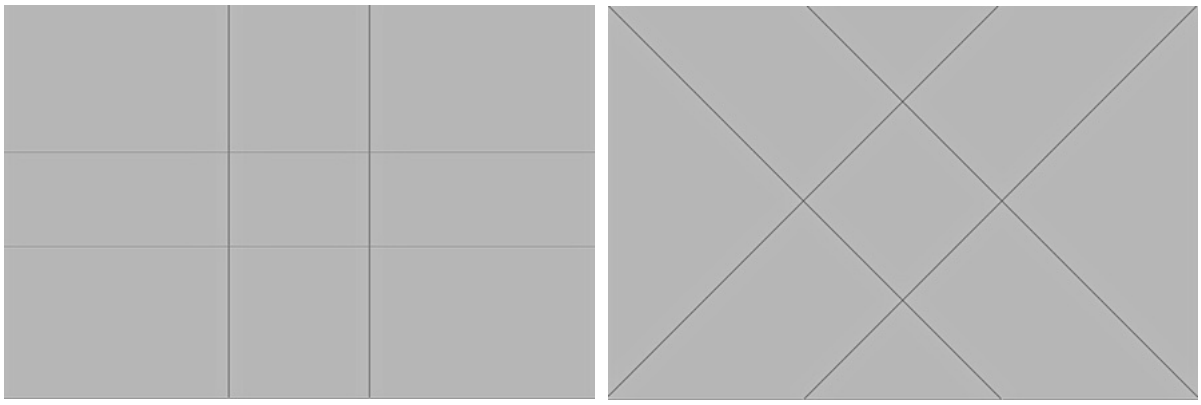
It helps to place as few other elements as possible in the image. There can be blurred elements in the background but there should be nothing that attracts too much attention. This empty part of the photo is called the **negative space**. It creates tranquility and directs the viewer's attention to the flower. Of course, you don't have to adhere to this rule either. Many different elements can also hold the viewer's attention for an extended period because there is a lot to see.

When there is a lot of negative space, it is important to consider the **residual form** in the image. This is the area between the subject and the edges of the image. Or, stated differently, it is the area you are left with when removing the subject. The shape of this area is a strong element of the image. It should not only be appealing in content (when blurred this is normally the case) but also in shape. This is largely determined by the outer shape of the flower but also by the distance between the flower and the borders of the image. Fortunately, most flowers have a nice outer shape and, hence, a nice residual form. But prominent stems can hamper the shape of the residual form, creating thin areas with sharp points.

When photographing flowers, it helps to be aware of these simple rules of composition. Rather than automatically placing the flower in the center, think about the rule of thirds. Not only look at the flower in your shot but also look at the background that often forms the empty space and think about how this empty space can enhance the shot.

Other divisions

In addition to the rule of thirds, in which the photo is divided horizontally and vertically into three equal parts, another division is based on the **golden ratio**. The golden ratio is a number that is approximately equal to 1:1.62. When dividing the image horizontally or vertically into two parts, it is attractive to use the golden ratio for this, using one of the lines in the left image below. It works great to place a flower with a vertical stem on one of these vertical lines. Cameras and photo editing software can display such a line pattern on top of the image which helps to use this ratio.



The division of an image based on the golden ratio (left) and diagonals (right).

With the **diagonal method**, the four corners of the image are divided into two equal angles. This way you get the four lines in the above image on the right. Important elements can now be placed at the four intersections, and other elements can be used to guide the viewer's gaze along the lines. This is harder to use in flower photography, but sometimes you can let stems of flowers follow these lines.

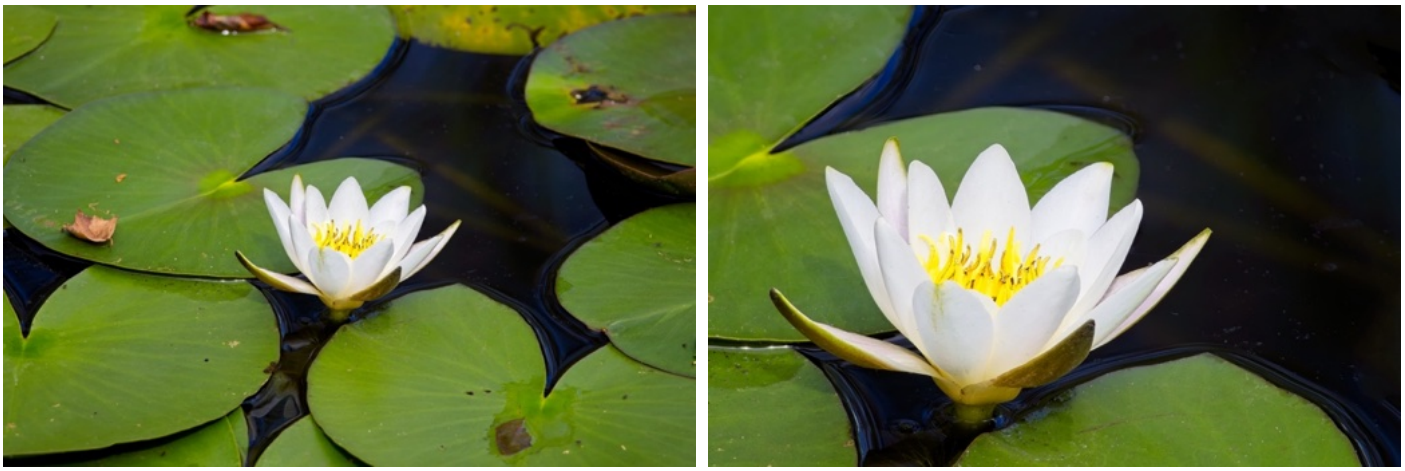
The stem of this flower follows the diagonal method. 200 mm, 1/350 s, f/8.

Framing

How do you frame a flower? Is there a lot of empty space around it, or does the flower fill the image?

In the previous section we discussed where to place the flower in the image. Another question is how large the flower should be. Does the flower cover most of the image or is there a lot of space around it? This is referred to as framing the image (although the term is also used when surrounding the flower or using a border).

Most of the time, it is best not to leave too much space around the flower. The flower is the interesting subject, and you want to show all its beautiful details. A large flower will also make the image colorful. The background is often not very interesting. Some background is required though to make the flower stand out and give it some breathing room. It works best to determine the final framing during post-processing, so, when taking the shot, leave enough space around it to allow for different framings.



The flower in the image on the left is too small, and too much attention is drawn to the background. In the image on the right a crop was applied to put all the focus on the flower and show all its details. 300 mm, 1/350 s, f/8.

Keeping the flower smaller in the image normally only works when the background is interesting in some way. This is, for example, the case when other flowers are visible in the background. You can also deliberately make the flower small to create a certain mood in the image. For example, when a small flower is placed in the corner of an otherwise bleak and blurry background, this will give a feeling of loneliness.

Sometimes it can be interesting to not show the complete flower but cut off part of it. What remains should be interesting enough because of its structure or details.

Because of the interesting pattern, it is not necessary to show the complete rose. 100 mm, 1/4 s, f/11.

Aspect ratio

Most cameras' default settings produce images with an aspect ratio of 2x3. So, the image is one and a half times as wide as it is high. For many flower shots this is not the best ratio. When you shoot horizontally, in landscape mode, there often is too much empty space on both sides of the flower, especially when the flower is close to being round. On the other hand, in portrait mode the stem often becomes too long, or there is too much empty space above the flower.

In such situations it helps to use a different aspect ratio. The aspect ratio can be set in the camera, but it's always easier to crop the image afterwards. As you will see in this book, many of the images have a different aspect ratio.

When photographing a flower from above, an aspect ratio of 1x1 (square) is often preferred. This reinforces the shape of the flower. Square images also emphasize symmetry in the flowers.

When shooting a flower from the side showing the stem at the bottom of the flower, it is effective to use a vertical aspect ratio of, for example, 4x3 or 5x4. This does still emphasize the vertical line of the stem, but the stem does not become too long. When shooting from the side while you want the flower to cover most of the image, a horizontal aspect ratio of 3x4 or 4x5 often is ideal.

Below you see an example. The original 3x2 image is shown in the top left. The stem is too long in this image (and there are too many distracting elements at the bottom). In the top right image, a 5x4 ratio was used. This gives a more balanced shot with still enough of the stem visible. If you want to put all emphasis on the flower you can use a 4x5 ratio, as shown in the bottom image.

Changing the aspect ratio of a shot. 300 mm, 1/500 s, f/8.

The particular use of the image might dictate the best aspect ratio. On social media, a 2x3 landscape image often works well. But in other situations, a portrait ratio might work better. And sometimes a square image is required, for example as a profile picture.

Focusing attention

Lines in the image can be used to guide the viewer's gaze toward the flower. Also, surrounds can be used to focus attention.

As we saw at the start of this chapter, a viewer typically starts looking in the left top or left bottom corner of a picture and moves from there through the image. The gaze can be guided by providing elements that lead it. These are referred to as **leading lines**. Stems of flowers work well for this. Make sure the stem starts at or close to one of the corners on the left. It then naturally leads the gaze of the viewer to the flower, like in the image below.

The stem leads the viewer from the top left corner to the flower. 200 mm, 1/350 s, f/8.

Other objects can be used as well to show the way towards the flower. For example, there can be other, blurred flowers in the left corners. Or there can be a streak of light or dark areas leading from the left corners to the flower.

Another (blurred) flower can also be used to lead the viewer to the main flower. 180 mm, 1/350 s, f/8.

Surrounding the flower

Another way to put more emphasis on the flower is to **surround** it with some kind of frame. We have already seen some examples in the previous chapter. The shooting through technique, discussed on page 61, is a way of surrounding the flower with some blurred color from leaves or other flowers. When done carefully, this will lead the focus to the sharp flower in the middle.

Another way is to surround the flower by elements in the background, like the background flowers we discussed on page 58. Care must be taken that the surrounding elements do not attract too much attention.

But the surrounding elements can also be more subtle. For example, there can be darker or lighter areas in the background surrounding the flower. You can search for these when taking the shot, but they can also be added in post-processing. Every photo editing software has the option to add a vignette to the image. This will make the image darker towards the outside. Sometimes a lighter vignette can be added as well. When not overdone, this does draw attention to the flower. We will discuss vignettes in more detail in Chapter 6 on page 213.

Below you find another use of a surround. In this high-key image I used the leaves of the grass to surround the foxtail. These leaves also provide a leading line from the left-bottom corner. I like that

the global shape suggests flow and motion in the image which at the same moment is static and serene.

In this high-key image the leaves surround the foxtail and lead the viewer diagonally through the image. 50 mm, 1/2 s, f/16.

Adding borders

When editing an image, **borders** can be added. And when printing a photo and placing it in a frame, a **mat** (also called a **passepartout**) is usually used between the image and the frame. The border or mat pulls the viewer into the image. It separates the outside world from the world inside the image. The color of the border or mat is important. A black border often works well with an image with bright colors. White is more neutral.

Photo editing software has a lot of options for using borders. But be careful that it doesn't distract from the content of the picture. Often a simple border works best. And if a photo is shown against a white (or black) background, such as in a book, a border is usually not necessary at all. The background already forms a frame.

Colors and texture

Flower can be very colorful and have nice textures. How does this affect the appreciation of an image?

Color plays an important role in flower photography. The flower has one or more colors and there are also colors in the background. These colors can enhance each other, but they can also reduce the appreciation of the image. The same applies to textures and detail. They can make an image more interesting, but when there is too much of it the image becomes messy (although some people may like it). Balance is crucial.

Too much color and detail can make an image messy. 100 mm, 1/320 s, f/13, flash.

Visual weight

Visual weight is an important concept in composition. The **visual weight** of an element in the image determines how strongly it draws the viewer's attention to it. The visual weight of an element is determined by several factors:

- **Color**. Saturated colors draw a lot of attention. Red and orange colors have a larger visual weight than green and brown colors. As most flower images have a background with green and brown colors, the flowers automatically draw all the attention.
- **Size**. Large elements draw more attention than smaller elements. The smaller the flower is in the image, the less visual weight it has.
- **Brightness and contrast**. The brighter an element is, the more it draws the viewer's attention. It has a higher visual weight. The same is true for contrast. The more contrast, the larger the visual weight. Bright flowers with strong contrasts will have a high visual weight while subdued flowers draw much less attention. The background should preferably be darker than the flower, unless you want to create a strong contrast between a light background and a dark flower.

- **Texture and detail**. Areas with clear textures and detail have more visual weight. This is one of the reason backgrounds should preferably be blurred. When they are not, there is a lot of detail and texture in them, drawing too much attention to the background.
- **Negative space**. Negative space has very little visual weight. When a flower is surrounded by negative space it increases the relative visual weight of the flower.

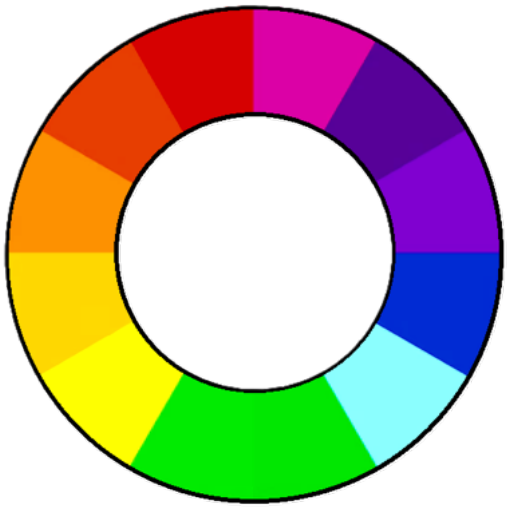
It is important that there is **balance** in the image between areas with large visual weight and little visual weight. The visual weight must be distributed in an interesting and appealing way. For example, not all visual weight should be close to one edge of the image. In many flower images there is just one area with a large visual weight. Don't place this too close to the side of the image or try to have an area of a lesser visual weight on the other side, like a blurred flower in the background.

For most shots it is important that the flower has the largest visual weight in the image. This can be achieved by a combination of the factors listed above. In the image below you see an example of how this can go wrong. The yellow color of the flowers in the background has a larger visual weight than the purple in the main flowers. Also, the background still has a lot of detail. As a result, not enough attention is drawn to the main flowers.

The yellow flowers in the background have a larger visual weight than the purple flowers and, hence, attract too much attention. 85 mm, 1/180 s, f/8.

Color

Many flowers have bright colors. Colors can be placed on a **color wheel**, as shown in the image below. They follow the colors in the rainbow, with purple and magenta connecting the ends of blue and red. **Harmonious colors** that resemble each other lie next to each other on the color wheel while **contrasting colors** lie opposite each other. Harmonious colors give tranquility in an image, while contrasting colors result in a strong visual appearance that draws the viewer's attention to the colors with the greatest visual weight.



A color wheel. Harmonious colors lie next to each other and contrasting colors opposite each other.

Contrasting colors are easy to achieve in flower photography. Many flowers are red, orange, or purple. These colors contrast strongly with a green background formed by leaves, as in the image below. Yellow and blue flowers provide less contrast with such a background. (With some careful editing of the background, you can enhance or reduce the color contrast.)

A purple flower creates more color contrast with the green background than a blue flower. Left shot 200 mm, 1/350 s, f/8. Righthand shot 300 mm, 1/350 s, f/8.

Harmonious colors are more difficult to obtain in flower photography. Some flowers are largely green and with a green or brown background the colors are harmonious. (In such a situation something else is needed to put the accent on the flower, like interesting textures.) Below you find

another example. The soft yellow/brown colors of the willow catkin and the butterfly match those in the background. But because the background is very blurred, the focus still lies on the catkin and butterfly. Also, note that the stem provides a leading line and that the butterfly follows the rule of thirds, leading to a pleasing image.

A butterfly on a willow catkin in a harmonious image. 400 mm, 1/350 s, f/8.

White balance

The **white balance** determines the extent to which the color temperature in the shot is shifted. You often want white in a photo to be really white, but depending on the type of light, it can look more orange (for example with a setting sun) or blue (for example with artificial light). The white balance can be used to correct this.

But the white balance can also be used to change the mood in a photo. You can make the image warmer (more orange) or cooler (more blue). The example below shows what a change in white balance does to a photo (the effect is deliberately exaggerated here). The left shot seems to have been taken in the shade and the shot on the right in the sun. When using the JPG images from the camera, the white balance must be set in the camera. But when using the RAW images, it can easily be adjusted afterwards when editing the image.

The same image of a flower with a cool white balance on the left and a warm white balance on the right. 150 mm, 1/350 s, f/8.

Creating emotion

An image has a bigger impact when it creates some emotions in the viewer. Flower image can do that.

Colorful flowers can generate a feeling of joy and happiness. Flowers are often used at birthdays, weddings, and other celebrations. This can be emphasized by adding some props to the flower images, like balloons or other festive items. A white ribbon can create an association with a wedding. But a colorful flower image can also produce happy feelings without building on an association.

Flowers images can also generate an aesthetic feeling in response to the beauty of the flower. Or they can produce a feeling of amazement because of the shape, textures and colors in the flower. Flowers can have incredible beauty and amazing shapes and if photographed in the right way, the image will convey this feeling.

An image of an amazing and beautiful orchid. 100 mm, 1/320 s, f/13, flash.

But flowers can also be associated with sadness. They are used at funerals and at cemeteries. To create this association, you probably need to show a bit of the environment, or some part of a ribbon. Another approach to generating a feeling of sadness is to photograph dead flowers. These have their own special type of beauty.

A dead rose is often associated with a lost love. 100 mm, 1/20 s, f/2.8.

A feeling of loneliness can be produced by showing one small flower in a large area without any other flowers. Take a shot at an angle from a relatively low position, such that a large area of grass is visible. It is most effective to place the single flower in a corner, looking towards the emptiness.

Mood

As we have seen in the previous sections, you have the means to create images with a large variation in atmosphere. This helps to create a certain mood.

Soft images can be created by taking the shots on a lightly clouded day such that the shadows are soft. By using a wide-open aperture, the image becomes dreamy, especially when the flower and background have soft colors. And it helps to make the image very light by overexposing it. On the other hand, strong and powerful images can be generated by creating a lot of contrast and by using a narrow aperture to get a lot of sharpness in the shot. This can be enhanced by using a flash. A flash produces a dark background which contrasts strongly with the flower. It also produces more saturated colors in the flower, leading to an image with a lot of visual weight.


A soft, dreamy image on the left, and a strong, powerful image on the right. Lefthand shot 100 mm, 1/90 s, f/2.8. Righthand shot 70 mm, 1/320 s, f/13, flash.

Telling a story

When pictures tell a story, they have more impact on the viewer. This is normally easier with images of people or occasions, but flower shots can also tell a story. We associate different types of flowers with different events. The flower images can tell the stories of these events.

Cherry blossom against a blue sky tells the story of spring. 100 mm, 1/320 s, f/13, flash.

For example, snow drops announce the end of winter. By taking a shot of a snow drop emerging from underneath a blanket of remaining snow, that image tells the story of the end of winter and the beginning of spring. Blossoms are associated with spring as well. Roses are associated with love. A picture of roses on a nice background can convey that story. You might even arrange them in such a way that there is a (vague) shape of a heart. Tropical flowers can tell the story of an exotic trip. And so on.

A **series** or **triptych**, consisting of three images, makes it easier to tell a story. In a series it works best to keep some elements the same in all images and vary one or two other elements. For example, you can keep the flower species the same, but show it in different stages (bud, blooming, dead), seasons or weather conditions. You can also show different flowers with the same color or similar shapes. You can keep the family the same but show different species, for example, different tulips. You can show the same flower from different directions or combine shots of the complete flower with macro shots of details.

Another way to tell a story is to give the image an appropriate **title**. Don't use a title that simply describes the subject, like "snowdrop in the snow". Instead, relate to the story, for example, "spring is coming". Or go even more abstract with a title like "hope". And sometimes you can add a description to an image. Again, don't describe what the viewer can see but relate to what she should feel.

Symmetry and repetition

Most people find symmetry attractive. Flowers, when shot from the right direction, can have a strong symmetry. Repetition can also make a photo more powerful.

Many flowers have a center with the stigma and stamens, surrounded by several petals extending in the different directions. Other flowers are composite flowers. They consist of a central disk consisting of many small flowers, while long-petaled ray flowers surround the disk. When shooting such a flower straight from above, the image has a strong symmetry. You can mirror the image in a point in the center and get largely the same image. It is not exactly symmetrical, but it still gives the impression of symmetry. You can strengthen this feeling by placing the center in the middle of the image and using a square aspect ratio, as in the image below.

When shooting a flower from above, there is often an attractive symmetry. 400 mm, 1/350 s, f/8.

Another type of symmetry occurs when shooting a flower from the side. For many flowers the left and right side will look almost like mirrored copies. To emphasize this, place the center line of the flower exactly in the middle of the image. Depending on the shape of the flower you can use a landscape, portrait, or square aspect ratio.

Obviously, this does not apply to all flowers. And, as we have seen in earlier sections, you can get very attractive flower images by shooting them from other directions, where there is no clear symmetry.

Many flowers, like this waterlily, have a form of symmetry when shot from the side. In this image, the reflection in the water adds some extra symmetry. 400 mm, 1/350 s, f/8.

Repetition

Repetition is another composition technique to enhance shots. By including repeating elements in a photo, the viewer's gaze will move along the repeated elements. There is normally a lot of repetition in the flowers themselves. For example, there are multiple petals. When a flower has a small number of clearly separated petals, this provides a nice balance. This is most effective when the number of petals is odd, like three or five. Fortunately, this is the case for many flowers.

An unusual picture of three flowers with three petals. 100 mm, 1/320 s, f/13, flash.

You can also use multiple flowers, placed in a pattern that leads the viewer from one flower to the next. Again, an odd number works best. For example, you can place three flowers in increasing sizes that lead the viewer from a corner to the main flower. The first two flowers can be blurred as the focus should be drawn to the final flower. But the flowers can also get an equal amount of visual weight, like in the high-key image below. We will discuss the creation of such high-key shot on page 153.

Repetition in a high-key image of grass foxtails. 70 mm, 1/6 s, f/16.

4. Light

Light is crucial in photography, which literally means “writing with light”. Different kinds of light and light directions lead to completely different pictures and require different techniques and settings. Weather conditions play a huge role when using ambient light. A flash or torch can be used to enhance the ambient light or even replace it. You can apply special techniques, like HDR, when dealing with difficult lighting conditions. Interesting photographs of flowers can be made using UV light or by underexposing or overexposing the shots. In this chapter we will discuss all these options.

Ambient light

During the day there is normally enough light for photography. But depending on the time of the day and the weather, the light can be rather different, leading to distinctive flower images.

Most people photograph flowers during the day. And many flowers grow where there is a lot of sunlight. So, most of the time, ambient light can be used for flower shots. But the lighting conditions can vary considerably, depending on the weather and the time of the day. For example, flowers look completely different on a sunny day, compared to a dark, rainy day.

In the sun, colors are bright and there is contrast and shadow to provide depth. 85 mm, 1/180 s, f/13.

About light

Light has six important characteristics:

- The **source of the light**. This can be the sun, either direct or indirect through clouds. But it can also be a flash or a torch. Indoors you have many more potential light sources at hand as well as the means to position them.
- The **size of the light source**, as seen from the subject. Although the sun is very large, seen from a flower's point of view it is very small. Small light sources produce hard shadows, while large light sources produce much softer shadows.
- The **intensity of the light**. Summer sunlight is very bright. In the winter the intensity is a lot smaller because the sun is closer to the horizon and the light must travel through more air. Flashes are very intense (but this can be adapted), while a torch is less strong. For these smaller light sources, the distance to the subject has a strong effect on the intensity of the light.
- The **type of light**. The light can fall directly on the subject, in which case the term **direct light** is used. It can also be reflected or diffused by other objects, in which case we use the term **indirect light**. For example, a reflector screen can be used to create indirect light towards the flower. Indirect light often produces a larger light source and, hence, softer shadows.

Diffuse light is light that has no clear direction (comes from all directions), like on a clouded day.

- The **direction of the light** with respect to the subject. There can, for example, be **frontal light** that fall on the subject from the direction from which the flower is shot, **side light** that comes from the side, or **back light** that illuminates the subject from behind. They all lead to different flower shots.
- Finally, there is the **color of the light**. The color of the sunlight depends on the time of the day. It is white/yellow during the day, redder in the evening, and blue after the sun has set. Your eyes very quickly adapt to this color, and you hardly notice the difference, but the camera will record the different colors, unless corrected by the white balance. Light from a flash looks like daylight, but other light sources, like LED lights, can be bluer.

So, there are many factors that determine the effect of light on the flowers. Here we just discuss the use of direct or indirect sunlight, but in further sections we will use light from flashes and torches.

There is also a significant difference between light reflected from the flower and light that is transmitted through the flower. Reflected light is strong, warm and colorful, emphasizing the color and texture of the subject's surroundings. Transmitted light tends to isolate the subject from its surroundings. Transmitted light illuminates the subject seemingly from within. See the section on backlight on page 115.

On a clouded day, flowers can look a bit dull, because there is little contrast and not much shadow. 100 mm, 1/125 s, f/8.

Shadows

The most important effect of light is the presence or absence of shadows. Without shadows, pictures look flat. Large shadows provide depth and small shadows create contrast. Shadows can also enhance textures.

The type of shadows depends on the characteristics of the light. When there is diffuse light, like on a clouded day, there are hardly any shadows. As a result, images can look a bit dull and lacking drama.

There will still be lighter and darker areas, depending on how much diffuse light falls on a particular area.

When there is a strong, small light source, like the sun, the shadows will be sharp and dark. This can produce too much contrast in the images, although some photographers like pictures with strong contrast and dark shadows. A larger light source provides softer shadows. For example, when there is a thin cloud in front of the sun, the cloud will act as a large light source.

In the left shot the flower was lit by direct sun light, leading to clear shadows. In the image on the right, it was in the shade (caused by my body). Both shots 50 mm, 1/750 s, f/4.5.

A large light source can be simulated by placing a **diffuser screen** between the sun and the flower. Foldable diffuser screens are easy to carry around. They are available in various size. Large ones work better but are more difficult to handle. To properly use a diffuser screen, it must be held above the flower and, hence, the camera should be placed on a tripod. I prefer to shoot handheld, so I hardly ever use a diffuser screen. You can also place your body between the sun and the flower, to remove the direct light.

The direction of the light has a strong influence on the shadows as well. When frontal light falls on the flower from the direction of the camera, the shadows will be small. But when there is side light, the shadows are a lot larger. This is the case during the golden hour, when the sun is close to the horizon. Be careful though as shadows of other objects, like trees, will also grow as the sun approaches the horizon and might fall partially over the flower.

You can change the direction of the light and/or add a second light source using a **reflector screen**. These are normally combined with the diffuser screen. They have a silver side to reflect the light and often also a golden side that creates warmer light. They should be placed such that sunlight is bounced to the darker parts of the flower to provide more even lighting across the subject.

Of course, the size of the shadows depends on the relative position of the light source with respect to the flower. You can carefully bend the flower to let the light come from a different relative direction. In this way large shadows in the flower can still be created during the middle of the day.

When the sun is low you get warm colors and long shadows. 100 mm, 1/350 s, f/8.

Direct or indirect light

As indicated above, light can fall directly on the flower or indirectly. Direct light creates strong shadows, especially on a bright sunny day. Indirect light creates softer shadows. Indirect light can be caused by clouds or when photographing flowers that are in the shade.

If you like flower shots with strong contrasts, use direct light. But if you prefer softer tones, indirect light works better. Most flower photographers don't like direct sunlight, except late in the day when the light is warmer and softer.

The shadows can be adapted when editing the images. It is easy to lighten up the shadows a bit and reduce the highlights. The contrast can also be reduced or increased. Often, it is best to only apply these edits to the flower only, using a mask. We will discuss these techniques in detail in chapter 6.

Background

As we have pointed out at various places in this book, the background plays an important role in flower photography. The available ambient light also illuminates the background, but this can be rather different from the flower. For example, the flower might be in the sun, while the background is in the shade. In such a shot the flower becomes very prominent, and the background becomes less distracting, even when it is not blurred much, because distractions are less visible. This effect can be enhanced when editing the image, by deepening the shadows.

When the background is in the shade, the flower becomes more prominent. 110 mm, 1/500 s, f/8.

The reverse can also give interesting images. When the flower is in the shade, but the background is lit by the sun, the silhouette of the flower is shown. However, this depends on the exposure choices. When exposing for the background, the flower indeed becomes dark, but when exposing the flower correctly, the background becomes very light. Combining this with a small depth of field produces dreamy images.

When exposing for the flower the background becomes light, leading to a dreamy image, especially when using an open aperture. 50 mm, 1/750 s, f/2.

Backlight

By photographing against the sun or a light background, the subject is lit from behind, leading to special effects in flower shots.

Backlight photography is a type of photography where the main light source is behind the subject. This can create fascinating flower images. Depending on the density of the flower's tissues, it can lead to translucent petals that show intricate textures and patterns, or to silhouettes that emphasize the overall shape of the flower.

When light shines on a flower from behind, the light can either go through the flower or be blocked by it. In the first situation, nice colors and patterns become visible in the petals. Because petals can overlap and their density can vary, lighter and darker areas combine to create interesting lines, shapes and patterns.

When the flower blocks the light, a silhouette is shown that emphasizes the outline of the flower. This is especially interesting when the flower has an interesting outer shape. Sometimes you get a combination because certain parts of the flower are translucent while others are not, like in the image below of a backlit crane flower.

A backlit crane flower combining a strong silhouette and translucent petals. 100 mm, 1/750 s, f/8.

The light

The light that illuminates the flower from behind can be produced by a direct light source, often the sun. Make sure that the sun is not shining directly into the lens of the camera, as this will produce flare. Use a lens hood or hold something between the lens and the light source to block the light.

You can also use your own light source. For example, a LED panel can be placed behind the flower, a flash can be used as well and fired using a trigger on the camera. We will discuss the use of a flash in more detail on page 124.

A particularly interesting type of shot is obtained by showing the sun in the image. This only works when the sun is setting (or rising). Place the camera in a position close to the ground, such that the flower is in front of the setting sun. You need a clear path from the flower to the sun. Use a lens with a large focal length (200-400 mm). That will compress the image and make the sun larger. Put the focus on the flower. Because the flower is close to the camera, while the sun is far away, the sun will get very blurry. This can be remedied by using a very narrow aperture. In the image below f/22 was used to keep enough shape in the sun.

Two flowers shot against a sunset. (Because there was a lot of wind, a fast shutter speed was required.) 300 mm, 1/750 s, f/22.

When photographing indoors the backlight can be simulated by placing the flower in front of a computer monitor and displaying an interesting background on it. (This is an easy way to get a flower in front of a sunset; just use a sunset picture on the screen.) A light source must be placed behind the flower to illuminate it from behind as the monitor is too weak for this.

The flower

Not every flower is suited for backlight photography. Depending on whether you want the light to shine through the petals or prefer a silhouette, a rather different flower is needed.

Flowers with soft, thin petals work best to let the light shine through them. The image looks nicest when there are some patterns in the petals, caused by color variations or by the nerves. Shoot the flower from a low point of view, like in the image below.

When you want to create a silhouette, a flower is required that has rather thick petals. It is important that the outside contour of the flower looks interesting, as that will get all the attention in the image. There should be no leaves or stems behind the flower. It becomes hard to distinguish different elements in a silhouette image, and most depth queues are lost. Hence, leaves and stems behind the flower will become connected to the flower and affect its overall shape. Your subject will therefore require a direct line of sight to the light source.

A backlit tulip, shot against the sky and slightly overexposed. 110 mm, 1/350 s, f/6.7.

Exposure

When you want light to shine through the flower, it helps to overexpose the shot a bit by selecting a positive exposure compensation, like in the image above. This might, however, make the background too light. You can normally correct this in post-processing. Another option is to create an exposure bracket with shots with different exposures and combine them into an HDR image. Cameras can create such a bracket automatically. See the next section on page 119 for details.

When you want to create a silhouette, it helps to underexpose the shot, to make sure the flower becomes largely black. This might, however, make the background too dark. This can be corrected in post-processing or by creating an exposure bracket. To enhance the effect, you can increase the contrast in post-processing.

A silhouette of a flower. The contrast was enhanced in post-processing. 100 mm, 1/350 s, f/13.

HDR

When there is too much contrast in the flowers, HDR can be used to improve the shots.

HDR (High Dynamic Range) is a technique in which multiple shots of the same scene with different exposures are combined into a single image. It is used to increase the dynamic range of the image such that both the bright and dark areas of a scene retain maximum detail. The technique can also be used for flower photography, but the effect might be a bit different from what you expect.

In HDR photography three (or more) shots are taken of the same scene. One shot is normally exposed, one shot is underexposed, and a third shot is overexposed. Typically, one or two stop of under- and overexposure are used.

A normal, under- and overexposed shot of a flower. 400 mm, f/8. Shutter speed 1/350, 1/640, and 1/180 s.

Software combines the three images. For the dark parts of the scene the overexposed image is used. This image still contains a lot of detail in these dark areas that is lost in the other two images. For the bright parts in the scene the underexposed image is used. Again, this image shows details in these bright areas that are not visible in the other shots. And for other parts of the scene the normally exposed image is used. In this way a larger range of intensities is obtained. This range is then compressed to fit into the dynamic range that the image format can store.

Below you find the result. Compare the resulting HDR image with the normally exposed shot above. As you can see, in the combined HDR image the bright parts of the flower contain more color and detail. (In this case the overexposed shot was hardly used in the resulting image.)

The combined HDR image.

When to use HDR?

HDR is often used for landscape photography when there is a bright sky and a darker foreground. The technique maintains the details in the sky while adding enough light in the foreground. It is also used for indoor shots, when bright light falls through windows. In some sense, an HDR image is more realistic, as our eyes have a considerably larger dynamic range than the sensor of a camera. On the other hand, the shots can look a bit unnatural, because we are used to photographs having a smaller dynamic range.

When photographing flowers, HDR is useful when there is too much contrast in the scene. This happens when the flower is in bright sunlight. Shadows become very dark while other areas might become too light due to the reflecting sunlight. When photographing flowers in the shade, HDR is hardly ever useful.

Below is a typical situation where HDR is useful. The flowers and the leaves of this plant are shiny. As a result, in the normally exposed image on the left there are a lot of highlights where the color is almost gone. In the HDR image on the right, these highlights are reduced considerably. Also, the shadows have become less dark, leading to a more balanced and pleasing image.

The same flower shot without HDR (left) and with HDR (right). 270 mm, f/13, varying shutter speed.

Another case where HDR is useful is when the background is very bright. For example, when shooting a flower from below and using the sky as the background, either the sky becomes too bright, or the flower becomes too dark. Using HDR will make the flower lighter while still maintaining some detail in the sky. This can be improved further in post-processing. (An alternative approach is to underexpose the shot and use a flash to add more light to the flower, as we will discuss in the next section.)

By using HDR, the details in the flower are visible, while the sky is not overexposed. 100 mm. To get the complete flower sharp, aperture f/22 was used. Shutter speed was varied for the three shots.

Taking the shots

Most cameras can automatically create the collection of images. This is called **exposure bracketing**. You can indicate the number of required images and how many stops of light difference there should be between the images. I usually use three images with 2 stops of light difference.

Because the shots are taken in quick succession, this can be done handheld, but hold the camera as steady as possible, to avoid too much camera motion between the shots. Be careful with wind. When the flower moves in the wind this often makes it impossible to combine the shots. Ghost copies of the elements in the photo will be visible.

Another HDR image. The rock behind the flower would otherwise have too much contrast and distract from the flower. 240 mm, f/13. Shutter speed was varied for the three shots.

Combining the images

Most cameras can automatically create an HDR image. They will shoot an exposure bracket and then combine the images. The software is clever enough to align the images such that small camera motions between the shots do not cause problems. Depending on the camera brand and model, sometimes only the combined HDR image is stored. In other cases, the exposure bracket images are saved as well. There might be an option in the menu to set the behavior. It is useful to keep the original images. This way the individual images can also be used individually or combined in post-processing.

One problem with creating HDR images in the camera is that these are stored in JPG format. The image is compressed and some color depth is lost. This reduces the later editing potential of the HDR image.

The alternative is to combine the RAW exposure bracket when processing the images. Photo processing software has functionality to merge images into an HDR image. For example, in Lightroom you select the three images, right-click to show the menu, select Photo Merge at the bottom and then HDR Merge. When combining the images in photo editing software, you have more control over the process, and the resulting images maintain the full color depth.

The results can vary considerably depending on the software that combines the images. In the example below, the left image was created inside my Canon R7 camera. The image on the right was created using ON1 Photo RAW, using the same original three shots. The second image has more contrast. Especially the highlights are stronger. I personally prefer the left image. Of course, it is easy

to get the same result in the image on the right by changing some development settings when processing the image.

The left HDR images was created automatically by my camera while the image on the right was created in ON1 Photo RAW. Notice the subtle differences.

HDR can be useful when photographing flowers. Especially in situations where there is (too) much contrast in the scene, HDR can produce nicer images. It is easy to use, especially when the camera combines the images. When keeping the original exposure bracket, it is possible to use the individual shots instead or combine the images in a different way.

Using a flash

If there is little ambient light, a flash can be used to provide extra light. But flashes can also enhance images when there is enough ambient light. With the correct settings, flashes are easy to use.

Many photographers don’t like flashes and don't know how to work with them. At best, they consider flashes a necessary evil when there is not enough ambient light. And if you just switch on the flash that is built into the camera or put a speedlight flash on the camera without the correct settings, chances are that the resulting images look artificial. But with a little bit of knowledge, shooting flowers with a flash is easy and can create beautiful images. With a flash, there is always enough light, and the best exposure settings can be chosen for the shots. The colors are often more vivid, but there is also the risk of too much contrast and hard shadows, so it is important to proceed with caution.

When you experience problems operating the flash, first check the flash unit. There is a button to let the flash fire. If this does not work the batteries are probably dead and should be replaced. When the flash operates correctly, the most likely problem is that the camera is set to use an electronic shutter or work in silent mode. The flash won’t fire in such a case. Switch to the mechanical shutter (or electronic first curtain) and the problem should be solved.

When photographing flowers in the evening, a flash is an easy way to get enough light. 400 mm, 1/320 s, f/13, diffused flash.

There are different types of flashes. To photograph flowers, it is easiest to use a **speedlight** that is placed in the flash shoe on top of the camera. There are speedlights with different strengths. You don't need a strong one for this type of shots because the subject is close to the camera. It is advisable to use a flash with a rechargeable battery. With these devices, the time required between flashes is smaller, so shots can be taken in quick succession. I always have a small speedlight on my camera and use it when required.

When using a flash, whether built-in or placed on the camera, a secondary light source is added. So, the ambient light (the primary light source) must be balanced with the light from the secondary light source (the flash). This is called the **light balance**. You can shift the light balance (almost) completely towards the flash, resulting in a bright flower against a dark background, called a **full flash**. Or you can shift it largely towards the ambient light, to just add a little bit of extra light to the flower, which is called a **fill flash**. The image below shows the difference.

The left shot was taken without a flash. In the middle shot a fill flash was used, while in the shot on the right a full flash was applied.

When using a flash, two groups of settings must be controlled, the exposure settings of the camera, and the settings of the flash. Fortunately, these settings are easy to master and most of them can be set to automatic.

Strength

The amount of light the flash produces is called the **flash power** or **strength** and can be controlled by the user. Each flash has a maximum strength, indicated by the guide number (see below). But often this produces too much light. In manual mode (of the flash, not the camera), the strength can be changed. This is indicated in fractions of the maximum strength. A value of 1/2 indicates half of the maximum strength and 1/4 indicates a quarter. This is equivalent to losing one and two stops of light, respectively. Most flashes can go down to 1/128 of the maximum strength, equivalent to reducing seven stops of light.

Modern flashes also have an automatic setting, called **TTL** (through the lens) or **ETTL**. With this setting, the camera determines how much light from the flash is needed for a correct exposure. In most cases, it's easiest to use this setting. In certain situations, the automatic TTL mode might not result in the effect you are after. The camera is making an educated guess of how much light from the flash is needed but it can be wrong. In TTL mode, the amount of light can be adapted with the **flash compensation** that can usually be set on the flash. You indicate how many stops extra or less light you want. I often use a value of +1 stop to overexpose the shot slightly. This adds some extra light on the flower. But in other situations, a negative value can be used, to avoid the flower becoming too bright. Check the documentation of the flash to see how to adjust the flash compensation.

Some flashes can **zoom** in and out when the focal length of the camera lens is changed. In this way, they narrow the light beam so that more light falls on the subject. It's easiest to set this to automatic, to let the camera decide the best value. However, changing the zoom manually can be

used for creative effects. For example, by increasing the focal length of the zoom, the light from the flash is limited to a smaller area. In this way just (part of) the flower is illuminated by the flash. A similar effect can often be obtained in post-processing by adding a vignette.

Guide number

Each flash has a **guide number** that indicates how strong it is. The guide number indicates the maximum distance at which you can shoot with the flash at ISO 100 and aperture 1. Of course, you don't have a lens with aperture 1, so the guide number must be divided by the aperture. With a flash with guide number 60, at aperture 4 up to 15 meters can be reached at ISO 100. When doubling the ISO value, the distance becomes 1.4 times larger. (When the distance becomes 1.4 times larger, the area that must be lit becomes twice as large, so it needs double the amount of light.) However, there are a few catches. Manufacturers like to show the largest possible guide number. Some manufacturers therefore use ISO 200 instead of ISO 100. In addition, the largest zoom value is usually used. With a lens of, for example, 50 mm, the maximum distance that the flash can reach is considerably smaller. The maximum distance is also measured indoors. Outside, the maximum distance is smaller because no light is reflected from walls and ceilings.

Controlling the light balance

So, the strength of the flash can be changed using the flash settings. But what about the ambient light? For this the exposure settings of the camera are used. Note that the aperture and the ISO value influence the effect of both the ambient light and the light from the flash. The shutter speed though only impacts ambient light. The duration of the actual flash is so brief that its effect is independent of the shutter speed.

So, to control the light balance, the exposure settings of the camera determine the effect of the ambient light, and the flash strength determines how much light the flash produces.

Changing the light balance. In the left image almost only flashlight is used, in the middle image more ambient light is used, and in the image on the right almost only ambient light is used. 70 mm, f/11, shutter speed varied between 1/320 s and 1/60 s.

Note that the intensity of the flower versus the background can also be changed in post-processing. So, if you prefer the flower from the image on the right, but want a darker background, that can easily be achieved. See chapter 6 on editing images for more information.

Full flash

When there is a distracting background, an option is to make the background dark, using a full flash. This means that the light balance is shifted completely towards the flash. This can best be achieved

in the following way. Set the camera to manual exposure mode (M). Set the shutter speed to fastest speed at which a flash can be used. This value depends on the camera. Often it is in the order of 1/250 s. For my camera this is 1/320 s. (That is why many photos in this book that were taken with a flash have this shutter speed.) Use any aperture you want, depending on the desired depth of field. Pick a small ISO value, like 100. This, together with the fast shutter speed, will block out most ambient light, even during the day.

Now set the flash strength to TTL. This will (most of the time) guarantee that the flower is lit correctly. When the result is too light or too dark you can correct that using the flash compensation.

By shifting the light balance completely to the flash, all focus is put on the flower. This shot was taken during the day, on an overcast day. 18 mm, 1/320 s, f/13, flash.

This approach might not work with a very open aperture, as still too much ambient light will reach the sensor, even with the fastest shutter speed that can be used with the flash. The only way to solve this is to use a narrower aperture, like f/8 or f/13, which might result in too much depth of field. For most flower images this is not a problem as images with a dark background often look great when there is a lot of sharpness in the flower. And, as the background is dark, it does not need to be blurred.

Fill flash

A fill flash is used to enhance the ambient light. This will brighten the flower while the background remains unaffected. A fill flash works best with one of the semi-manual exposure modes, like aperture priority mode (A). I normally use manual mode but set the ISO value to automatic. This ensures that the background is correctly exposed. When switching on the flash, most cameras will underexpose the image by one stop. So, the background becomes slightly darker. When required, you can adapt the exposure of the background using the exposure compensation.

Again, use the TTL mode of the flash. This will add some light from the flash to the flower. Use the flash compensation to increase or decrease the amount of extra light, to get the required amount.

You can now change the effect of the ambient light using the exposure compensation of the camera and the effect of the light from the flash using the flash compensation. In this way the light balance can be set to any value you like. (Both the exposure compensation and the flash compensation have a limit of about three stops, depending on your equipment. If more compensation is required, you can use fully manual exposure and/or flash strength.)

The left shot was taken without a flash, and in the shot on the right a fill flash was used while the effect of the ambient light was reduced a bit. Both shots 100 mm, 1/320 s, f/13. The shot on the right was underexposed by two stops and a flash was added.

An important use case of a fill flash is when the flower is in front of a light background, like the sky. Without a flash either the flower is underexposed, or the sky is overexposed. By using a fill flash, enough detail is visible in both the flower and the sky.

When shooting against the sky, adding a fill flash makes sure the flower is not too dark, like in the image on the right. Both shots 50 mm, 1/320 s, f/8.

Flash sync time

Every camera has a maximum shutter speed that can be used in combination with a flash. This is called the **flash sync time**. This is often 1/125 s, 1/250 s or 1/320 s. When choosing a faster shutter speed, only part of the image will be exposed by the flash. When applying a flash, you are limited by the flash sync time. This can cause problems when there is too much ambient light. Even with a narrow aperture and the smallest ISO value, the ambient light might still be too strong. Modern flashes allow for **high-speed sync**. In this mode the flash produces multiple flashes in quick succession and can successfully illuminate the subject at much faster shutter speed. However, this reduces the strength of the flashes, decreasing the effect of the flash. When shooting in bright sunlight, an **ND filter** can be used. These filters are placed on the front of the lens, and act as sunglasses that block out one or more stops of light. You can then reduce the shutter speed while using a strong flash to illuminate the flower.

Diffusers

Light produces shadows. The length of the shadows depends on the direction of the light. The softness depends on the size of the light source as seen from the subject. A speedlight flash is a rather small light source. Hence, it produces hard shadows that can be unpleasant, especially when limited ambient light is used. To make the shadows softer the light source must be enlarged. For this, **flash diffusers** can be used.

There are many different types of flash diffusers available, but two of them are particularly useful. A ring diffuser that is attached around the lens, or a soft-box can be used. A **ring diffuser** is a piece of white fabric with a hole in it. It shifts around the lens (the diameter of the hole must match the lens to ensure the correct fit). See the left image below. Such diffusers are very cheap. The flash's light hits the diffuser from behind, illuminating the entire fabric and reducing the appearance of shadows on the subject.

The second type of flash diffuser is a kind of small **soft-box** that is attached to the flash. See the righthand image below. The light from the flash bounces inside the soft-box and illuminates the large white area at the front. This then forms a large light source. This type of diffuser is a bit more expensive but can also be used when the flash is removed from the camera and triggered remotely.

On the left a ring diffuser is placed around the lens. On the right a soft-box diffuser is placed on the flash.

If the flash unit has a zoom feature, it is best set to manual, with the smallest focal length available, for example, 35 mm. In this way, the largest possible part of the soft box is illuminated from behind, making the light source as large as possible.

Below you see an example. In both shots the flash was used off-camera and placed at the right side of the camera. The left shot was taken without a diffuser. As you can see, the light reflections in each of the water drops is small. There are also harsh shadows along the edges of the water drops. In the shot on the right a soft-box diffuser was placed on the flash. The light reflections in the drops are significantly larger while the shadows are softer, leading to a more pleasing image and more noticeable water drops.

The shot on the left was taken without a diffuser and the shot on the right with one. 100 mm, 1/320 s, f/9.5, flash.

In macro photography a flash is often required to get sufficient light. To get enough depth of field a narrow aperture is used and there is often not enough ambient light for this. Also, the camera and lens can cast a shadow on the flower. Because the subject is small and close to the lens, a flash without a diffuser will not illuminate it evenly. Also, harsh shadows will become very prominent. So, I strongly recommend using a diffused flash in this case. Because the subject is so close the camera the diffused flash forms a huge light source, almost completely removing the shadows.

When the distance between the flash and the flower increases, the effect of using a diffuser decreases. You also lose a lot of light because the diffuser distributes the light over a much larger area. Once you are more than a meter away the amount of light from the diffused flash becomes so small that a diffuser is no longer effective (unless you use a very strong flash). In this case you must resort to other means to remove the harsh shadows, like allowing for more ambient light or using a second flash.

Using a diffused full flash from the front removes all shadows. There is still depth in the image because the flowers that are further away are darker and less sharp. 100 mm, 1/320 s, f/13, diffused flash.

The flash color

Light from a flash has the same color as the ambient light on a lightly clouded day. This is important when using a fill flash. During the day, the flower will be illuminated with light from the flash of a similar color as the ambient light that illuminated the background. But this is not the case when shooting flowers early in the morning or in the evening. The ambient light will be a lot warmer than the light from the flash and, hence, the flower will look cold compared to the background. In certain situations, this might be the effect you are after but often the different light colors make the image look unnatural; it is clear from the image that a flash was used.

It is difficult to correct this color mismatch. When you adapt the white balance, this changes both colors and won't solve the mismatch. However, during post-processing you can create a mask of the flower only and then change the white balance of the flower to match the background.

There are ways to change the color of the light from the flash. **Color filters** (also called **gels**) exist for flashes. They are fixed around the head of the flash unit. Sets of gels cost little and provide many different colors to choose from. It is also easy to create them yourself. A gel with a warmer or cooler color can be used to bring the flash color into accordance with the ambient light.

The color filters can also be used for creative effects. The color of the flower can be adapted, while keeping the background color the same (when the background is lit using ambient light). Another option is to use a colored flash as backlight to get colored outlines around the flower.

It is possible to change the color of the background instead of the flower. Say we want to make the background color cooler. The white balance setting in the camera can be changed to achieve this, but that will also make the color of the flower cooler. To restore the color of the flower, use a warm gel color on the flash to compensate for the cold white balance. As the flash only illuminates the flower, the background remains cool.

Below you see an example. In the normal shot on the left both the flower and background are rather warm. In the middle shot the white balance is set to a much cooler value. In the right image an orange gel was used on the flash to make the flower warmer again.

By changing the white balance and adding a color gel to the flash, the background is made cooler. 150 mm, 1/125 s, f/13, flash.

Using a LED-panel

Instead of a flash, a **LED-panel** can be used. Special LED-panels are available for photography. With these, you can control the intensity and color of the light. They are equipped with a ¼ inch screw hole such that they can be placed on a tripod or, with a little connector, in the shoe on the camera.

The LED-panel does not communicate with the camera, so no trigger or wire is required. Simply switch it on, determine the light intensity and color, and place it at the desired position. LED-panels provide continuous light, so the effect is immediately visible. The panels are large sources of light, so they result in soft shadows.

A LED panel on my camera, illuminating a flower.

LED-panels work great when shooting in the dark because they provide sufficient light to determine the composition and to let the autofocus of the camera work. When it is bright outside the power of a LED-panel is too small to have a significant effect on the image. During the day they can still be used as a fill light, for example, to lighten up some shadows or add some color, but they cannot be used as primary light source.

You can also use a mobile phone as a light source. Either the light on the back or the screen itself can be used. There are apps that can show any color you like on the screen. On my iPhone I use an app called *Screen Light*. The free version is powerful enough. Keep in mind that the amount of light produced by the phone is considerably smaller than a LED panel. So, it can only be used in dark circumstances or at very close range. But to add some color to a flower, a mobile phone is an easy solution that is always available.

Ring flashes and macro flashes

In addition to speedlight flashes, there are also ring flashes and macro flashes. **Ring flashes** are shaped like a ring around the front of the lens. As a result, a subject is illuminated from all sides and there are no hard shadows. Without shadows, however, you can lose depth and contrast, and the result sometimes looks unnatural. **Macro flashes** consist of two smaller flashes that are attached to a unit on the camera's flash shoe via flexible arms, or they are attached to a ring on the front of the lens. This produces light from two directions, typically left and right from above. This results in natural light with soft shadows. However, ring and macro flashes only work if the subject is close to the lens. Both type of flashes can be used when photographing flowers, especially when taking close-up and macro shots.

Triggers

With a trigger, a flash can be operated while it is not connected to the camera. This gives considerably more control over the direction of the light.

When a flash is put in the hot shoe of the camera, sometimes called **on-shoe** use, the light comes from a position slightly above the lens. Although this is convenient, it does not always offer the best subject illumination. In that position, the light from the flash produces small, dark shadows just below elements. But for the rest there are no shadows and, hence, no depth in the image. Light that comes from the front can make it difficult to see textures. Also, there is less contrast in the flower.

The left shot was taken with the flash on the camera. In the shot on the right the flash was positioned to the left and above the flower for a more natural light direction. 100 mm, 1/320 s, f/13, flash.

Ambient light normally comes from above, so that is what people are used to. To produce a natural looking image, the light from the flash should also come from above. And for more creative shots you might prefer light that comes from behind the flower or from the side. To achieve this, the flash must be detached from the camera and placed at a different position. This is called **off-shoe** use of the flash.

Some flashes can be connected to the camera via a cable. But nowadays wireless flashes are mostly used. They require a **trigger** that is placed in the hot shoe on the camera. A trigger must be bought separately, but they are inexpensive. Older triggers can only tell the flash to fire, but modern triggers communicate with the flash in both directions and can be used to change all settings. They also work in TTL mode. You can hold the flash in your hand or place it on a stand (often included with the flash) or a little tripod. The trigger must be of the same brand as the flash, otherwise they cannot communicate. Modern cameras often have a built-in trigger, but it only works with flashes of the same brand as the camera. Modern flashes can also act as a trigger to control another flash of the same brand.

My Canon camera with a Godox trigger and a remote flash on a stand, positioned at the side of the flower.

To use a trigger, communication between the trigger and the flash must first be established. The flash must be set to **wireless** mode and to **slave**. (The trigger is the **master** that controls the flash.) Also, the trigger and flash must use the same **channel** for communication. There are different channels available to avoid interference with other photographers. Check the documentation of the flash on how to do this.

The settings of the flash can now be controlled from the trigger. The flash will belong to a **group** indicated with the letters A, B, C, etc. The trigger must be set to the same group. Now the strength of the flash can be changed using buttons on the trigger. You can also set it to TTL mode. The trigger can control multiple flashes that can be put in different groups, such that each group can have its own settings.

When the shutter button of the camera is pressed and a flash is required, the trigger sends a signal to the flash, which then fires. I recommend practicing a bit with this at home before using it in the field. Once you get the hang of it, using triggers is very easy. The remote flash can be used as main light source or as a fill flash, like in on-shoe use.

The flash can be placed at any position. When you can operate the camera single-handed, hold the camera in your right hand and the flash in your left hand. The camera can also be placed on a tripod, while holding the flash in your hand. A remote control is useful to take the shot, or you can set a delay timer to have enough time to hold the flash at the desired location.

An alternative is to fix the flash using a stand or a tripod. In this way, every shot will have the flash at the same position, making it easy to take different photos with the same lighting. Flashes normally come with a little stand, but this can only be used when the flash should be close to the ground, like in the image above. However, the stand has a ¼ inch screw hole that can be used to fit it on a tripod. In this way you can position the flash wherever you like. For low flowers a small macro tripod will do. There are also pins that you can put in the ground and that can hold the flash on a little ball head.

A flash with soft-box diffuser on a pin, put in the ground next to a flower.

As indicated above, modern flashes have a zoom setting. When using the flash remotely, set the zoom to manual to adjust the width of the light beam. When a large area must be illuminated, use a small focal length, like 24 mm. More of a spotlight can be created by using a large value, like 105 mm. An even more directed light beam from the flash can be created using a **snoot**, that you can buy separately or make yourself (you can for example use a Pringles can; search the web for instructions).

Triggers can be used to control multiple flashes at the same time. Each flash can be put in a different group and controlled independently from the trigger. For example, a strong flash can be used to illuminate the flower from above and a softer fill flash can be placed at the front to add some light to the shadows. As most people don't have multiple flashes, I won't go into the details. For more information, check the documentation of the flash or look at some tutorials on the web, and experiment.

The same flower, flashed from different directions. 50 mm, 1/320 s, f/13, flash.

Flash positions

When the flash is detached from the camera there are many ways to light the flower. Here are some examples.

With **frontal light**, the light from the flash comes from the front, possibly at a slight angle. This is the type of light you get when the flash is placed in the shoe on the camera. Using a trigger allows the flash to be directed more from above and from the side, leading to a more natural looking image.

By placing the flash on the left or right side of the flower you get **side light**. This leads to long shadows, like when the sun is low. A diffuser can be placed on the flash to get softer shadows. A side light adds more depth to the image.

An example of frontal light on the left and side light on the right. 40 mm, 1/320 s, f/13, flash.

A special form of side light is **skimming light**. Here the light is directed at a shallow angle across the surface of the flower. This emphasizes the irregularities in the surface because they will cast shadows. The texture in the flower becomes more visible. A concentrated light source is required for this, so place the flash far away, use the largest zoom, and don't use a diffuser.

Probably the most interesting way of illuminating the flower with a flash is **backlighting**. Here the flash is placed behind the flower. We already discussed backlighting with ambient light in an earlier section on page 115. The same applies when using a flash, but with a flash you have more control over the direction and strength of the light. Depending on the type of flower the light will go through the petals, or only the silhouette is visible with a light border. It can help to add a little frontal light using a torch to put a bit more detail in the flower. With backlighting, care must be taken that light from the flash does not fall directly into the camera lens. This can lead to white areas or flare. To avoid this, you should put something between the flash and the camera.

Another approach is **background lighting**. Here the flash is placed behind the flower, directing it towards the background. So, the background lightens up while the flower remains dark. This is another way to create silhouettes of flowers.

In the left shot the flash was held at the left-top in front of the flower, while in the shot on the right it was moved behind the flower to only illuminate the paper background. 60 mm, 1/320 s, f/6.7, flash.

When photographing flowers, it is also possible to illuminate the flower from the **inside**. This only works with a bucket shaped flower, like a tulip. To this end, hold the flash above the flower and direct the light inside it. By photographing the flower from the side, it looks like the flower lights up by itself, making very pleasing shots. This can also be achieved with a torch, and we will discuss it further in the next section.

Using a torch

Instead of a flash, a torch (flashlight) can be used to illuminate flowers. Their focused light can produce wonderful images.

I advise to always carry a little torch when shooting flowers. Sometimes a little highlight should be added to a flower, and a torch is ideal for this. Viewers are attracted to the brightest location in an image and with a torch this can easily be controlled. And torches can also be used to illuminate a flower when it is getting dark outside. (I use the term torch instead of flashlight to avoid confusion with using a flash.)

Illuminating part of a flower with a torch. Shot taken in the evening. 100 mm, 1/180 s, f/8.

The torch

Modern LED-based torches are strong, rechargeable, and inexpensive. The light they produce is a bit colder than the older torches with little light bulbs. This can be corrected with the white balance setting of the camera. Here are some favorable properties of the torch:

- It should be small, such that it can easily be manipulated.
- It should be strong to provide enough light.
- It should be rechargeable. Otherwise, you spend a fortune on batteries.
- It should produce a narrow beam of light. Otherwise, too much of the environment gets lit. Preferably it should be possible to change the size of the beam. This is useful as it allows for illuminating very specific areas, and it can also be used to change the intensity of the light.
- It should not flicker. The cheapest LED torches flicker to reduce power consumption. This is not notable with the naked eye, but when taking a shot with a fast shutter speed it might result in dark bands in the image. (This is difficult to establish when purchasing a torch, unless you can try it out before buying.)

Such torches are not very expensive. It can be useful to have two torches to illuminate the flower from two directions simultaneously. In this case one of them must be placed on a tripod.

Tripod

To use a torch without a tripod, you must learn to shoot with a single hand, holding the camera in your right hand and the torch in your left hand. This requires a bit of practice, but shooting with one hand helps in many situations. When the light should come from the front, your left hand can still support the lens, while simultaneously holding the torch.

The alternative is to use a tripod, either for the camera or for the torch. I prefer to use the tripod for the torch. In this way you can determine very precisely how the flower is lit. It can then be photographed from different directions. When using two torches, at least one of them must be placed on a tripod. The other can be held in your hand or placed on a second tripod.

As a tripod I use a small macro tripod. On it I place a flexible metal arm which holds the torch. Some torches, like the Alonefire X37 I use, have a threaded hole and can be screwed directly on the tripod or the metal arm. For other torches a clamp must be used that can be attached to the tripod or arm. Below is an image of the setup I use.

An Alonefire X37 torch placed on a tripod with a flexible arm. This torch can produce light in four different colors. In this case red light was used.

During the day

When shooting flowers during the day, a torch is primarily used to add light accents. The camera can determine the exposure in any of the (semi-)automatic modes. I normally use manual mode and set ISO to automatic while determining the shutter speed and aperture myself. When the light accent is small, it can help to underexpose the shot a bit using the exposure compensation. Otherwise, the flower can become too bright. Alternatively, determine the exposure as if there was no torch. Then

switch on the torch and take the shot. The strength of the light accent can be manipulated by changing the distance to the flower and the size of the beam. Experiment with the exposure settings and torch strength, to create many different effects.

A torch was used to lighten up the center of this flower during the day. 100 mm, 1/350 s, f/13.

In the dark

When shooting flowers in the dark, there are many more possibilities to manipulate the light and, hence, the resulting image. As we discussed in the previous section, a flash is often used in the dark. But a torch has the advantage that the result is immediately visible. This makes it easier to choose the correct settings. It also helps to focus on the correct spot. The main disadvantage of torches is that the light is considerably weaker. So, a longer shutter speed or higher ISO value are required than when using a flash.

Photos taken in the dark with a torch tend to have a lot of contrast. This is best combined with a lot of sharpness in the image. For this, use a narrow aperture. My default aperture value for such shots is f/8 but when I get close to the flowers I sometimes go up to f/13 or more. As the background won't be visible in the dark (unless you illuminate it) you don't have to worry about keeping that blurred.

Choose a shutter speed and ISO value such that, without the torch, the image is largely black. When shooting handheld, make sure the shutter speed is fast enough to avoid motion blur. When there is wind, this can also cause motion blur, and a shutter speed of at least 1/180 s should be used. But in the evening the wind often dies down.

In this macro shot the torch was held behind the flower and the light shines through the petals. 100 mm macro, 1/180 s, f/13.

Illuminating the flower

Using the torch, you can very precisely control what the viewer will be looking at, by only illuminating that part of the scene. Interesting shots occur if part of the flower remains in the shade. Such shadows create depth in an image. Illuminating the flower with a torch leads to strong contrast. The closer the torch is placed to the flower, the brighter it is and the stronger the contrast with the unlit parts becomes.

The torch can be pointed towards the flower from different directions. When holding it close to the camera, the flower is lit from the front, like an on-shoe flash. Placing the torch at the side of the flower gives strong shadows and clear textures. By moving the torch around, the position and direction of these shadows can be changed to get the best results. The torch can also be positioned directly above the flower. As a result, the stem lies in the shadow, and the flower appears to float in the dark space.

By holding the torch above the flower, it seems to float in space. 50 mm, 1/350 s, f/8.

When the petals of the flower are somewhat translucent, placing the torch behind the flower can give wonderful effects. Two torches might be required to light it from both sides. Don't let the torch shine into the lens. No direct light from the torch should reach the lens as this will lead to white flare in the image, and reflections. Place something between the torch and the lens or put a black (paper) tube around the front of the torch (a kind of snoot for the torch).

This flower was illuminated with a torch from the rear. 50 mm, 1/350 s, f/8.

White balance

Most people, including myself, set the white balance on their camera to automatic. In this way the camera adapts the colors in the image to the color of the light. Modern cameras are very good in determining that color. But when using a torch in the dark, only the flower is lit, and this can cause problems. For example, when the flower is orange, that is the only color available in the image. So, the camera might think the light is orange and adapt the white balance, leading to a pale, blueish image. So, if the image does not look the way you expect, set the white balance manually, for example to sunshine or clouded. When shooting in RAW this is less of a problem as the white balance can easily be changed during post-processing.

The left shot was taken with automatic white balance. In the right shot the white balance was set to sunshine, bringing back the correct orange color of the flower. 100 mm, 1/60 s, f/8.

Special effects

To get some nice effects, spray water on the flower. The light from the torch reflects in the droplets. The effect is different, depending on the direction from which the flower is illuminated. You can also spray water in front of or behind the flower to simulate rain. For more information, see the section on dew on page 64.

There are also colored torches. These can be used to get surprising photos. The color of the photo can be changed completely, like in the image below. Colored torches can also be used to add some extra color to an otherwise normally lit flower. And there are special UV-torches which can illuminate flowers in unexpected ways using the fluorescence of certain parts of the flowers. We will discuss these on page 160.

Adding water droplets and using a green torch gives a spooky image. 50 mm, 1/90 s, f/13.

Light painting

A torch can be used for **light painting**. In this special technique a long exposure time is used, and during this time the torch is used to paint light on specific parts of the flower. This works as follows.

Any motion in the flower – especially due to wind – will ruin a light painting. Indoor shots are therefore the most reliable way to successfully complete a light painting. Place the camera on a tripod and direct it towards the flower. Use manual focus and set the correct focus distance with the lights on. Use manual exposure settings with a long exposure time of, for example, 15 seconds. Select a narrow aperture (f/16 or narrower) and a low ISO-value (for example, ISO 100).

Now switch off the light and make sure it is completely dark. Take a shot without adding any light. Verify that the resulting image is (almost) completely black. If not, use a narrower aperture or a shorter exposure time. Now take a second shot. During the exposure, shine the torch at various parts of the flower. Use a narrow beam. Preferably the torch should not be too strong. In this way you “paint” light onto the flower. The longer the torch is directed to a particular area, the lighter this area becomes in the image. Never point the torch towards the camera as that will add large white areas to the image.

When the exposure time is finished, check whether the flower is correctly exposed. If it is too dark, a longer exposure time must be used, and the torch must be pointed longer to the various parts. If the flower is too bright, illuminate it for a shorter time, or from a greater distance. Alternatively, increase the aperture value. If that is not possible, an ND-filter can be used to reduce the amount of light reaching the sensor.

By varying the time certain areas are illuminated by the torch, you can control which parts of the flower(s) are lit and which remain darker. If you want to remove most shadows, carefully shine the torch from many different directions. It will require a bit of practice to get good results.

Two different light paintings of the same flowers. In the image on the right almost all shadows are removed. 100 mm, 15 s, f/32. Aperture f/32 was required to avoid overexposing the image.

Low-key

In low-key photography, dark tones predominate in the image. Taking such special shots of flowers is easy.

Low-key photography is popular, although it is less common when photographing flowers. Great low key flower shots can though be created that leave a strong impression with the viewer. And it is rather easy to do. You already saw several low-key shots in the previous sections of this chapter.

There are two different types of low-key photography. In the first type, the whole image is dark. This gives a moody atmosphere in the image, like in the picture below. In the second type most of the image is black but there is one element that is bright and gets all the attention. I will discuss both types here.

A dark and moody low-key shot. 70 mm, 1/320 s, ƒ/13, flash.

Dark and moody

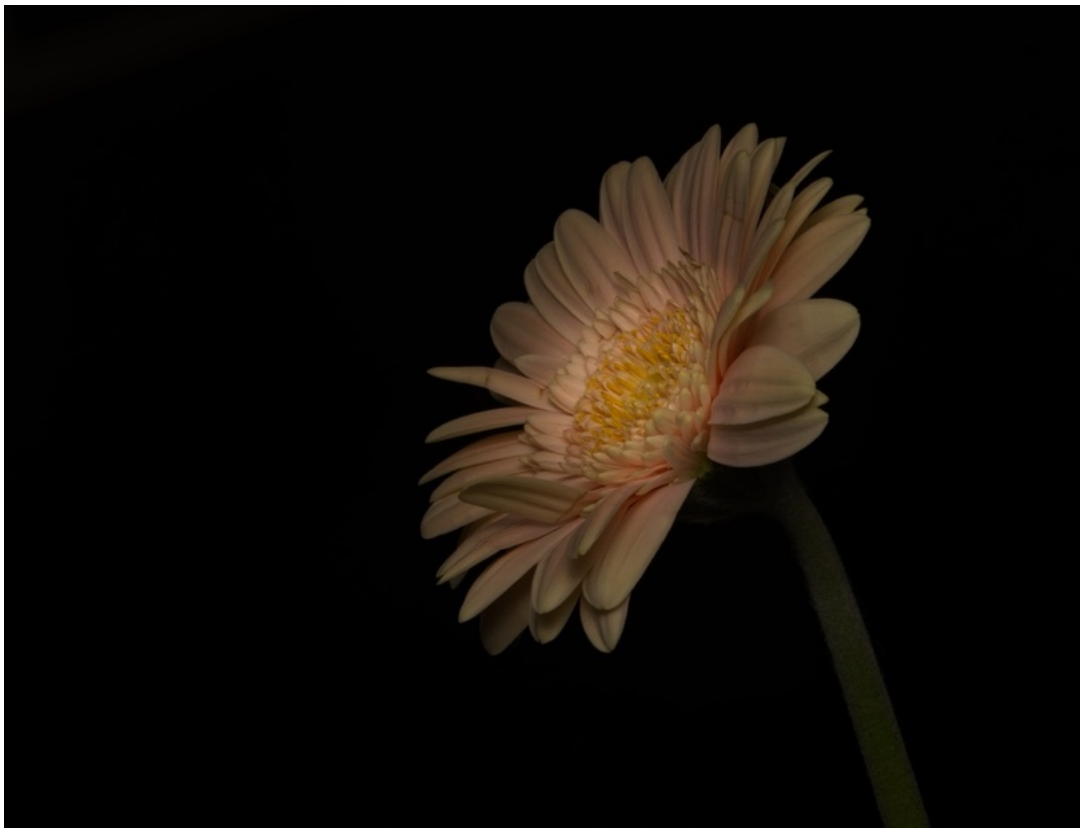
In a dark and moody image everything should be underexposed. It should be more difficult to distinguish precisely what is shown. One or more features should be given a bit more light though to create a focus point for the viewer. As a result, the viewer will spend considerable time looking at the images.

To create such an image, the shot must be considerably underexposed. Exposure compensation is usually used for these photos. The exposure compensation of most cameras can underexpose the shot up to three stops. If you need the images to be even darker, manual exposure can be used.

Underexposing the shot might not make the background dark enough, or it might make the subject too dark. To solve this, a flash can be used. When the background is far enough away it will receive little light from the flash and becomes dark, while the subject receives enough light from flash. Strongly underexpose the shot such that the background without the flash is indeed very dark. Use the flash in manual mode and determine a flash power that adds just enough light to the flower. You will need to try different values to get the best result.

The exposure can be adjusted further in post-processing. This is the recommended approach because it gives more control over which parts should be completely black, and which parts should still be visible. The exposure can be reduced at certain locations using a brush (this is called **burn**). Basically, you paint darkness on the image. We will discuss this further in chapter 6 on editing images.

In a low-key image, you often want to attract the viewer to a particular place, like the center of the flower. This area should be slightly lighter than the rest of the subject. While taking the shot, this can be achieved by pointing a torch towards that position. The same effect can be achieved in post-processing by making that area a bit lighter (this is called **dodge** and can again be done with a brush).



Another moody shot. A bit of light was added to the center of the flower to put the accent there. 60 mm, 1/320 s, f/13, flash.

When displaying dark images on a monitor, the darkness can vary considerably depending on the brightness setting of the monitor. This can easily make the image too dark or too light. Make sure your monitor has correct settings; otherwise, others will not see the image as intended. This is normally a matter of trial and error. There are guides for this on the internet. A similar problem occurs when printing the image. Printing services tend to make low-key images too light. When uploading images, you can often indicate that the printing service should not "improve" the image.

One clear subject

In the second type of low-key shots, there is one clearly visible subject against a black background. When taking such a shot outside, a flash or torch must be used. It helps to either work in the evening or on a very cloudy day. Make sure the background is as far away as possible. Set the exposure mode of the camera to manual and pick such settings that the effect of the ambient light is very small. I typically use f/13, a low ISO value and a fast shutter speed.

A flash or a torch is used to illuminate the flower. We discussed both in previous sections. Use the TTL setting of the flash. A positive flash compensation might be needed to get enough flash power.

When shooting the flower indoors, you can place a black background behind the flower, making it a lot easier to get a good low-key shot. You also have more control over the lighting, using flashes, torches, or other light sources.

A low-key shot puts all focus on the flower. 100 mm, 1/320 s, f/13, flash.

It might be necessary to make the background darker in post-processing, like I did in the image above. Fortunately, modern photo editing software can easily select the background, and the exposure of that area can then be reduced. This type of low-key images is normally the nicest when the flower is very sharp. So, in post-processing some sharpening and clarity might be applied to the flower. We discuss all these techniques in chapter 6.

Because all focus lies on the flower, it is important to choose subjects with interesting shapes, colors and details to attract and keep the attention of the viewer. For example, there should be fascinating

details, like the stamens in the image above. Or the global shape should be attractive, like in the image below.

For a good low-key shot, the flower should have some interesting shapes or details. 100 mm, 1/320 s, f/13, flash.

Black and white

Low-key images are often converted to black and white. This will produce a high-contrast image that accentuates the details, both in shape and in texture. There are many ways in which you can create black and white images, and we will discuss these in chapter 6 on editing images on page 228.

Black and white works well together with illuminating a flower from behind. When the flower is largely opaque, the centers of the flowers will become dark, while the backlight will create bright borders around the flower's extremities, accentuating its shape. Below you find an example. I added a tiny bit of light from the front such that the flowers still show a bit of texture.

A black and white low-key image in which the flowers are lit from behind using a torch. 100 mm, 1/20 s, f/16.

High-key

In high-key photography, the light tones predominate, resulting in an energetic image. There are different ways to create such pictures.

High-key is a style of photography, where the tones are primarily light. It uses bright light to eliminate most of the shadows and the background. This puts all emphasis on the flower. Because the image is bright it radiates a lot of energy.

A soft image

There are two main styles of high-key flower photography. In the first style a wide-open aperture is used. The flower is shot against a light background, and the photo is overexposed a bit. This leads to light, dreamy images with little detail, like in the image below.

A high-key shot using a wide-open aperture. 50 mm, 1/1000 s, f/1.8.

To take such a shot, find a flower where the background is far away and light. There should be little contrast in the shot, so preferably work on a clouded day. Use a wide-open aperture, like f/2. This will create a small depth of field. Only a small part of the flower will be sharp. It is important to pick the correct focus point. Normally, this is a position where there is still some contrast with the background. Overexpose the shot by one or two stops. This will make the image lighter and softer.

The effect can be enhanced in post-processing. Make the shadows lighter and add a light vignette to the image. You can also add an overlay to put a bit more color in the background, like I did in the image above. We will discuss such techniques in chapter 6 on editing images.

Showing details

In a rather different type of high-key photography, a lot of emphasis is put on the details of the flower. In such shots a completely white background is preferred to put all focus on the flower, without any distractions. The flower is placed in front of this background. By using a narrow

aperture, all the details in the flower will be clearly visible. As there is no background, a large depth of field can be used to create a lot of sharpness.

In this high-key shot a narrow aperture was used for a large depth of field and a lot of sharpness. 150 mm, 1/3 s, f/16.

For such a shot, a setup is required as you normally do not find completely white backgrounds in nature. This can be done in the field, but it works easier indoors.

As a background, use a sheet of white paper, some white Perspex, or a large diffuser screen. The background can be illuminated from the front, but the effect is stronger when it is illuminated from behind, so it should be a bit translucent.

Place a diffused flash behind the background. A trigger on the camera is used to operate the flash. If you do not have these, use a strong white LED panel or a computer monitor showing a perfectly white image. (You might need to adjust the brightness and color settings of the monitor to get the best result.)

For some flowers, the background provides enough light and shows the translucent petals. For other flowers, the flower must be illuminated as well, preferably in such a way that there are no shadows. For this a second, diffused flash, torch, or LED panel can be used to light the flower from the front. The larger the light source the better.

Be careful when the flower has tiny parts. Strong backlight can make these largely invisible due to haloing/blooming effects. Adding light from the front can reduce this problem. When the petals are largely opaque, you will always need extra light from the front (unless you want to go for a silhouette, but that is no longer considered a high-key shot).

My indoor setup for high-key photography. A flash with soft-box diffuser is placed behind a large diffuser screen, and the flower is put in front of it.

For the flash behind the diffuser, use manual strength and set it to full power. When also using a front flash, a smaller strength should be used for this, like 1/4. You need to experiment with these settings to get the desired effect.

Overexposure can create wonderful effects. 60 mm, 3 s, f/16.

As exposure settings for the camera, use manual exposure and overexpose the image slightly. Make sure the background in the image is indeed fully white. Overexposure might lead to highlights in the

flower being blown out and losing all detail. There are two solutions for this. The exposure can be reduced, making the background less white, which must be corrected in post-processing. Alternatively, an exposure bracket can be created, taking one overexposed shot for the background and one normal or slightly underexposed shot for the flower. These can be combined in post-processing. You can also try to use HDR photography, but this might make the background less white.

Type of flowers

The effect of a high-key shot depends a lot on the type of flower. As we saw in the section on backlight on page 115, some flowers have translucent petals. The light from the background will shine through them. In this situation you can use the white background as the only light source. It is also nice to add a little frontal flash to highlight flower details slightly while maintaining translucency. The following images show the difference.

In the left shot only the light from the background was used. In the shot on the right a frontal flash was added. Both shots 100 mm, 1/320 s, f/13.

Light pads

As an alternative to a diffuser screen, a light pad can be used. **Light pads** are normally used for drawing. They consist of a large flat surface (A4, A3, or A2 format) that gives uniform, bright white light. A3 is the most common size and suitable for most flowers. These cost around $40.

There is some variation between light pads in brightness, expressed in lumen. The stronger the better. In some light pads the brightness can be set and sometimes different color temperatures can be chosen. Light pads work with an USB interface, so they can also be used with a power bank. Some have a rechargeable battery and can be used cordless. This is very convenient, when using them outside. For smaller flowers you can also use a tablet. Use the app *Screen Light* to set the color.

Light pads can be used as backlights by placing them vertically behind the flower. You can also use them as diffuse directional light sources. But what makes light pads special is that they can be used horizontally as well.

To this end, place the light pad flat on the floor. Make sure the light pad is clean. Place one or more flowers on the light pad and try to lay them as flat as possible. The big advantage of working horizontally is that the flowers can be arranged in nice patterns. It is also possible to use dried flowers or pressed flowers. When the flowers are translucent, it can be nice to overlap them. You have all the time in the world to follow the various composition rules discussed in chapter 3 and create a balanced arrangement.

The setup with a light pad and the resulting image (after a crop). 50 mm, 1/3 s, f/13.

Place a tripod over the light pad and position the head such that the camera points straight down, like in the image above. Most ball heads have a special position for this. Make sure the camera is exactly vertical. Use a lens with a focal length around 50-150 mm, depending on the size of the flowers. That gives an ideal distance to the light pad.

Use exposure settings such that the white background is indeed completely white. Because the light pad is not as strong as the diffused flash, a longer exposure time is required, often on the order of half a second. Use a narrow aperture (f/13 or more) for maximum sharpness, and the smallest ISO value (typically ISO 100 or 200). Use auto focus or manual focus on the flower(s) and take the shot. Depending on the translucency of the flower petals or the desired effect, a diffused flash, torch, or LED-panel, can be placed on the camera to provide extra light.

An arrangement of multiple buttercups. 150 mm, 1/3 s, f/16.

Post-processing

For the best result, images require some post-processing. First, make sure the background is completely white. To this end use the clipping indicator in the photo editor. This shows the areas that are completely white or black. When the background area is not completely white, increase the whites (or the exposure) in the image. In some situations, this can be done for the entire image, but often you must select the background only, using a mask.

Also make sure all dust spots in the background are removed. Small pieces of dust on the light pad or on the camera sensor can become clearly visible on the white background and are distracting. They can easily be removed using photo editing software.

The next step is to improve the look of the flowers. For this type of high-key shot, very clear detail is desired. So, it can help to add some clarity, structure, and/or contrast, depending on the look you are after. Similarly, the vibrance of the colors can be increased. We will discuss all these techniques in chapter 6 on editing images.

In this shot, sharpness and contrast were added, and the image was converted to black and white for maximum effect. 60 mm, 0.7 s, f/16.

UV fluorescence

Some flowers produce spectacular colors when illuminated with UV light, allowing for wonderful images.

When illuminating a flower with invisible UV light, some parts of the flower might turn this invisible light into visible light of various colors, which can then be recorded by a normal camera. It can lead to wonderful images of flowers, and it is not difficult to do.

In **Ultraviolet-Induced Visible Fluorescence (UVIVF)**, as it is officially called, certain substances emit visible light when they are illuminated with UV light. They will start to glow. The type of material and the wavelength of the UV light will determine the intensity and color of the emitted visible light. Because the light produced is visible, it can be photographed with a normal camera.

There is a completely different technique called UV Reflective photography. Here UV light is reflected from a subject and, with a special filter, the camera records that reflected UV light. UV Reflective photography is much more difficult and will not give the nice images we are after, but it has its uses.

As can be seen in the image below of a passionflower, different parts of the flower emit different colors of light: red, blue, and white. There is little or no relation with the normally visible colors of the flower in the left image.

A passionflower with normal light (left) and UV light (right). Left shot 100 mm, 1/8 s, f/13, flash. Right shot 100 mm, 30 s, f/32.

All living subjects fluoresce a little under UV light, some more than others. This is only visible when there is no other light, so we will have to work in a dark environment and will need a long exposure time to capture enough induced light. This is very difficult outside, so it works best when photographing indoors. You also need a UV light source. Fortunately, these can easily be obtained.

The torch

A UV torch (flashlight) can be used as a light source. There are many different UV torches for sale, but not all of them are suitable. You need one that produces light with a wavelength of 365 nm. Many UV torches use 395 nm instead, but that is too close to the visible spectrum and does not produce the desired effects. Second, the torch should contain a special filter that blocks almost all visible light. Any visible light will make the fluorescence less prominent. Such torches are a bit more expensive, but it is worth it. Reviews of UV torches can be found on the web.

I use an Alonefire SV18 torch. This has good reviews and is not very expensive (around $35). It has 12W power, is rechargeable, has two brightness settings, and comes with protective UV glasses.

This flower is normally yellow with some green leaves, but under UV light the colors become completely different. 100 mm, 30 s, f/32.

Safety

UV light is invisible but harmful to the human eye. When using a UV torch, it looks like it produces little or no light, but it is actually very strong. Never look directly into the light or shine it at another person! Reflected UV light can also be harmful. Always use glasses that protect against UV light.

Many glasses have a UV protective coating. This can easily be tested. Shine the UV light through the glasses onto a white piece of paper. When the paper lights up, the glasses do not protect you and another form of protection is required. Special glasses are available that filter out UV light. They are sometimes sold as night glasses and are often yellow. They will change the colors you see which might hamper your photography. Sunglasses can also be used, but that might make things hard to see when working in the dark.

Finding flowers

Not all flowers light up in interesting ways under UV light. To find good ones, go outside when it is dark and take a normal and a UV torch with you. Use the normal torch to find flowers and then use the UV torch to see whether anything interesting happens under UV light. White spots on flowers often light up very brightly. But some other parts can completely change color. Decaying flowers can also give interesting effects.

Take the flowers with you and do the photography at home. It is difficult to photograph with UV light outside as very long shutter speeds are required and the flowers will most likely move, even when you think there is no wind.

A flower lit with a normal torch (left) and with a UV torch (right). 100 mm. Left shot 2 s, f/16. Righthand shot 20 s, f/16.

Setup

Place the flower in a little vase on a table or hold it with a clamp. Use a black background that reflects as little light as possible. It should not light up under UV light. Put the background as far as possible behind the flower such that the least amount of UV light reaches it.

Place the camera on a tripod. Make sure image stabilization is switched off. On a tripod using long shutter speeds, image stabilization can cause motion blur. Operate the camera remotely or use a timer to take the shots. This avoids motion blur caused by the camera.

The UV torch can be placed on a tripod as well, but I prefer to hold the torch in my hand and paint UV light on the flower. Make the room as dark as possible. Preferably work on a solid floor. A wooden floor can move when you move. It helps to have a normal light illuminating the scene that you can switch on and off without moving away.

When the background is close to the flower, some reflected blue light from the torch can become visible. This sometimes gives a nice effect though. 100 mm, 15 s, f/16.

Exposure settings

The UV fluorescence is weak, so a long exposure time is required to photograph it. Also, a large f-value is required to get enough depth of field. I use the following settings:

- Shutter speed: around 20 seconds. This depends on the power of the UV torch. You need to experiment a bit to find the correct setting for the torch.
- Aperture: f/16, to get enough depth of field.
- ISO: 100, to get the best quality image.

Now take a test shot without any UV light (or normal light). Check that the image is completely black. Otherwise, there is too much light in the room. In that case try to use a narrower aperture.

Taking the shots

Switch on the normal light and focus the camera on the desired position. Autofocus can be used if that works but manual focus can work better to have precise control. Now don't touch the camera or the table anymore. Don't put the torch on the table. Picking it up can cause motion!

Switch off the normal light. Open the shutter using the remote control or the timer. Shine with the UV torch on the flower and paint the UV light onto it. Avoid pointing the light towards the background as much as possible, although it can sometimes give a nice effect, as in the image above. Try to give the different parts of the flower an equal amount of light (unless you want a particular area to get more focus).

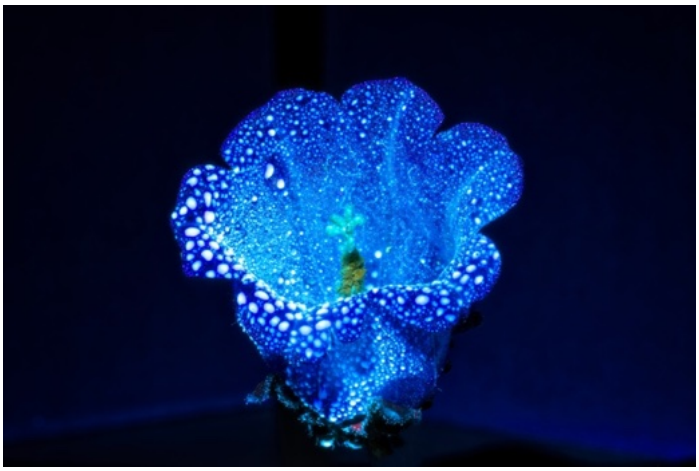
When the shutter closes again, inspect the result to see whether the settings are correct, there is no focal or motion blur, and the flower is lit in the desired way.


A boring macro shot can become very interesting under UV light. Both shots 100 mm, 20 s, f/22.

The resulting images might still be a bit on the dark side. This can easily be corrected in post-processing. The background can also be darkened if it caught too much UV light.

For some special effects, tonic water can be used. Put it in a plant sprayer and spray it on a flower. The tonic will emit bright light under UV light. This is due to the quinine in the tonic water that is strongly fluorescent and emits white/blueish light. Depending on the amount of tonic sprayed on the plant small droplets or larger white areas are visible, like in the image below.

You can also use a pipet to place drops of tonic at particular positions. In this way little light bulbs can be created inside the flower. Keep in mind that after applying tonic to a flower, there is little else you can do with the flower. It is impossible to remove the tonic again. So, it should be the last shots taken of the flower.




Two flowers with different amounts of tonic. Both shots 100 mm, 20 s, f/16.

5. Macro photography

Flowers have amazing details. By using macro photography, these small details can be made visible to the viewer. For macro photography, some special equipment is required, but there are inexpensive solutions. Some knowledge is required of magnification and its effect on focus distance and depth of field. And there are special techniques, like focus stacking, to create even more stunning images. We will discuss all these aspects of macro photography in this chapter.

Magnification

The smaller the subject, the larger the required magnification. What magnification is necessary for flower photography and how does it affect the depth of field?

An important concept in macro photography is the **magnification factor**. When taking a photo, the subject is projected onto the sensor. The size of the projected subject, relative to the original size of the subject, is the magnification factor. With a magnification factor of 1, the size of the projection is the same as the actual size of the subject. With a full-frame camera, the sensor is 36x24 millimeters in size, which means that with a magnification factor of 1, a subject of 36x24 mm will cover the entire image.

Depending on the magnification factor, a larger or smaller part of the flower is visible. As said, with a factor of 1, you will see a subject of width 36 mm. With a factor of 0.5, this becomes 72 mm, while with a factor of 2, the visible part is only 18 mm wide. This all applies to full-frame cameras. APS-C cameras and micro four-thirds cameras have a smaller sensor. They crop the image. As a result, the part of the subject that is visible becomes even smaller, leading to a larger effective magnification. The magnification factor must be multiplied with the crop factor, which is around 1.5 for APS-C sensors and 2 for micro four-third sensors.

A macro shot gives a completely different perspective on a flower. Both shots 100 mm, 1/320 s, f/13, flash.

Each macro lens has a maximum magnification factor. This is measured for a full-frame sensor. For true macro, the magnification factor should be 1 or more. There are also lenses with a factor of 2 or even 5. Be careful, though. Some lenses have the word Macro in their name but only achieve a magnification factor of 0.5. Those are not good enough for true macro photography!

The actual magnification depends on the focal length of the lens and the distance to the subject. The closer you get to the subject, the larger the magnification becomes. The maximum magnification factor is achieved at the **minimum focus distance**.

The focus distance is measured from the sensor of the camera to the subject. The sensor position is indicated with a small line on the camera body. The distance between the front of the lens and the subject is more relevant. This distance is called the **working distance**. To calculate the working distance, the length of the lens and part of the thickness of the body must be subtracted from the focus distance. That can make a considerable difference. For a high magnification, the front of lens is often just a few centimeters away from the flower.

A macro shot of a tropical flower, showing amazing detail. 100 mm, 1/320 s, f/13, flash.

The effective magnification can be increased by cropping the image when processing it afterwards. Modern cameras produce images with a very high resolution of 24 MP or more. For most purposes a resolution of 8 MP is more than enough. This means that you can considerably crop the image and still have enough resolution to maintain clear and detailed images. Cropping makes a smaller area visible in the image and, hence, effectively increases the magnification. For example, a crop from 20 MP to 8 MP, results in an extra magnification factor of 1.6. So, when using a lens with a magnification factor of 1 on an APS-C camera and cropping the image afterwards, the effective magnification is 1x1.5x1.6 = 2.4, which means that a subject or detail with a width of 15 millimeters covers the entire image.

Depth of field

As explained in the section on page 40, the depth of field is the size of the area that is in focus. For macro shots, due to the large magnification, the depth of field becomes very thin. This can be controlled with the aperture, but even with a narrow aperture (large f-value), the depth of field remains small.

The image below shows an example. These four shots were taken from the same position with a magnification factor of 1. In the photos, apertures f/2.8, f/4.5, f/8, and f/13 were used. For the first shot, this resulted in a very small depth of field of 2.5 millimeters. Only part of the stamens is sharp. In the last shot, the depth of field was increased to 15 millimeters. Here also part of the petals in the

back is sharp. For these shots an APS-C camera was used. When taking the same images with a full-frame camera, the depth of field would be even smaller.

Which shot you like most depends on your personal taste. Some people prefer the first shot that has a very clear focus point. For me, the third shot, using f/8, has the best balance between sharpness and blurriness.

The same flower shot with f/2.8, f/4.5, f/8, and f/13.

Tubes and converters

Rather than buying an expensive macro lens, there are inexpensive extension tubes and macro converters that turn a normal lens into a macro lens.

If you are truly passionate about macro photography, I recommend investing in a macro lens, which we will discuss in the next section. But for occasional macro flower photography it is not necessary to buy an expensive macro lens. There are low-cost alternatives available. These are used in combination with a normal lens to considerably increase the magnification. There are two different options: extension tubes and macro converters.

Extension tubes

Extension tubes are hollow rings that are placed between the camera and the lens. They ensure that the minimum focus distance is significantly reduced, which increases the magnification (sometimes with a factor of 2). There are extension tubes of different lengths. The longer the tubes, the stronger the magnification. It is also possible to combine the tubes. The tubes do not contain glass, so the image quality is not affected, but you lose a stop of light.

The smaller the focal length of the lens, the stronger the effect of the extension tubes. A lens with a focal length between 50 mm and 100 mm is ideal. Extension tubes are very affordable (around $40). The tubes must match the camera's lens mount. Get extension tubes that relay communication between the camera and lens, so that autofocus and aperture selection continue to work. These tubes often have 'AF' or 'auto' in their names.

A macro shot with a kit lens, using 31 millimeters of extension tubes. 70 mm, 1/320 s, f/13, flash.

A major disadvantage of using extension tubes is that it is no longer possible to focus to infinity because the maximum focus distance is significantly reduced. Removing them is necessary to take shots from a greater distance. The range of distances at which you can focus becomes very small. I recommend using extension tubes in combination with a zoom lens. By increasing the focal length of

the lens, the additional magnification by the extension tube is reduced and the focus distance increases. This makes it possible to shoot flowers from different distances.

For example, I use an 18-150 mm kit lens in combination with 31 millimeters of extension tubes. With this combination, the magnification factor can be varied between 1.5 and 0.3, which is a good range for most flower shots.

My camera with extension tubes (left) and with a macro converter (right).

Macro converters

Macro converters, also called **close-up lenses**, are placed on the front of the camera lens in the filter thread. Some converters are threaded while others, such as the commonly used Raynox converters, click onto the lens like a lens cap. The latter is very handy because the converter can quickly be placed when needed and removed afterwards. Make sure that the filter size of the converter lens matches the size of the camera lens.

Converter lenses come in different strengths. For example, there is the strong Raynox DCR-250 and the weaker DCR-150. The larger the focal length of the camera lens, the stronger the effect of the converter. When using a telephoto lens of 100 mm or more, it is best to get the less powerful DCR-150, while shorter lenses pair best with the DCR-250. With a zoom lens, avoid using the large focal lengths, as the magnification becomes too strong. Good macro converters are about twice as expensive as extension tubes.

Macro converters have the same disadvantage as extension tubes. It is no longer possible to focus to infinity. For macro converters, the distance range that can be used is typically 5–15 cm (rather independent of the focal length). But macro converters can more easily be removed when you need to take a shot from a greater distance.

A macro shot using a macro converter on a 100 mm lens. 100 mm, 1/320 s, f/13, flash.

Combining them

It is possible to combine extension tubes with a macro converter. This will further increase the magnification to reveal even the smallest details. Simply place the extension tubes between the camera and the lens and place the macro converter on the front. You can even use a true macro lens in combination with extension tubes and/or macro converters. This will easily lead to a magnification factor of 3 or more.

With such large magnifications, the depth of field becomes extremely small. A narrow aperture is often required, or focus stacking must be used, which we explain on page 182. Also, focusing on the desired spot becomes more difficult as the magnification factor increases. Outdoor photography becomes harder due to the increased impact of subject motion. Use manual focus and take several shots. I recommend using a tripod. Below you find an example of a flower shot where I used extension tubes in combination with a macro converter to get a large magnification factor. For this shot an aperture of f/22 was used to get enough depth of field.

For this shot, extension tubes were combined with a macro converter to obtain a very large magnification, but a small depth of field. 150 mm, 1/320 s, f/22, flash.

Macro lenses

What features of macro lenses are important for flower photography?

A macro lens is a lens with a small minimum focus distance and, hence, a large maximum magnification. As discussed in the previous section, extension tubes and macro extenders can be used to turn a normal lens into a macro lens. Those solutions have a couple of disadvantages though.

- It is no longer possible to focus on subjects that are far away, which can be inconvenient if you need to rapidly change subjects.
- Extension tubes cost a stop of light or more. This is not the case for macro converters, but these will lead to slightly inferior image quality.
- Macro lenses can often accommodate wide apertures of, for example, f/2.8. While most of the time a narrow aperture is required to get enough depth of field, sometimes a wide aperture can produce interesting creative effects.

So, using a true macro lens is more convenient than extension tubes and macro converters. It provides slightly better image quality and enables some additional creative effects. When you are a serious macro photographer, a good macro lens is recommended. There are many different macro lenses available, and to make the best choice, close attention must be paid to the various features on offer. Macro lenses have varying maximal magnification factors. Some only reach a factor of 0.5 which is not enough for true macro. A factor of 1 is recommended and if you want to shoot very small details a higher factor is convenient.

A flower of winter heather, shot with a large magnification. 100 mm, 1/320 s, f/13, flash.

Focal length

There are macro lenses with many different focal lengths, ranging from 25 mm to over 150 mm. The larger the focal length, the further away you can stay from the subject, so the focus distance increases when the focal length of the lens increases. However, lenses with a larger focal length are

themselves longer, so the increase in working distance (from the front of the lens to the subject) is less prominent as compared to lenses with smaller focal lengths. A larger working distance is especially important when photographing insects. For flowers it is less of an issue. However, as the working distance decreases the lens itself can cast a shadow on the subject.

Macro lenses with a large focal length tend to be much heavier than smaller ones. When shooting handheld, this can be inconvenient, as it becomes harder to keep the camera steady. When using a tripod this is less of an issue, but heavier lenses might make your tripod sag a little under the additional weight. A sagging tripod can be frustrating as you keep trying to position your camera to compensate perfectly for the tripod sag.

The focal length does not affect the depth of field in any significant way. But, due to compression, it does influence the background. With most macro shots of flowers, you won't see the background, but when you do, it might be nicer to see a bit more of it and, hence, a smaller focal length would be better. (The background will be blurred anyway, because of the small depth of field in macro shots.)

Finally, lenses with a smaller focal length cost less, which can be an important criterion as well. I recommend using a focal length between 60 mm and 100 mm.

The tiny female flower of a hazelnut, shot with a working distance of 10 centimeters. 100 mm, 1/320 s, f/13, flash.

Focusing

Many texts on macro photography recommend manual focus. The reason is that the autofocus of older lenses and cameras was not fast enough to keep up with small motions of the camera or the subject being photographed. This has changed in recent years. Autofocus has become incredibly fast

and accurate, for both the computation and lens motion. With a modern camera and lens, autofocus can be used in most situations without encountering much difficulty.

Of course, this is only true when the macro lens supports autofocus. And there are many manual macro lenses available that have no motors and do not support autofocus. In such cases manual focus is mandatory, as we described on page 45. Also, when there is little contrast in the flower, the focusing of lenses that do support autofocus might fail, and you must resort to manual focus. Macro lenses with autofocus are often more expensive than manual lenses.

Another important feature is image stabilization. Modern macro lenses often have image stabilization, especially those with larger focal lengths, unless they are completely manual. Image stabilization will help to reduce motion blur due to camera motion. But what is also important is that they will keep the image in the viewfinder more stable, especially when shooting handheld. This will make it easier to focus on the desired position.

Fast, precise autofocus is required to keep the correct position in focus. 100 mm, 1/320 s, f/16, flash.

When you plan on buying a macro lens, I strongly recommend checking out reviews about the lens on the internet. Also, whenever possible, borrow or rent the lens for a day and try it out in various circumstances.

Photographing flower details

Taking good macro shots of flower details requires some photography techniques to deal with the depth of field, focus, and light.

Even with a good macro lens some knowledge and practice are required to take nice macro shots. The first step is to decide what to photograph. Carefully inspect the flower and look for interesting details. Often these are the stamens and stigma, but sometimes there are also nice shapes or textures formed by the petals. Some composite flowers consist of many small flowers, so you might want to zoom in on one of them. Other flowers are so small that macro photography is always required to shoot them.

Then decide from which direction to take the shot. Because the depth of field will be very small, the background will be blurred. But there is a big difference between using part of the flower as the background (photographing the details into the flower) or using a direction where the details extend beyond the flower's edge where they can be photographed with a background that is much further away, like in the image below.

When choosing a direction such that the stamens extend out of the flower, the background is far away and becomes black when using a flash. 100 mm, 1/320 s, f/13, flash.

Elements that are slightly behind or in front of the main subject will become blurred as well. For example, when photographing multiple stamens, think about which ones should be sharp. Try to put these at an equal distance from the camera. But if you want all focus on one element, make sure that the other elements are at different distances and, hence, become a bit blurred.

After deciding on the composition, check whether the selected part of the flower is clean. Dust and spider webs also get magnified and can become very distracting. Some of these can be removed in post-processing, but anything that can be removed before taking the shot helps. Use a lens blower or tweezers to remove the distractions. Be careful not to damage the flower.

Aperture and depth of field

As we discussed before, the depth of field gets very small when using large magnifications. It is often impossible to get the complete subject sharp with a single shot, but by changing the aperture the part that is sharp can be increased or decreased. This will result in completely different images. Most of the time I use a narrow aperture of f/13 or more, to get as much sharpness in the details as possible. But sometimes it is nice to put all focus on just a single detail and chose an open aperture, like in the image below where f/4 was used to get only part of the stigma sharp and render the petals behind it completely blurred.

Using a small f-value puts all focus on a tiny part of the flower. 100 mm, 1/8 s, f/4.

Focusing

It is essential to focus on the correct position in the flower. The sharp part is very small, so precise focus is required. As indicated in the previous section, with a modern automatic macro lens autofocus can be used. But make sure to use continuous autofocus (called servo in Canon terminology) to let the camera constantly adapt the focus, because otherwise any small motion of the camera or flower will alter the focus.

Use the smallest possible focus area (spot focus) to very precisely determine what to focus on. When there is not enough contrast, the autofocus of the camera might fail. In that case, resort to manual focus. For more information on focusing, see the section in chapter 2 on page 45.

The anthers or stigma of a flower are often a great subject for a macro shot but require very careful focusing. 100 mm, 1/320 s, f/13, flash.

Light

Most of the shots in this chapter were taken with a flash. That is not a coincidence. Light is important for macro photography and often there is not enough ambient light for this.

To get enough sharpness in the image, a narrow aperture is often required. Also, a fast shutter speed is required because any camera or subject motion will cause motion blur. Image stabilization is less effective with macro shots. Only when working inside from a tripod, longer exposure times can be used. As a result, a lot of light is required to avoid using a large ISO-value.

An additional problem is that the lens is very close to the flower. This can block ambient light from reaching the flower. When shooting in the sun, it is hard to avoid casting a shadow on the flower, and also less diffuse light will reach the flower.

So, additional light is often required. A flash works easiest in this case. As discussed on page 134, there are special flashes for macro photography. But I tend to use a simple speedlight on my camera. To avoid harsh shadows, I use a diffuser. I normally use a diffuser around the lens as this brings the light closer to the subject. Never use a lens hood for macro photography as this can block light from the flash.

Macro on mobile

How to create macro shots of flowers on a mobile phone?

It might surprise you, but it is possible to take great macro shots of flowers with a mobile phone. As we discussed before, mobile phones have a very small sensor and, as a result, they have a large depth of field. This hampers you when shooting complete flowers as the background stays too sharp. But for macro photography this works well because more of the details of the flower become sharp.

Modern (expensive) mobile phones have a macro mode that makes it possible to get very close to the subjects. On iPhones this is automatically activated when getting close to a subject. In the Android camera app, macro mode can be selected in the top-right menu.

The macro mode uses the wide-angle lens of the camera. Because this lens has a small focal length you must get very close to the subject. This can be a problem. Tiny movements of the camera or the flower will change the composition completely. A tripod can be used with a mobile phone but that removes most of the convenience of using a mobile phone. Also, the mobile phone can cast a shadow on the flower, reducing the amount of light. The flash of the phone is not effective as it does not reach the area close to the lens. One can zoom in to stay a bit further away from the flower, but this feature uses digital zoom, which reduces image quality.

A macro photo of a tulip, shot with an iPhone 13 Pro.

Clip-on lenses

When your device does not support macro shots, or you wish to increase your phone's macro abilities, you can purchase low-cost lenses that are clipped onto the phone in front of the camera lens. These are magnifying lenses that enlarge the image that is presented to the camera. They make it possible to get very close to the subject and take macro shots with any phone. They only work at close range. When the subject is further away the lens must be removed. (They work like the macro extenders we discussed on page 170.)

A simple clip-on macro lens for mobile phones.

The camera's zooming functionality can be used in combination with a clip-on lens, but this will reduce image quality. Keep in mind that when the camera has multiple lenses, the position of the clip-on lens must be changed when the phone switches between them.

There are clip-on macro lenses in a large price range. The cheapest ones are around 5 dollars. The most expensive ones cost over 100 dollars. The prime difference is image quality and the amount of distortion near the edges. The more expensive ones have a larger focal length, allowing you to stay further away from the subject. Also, the clip-on mechanism might be more convenient for the expensive ones.

I tested a low-end lens by Apexel that costs less than 10 dollars. It is 12.5x macro lens, which means that the visible area when using the macro lens is 1/12.5 of the area when not using it. The following image makes this comparison clearer. The left shot is taken without the macro lens, at the closest possible distance. The shot on the right is taken with the macro lens, again at the closest possible distance. In the left image, the visible area is 14 centimeters wide, while in the right image it is 4 centimeters wide. Four centimeters is equivalent to a magnification factor of 0.9 on a full-frame camera. Officially, that is not yet called macro, but for many flowers it is adequate.

Closest possible shot without (left) and with (right) the clip-on macro lens.

Clip-on lenses are a low-cost solution for taking macro shots with older mobile phones. The image quality is not perfect, and there is some distortion towards the edges, but with flowers this is not really a problem, as the outside will be blurred anyway. But when the mobile phone has a macro-option, that is almost always the preferred option. The image quality will be better, and they can reach a considerably larger magnification.

So mobile phones can be an attractive option for casual macro flower photography. Unfortunately, you do have considerably less control over the result, especially because the aperture of the lenses in mobile phones is fixed. So, the depth of field cannot be adapted. But it is worth a try.

With macro on mobile there is no control over the depth of field.

Focus stacking

To get an entire flower in focus from front to back, focus stacking can be used to increase the depth of field, while keeping the background blurred.

Flowers can have a large depth, especially when shooting them from the side. The distance from the camera to the furthest point on the flower is considerably larger than the distance to the nearest point. To get the entire flower in focus, a large depth of field is required. And when shooting from a close range this is impossible to achieve, even when using a narrow aperture such as f/16. As we have seen before, an additional problem with using a narrow aperture is that the background becomes less blurred.

Focus stacking is a technique to get a larger part of a photo in focus. To this end, several shots are compiled into one. This used to be a complicated process, but modern cameras and software make focus stacking a lot easier.

The technique consists of two steps. First, a series of photos is taken of the same subject from the same position, each using a slightly different focus distance. This is called **focus bracketing**. For each part of the flower there will be an image in the series where that part is in focus. In the second step the sharp parts of the different images are combined into a single image. This is called **focus stacking**.

We will discuss both steps in more detail below, but let us first consider an example. The image of a dew-covered flower below was taken early in the morning with little light. Hence, a narrow aperture was not possible. The flower also has a lot of depth. To get all the dew drops sharp, a focus bracket was created consisting of thirty images, using a tripod. The images were combined by the software in my camera.

A flower covered in dew, composed of thirty images using focus stacking in the camera. 100 mm, 1/125 s, f/4.5.

Below you can see the first, middle and final images from the series. In the first image the front droplets are sharp, in the middle image the front is blurred but the middle droplets are sharp, and in the final image the droplets at the back of the flower are sharp.

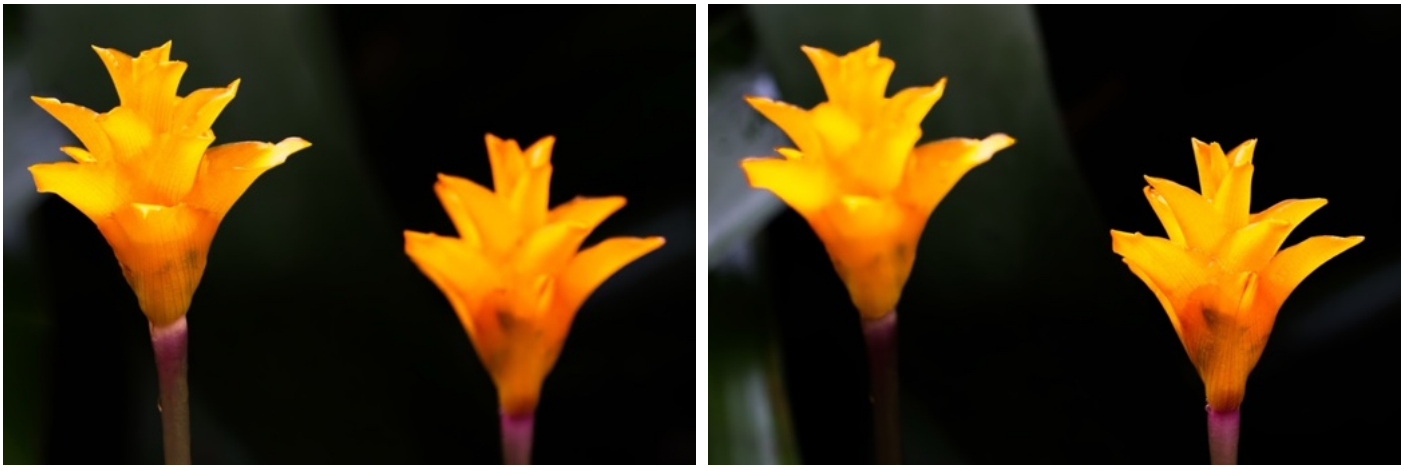
The first, middle and final images of the focus bracket.

Note that the background remains blurred because an open aperture was used. This is a major advantage of using focus stacking.

Stacking two images

Let us start with a simple example. Assume you want to photograph two flowers in a single shot, but they are not at the same distance from the camera, like in the image below. It will be impossible to get both flowers in focus in a single shot. When focusing on the front flower the rear flower will be blurred, and when focusing on the rear flower the front flower will be out of focus. It might be possible to use a very narrow aperture, like f/22, but that will affect image quality, and the background will no longer be nicely blurred (see below on page 188).

To solve this problem, take two shots from the exact same position. In the first shot, focus on the front flower and in the second shot on the rear flower, as in the two images below. Using a tripod is important, otherwise it will be hard to keep the composition the same.



Two images from the same position. In the left image focus was put on the front flower at the left and in the righthand image on the rear flower. Both shots 100 mm, 1/90 s, f/5.6.

To stack the two images, use photo editing software that supports layers, like Photoshop, ON1 Photo RAW, or Affinity Studio. Add both images as layers. Make sure the flower that is farthest away is on top. When the images are not perfectly aligned (this can be checked by making the top layer partially transparent), use the option in Photoshop to align the layers, or do this by hand. In the top layer of the rear flower, mask away everything except the rear flower. It might be necessary to leave a bit of room around the flower to avoid a halo. Now merge the two layers. Note that we keep the background from the front flower image. The reason is that in that image the background is nicer because it is further behind the focus point. For more information on using masks and layers, see chapter 6 on editing images.

The combined image. Both flowers are in focus.

Obviously, this technique can also be used for three or more flowers, if they do not overlap. This technique works best when there is not much detail in the background.

Creating a focus bracket

When many more images must be combined, a focus bracket can be created. There are several different ways to achieve this, depending on the equipment available.

Automatically. Many modern cameras can automatically make a focus bracket. In the settings you select the number of shots and the focus step size. Then you focus on the nearest point that should be sharp and press the shutter button. The camera takes the indicated number of shots in quick succession, and each time shifts the focus with the indicated step size. (For some cameras you must focus on the furthest point when starting the focus bracket. Check the camera's manual.) The lens must be on autofocus. Automatic focus bracketing does not work with a manual lens because the camera must be able to change the focus distance.

The focus step size is a bit of an arbitrary value. With a smaller value, there is a larger overlap between the sharp areas in the images which leads to a better result. But many more shots are needed to get the whole flower in focus, which takes more time. During this period the flower and the camera must remain largely motionless, which can be a problem when there is wind, or when shooting handheld. To find the best value for your camera and lens, experiment at home with different values.

The smaller the aperture, the fewer shots are needed. The camera will adapt the shift in focus distance based on the aperture. I recommend using an aperture between f/4 and f/8. Pay close attention to the exposure. This should be the same for all shots. Using a flash can be difficult because it takes long to charge between the shots. For some camera’s a flash can be used by changing the time between the shots, but you must work on a tripod.

Manually, handheld. If the camera cannot automatically make a focus bracket and you photograph handheld, proceed as follows. Set the lens to manual focus. Let the camera shoot continuously (burst mode) at the highest possible speed. Now focus on the nearest point of the flower. Press and hold the shutter button while slowly moving the camera forward. As soon as the furthest point is in focus, release the shutter button. (Some people find it easier to start at the furthest point in the flower and move the camera backward.)

It requires practice to do this smoothly and at the right speed. It is important that the subject remains in almost the same place in the image. The focus stacking software can correct the position somewhat, but if the deviation is too great, stacking fails. Practice this at home first.

With a tripod. When using a tripod there are two different approaches. With a macro focusing rail, focus in manual mode on the nearest point on the flower, take a shot, move the camera a small distance forward along the rail, take a second shot, move forward, and so on. There are motorized macro focusing rails that can do this whole process automatically. Without such a rail, proceed as follows. Set the lens to manual focus again. Focus on the closest point on the flower and take a picture. Now turn the focus ring slightly and take another picture. Continue like this until you reach the furthest point on the flower.

This way of working is much slower. It therefore only works if there is no wind and the lighting conditions stay the same. An advantage is that a flash can easily be used with this approach. When using a flash, you can narrow the aperture so that fewer shots are needed.

Another focus stacked image, shot indoor with a tripod. Because of the narrower aperture, a stack of 15 shots sufficed. 100 mm, 0.6 s, f/8.

Combining the images

Again, there are several ways to combine the shots from the focus bracket into a single image.

Automatically. Many modern cameras can combine the images. This is very convenient. The result is immediately visible. Due to unwanted movements by the flower or the camera, a focus bracket often goes wrong, and it is a shame if you only find out after getting home.

The software in the camera is somewhat inferior to specialized editing software. One other concern is that the combined image that the camera produces is usually saved only in JPG format. Such images have a somewhat lower quality than RAW format and give fewer possibilities to edit the images afterwards. But the camera also saves the individual shots of the bracket in RAW format, and these can be combined afterwards with their full editing potential intact.

On the computer. The images from the focus bracket can also be combined on the computer afterwards. Modern photo editing software has built-in focus stacking functionality (see below). In addition, there is software that is specially made for focus stacking, such as Helicon Focus (www.heliconsoft.com) and Zerene Stacker (www.zerenesystems.com). This software is considerably more extensive than the functionality offered by most photo editing software, but also a bit more difficult to use as well as being more expensive.

Focus stacking in Photoshop

There is no focus stacking in Lightroom, but Photoshop can be used to combine the images as follows:

- Select the images of the focus bracket in Lightroom, right-click and choose **Edit in -> Open as Layers in Photoshop**.
- Select all layers in Photoshop. Right click and choose **Edit -> Auto-Align Layers** and choose **Auto**. Photoshop will now overlay the images exactly.

- Now go to **Edit -> Auto-Blend Layers**. Check both options and choose **Stack Images**.
- After some calculations, the layers are assembled into a single layer. The original layers can now be removed.

Detailed instructions and videos can be found on the Internet (for example https://www.youtube.com/watch?v=5-RN9JuqlNY).

Focus stacking in Affinity Studio

For a free focus stacking solution, Affinity Studio (https://www.affinity.studio/) can be used. This extensive photo editing software has recently become free. Focus stacking in Affinity Studio is very simple.

- Go to the menu **File -> New Image Process** and select **Focus Merge**.
- Use the **Add** button to select the images from the focus bracket. Both RAW images and JPG images can be used (as well as many other formats).
- Press **OK** and the software will create the stacked image. It first aligns the images, then merges them.
- After some processing the result is shown.

Preventing movement

The focus stacking software aligns the images of the focus bracket before combining them. This can correct small movements of the camera or the flower, but it is still important to prevent movement as much as possible. There are two types of movement that must be avoided:

Movement of the flower, for example, due to wind. If this is a movement to the side, the software can usually correct it. But if the movement is in the direction of the camera or away from it, stacking often fails because such a movement leads to a change in focus distance. Also, when the flower moves, parts of it might start obscuring other parts. This can lead to effects such as haloing. Preferably use focus stacking on a day with little wind. Early in the morning or in the evening, wind is often weaker. You can also try to use something (or yourself) to form a windshield.

Camera movement. The best way to avoid this is to use a tripod. When shooting handheld, try to find some support for the camera or for your arms. Again, movements in the direction of the flower are a bigger problem than sideways movements. The fewer shots are needed, the more likely the bracket will succeed. Image stabilization in the camera and/or lens will also help.

Movements during the focus bracketing will result in unsharpness or halos in the final image. Several tries might be required before a good series is obtained.

Artifacts

As indicated above, movement of the flower or the camera can lead to unsharpness and halos in the resulting image. But artifacts can also occur during the stacking process. There are two common issues.

Bands may appear on the flower where the image is less sharp than at other places. This is caused by a focus distance step size that is too large. The sharp areas in the different images no longer overlap. This can be solved by using a smaller step size and more images in the focus bracket.

A second problem can occur in places where two parts of the flower at different distances overlap, both of which need to be sharp. For example, stamens might appear in front of the rear rim of the flower. At the position where the parts touch each other in the image, there is no shot that contains both parts sharply. The software will generally use the shot where the closest part is in focus, and

the other part is out of focus, leading to a halo. This can sometimes be improved by manually combining the images at such positions.

Using a small aperture instead

The depth of field in an image can also be increased by using a narrower aperture. This is much easier and a tripod is not usually required. But the effect is completely different from using focus stacking. When using a narrow aperture not only does the flower become sharper but also the background. So, unless the background is far away, the blurriness of the background is lost, and that is often unattractive. An additional problem with a narrow aperture is that a larger ISO value or a longer exposure is required. And, finally, a narrow aperture can lead to diffraction, which can also decrease the sharpness of the image.

Below you can find an example. The left image was combined from ten shots using focus stacking. Here f/5.6, 1/125 s and ISO 400 could be used. The righthand image of this flower was taken with f/22. To compensate for the narrow aperture, 1/90 s shutter speed and ISO 4000 were needed. Noise reduction was applied to remove the noise in the second image. In both images, the flower is almost completely in focus. But in the right image, the background has also become sharper due to the small aperture. This is not the case in the left image because no sharp shots of the background were taken. The image on the left is therefore cleaner with more attention to the flower. The left image also contains a bit more detail. The high ISO value required for the righthand image and the very narrow aperture have a negative effect on the image quality. So, when possible, use focus stacking instead of a very narrow aperture.

The left image was focus stacked from 10 shots. The image on the right was a single shot using f/22. Left shot 100 mm, 1/125 s, f/5.6. Righthand shot 100 mm, 1/90 s, f/22.

Abstract photography

Macro shots of flowers can become abstract images where recognition of the subject is no longer important.

Abstract photography is a type of photography where the subject is no longer important and often unrecognizable, and all attention goes to the colors, shapes, patterns, and textures. When people view an abstract photo, they initially start wondering what it is they are looking at. But that is not the point. After this question, they start looking at the image itself and (hopefully) appreciate the colors and patterns, not what it shows. An abstract image can keep the viewer's attention for a long period of time.

For example, consider the image below. Because you know this is a book about flowers you probably conclude rather quickly that this is a close-up of the petals of a rose. But without that context, it is primarily a play of red and yellow shapes.

A detail of the petals of a rose can form an abstract image with interesting shapes and colors. 100 mm, 1/3 s, f/16.

Abstract images are often produced to create a feeling of beauty or amazement. But they can also convey rather different feelings. Sometimes viewers see something in an image that is not there but relates to their own emotion.

Creating an abstract image of a flower requires you to think and look in a different way. No longer think about how to show the flower in the best possible way. Instead look at details of the flower and consider the play of colors, shapes, and textures. This normally works best when taking shots of small details. Repetition and rhythm can also be used, like in the image at the start of this chapter. Composition is important in abstract images as it leads the gaze of the viewer.

Pay attention to light and shadow. Illuminate a flower from different directions to see how the shadows shift. Normally I recommend avoiding hard shadows, but in abstract images they might add

something extra. Similar, think about sharpness. Sometimes an image becomes more interesting when it is out of focus.

It is no longer necessary for the image to represent reality. For example, the colors can be changed, or the picture can be distorted. Multiple images can also be combined, and you can play with motion. What matters is the result.

Not everybody will appreciate abstract images. It requires a different way of looking. The most important thing is that you like the result yourself.

Patterns and details create interesting abstract images. 100 mm, 1/2 s, f/16.

6. Editing images

Cameras can produce beautiful JPG images. But to keep full control over the shots, it's best to shoot in RAW format and edit the images afterwards with one of the many photo editing programs. Editing a flower image can turn a good shot into a great shot. And with modern software, it is little work. In this chapter we discuss how simple editing can improve flower shots considerably. We describe techniques like cropping, enhancing tone and color, sharpening, using masks, and creating black and white images. We do not focus on a particular photo editing program but describe techniques that most tools support.

Photo editing software

There are many different photo editing apps. Which one should you use?

There is a lot of photo editing software available. As described on page 19, the Windows or MacOS operating systems contain free **Photos** software to enhance images. This software can be used to edit the JPG images, and modern version also support (most) RAW formats. The apps are somewhat limited in functionality though. The software also organizes your photos, which is very useful when your collection of images is growing.

Many camera manufacturers provide free software to read and edit the RAW files from their cameras. For example, Canon provides **Digital Photo Professional** (www.canon-europe.com/software/digital-photo-professional/) and Nikon has **NX Studio** (www.nikon.co.uk/en_GB/product/apps-software/nx-studio). Sony has the **Imaging Edge Desktop** (https://creatorscloud.sony.net/catalog/en-gb/ie-desktop/index.html). These tools can normally only read the RAW files produced by the cameras of their own brand. Also, they are somewhat limited in functionality and not always user friendly.

In addition, various commercial packages are available, and if you are serious about photo editing, you are strongly recommended to get one of these and invest some time to learn how to use it. There are huge numbers of videos and tutorials available on the web for all these tools.

The combination of **Adobe Lightroom** and **Photoshop** (www.adobe.com/products/photoshop-lightroom.html) is used by the largest number of photographers. Lightroom is meant to organize photos and carry out the most common editing on them. For more advanced editing, Photoshop can be used. This software has the most features but is also the most expensive, with only a subscription-based model available, starting at $20 per month for new users at the time of writing.

I use **ON1 Photo RAW** (www.on1.com) which combines the most important features from Lightroom and Photoshop. It has similar image organization features as Lightroom and the most important photo editing tools from both Lightroom and Photoshop. It is considerably less expensive (a perpetual license, with one year of updates costs less than $100), but very powerful.

The ON1 Photo RAW photo editing interface.

Another option is **Luminar Neo** (www.skylum.com/luminar). This program focuses strongly on the use of AI. It tries to keep things as simple as possible for the user, but this sometimes means you lose control over the result. The image organization functionality is limited. The program is rather expensive (a perpetual license costs around $400) but there are often big discounts (I got my copy for a quarter of the price).

Capture One (www.captureone.com) is an extensive professional tool. It is especially suited for working in a studio setting where you want to immediately see and store the images on a computer. It is similar in price to Photoshop but also offers a perpetual license.

Affinity (https://www.affinity.studio/) has recently been bought by Canva and is now completely free. This program is much more than a photo editor, including many vector-based drawing tools, and it works somewhat like Photoshop. There is no photo organization functionality. AI-based features are only available when you have a paid Canva plan.

Another free option is **GIMP** (https://www.gimp.org/). This is an open-source image editor. It will take some time to get used to. Also, it does not natively handle RAW files, but there are plugins that add this functionality.

The commercial software can be used for free for a limited time to try it out. Before making a choice, read some reviews on the Internet or watch some introductory videos. Each of these programs is different, but they all require a significant time investment before you fully understand how they work. So, choose carefully as switching later can be difficult.

Some photo editing software adjusts the images directly. In that case, it is advisable to make a copy before editing an image. This is called **destructive** processing. Other software is **non-destructive**, which means that the edits you make are not actually applied to the original image but are stored in a separate file (or in the image file itself). When loading the image into the program, these edits are performed again so that the result is shown. Editing steps can always be undone and it is possible to revert to the original. That way, the original image is never lost.

As I use ON1 Photo RAW myself and Adobe Lightroom and Photoshop are used by many photographers, those are the tools I focus on in the remainder of this chapter. All images in this book were edited with ON1 Photo RAW, unless stated otherwise. Most of the techniques discussed are also available in the other programs and they are described in general terms.

JPG or RAW?

Cameras can produce images in both JPG format and RAW format. JPG images are the easiest to use, but RAW images contain more information and give much more flexibility.

For most cameras, you can choose how to save the images: in JPG format, in RAW format, or in both formats. When choosing the JPG format, the resolution and the image quality can be indicated. I strongly recommend using the highest possible resolution and the best image quality. This will increase the file size though, typically some 10 MB per image. The RAW files are a lot bigger, on the order of 40 MB per image. Some cameras allow for compressed RAW files (**C-RAW images**) that are smaller at the cost of a slight reduction in image quality.

In the past, the size of the image files was an important matter, but this is no longer the case. 256 GB memory cards can be bought for less than 50 dollars and can store around 5,000 images in both formats. So, best let the camera store the images in both formats to have all options available later. (There are reasons to not store images in both formats, like when using burst mode, but for flower photography these are not relevant.)

Using **JPG images** is the most convenient. These images are ready to be used and shared. All platforms and printers support them. The camera has already edited these images to improve them. Creative filters can be applied in-camera as well. If you do not want to edit the images and want to share or print them as quickly as possible, the JPG format is ideal.

The **RAW images**, on the other hand, store exactly what the sensor in the camera registers. No processing is applied. The white balance or the creative settings have no effect on this. You get the raw data, hence the name. A RAW image is therefore initially less beautiful than the corresponding JPG image. Below an example is shown. The left image is the JPG image produced by the camera while the image on the right is the unprocessed RAW image. The colors in the JPG image are more vibrant, and if you look closely, you'll see that the JPG image is sharper.

On the left the JPG image from the camera and on the right the unprocessed RAW image. 300 mm, 1/320 s, f/16.

To get the best result, a RAW image should always be edited. You must adapt the tones and colors, otherwise the image will remain too flat. It can also help to change the white balance setting. The photo editing software uses the white balance setting of the camera, but this can be changed. After these limited adjustments, the image below was created.

The slightly edited RAW image.

Of course, the JPG image can also be edited, but you will never get the same result. First, JPG images are compressed. This reduces the amount of detail in the photo. In most situations this is not a problem, but when cropping the image strongly, artifacts will show in the image. In addition, the **color depth** of JPG images is smaller than with RAW images. JPG stores a color using 24 bits, 8 for each of red, green and blue. That means that 256 shades of red, green and blue are possible. The camera's sensor can distinguish many more shades and often uses 12 bits or even 14 bits. At 12 bits, there are more than 4000 different shades of red, green, and blue. With more different shades, there are much better opportunities to improve the image. For example, in a white flower, the JPG image contains few different shades. The RAW image retains a lot of detail that can be “brought back” when editing.

A white flower will have more detail when editing the RAW file. 100 mm, 1/350 s, f/8.

You cannot print RAW images or post them on social media. To do so, the (edited) RAW image must be exported to a format that is supported. All photo editors have functionality to export the RAW images to many different formats. When exporting an image, sometimes also the size can also be changed and other adjustments can be made, like sharpening the image for printing. You will often use one of the following export file types.

- **JPG** is the most common type of image file. The files are relatively small and can be used anywhere. But they are compressed, and some image quality is lost. JPG images are often used for social media, but many people also use them when printing photos.
- **PNG** is also a popular type of file. It is widely used for high-quality websites. The files are compressed but without loss of quality. They are considerably larger than JPG files.
- **TIFF** files deliver the best quality and are used by professionals to print photos. But the files are significantly larger than the JPG and PNG files.

In most situations, it's best to choose a JPG file when exporting. When exporting to JPG the image quality can be selected on a scale of 1-100 or 1-100% (some software uses 1-12), with 1 being the worst and 100 (or 12) the best. A value around 90 gives a reasonable trade-off between file size and image quality. Each time you edit and store a JPG file again you will lose some more quality.

Cropping

Cropping can be used to improve the composition of photos, remove distractions, and change the aspect ratio.

Cropping and rotating images is very easy. Every photo editing program has functionality for this, including the software that comes for free with the computer's operating system. I recommend always checking whether it helps to crop your images, even if you do not plan to do any further editing. There are four main reasons to crop photos.

- Increase the **magnification** to reveal more detail of the flower.
- Improve the **composition**.
- Remove **distracting elements** from the image.
- Adjust the **aspect ratio**, for example, by making the image square.

Increasing the magnification

Sometimes, flowers appear too small in the shots. This can have various causes. The minimum focus distance of the lens makes it impossible to get any closer to the flower, or the flowers were high up in a tree or on the other side of a fence. Fortunately, modern cameras produce images with a large enough resolution to crop them considerably, without losing much quality. A resolution of 8 MP is enough for most uses, and cameras often have sensors with 24 MP or more. So, the image can easily be halved in size. By cropping the image more details become visible in the flowers.

By cropping this image, more details of the flower become visible. 100 mm, 1/350 s, f/8.

As already mentioned in chapter 2 on page 40, cropping an image has a different effect than taking the shot from closer range. The size of the flower in the image will be the same in both cases, but when moving closer, the depth of field becomes smaller, while it stays the same when cropping. Whether this is desirable or not depends on the type of image you are after. The depth of field can of course be adapted using the aperture, assuming there is enough light, and the lens allows this.

When cropping a lot, the resolution of the image might become too small, for example, for a large print. This can be solved using modern **upscaling tools**. These tools use AI to increase the resolution, while maintaining and even improving detail. The results can be amazing. These tools are built into recent versions of photo editing software. In Lightroom it is called Super Resolution, in Photoshop Generative Upscale, and in ON1 Photo RAW it is called Resize AI.

Improving the composition

The main reason to crop an image is to improve the composition. As we have seen in chapter 3, there are certain compositional rules regarding the positioning of the elements in the image, such as the rule of thirds. Lines in a photo should run in the correct way, for example from a corner of the image. When the composition of a shot isn't ideal, this can often be corrected by resizing and/or rotating the image. In the example above, not only was the magnification increased, but the flower was also positioned according to the rule of thirds, improving the composition.

While taking the shots you can try to get the composition exactly right. A tripod is recommended for this. But it is often easier to frame the shot a little wider and crop and rotate the image to the desired composition afterwards.

Removing distracting elements

Flowers are often surrounded by all sorts of objects, like branches, stems, leaves, and other flowers. These can form distracting elements in the image. Also, there can be bright or dark spots in the background that draw too much attention. Elements are especially distracting when they cut through the borders of the image. It is important to always check the borders of images for this.

You can remove some distracting elements using the retouching techniques described on page 204 below. But when the elements are close to the edges, it is often easier to remove them using a simple crop. Also, rotating the image can sometimes help. Below you see an example. In the original image there are pieces of flowers visible at the edges. By cropping the image from the left and the right, the distracting elements are removed.

By cropping this image, the distracting flower parts at the edges are removed and the aspect ratio is improved. 100 mm, 1/350 s, f/13.

Adjusting the aspect ratio

Most cameras produce images with a 3x2 aspect ratio by default. So, the image is one and a half times as wide as it is high. This is a great ratio to print the photo in landscape orientation or to show the photo on social media. For flower photography, however, this is not ideal. As we discussed before on page 92, in landscape orientation, there can be too much empty space on both sides of the flower. And in portrait orientation the stem of the flower often becomes too long. An aspect ratio of 3x4, 4x5 or even square can lead to more pleasing images. In the example above the aspect ratio was changed to a square format to mimic the shape of the flower.

Effect on image quality

Cropping an image has no effect on the image quality. After all, the remaining pixels are unaltered. The overall resolution does decrease, especially when cutting off large sections. But this is only noticeable when the photo is printed in large format. And, as indicated above, there is upscaling software that can increase the resolution. Of course, it is always better to choose the best possible framing when taking the picture, but you might have a better idea about the correct framing when inspecting the photo on the computer. So, it is often preferable to take a wider shot to have all options to crop and/or rotate the image later.

When rotating at an angle other than a multiple of ninety degrees, new pixel values are calculated based on several values in the original image. This does impact the image quality, usually making the image a little less sharp. This can easily be corrected by sharpening the image. Always do the rotation and cropping first, before further editing the image.

Tone and color

After cropping, the next step is to develop the image, that is, adjust the exposure, tone and color.

As mentioned on page 194, RAW files contain the pixel values from the sensor, and these give a rather flat image with dull colors and not much contrast. At this stage of development, two aspects are adjusted: the tone and the color. Photo editing software can do this automatically. It analyses the image (often using AI) and makes appropriate changes. With images of flowers the results can be disappointing though, so I don't rely on it. It is better to develop the images manually. This is very simple, using just a few sliders. Developing works globally on the total image. In later sections we will discuss techniques to apply certain changed only locally, for example, only on the flower or the background.

Tone

Tone refers to the brightness in the image. If the shot is overexposed or underexposed, you can change the global exposure of the image to correct this. In addition, the contrast can be adjusted. When a flower image has a lot of sharpness, a little extra contrast can make the image stronger. But when you want to create soft, dreamy images, it can help to reduce the contrast.

To work in more detail, you can use several sliders to adjust certain brightness ranges. For example, you can lighten or darken the black tones or the shadows. Often, it helps to lighten the shadows a little because some parts of the image can be very dark. However, it is best to leave the black parts unchanged.

Likewise, you can adjust the whites and the highlights. When flowers are very bright it helps to darken the whites and highlights a bit to show more detail. However, do this as little as possible because it will make the image flatter. The software has a setting to see which parts of the image are washed out, where all detail in the light areas has disappeared. Depending on the software you can select this in the menu or with little arrows in the intensity histogram. Move the white tones and highlights sliders back until (almost) no part has been washed out. Finally, there are the midtones. These are often the most important parts of the flower, like the colored petals. By making them lighter or darker, the effect of the flower will change.

Changing the tone brings back the details in the sky and in the flower. 100 mm, 1/350 s, f/8.

The images above show an example. When photographing with the sky as a background, often the sky becomes too light, while the flower becomes too dark. As we discussed in chapter 4, this can be solved using a flash or by taking an HDR image. But, when shooting in RAW format, you can correct

the image by adapting the tone. In the example, the highlights and whites were made darker, while the midtones and shadows were lightened a bit (to put some light in the center of the flower). No other changes were made.

Color

In addition to the tone, you can adjust the color in the image using several sliders. When editing RAW images, the editing software chooses the white balance that was set in the camera. This is expressed by the color temperature, which can be adjusted using a slider. In this way the image can be made warmer or cooler. In addition, you can change the tint of the color. This compensates for a green or magenta color cast.

There are also sliders to adjust the color saturation and change the vibrance of the colors. I recommend keeping the saturation untouched most of the time or reduce it a bit. Flowers have rather saturated colors and when increasing the saturation further, the look becomes unnatural. The vibrance can be changed though. The vibrance changes the saturation of those colors that seem to be subdued. This works especially well when the flowers contain multiple colors. Increasing the vibrance makes the different colors more equal in saturation and, hence, more noticeable.

In the image on the right, the vibrance of the colors was increased. 100 mm, 1/320 s, f/13, flash.

Changing certain colors

When adapting the saturation and vibrance of colors, these operations work on all colors at the same time. This is not always the desired effect. Often you want to increase the vibrance of the flower, but not the leaves in the background. As we will see later in this chapter on page 209, masks can be used to apply changes locally.

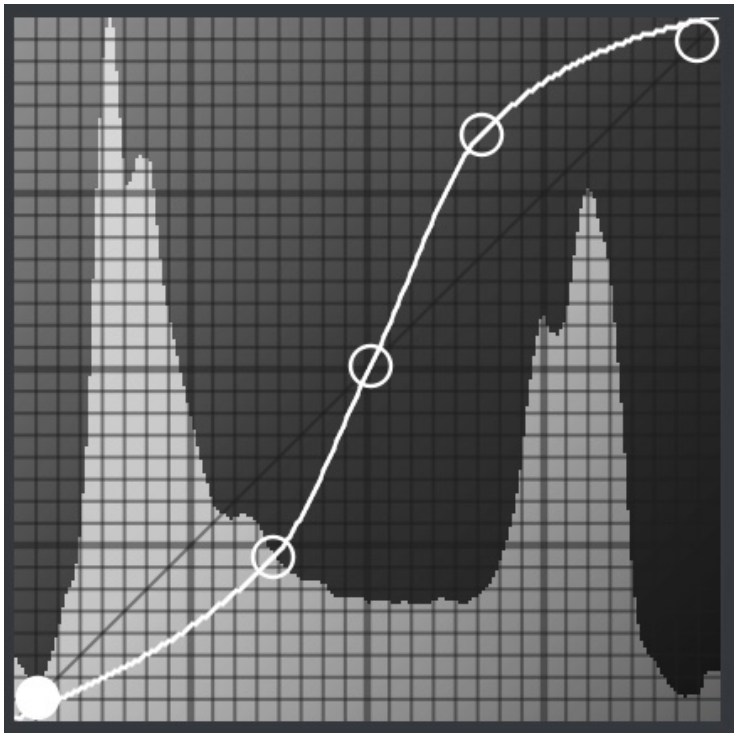
But in many situations, there is an easier solution. Most photo editing software has functionality to only apply color changes to pixels within a certain color range. Lightroom, for example, has the color mixer and the dot color, and ON1 Photo RAW has a color enhancement filter for this. In these tools you select a certain color, together with a range. You can now adapt the saturation and brightness of only the pixels with those colors. You can, for example, use this to desaturate the color of the green and brown leaves in the background and make the colored flower more vivid. You can adapt the hue of the selected colors as well, as was done in the image below. I shifted the purple color a bit towards pink.

In the image on the right, the hue and saturation of the purple colors were adapted. 90 mm, 1/500 s, f/8.

The histogram and curve

Photo editing software can display the histogram of the image, just like most cameras. The **histogram** shows for each brightness value the number of pixels in the image that have that brightness. Together, these make up the brightness intensity distribution. The histogram can show this globally or by color. The low-intensity pixels are shown on the left side of the histogram. If there are many of them, a large part of the image is dark, and it may help to increase the exposure. Similarly, if there are a lot of high-intensity pixels on the right, then it can help to reduce the exposure. Any edit that adjusts the tone also changes the histogram. If you pay attention to the histogram while editing, you can ensure that the total range from completely black to completely white is used as optimally as possible.

To get more control over the different tones in the image, the **curve** can be adjusted. In Lightroom the curve is part of the development settings. In ON1 Photo RAW there is a filter for this. In the background of the curve, the histogram is shown (see the image below: the curve is the white line with circles on it). The curve is a mapping of light intensities in the original image to new intensities. The curve is initially a straight line from the bottom left to the top right, so every intensity is mapped to itself (and, hence, there is no change).



The curve with the histogram in the background.

Positions on the curve can be moved up or down by moving the markers on the curve. Additional markers can be added. By moving a marker, the brightness of the pixels with that intensity is changed, along with the intensities around it so that you get a smooth gradient. For example, the example below shows the well-known S-curve that makes the darker tones darker and the lighter tones lighter, resulting in more contrast in the image. It is also possible to adjust the curve for one of the primary colors to add more contrast in just the red colors, for example.

Retouching

Blemishes on flowers and larger distracting elements can easily be removed using retouching techniques.

Most flowers are not perfect. There can be small dark spots on the petals or strands of spider web between them. There can also be bad spots on leaves surrounding the flower, or distracting elements in the background. Such elements can flaw an otherwise beautiful photo. By removing them, you obtain a cleaner and more pleasing image.

Healing brush

As mentioned earlier, you can remove large distracting elements near the borders of the image by cropping or rotating the image. But if that fails, photo editing software has several options for retouching the image. You can use a brush to indicate which area needs cleaning up, and the software uses information from the nearby pixels to fill in the area with more neutral elements. This is often called a **healing brush** or **perfect eraser**. You can change the size of the brush. Keep it as small as possible, while still covering the area. Sometimes multiple tries are required for the best results.

In the example below you see the effect. The large distracting bud at the bottom right could have been removed by cropping the image but in this case that would not lead to the nicest composition, because the shape of the flower is more rectangular. The software can easily remove the bud though. I removed some small blemishes on the petals as well, and some spider webs around the outside.

The original shot on the left and the retouched image on the right. 110 mm, 1/350 s, f/13.

Clone brush

If the automatic tool fails, you can use a **clone brush**. Here you indicate from what part of image the new pixels must be taken. This can, for example, be used to remove blemishes along the edge of a petal or stem by copying a similar part of the petal or stem. The size of the brush can be changed. The feathering indicates how soft the transition should be between the area and the surrounding pixels. You can also select the opacity of the fill (referred to as density). Sometimes it is nicer to use a lower opacity and still see part of the old pixels.

Below you find an example of a lily. The original image has some dark spots which hamper the cleanness of this type of flower. In the image on the right, I removed these. And using a clone brush,

I removed some holes at the edges of the petals. I left the hole at the bottom right, because it would be hard to remove it in a convincing way and it did not bother me.

On the left you see the original image. In the image on the right several blemished were removed. 110 mm, 1/350 s, f/13.

Retouching works especially well if the area containing the blemish doesn't have too much specific detail. It is normally effective to remove distracting elements from the background, or small spots on the petals or leaves. If distracting elements run over the entire flower, the technique usually does not work well. For example, a stem in front of the flower cannot normally be removed by retouching.

Generative removal

Recently, editing software introduced new retouching techniques based on AI, called **generative removal**. Using generative removal is extremely simple. You select the part you want to remove and let the software generate new content. This is not based on the image itself but on information learned by the AI from millions of other images. The result is not always what you want, so sometimes multiple tries are required. My experience with generative removal for flower images is not very good. Most of the time the distracting element should be replaced by a blurred background, but instead the software adds new elements to the image. Also, the resolution of the new content is sometimes lower. So, I hardly ever use generative removal.

Sharpening and noise reduction

When you like sharp flower details, several forms of sharpening can be applied to the image. And when there is noise due to high ISO values, this can easily be removed.

Some people like sharp details in their flower shots, while others prefer very soft images. There are various ways to improve the image by increasing (or reducing) the sharpness.

Contrast

Increasing the **contrast** in an image makes the dark tones darker and the light tones lighter. It stretches the histogram left and right. This is useful when the image is rather flat. It gives the image a stronger feeling, but it does not really make the image sharper. Reducing the contrast makes the image softer.

Another value that can be changed with a slider is the **clarity**. This also changes the contrast, but locally. Small details that are lighter than the surrounding pixels are made lighter and dark details are made darker. This makes these details more visible and, hence, increases the sharpness of the image. Clarity works mostly on the midtones in the image. In ON1 Photo RAW there is a slider called **structure** that has a similar effect.

ON1 Photo RAW has a special filter called **dynamic contrast**. This is an extended version of clarity. It also makes dark details darker and light details lighter, but you can change the amount depending on the size of the details. So, for example, you can tell the software to make the larger details more prominent while making the smaller details less visible. Or the other way around. This gives a lot of control. Dynamic contrast can be applied globally to the whole image, but it is more effective to use a mask and only increase the dynamic contrast for the flower, as we will discuss in a later section.

In the image on the right, dynamic contrast was added. 100 mm, 1/320 s, f/13, flash.

Sharpening

Traditionally, **sharpening** increases the contrast along edges where there is already contrast. In this way the edges are made clearer, creating the illusion of more detail. There are many ways to achieve

this, and they involve several parameters. This used to be an important part of photo processing. But traditional sharpening techniques have lost most of their use. They can add a bit more detail to the image but quickly lead to unnatural results.

The traditional approach has largely been replaced by **AI sharpening**. This works in a completely different way. The software recognizes the logical structure of blocks of pixels and replaces them with versions that are sharp. This is learned by analyzing millions of images. Only those parts that are already reasonably sharp are made sharper, so, blurry backgrounds stay blurry. This software is getting smarter all the time and can now also recognize and correct certain forms of motion blur.

I use AI sharpening on most of my images, unless I deliberately want soft images. The AI sharpening brings out the beautiful details in the flowers while it does not change the blurred background. No mask is required for this.

There is a lot of discussion about the use of AI when editing photos. Some photographers are strongly against it, and many photo competitions don't allow it. I personally have no problem with techniques that stay very close to the original image, like AI sharpening or noise reduction, and only correct certain limitation of the camera and lens. Techniques that generate new content, like the generative removal discussed in the previous section, are rather different and I tend not to use them. But you must make your own decision about what techniques to use. (Note that the camera itself also applies various AI-based techniques to produce the image, so it is nowadays basically impossible to avoid the use of AI in photography altogether.)

In the image on the right, AI sharpening was applied. 100 mm, 1/320 s, f/13, flash.

Noise reduction

As we discussed in chapter 2 on page 38, high ISO values can lead to noise in the image. When saving JPG images, the camera reduces noise according to your settings, but reducing noise in RAW images must always wait until post-processing.

Noise refers to a visual distortion that appears as random, grainy, or speckled patterns, particularly in darker areas of an image, and is caused by factors like high ISO settings or poor lighting

conditions. Sensors are not perfect, and small errors occur when measuring the amount of light. At a low ISO value, a lot of light falls on the sensor, and those errors are practically negligible. But at a high ISO value, the amount of light captured per pixel is relatively small. The greater the ISO value, the more the camera amplifies these small differences in intensity value. Any small errors in the original measurement are also amplified leading to a greater appearance of noise.

In the past, to remove noise, the intensity of pixels with noise was replaced by a kind of average of the intensities around them. The noise disappeared, but the image also became less sharp. Modern software works very differently. It uses AI to recognize the logical structure of a block of pixels and replace it with a version without noise. The sharpness remains unchanged.

Noise reduction is easy to apply. You simply select the option, and the software starts calculating to create a version of the image without noise. There are several settings to determine exactly how the noise reduction works, but usually the default values are fine. The software is smart enough to choose the best values. At high ISO values, noise reduction should always be applied, unless you want to deliberately include the effect of noise in the photo.

A noisy image on the left, shot with ISO 6400, and the same image with noise removed on the right. 300 mm, 1/350 s, f/8.

Photo editing tools like Lightroom and ON1 Photo RAW have excellent noise reduction functionality. For even more quality and control, there are also special noise reduction apps, such as Topaz Photo AI (www.topazlabs.com/topaz-photo-ai) and DxO PureRaw (www.dxo.com/dxo-pureraw).

Working with masks

To apply edits to only a part of the image, a mask is needed. There are several ways to create these masks.

Masks allow you to limit some of your editing changes to specific parts of the image. For example, you might want to make the colors of the flower more vibrant, or the background darker. For this a mask is required. A **mask** determines which parts of the image a filter or edit is applied to. After creating a mask, you can apply certain changes only to the pixels in the mask. This is often referred to as a local adjustment.

In the past, creating a mask was difficult and time consuming. But nowadays photo editing software has many different methods for creating masks, the most important of which we discuss here. To show the effect of the different masks, we use the following image.

Our example flower for the masks. 300 mm, 1/350 s, f/13.

A mask is basically a monochrome overlay with the same size as the photo. Where the mask is white, the editing operation is applied and where it is black, the operation is not applied. For gray areas, the operation is partially applied. A mask can have hard edges or soft edges. Hard edges are used to indicate an area very precisely, such as the flower. Soft edges are used if you want the parts that are being edited to flow smoothly into the unedited parts, such as when blurring a part of the background.

The following masking techniques are available in many photo editing packages.

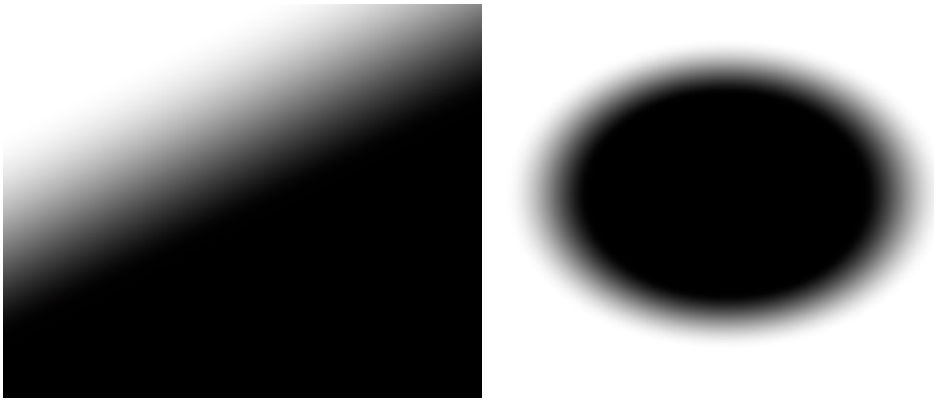
- **Brush**. The mask can be drawn using a brush. You can select the size of the brush and the density (degree of transparency). You can also indicate the feathering that softens the mask outwards. Due to the soft gradient, adjustments flow smoothly into the part outside the

mask. Brush masks can be used, for example, to make parts of the photo a bit darker (burn) or lighter (dodge).

- **Subject or background**. Using AI, the software is often able to determine the subject in the image and the background. With such a mask, the flower can be selected exactly with just a single click. Same for the background. Other objects in the image can be selected using AI as well, for example an annoying leaf in the background. Such precise masks are useful when making prominent changes to an area. For example, when making the flower lighter, a precise mask is required, otherwise a halo will appear around the flower. We will discuss changing the subject and the background separately in the following sections.

A soft mask drawn with a brush and a hard mask created using AI to determine the subject.

- **Linear gradient**. For a linear gradient, you indicate a line, and the masking tool then fills the section on one side of that line. Around the line, the mask ranges from 0% to 100% density. You can set the width of the gradient. A common application is to make the image a bit lighter towards one of the top corners. This suggests light coming from that direction. Several gradient masks can be combined if necessary.
- **Radial gradient**. In this case you indicate a circle or oval. The area inside (or outside) the oval then becomes the mask. Along the edge of the oval, the mask goes from 0% to 100% density. Again, multiple masks can be combined. A common application is to create a vignette. By slightly darkening the area towards the outside, the viewer is drawn towards the center of the image. Editing software also has functionality to add a vignette, but with a radial gradient you have much more control over the result.



A linear gradient mask and a radial gradient mask.

- **Color range**. You specify a color and a range, and the mask selects all pixels in that color range. You can, for example, use a color range mask to select the colored petals of a flower

and add some sharpness to them, or you can select the green leaves in the background to make them darker.

- **Luminosity range**. Selection is not based on color, but on intensity. You indicate a range of intensities. This can, for example, be used to select all dark pixels or all light ones. If some parts of the photo are a bit overexposed, these pixels can easily be darkened with such a mask. For flower photography these masks are barely used.
- **Depth mask**. This is a new technique in which the software uses AI to determine the depth of the different pixels in the scene. You can then apply an edit to the pixels that are far away or close by. A depth mask can be used to select the background and, for example, simulate the blurring effect of an open aperture lens on it, where the background gets blurrier depending on the depth. But recent versions of editing software have functionality to add this type of lens blur automatically.

A color range mask and a depth range mask.

Masks can be edited in various ways. You can blur or sharpen them, and they can be inverted. Masks can be made larger or smaller. For example, when a subject mask of the flower is slightly too large and results in halo effects, its size can be reduced slightly to remove the halo.

It is possible to copy, paste, and combine masks as well. For example, you can combine a mask for the background with a linear gradient to have the background (and only the background) become darker towards the bottom. It is worthwhile to delve into the masking possibilities of your software. If you can work well with masks, you can edit images much better and faster.

Focus on the flower

An important aspect of editing flower images is to put more emphasis on the flower and less on the background of the image.

When developing an image by changing tones and colors, the whole image is affected. But for the best result it is often better to change the flower and the background differently. In this way it is possible to make the flower more prominent while reducing the focus on the background. To edit the flower or the background only, a local adjustment to the image is used.

Local adjustments of the flower

To only edit the flower a mask is required. Depending on your intentions you might want to select the flower with the stem and leaves or only the flower itself. For this, you can use masks based on AI or on color. Sometimes the best effect is obtained by only adjusting the center part of the flower, using a brush mask. Here are some typical edits to increase the focus on the flower.

- Increase the vibrance of the colors of the flower. If you only apply vibrance to the flower, the background stays a bit dull, which puts the emphasis on the flower.
- Add contrast, clarity (dynamic contrast), or apply sharpening to the flower. When there is a bit of detail in the background, this should not be enhanced, so it is better to apply these edits to the flower only. When the background is blurred enough, you can apply them to the whole image, and no mask is required.
- Add light. It is especially nice to add some light to the center of the flower only, using a brush mask or a radial mask.

Below you find an example. On the left you see the original image. In the image on the right, vibrance, contrast, and clarity were applied to the flower and the stems. The background was left unchanged.

In the righthand image a local adjustment is applied to the flower. 100 mm, 1/180 s, f/11.

Local adjustments to the background

Rather than changing the flower, you can also use a local adjustment to change the background only. Here the goal normally is to make the background less prominent. You typically apply the reverse of the operations that were applied to the flower. It can help to reduce the vibrance of the colors, reduce the contrast and clarity, and to make the background a bit darker. Don't overdo it though, because it can lead to unnatural looking images.

A special operation is to add blur to the background when there is too much detail visible, for example, because a narrow aperture was used or the background was too close to the flower. Applying blur requires some care though. You need a mask for the background, but a precise mask will often lead to halos around the flower. You can avoid this by using a brush to create a mask that leaves some room around the flower. Now apply a blur filter to the selected area. Editing software has various options for this and the strength of the blur can be determined as well.

Another option is to use a filter that simulates lens blur. Such a filter makes it possible to set exactly how the blurring of the lens should behave. The software uses AI to determine the depth of different parts of the image and applies the correct blur based on that depth. You can select the depth at which the image should remain sharp.

Below you find an example. In the original image on the left there is a bit too much detail in the background. In the righthand image the clarity of the background was reduced, and it was blurred a bit.

In the righthand image, blur was applied to the background. 100 mm, 1/250 s, f/8.

Vignette

A vignette is a simple way to draw the viewer's attention to a certain part of the image. A vignette applies a gradient to make the image a bit darker or lighter towards the outside. You place the center of the vignette at the position where the emphasis should lie, such as the center of the flower. You can indicate the strength of the vignette, but when it is too strong, the image can look unnatural. A subtle gradient is often hardly noticeable, but still influences the viewer. All photo editing software has simple tools for adding vignettes.

A dark vignette makes the image a bit bolder. A light vignette on the other hand makes the image softer and a bit dreamier. Light vignettes work especially well with a slightly overexposed image with a small depth of field. In the image below you see how a strong vignette completely changes the mood of an image.

The same image with a dark vignette (left) and a light vignette (right). 400 mm, 1/350 s, f/8.

In some situations, you need more control over the location and shape of the vignette than the standard vignette offers. In that case, you can create a vignette using any mask and reduce or increase the exposure in the masked area using a local adjustment. For example, when there are two flowers in the image you want to darker neither of the flowers but only the area outside both. This can be achieved by combining two radial gradient masks. The image below shows another example where the vignette is defined using a rotated oval along the flower.

In this image a rotated radial gradient mask was used to create a vignette. 400 mm, 1/350 s, f/8.

Extending the background

Rather than cropping the image, you sometimes want to extend it to improve the composition.

There are situations where you took a great shot of a flower, but there is not enough space around it for a nice composition. For example, the flower might be looking to one of the sides, but it is too close to the edge of the image. In such situations the image should be extended by adding a bit more background. There are several techniques that can help with this.

This shot was framed too narrow. 100 mm, 1/250 s, f/8.

The first step in most techniques is to enlarge the canvas, that is, adding additional space on the desired side of the image. Somewhat surprisingly, this cannot be done in Lightroom. You must use Photoshop. Tools like ON1 Photo RAW can change the canvas size. Place the original image in the required position in the new, larger canvas.

Now the empty space must be filled. When the background has a single color, for example black when using a flash, or blue when photographing against the sky, the empty part can simply be filled with that color.

Cloning

Image editing software has a clone brush that is normally used for retouching. With this brush, parts of the image can be copied to other locations. The copy is blended with the original image. This brush can be used to copy parts of the existing background to the empty space. For this to work the background should be rather blurred and there should be enough of it visible in the original image to copy from. Some blurring might be applied to the new background afterwards for the best effect. In the left image below, you see the effect when applied to the shot above.

In the left image a clone brush was used. In the image on the right generative crop was applied.

Generative crop

Modern image editing software has an AI-based **generative crop** tool. Here you simply extend the size of the image, and the software uses AI to fill the new area. The results are different each time and can be rather surprising. An ideal generative crop for most flower photography would consist of a simple blurred background. Unfortunately, in my experience, generative crop often tends to add too many novel and distracting details such as additional flowers or landscapes to be ideal in this situation. In other cases, the texture in the background is not copied well into the empty areas, as can be seen in the righthand image above, where the additional area at the right side is too dark.

Another option is to completely replace the background with a larger one. We will discuss replacing backgrounds in the next section.

Separating the background

By separating the background from the foreground, they can be edited independently, and you can even replace the background completely.

The background plays a crucial role in flower photography, and a nice, soft background puts all attention to the flower. But unfortunately, the background is often not nice enough. The background can be improved using the techniques in the previous sections, but sometimes more involved changes must be applied to the background. To this end, the background needs to be separated from the foreground.

The techniques described in this section are rather advanced and require the use of layers. They cannot be achieved in Lightroom, for example. Also, these techniques can change the image considerably, and some photographers do not want to go that way, either because they feel the result is no longer their shot, or because they don't like to spend much time with photo editing software.

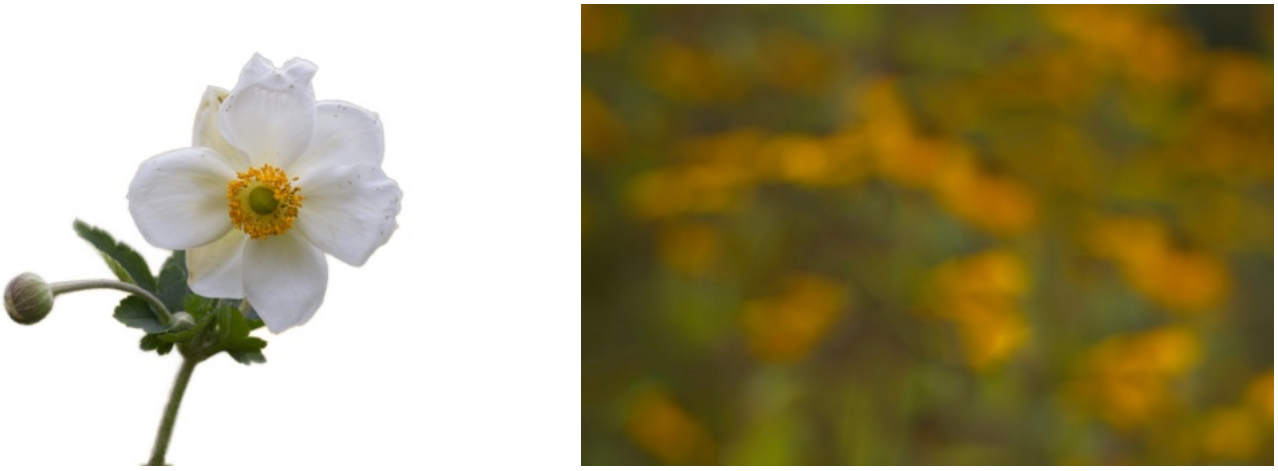
This original unedited image is used as an example. 200 mm, 1/350 s, f/8.

Separating foreground and background

The first step in changing the image is to separate the flower from the background. Duplicate the image layer to have two equal layers. In the front layer, mask everything away but the flower. For this, you can use subject masking based on AI, that many photo-editing apps support.

In the second layer the flower must be removed. For this, the retouching techniques described on page 204 can be used. Generative removal, based on AI, can also be used. Simply select the flower and ask the software to remove it. It is not important that the area behind the flower looks very nice, as the flower layer lies on top of it. But when you, for example, blur the background later, part of the blurred flower should not become visible.

Here is the result for the example image above. In the background layer the flower has been removed using simple retouching with a clone brush.



The separate flower and background layers.

Editing separately

The flower and background layers can now be edited separately. For example, you can sharpen the flower, increase clarity and vibrance, and so on. No masks are required for this. In the example image, I also did some retouching in the flower. The flower layer can be shifted or scaled as well, if that improves the composition.

In the background layer you can reduce the clarity and vibrance. It is now easier to blur the background image. You can blur the complete layer, so no mask is required. It is also possible to change the color of the background to harmonize or contrast more with the flower. Another possibility is to add a vignette to the background layer only. In this way the flower remains untouched. Here are the resulting layers.

The edited flower and background layers.

You can now combine the layers into a single layer, although this is not strictly necessary. When exporting the image, the layers will automatically be combined. Keeping the separate layers is also useful in case you want to make additional changes later. Here is the combined result, which you should compare to the original image at the start of this section.

The combined result.

Replacing the background

When the flower is great, but the background of an image is poor, it is also possible to completely replace the background with a different image. As we discussed in chapter 2 on page 73, it is useful to create a collection of blurred background images. To replace the background, add the new background image as a layer below the flower and remove the original background layer.

When the brightness of the new background is different from the original, a border or halo might appear around the flower. This is caused by imperfections in the masking in the flower layer. Photo editing software has tools to slightly reducing the mask. In this way the halo can be removed.

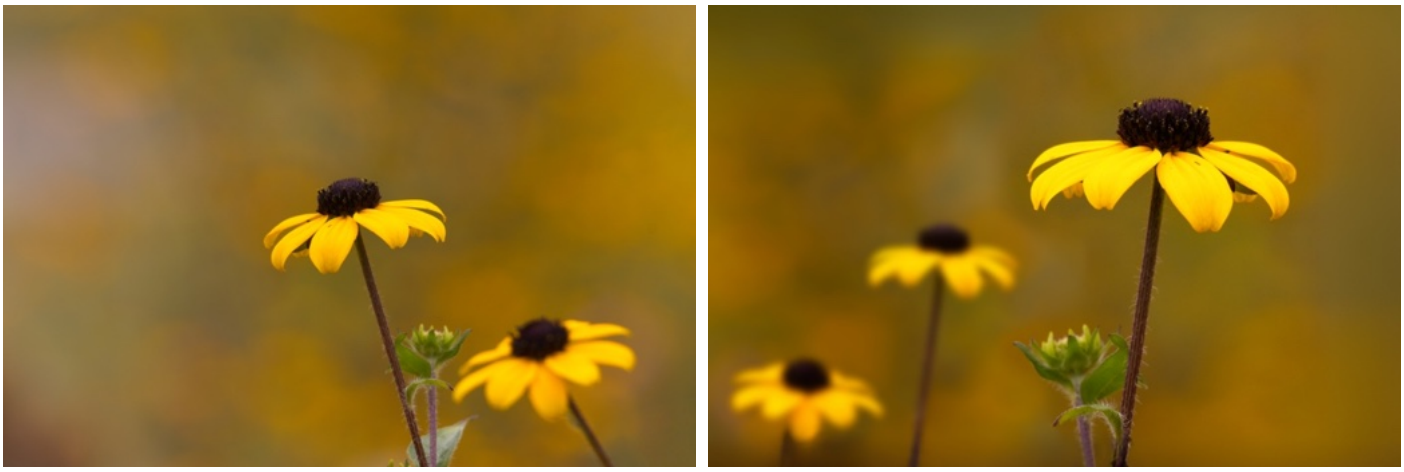
The same flower with a different background. The flower was shifted to change the composition.

More flowers

As indicated above, once the flower is separated from the background, it can be shifted or scaled. But this can be taken a step further. You can also mirror or rotate the flower. And multiple copies can be created by duplicating the layer. This can be used to change the composition in many ways.

Here is an example. Consider the left image below. The flowers are nice, but I did not like the composition. The visual flow should preferably go from the left to the right, and three flowers look better than two. The image on the right was created to improve the composition. This was achieved as follows:

- The image was duplicated two times, so there are three layers in total.
- In the top layer, everything was masked away except for the tallest flower and the flower bud. The layer was then mirrored, enlarged and shifted to the right and rotated slightly.
- In the middle layer the background and the flower bud were masked away. The layer was also mirrored, reduced in size, rotated slightly, and shifted to the bottom left corner of the image. It was blurred a bit to give these two flowers less focus.
- In the bottom layer, both flowers were removed using retouching, to keep the background only. The background was then blurred, darkened, and scaled a bit.
- Finally, the layers were merged, and some final small edits were applied.



Using layers, you can duplicate and transform parts of the image.

It is also possible to take flowers from different images and combine them. As the example shows, using layers, there is incredible flexibility to change the images.

It can help to keep these possibilities in mind when taking the shots in the first place. For example, when there is a nice flower with a nice background, but the background is too close to be blurred, proceed as follows. Put the camera on a tripod. Take a shot with a narrow aperture to get the whole flower sharp. Now bend the flower to the side, out of the frame, and take a second shot with a wide-open aperture to get a blurred background. In post-processing the sharp flower can be combined with the blurred background.

Using textures

Adding a texture can make the background more interesting and creates softness.

The background of a flower image should not be distracting. But sometimes it is too dull. In such situations you can improve the image by adding a texture in post-processing. A texture is simply a partially transparent image that is placed on top of the flower image. The opacity of the texture is reduced such that the original image is still vaguely visible. You can apply a mask to add the texture to the background only.

Below is an example. The background of the original image on the left is rather dull. By adding a blurred texture with the same color as the flower, the background becomes more interesting while keeping the focus on the flower.

The original image on the left and the one with the added texture on the right. 50 mm, 1/250 s, f/1.8.

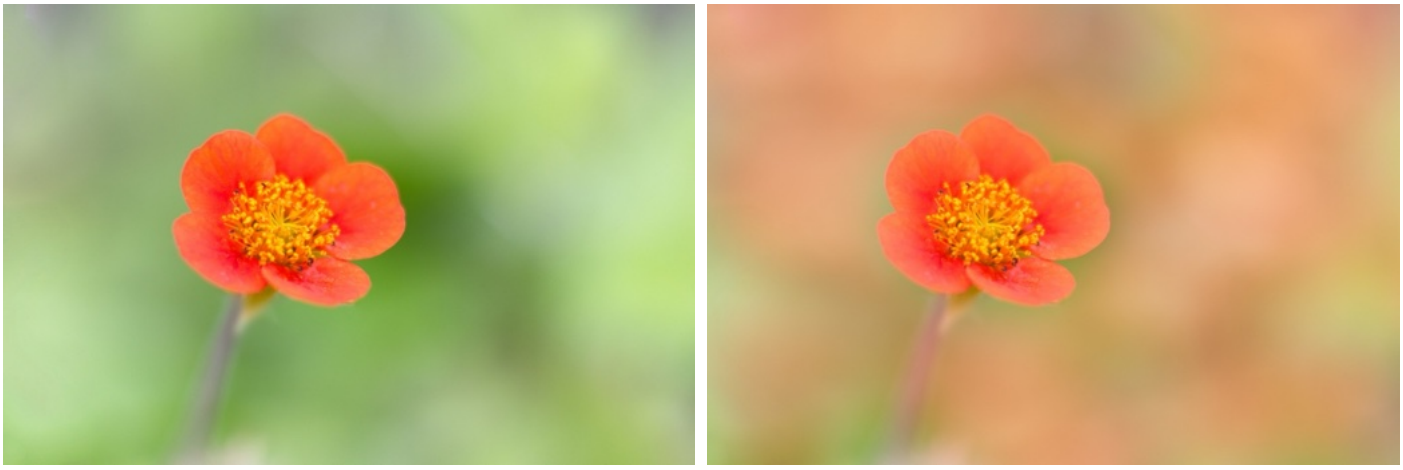
Textures can also be used when the background is too busy and distracting. In this case the texture will make the background softer. By using a texture with a color similar to the flower, the colors in the image become more harmonious, making the image softer and dreamier. Textures can also add more depth to the image by providing soft background elements.

Texture images

Textures are created from other images. They are normally largely blurred and can contain transparent areas where the original image will shine through. Photo editing software often comes with large collections of textures, although most of these are not applicable to flower images. The images might require some further blurring to get the best effect.

You can also create textures yourself. On page 73, we discussed creating a collection of soft background images. These can sometimes also be used as textures. But it helps to take specific texture shots and build a separate collection of these. You can also paint textures, either with real paint or in a painting program.

Don’t worry too much about the color of the texture. It is easy to change the color of an image in the photo editing software. So, the same texture can be used with flowers of different colors.



Another example. In the original shot the colors are rather contrasting. By adding a texture with the same color as the flower the colors become more harmonious. 50 mm, 1/500 s, f/1.8.

Adding a texture

In any editing software that supports layers, you can add the texture image as a layer above the image layer. Adjust the opacity of the texture layer. There is a slider for this when selecting the layer. You can start with a value of 50 per cent. When the texture is too strong, reduce the value. When the flower is too strong, increase it. A typical value lies between 20 and 80.

You can apply a **blend mode** to get the desired effect. Blend modes indicate how layers are merged to obtain the final image. The default "Replace" blend mode replaces the original image with the texture. When using an opacity of 100 per cent, only the texture is visible. Other blend modes combine the images. For example, the "Multiply" blend mode makes the image darker by multiplying the RGB values of the image and the texture. The "Lighten" blend mode only uses the pixels in the texture when they are lighter than the image. This works well when the background is dark. The "Darken" blend mode uses the pixels when they are darker and works well with a light background.

The texture layer can easily be edited for the best effect. For example, you can blur it, reduce the contrast or clarity, or change the hue of the colors. Using dodge or burn, areas can be made darker or lighter.

Some editing software, like Photoshop and ON1 Photo RAW have dedicated texture filters that are more convenient to use. Here you simply pick a texture from a collection. (You can add your own textures to this collection.) There are various options, depending on the software. For example, in ON1 Photo RAW you can select the blend mode, the hue, brightness, saturation, and opacity. The image at the start of this section was created with this texture filter.

Applying a mask

When the texture is applied to the whole image, you get a kind of ethereal effect. But often it is better to apply the texture only to (part of) the background. To this end, in the texture layer, the flower must be masked out. Often, the mask does not need to be precise, so a brush mask can be used for this. Use a small brush size and start removing the flower from the mask. Move almost to the edges of the flower but don't go over them, as it will lead to a halo. This might be a lot of work though.

As an alternative, use subject masking to get a mask of the background (or an inverted mask of the flower). However, there is a problem here as the flower is in a different layer, so you can only create

that mask in the flower layer. Copy the mask and then paste it into the texture layer. You can now remove the mask that was created in flower layer. This will give a very precise mask, although some cleaning up might be required around the edges.

When using the technique in the previous section to separate the background and the flower into different layers, the texture can simply be added between the flower and background layer, and no mask is required.

Rain and snow

A special type of texture is a weather effect, like rain, snow and mist. There are many textures for this, but they are normally meant for landscape photos. To apply them in a somewhat believable way to flowers, you need a flower that fits such an image. For example, when adding a rain texture, there should be raindrops on the flower, so you can use a flower with dew. There should be no shadows in the flower as in the rain, the sun is normally not shining. And the flower image should look a bit flat. This can easily be achieved by reducing the saturation and vibrance of the colors and by reducing the contrast and clarity. It can help to make the image a bit darker.

The texture also requires some changing. For example, the rain drops might be too small. Scaling the texture will help. Rain (or snow) should lie both behind and in front of the flower. So, it can help to use two textures. One where you mask out the flower and another, with larger drops, without a mask.

In ON1 Photo RAW there is a special weather filter. That creates such effects without adding textures (although the filter obviously uses textures itself). Below is an example created with this filter. In the image on the right the saturation and vibrance of the colors were reduced, and the image was made darker with less contrast. Next a weather filter with rain was added twice, in front of and behind the flower.

Adding rain to a flower shot. 400 mm, 1/250 s, f/8.

Two complete examples

By combining different editing techniques, a flower photo can be improved considerably.

In the previous sections, several techniques have been presented to edit flower images. Ultimately, these techniques need to be combined to get the best results. It is important to first ask yourself what you want to achieve with a certain image. Where should the emphasis be? Do you want to highlight some details or the overall image? Should it be a cheerful, colorful image or a more subdued image? Here are two examples of the overall process to clearly show the effect of the different edits.

My standard workflow

For many of the flower images, I use similar editing steps. Here is an example.

The original, unprocessed image. 400 mm, 1/180 s, f/8.

- The first step was to crop the image to get the best composition. This composition was already pretty good. I removed a tiny fraction from the left to put the flower exactly in the center, which I like for such a round flower. It also removed the distracting element on the left.
- Next, I developed the image. In this case, I increased the contrast but also lightened the shadows a bit to avoid them getting too dark. I added a bit more vibrance to the colors.
- As a next step I used retouching to remove distracting elements. For this image, the grass to the right of the flower was too strong, so I removed it. I also removed the bokeh disk at the top, for the same reason.
- After this I worked on the flower. I added some sharpening and clarity to the flower only, using a precise mask. (The AI had no problem computing this mask.)
- The background often also needs some improvement. In this case the background was too busy. I reduced the clarity using a mask and reduced the vibrance of the background colors.

Next, I applied blur to the background to make the details less visible. Finally, I darkened the two light blobs at the bottom using a brush mask.

- As a final touch, I darkened the sepals (the little petals at the bottom) because they attracted too much attention. I also added a very soft vignette to put a bit more attention on the center of the image.

Here is the result.

The final result.

So, I always crop first, next perform some global editing, followed by improving the flower, making the background less prominent, and applying some finishing touches when required. It may sound like a lot of work, but I normally spend just a few minutes per image.

I recommend that, after a few weeks, you have a second look at your images. My experience is that editing twice will improve the image even further. The first time editing a photo, I tend to compare the result with the original. The second time editing, this is no longer the case. When the photo editing software is non-destructive, it is easy to adapt the different settings.

Close-up

In this second example, I was intrigued by the shape and colors of the stigma and stamens of this flower. The original shot was taken at close range, but I felt that some of the petals were too distracting. Also, the image was rather dull and dark because, even though a flash was used, not enough light shone into the flower.

The original image. 100 mm, 1/320 s, f/13, flash.

To improve this image, the following editing steps were applied.

- I cropped the image to remove most of the petals and rotated it such that the stigma was pointing upwards. Because of the round shape with a lot of symmetry, I kept it in the middle of the image.
- I increased the exposure and made the shadows a bit lighter.
- I made the white balance a bit warmer and increased the vibrance of the colors slightly.
- Some retouching was performed to remove some visible parts of petals and to remove some pollen.
- I applied some sharpening and clarity to the stigma and stamens, using a brush mask.
- Using another brush mask, I added some extra light to the stigma because it has such an intricate shape and I wanted to put more focus on it.
- Finally, a light vignette was added to make the outside of the image lighter.

This was all rather easy. No precise masking was required.

The edited image.

Automatic editing

If you don't know how best to improve an image, so-called **presets** can be applied. A preset is a collection of settings and filters that produces a specific effect. Most photo editing software comes with extensive collections of presets, and you can also create your own. By going through the different presets and checking the result, it is easy to find a preset that has a nice effect. You can use this as a starting point for further editing the image. Most presets work on the entire image, but recently presets have been introduced that use AI to apply certain effects only to, for example, the background or the subject.

Nowadays, there is also functionality to have the software analyze the image, with the help of AI, to determine the best editing settings. This mainly concerns the tone and color. This can also be a good starting point for your editing.

Black and white

Black and white flower shots can produce dramatic effects.

Most flowers have bright colors and, hence, color images of flowers often have the most impact. But the colors can also attract too much attention, hiding the beautiful textures, shapes and patterns. By converting a flower shot to black and white, the colors stop playing a role and the focus lies on these interesting details.

For example, consider the images below. Because of the strong pink color, much of the intricate detail in the flower might be lost to the viewer. In the monochrome version of the image this detail is more prominent. Both versions have their merits though, and it is largely a matter of taste which one you like most.

The strong pink color of this flower hides some of the intricate patterns. 100 mm, 0.7 s, f/13.

When a flower has a strong silhouette and many details, you can put the emphasis on that by shooting it against a light background and converting the image to black and white. Below you find an example. I shot this flower inside with a light, textured background behind it. I used a LED-panel to illuminate the background and there was hardly any light reaching the flower itself. I also used a small light to keep some detail visible in the center of the flower. Otherwise, it would become a large black disk.

A flower with a strong silhouette. 100 mm, 1/4 s, f/8.

Black and white images work especially well with low-key photography. The low-key effect is accentuated by the lack of color. Colors in a low-key image can become dull and when converting the image to black and white that dullness disappears. The following image was shot indoors with very little light, resulting in a low-key image with many dark tones. Converting it to black and white puts more focus on the shape and the textures in the flower.

Turning an image into black and white will accentuate the shape and textures. 100 mm, 4 s, f/16.

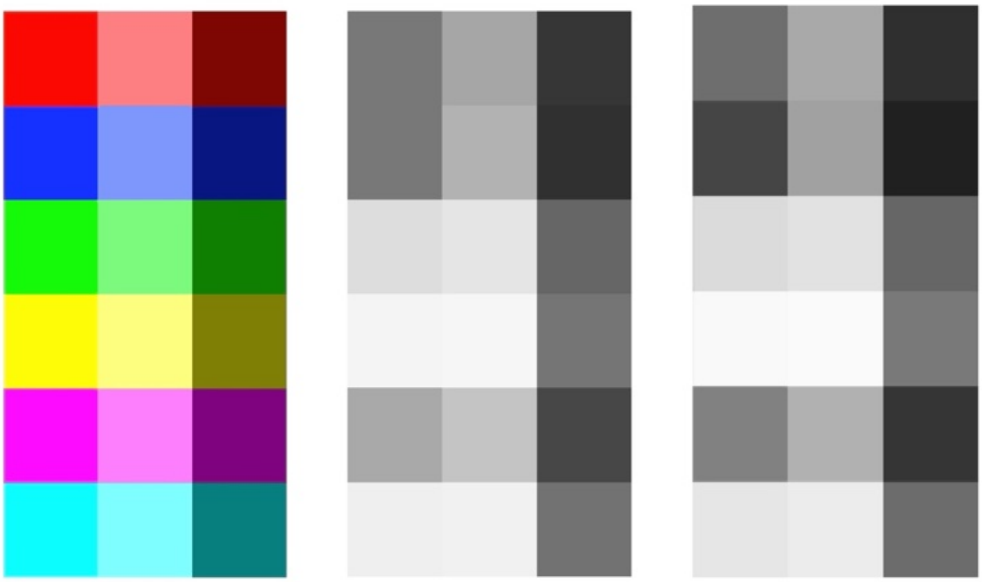
Converting images

There are different ways to create a black and white image. Every camera has a black and white mode. Although the produced JPG files are black and white in this mode, the RAW files are in color, as these files store the raw sensor data. But in this mode, you see the black and white image in the viewfinder, which helps to determine the best composition and exposure. Textures and shapes are noticed better, and you become more aware of the contrast in the scene.

Converting your images to black and white in post-processing gives a lot more control over the final result than setting your camera to black and white. The easiest way is to set the saturation of the image on 0. That removes all color, but it does not give the best result.

A second approach is to use presets. Most photo editing software has presets to change the look of an image in various ways, including many black and white presets. You can check the different presets to find one you like. But for most control, use a black and white filter (for example in ON1 Photo RAW) or the black and white mixer in Lightroom. With these filters you can indicate the strength of the different colors in the resulting black and white image. Color filters can also be applied (much in the same way as using color filters on the camera).

To show the different effects, look at the images below. The image on the left contains some primary colors. The middle image shows the effect of setting the saturation to 0. Notice that this turns the red and blue colors into almost the same grey value. On the right the effect of a (simulated) yellow filter is shown. This makes the blues much darker, leading, for example, to more dramatic skies. The black and white filter allows you to play with the different settings to get the effect you are after.



The color image, the image when setting the saturation to 0, and when applying a yellow filter.

In the images below you see the same conversions applied to a shot of a rose. Note that when setting the saturation to 0, there is little contrast between the flower and the leaves in the background. When using a filter, the rose becomes much stronger and better separated from the background.

The original image, the image when setting the saturation to 0, and when applying a filter.

Contrast and sharpness

Black and white images are all about the variations in tone. While softness can work very well for color images of flowers, it often makes black and white images flat and boring. Contrast is important. For example, a strong contrast between the flower and the background accentuates the outline of the flower. Light and dark areas in the flower can show interesting shapes. And textures become more visible when there is a lot of contrast, for example, by using side lighting.

Sharpness also helps in black and white image. Sharpening the image and adding more clarity can make the images stronger.

Adding contrast and sharpness often makes a black and white image stronger. 100 mm, 1.2 s, f/8.

Further effects can be applied to the image to make it stronger. For example, film grain can be added. Combining this with high contrast and a lot of sharpening can give great results, like in the image below. Textures can also be added to make the image more interesting. Always first convert

the image to black and white before making other changes. Otherwise, it is hard to tell the effect of the changes.

An extreme conversion to black and white, adding lots of contrast and film grain. 200 mm, 1/350 s, f/6.7.

Only changing the background

Sometimes the colors in the background of a flower shot are not very nice, or there is too little contrast between the flower and the background. In such situations it can help to only make the background black and white. This will put all focus on the flower and makes its colors shine, but the image can look a bit unnatural.

To only affect the background, a mask is required. The mask needs to be precise, otherwise there will be a colored halo around the flower, or parts of the flower become black and white as well. Fortunately, as discussed on page 209, modern photo editing software has tools to only mask the subject or the background. When only converting the background, a soft black and white version with little contrast often works best. Simply setting the saturation of the background to 0 will give the desired effect. Below is an example. You can also set the saturation close to 0 to keep a little bit of color in the background. That might look more natural.

When the background is too dominant or the color is not nice, you can make it black and white, to put all focus on the flower. 50 mm, 1/750 s, f/1.8.

Creative effects

Besides enhancing the image, photo editing can also be used to apply various creative effects to flower images.

Up to now we primarily discussed techniques that enhance the flower shots. The edits kept the image natural and did not change it substantially. (One can argue that converting an image to black and white is more than enhancing the shot.) But with photo editing software, it's also possible to make much more creative images. The software contains many tools to adjust the images in all kinds of ways. And there are large collections of plugins to edit the images further.

LUTS

A **LUT** changes the colors in an image. LUT stands for LookUp Table. It is a table in which for each color in the original image it is indicated what the corresponding color in the final image should be. With LUTs a lot of special color effects can be achieved. Photo editing software often comes with large collections of LUTs, and more can be downloaded or bought. Applying a LUT can completely change the mood of an image, as can be seen in the example below.

In the image on the right a LUT is applied. 100 mm, 1/90 s, f/16.

Glow

Another creative technique is to add some glow to a flower image. This makes the flower radiate some light as a kind of halo. It makes the image a bit softer.

To create glow, a blurred copy of the original image is added. This can only be done in apps that support layers, for example in Photoshop. Proceed as follows. Create a duplicate layer of the image. In the top layer add some blur. Next the blend mode must be determined. When the blend mode is set to “screen”, the blurred version is used to make the original image lighter. When it is set to “multiply”, the blurred version makes the original image darker.

To get the desired effect you can change the amount of blur in the top layer, change the opacity of that layer, or adapt the blend mode. It is also possible to add a mask to the blurred layer to apply the glow effect only at certain places in the image.

In ON1 Photo RAW there is a special glow filter. This makes it considerably easier to add glow. You simply pick the type of glow (which relates to the blend mode), the amount (which corresponds to the opacity of the layer) and the halo (which is the amount of blur applied). Below you find an example. Note that the effect of adding glow is (and should be) subtle in most cases.

In the image on the right glow was added to the shot. 10 mm, 1/30 s, f/4.5.

Special effects

There are several special effects available. On page 221 we have already seen how textures can be used to create more softness in flower shots. But textures can also be used in creative ways. Photo editing software comes with many textures that can be applied. Images can also be overlayed in various ways using layers, creating double or triple exposures.

All sorts of borders can be added to the images, and it is possible to simulate the effect of old analog film. You can add film grain and other imperfections to make the image look old, and so on. Play around with the various options of your photo editing software and try to create your own unique looks.

Artistic filters

There are large collections of artistic filters available on the web. These can be used as plugins for the various photo editing tools. An example of this is the free GMIC plug-in (www.gmic.eu) which contains more than 500 filters. There are also many websites and specific apps for applying artistic effects. With such filters and apps, the photo is transformed into an image in any artistic style imaginable. The image below shows an example where I applied a paint with brush filter from the GMIC plug-in to a flower shot.

The artistic filters give endless possibilities, but I strongly advise you to think about what you want to achieve before getting started. Playing around with the different possibilities is fun, but it usually doesn't lead to good results.

A brush effect from GMIC, applied to a flower shot.

Mobile editing

There are many tools to edit photos on phones and tablets.

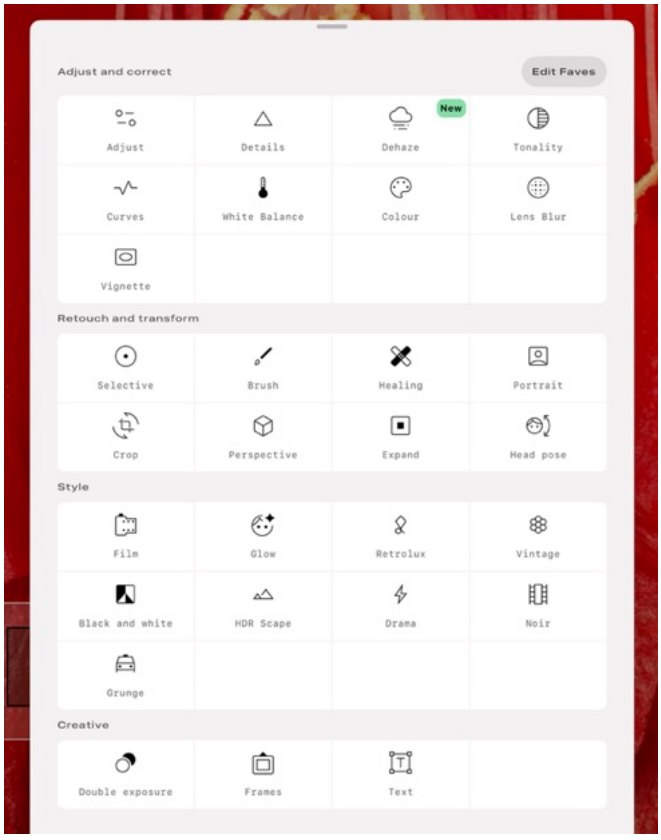
When you take a shot with a mobile phone or when you are not near a computer, images can also be edited on a mobile device. There are various photo editing apps. Android and iOS contain some basic photo editing but for more control a special app is required.

There is a mobile version of Lightroom. The free version has some basic editing functionality but for more advanced features you need a subscription. When you already have a subscription for Lightroom on your computer, the full version of the app can be used as well.

ON1 Photo RAW also has a mobile version that is free. It contains many of the tools of the desktop version, but not the AI based tools like the advanced noise reduction and sharpening. Many filters and presets can be applied. There is basic masking but no AI-based subject or background masking. The app does contain a built-in camera app that gives a lot of control over the various settings.

Snapseed

Snapseed is a free photo editing app for iOS and Android, created by Google. It contains many of the editing tools of expensive programs like Lightroom. The interface is designed to make it easy to change the images. There is functionality to crop the image and even extend the canvas. It is possible to change the tone and color, retouch areas, adapt contrast, clarity and sharpness, change the white balance, add a vignette, and so on. It is also possible to change the hue, saturation and brightness of color ranges, like we discussed on page 201. And there even is a curves filter.



The tools in Snapseed.

Snapseed has some functionality for masking. When applying basic edits, like changing the tone and color, these can be applied to the subject or background only, or to a particular object. But masking is not possible for other edit operations. It is also possible to make local changes using a brush. By zooming in or out of the image the brush size can be changed. The brush can be used for dodge and burn, and to locally change the intensity or saturation.

Snapseed contains many different styles. There are film styles, glow styles, HDR styles, black and white styles, and many more. Each style has presets, but you can also change the various parameters. Especially the black and white style has many options to create interesting images. Styles can be used in combination with the other editing tools. Styles can also be combined.

Snapseed is non-destructive during an editing session. Changes can be undone. When the image is saved it is still possible to go back to the original, but individual changes can no longer be undone.

When you want a free and easy to use photo editing app on your phone or tablet, I recommend taking a look at Snapseed.

Acknowledgements

First, I would like to thank all the people that put wonderful flowers in their gardens. Their work provided me with many of the subjects for my flower shots. Especially many thanks to the employees and volunteers of the botanic gardens in Utrecht (https://www.uu.nl/en/botanic-gardens). Their collection of flowers, both outdoors and in greenhouses, is amazing.

A flower in the botanic gardens in Utrecht. 100 mm, 1/320 s, f/13, flash.

I am a member of various photo clubs where I can show my work and get feedback. I would therefore like to thank the members of photo club Kiekendief in Dronten, De Iris in Harderwijk, and the KNNV department Noordwest Veluwe for their enthusiasm and helpful comments.

A considerable part of this book has appeared in a series of articles on Medium (https://medium.com/@m.h.overmars). I would like to thank the many readers for all their comments and claps, which stimulated me to photograph more and better.

The employees of ON1 have created the ideal photo editing program for me with their product ON1 Photo RAW (https://www.on1.com/). It helps me to organize my photos and to improve them in many ways. All photos in this book were edited with this program.

A number of people have read and commented on earlier versions of this book. This has significantly improved the content. In particular, I would like to thank Mark McCormack and Egbert Beuving for their useful comments.

And finally, I would like to thank you for reading this book. A writer is nothing without his readers. I hope the book has helped you to take more beautiful pictures of flowers, and made you enjoy flower photography as much as I do.