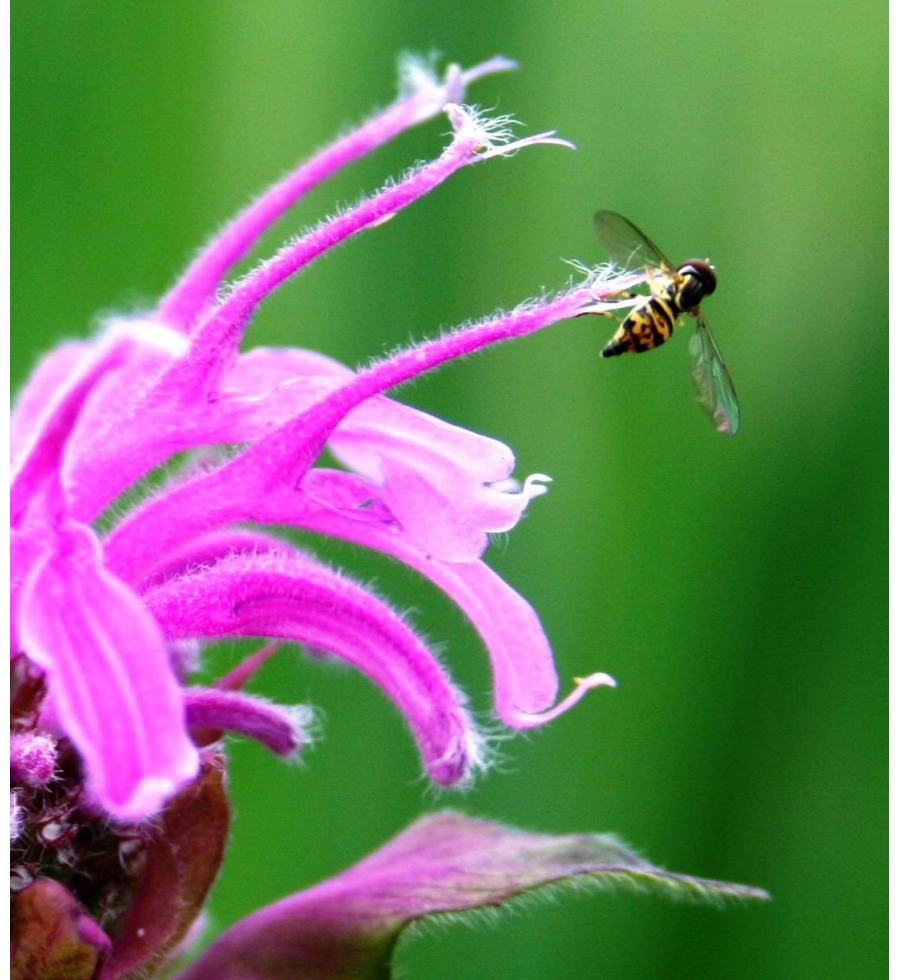


Macro Photography



What is Macro Photography?

- Macro photography means to record a subject at life size on the negative or sensor. That means that the image on the negative is the same size as the subject in real life. In common usage, however, macro photography simply means an extreme close up image.
- In recent years, the term *macro* has been used in marketing material to mean being able to focus on a subject close enough so that when a regular 4x6 inch print is made, the image is life-size or larger.
- With digital cameras the actual image size is rarely stated, so that the magnification ratio is largely irrelevant; cameras instead advertise their closest focusing distance.



Special Equipment

- Digital SLRs and even newer point & shoot cameras can produce very good close-up photos. But if you want to go beyond typical close-up photography, into true macro photography, you will need dedicated macro equipment. This includes true macro lenses, extension tubes, close-up filters, bellows, and “reversed” lenses.
- **True Macro Lens**: This is a dedicated 1:1 macro lens that does not require any special attachment to achieve true macro magnification, although magnification may be increased with accessories like extension tubes and/or close-up filters. These lenses are “prime” lenses, meaning that they are of a fixed focal length, usually in 50mm, 100mm, or 180mm. Just about every 35mm lens manufacturer produces true macro lenses.

Extension Tubes

- These are hollow tubes that are placed between a lens and the camera body, and they simply move the lens elements farther away from the film plane, thus increasing magnification. Because there is no glass in the tube, image quality will not be degraded by optics that are of lesser quality than the lens you're using. As a general rule, the magnification you can achieve using extension tubes is relative to the focal length of the lens you use them with, and the “formula” is:

$$\text{tube length} \div \text{focal length} = \text{added magnification}$$

- For example, if you use two 25mm extension tubes on a 50mm macro (1:1) lens, then your magnification will be 2:1 (2x lifesize) because your lens was already 1:1 (by virtue of being a true macro lens) and then you added another 50mm (2 x 25mm) of extension tubes which is the same as the focal length of your lens, adding another 1x.

Reversing Rings

- Some cameras allow you to use a "reversing ring" to reverse the lens on the camera. This special attachment connects to the filter thread on the front of a lens and connects the front of the lens to the camera body. The lens is now in reverse. Excellent high quality results can be obtained using this inexpensive attachment, although you do need to be careful to protect the rear element of the reversed lens.
- Reversing any lens shorter than a 60 mm focal length turns it into a macro lens. In order to make aperture and focus adjustments while the lens is reversed, it's best to choose a lens that has both a manual focus adjustment as well as an aperture ring.

Challenges of Macro Photography

- There are several things to keep in mind that make it difficult to take pictures of small things.
- Macro Photography is very different in some ways than normal photography. When objects are at such an extremely short distance from the lens the light is blocked, objects blur easily, focusing can be difficult, and camera movement can easily destroy the image.
- Learning how to deal with these challenges will help you produce some great macro shots!



Depth of Field

The Depth of Field is the part of the photograph that is in focus. The Depth of Field is very shallow with Macro Photography. To increase the Depth of Field, or the amount of the subject that is in focus, use a smaller aperture. Using small apertures from f/8 to f/16 or f/22 help get more Depth of Field.



Depth of Field

Of course, a shallow depth of field can often be used to create your focal point by blurring other objects.



Lighting

Macro photography requires much more light than “standard” photography. This is because high magnification lenses and extension tubes lead to less light reaching the film/sensor. Also, the small apertures used to get as much depth of field as possible require much more light for an adequate exposure. If enough natural light is not available, fill flash and reflectors are good options.



Lighting

I prefer to take most of my macro photos in direct sunlight. This can however create dark shadows producing too much contrast. There may be washed out bright areas or deeply shadowed areas. To create diffused lighting in direct sunlight hold up a white umbrella to "shade" the subject to decrease the shadows. You can also try holding a large white card or reflector on the shady side of the flower to show details that are in the shadows. This can greatly illuminate the subject.



Sharp & Clear Macro Photos

- **Check your focus:** When shooting at 1:1 or higher magnifications, depth of field is extremely narrow.
- **Eliminate motion:** If you're outside, it's best to take photos on days that are not windy. It is much more difficult to get a great macro shot of a flower that is blowing in the wind.
- You can control composition and eliminate the variable of a moving camera very simply: don't move it. Put it on a tripod, a bean bag, or a mini-pod so it can't move.



Resources

There are many online resources for further information on macro photography, including:

- <http://photo.net/learn/macro/>
- <http://www.bmpt1.com/> Basic Macro Photography Tutorial
- <http://photography.about.com/od/takingpictures/a/macrolesson.htm>
- <http://www.macro-photography.org/>
- <http://www.adorama.com/alc/category/Macro>