If you haven’t tried macro photography before, it will open up an unfamiliar and fascinating world to you and stretch your photographic skills. Focussing, lighting, composition and working with a very shallow depth of field all pose challenges, and shooting macro will improve your overall photographic skills as well as revealing the mystery and beauty of the world around you.

What is macro photography?
Roughly speaking, macro photography is extra close-up photography. Technically, though, true macro photography refers to a setup where the subject is reproduced on the sensor at its original size or larger — ie, if you shoot an ant that measures quarter of an inch long in real life, then for true macro your lens should create an image that’s quarter of an inch long on your camera sensor. This proportion is referred to as 1:1.

However, these days the term ‘macro’ is used for close-up photography where this doesn’t necessarily happen, and if your quarter-inch ant is captured on the sensor at one eighth of an inch (or less) instead, then it’s still fine to refer to it as macro unless you’re a bit of a purist. In practice, macro has come to mean very close up photography that isn’t normally achievable with a standard lens.

Getting close enough
Obviously you need to get pretty close to your subject if you want to have it this size in your frame, so how do you do that? When using a normal lens you won’t be able to focus on your subject when you’re as close as you’d like to be. Every lens has a minimum focussing distance and you might find that your lens simply refuses to focus at a distance of less than two feet, for example. Telephoto lenses have a longer minimum focussing distance and will typically only focus up to about half a meter from the subject. Medium range lenses – eg, from 24mm to 70mm – will be able to get you
quite a bit closer than this, and some lenses may even allow you to get just a few centimetres from your subject.

The only way to find out what your existing lenses will do is to try them. Decide on a subject and start about a metre away from it. Half press the shutter button to check that the lens will focus at this distance. Move closer in increments, each time checking if you can achieve focus at that point. Sooner or later there will come a point when your lens simply refuses to focus and a little bit back from that will be your minimum focussing distance. If you have a prime or fixed 50mm lens, this is a good place to start as it’s likely to get you in quite close and will give excellent sharpness and clarity. If you’re lucky, you may be able to use an existing lens to get started with macro.

**Equipment**

All of the above assumes that you’re using a DSLR or another type of camera with interchangeable lenses, and it may be that none of your lenses work very well for this purpose. However, if you own a good compact camera you can get started with macro without buying any new equipment. Virtually every compact camera comes with a Macro mode, indicated by the universal icon of a small tulip-like flower – just select this and you’re ready to go. The macro option on a compact is usually very good and because the sensor size is smaller – which gives greater depth of field – it’s ideally suited for macro shooting and a great way to get started.

Nevertheless, you might want the extra quality of a DSLR, or the true macro magnification of 1:1 (which isn’t achievable with a compact), and that means looking at other equipment choices.

**Macro lenses**

The obvious option is to buy a dedicated macro lens for your DSLR or CCS camera. These will allow you to focus extremely close up, and most will give you the 1:1 ratio of the true macro. Some will give you even more than this – eg, Canon produce a lens that gives a 5:1 ratio, allowing you to shoot your subject at five times its normal size. However lenses like this can be prohibitively expensive, and even the cheaper macro lenses are a sizeable investment. You can save money by buying third party lenses rather than manufacturer’s lenses – these are often just as good – or you might be able to pick up a second-hand lens.

Macro lenses come in different focal lengths, ranging from 50mm to 200mm, and which focal length you need will depend on what you want to shoot. If you’re into photographing insects, for example, you’ll need a longer focal length of about 100mm or more – if you have less than this you’ll end up so close to your bug that you risk scaring it off or making it move, or perhaps even touching it with the end of the lens.

Longer focal lengths (eg, 150mm-200mm) are often a better all-round choice. As we’ve noted above, you can stay further away from your subject, casting less of a shadow on it and making lighting easier. Your lens will also come with a tripod collar that makes it very easy to support on a tripod. The down side is that they’re a lot more expensive, and also a lot heavier, and if you’re not using a tripod then the extra weight can work against your ability to handhold.

Finally, something that many people are unaware of is that macro lenses can also make good portrait lenses, so their use isn’t restricted to close-up photography. This makes them much better value than if they limited you to macro use alone.
Extension tubes
Relatively inexpensive, extension tubes are hollow, light-tight cylinders that go between your camera body and the lens. This moves the lens away from the sensor and lets you focus much more closely than you’d normally be able to do.

These tubes are usually sold in a set of three and offer you different focal lengths. You can normally stack them together for more options and flexibility, and the longer the extension the closer you’ll be able to focus. However, it is possible to overdo this on a short lens and find that you can’t focus at all, so a bit of trial and error is in order.

To make life easier, go for extension tubes labelled ‘auto’ as these will still allow electronic signals between your camera and your lens and your autofocus, metering, and aperture settings will still work. They do cost more, but are likely to be worth it in terms of convenience.

Extension tubes work best with short to medium range focal lengths, unlike close-up filters (below) which are better with telephoto lenses. The only real downside of using extension tubes is that you will experience some light loss and will therefore have to compensate with a longer shutter speed or a higher ISO. There will also be a slight loss of quality but this is minimal.

Close-up filters
Another option you can try is close-up filters. They often come in sets of three, although you can buy them individually as well. There are various strengths – the most common being +1, +2, +3 – and are a bit like attaching a magnifying glass to the end of your lens.

Adding extra bits of glass in front of your lens will always lead to some image degradation and this is the downside of these filters. The more you pay for them, the less they’ll affect the quality of your image, but filters at the high end of the scale can cost almost as much as buying a third party dedicated macro lens. However, they’re easy to use and you should be able to find something in the middle of the price range that will do a great job.

Close-up filters come in two options – single element and double element. Single element filters have one optical element and this makes them very cheap to buy but lacking in image quality. They suffer from chromatic aberration (coloured fringing around the edges of your subject) and lack of edge sharpness.

Double element close-up lenses have two optical elements in them and offer much better image quality. The second element corrects the faults of the first one, giving increased quality and minimal chromatic aberration. However, they’re a lot more expensive, and they’re not that easy to find. Of the major manufacturers, Canon is the only one who produces these. You can use a Canon filter even if your camera’s a different make as all you’re doing is screwing it on the end of the lens. Just make sure you buy the right size for your lens – you’ll see the size given in mm marked on the end of your lens. If you have more than one lens, and they differ in size, you’ll either have to buy several different close-up filters in different sizes or – better - a conversion ring to make them fit.

Close-up filters/lenses work best with telephoto length lenses – ie, 70mm+ - unlike extension tubes which are more effective with shorter focal lengths. However, one word of warning – if you have a zoom lens with a large range, such as 24mm-250mm, the range at which the close-up filter achieves focus may be so narrow that it’s almost impossible to use. If in any doubt, try it out in the shop first before you purchase.
Coping with shallow depth of field

One of the biggest challenges when shooting macro is that depth of field becomes very shallow. DOF is controlled by the following factors:

- Your distance from the subject - the nearer you are to your subject, the less DOF you’ll have
- Focal length - telephoto lenses (which is effectively what you’re using whatever equipment you have) give you very little DOF
- Aperture - a wide aperture gives shallow DOF and a small aperture will give deeper DOF

When shooting macro, even a small aperture doesn’t give you anything like the DOF you’d normally expect. This isn’t always a problem, as minimal DOF can work really well. In the image on the left only the very edge of the daffodil is sharp but this is effective.

However, if you want more than just the edge of a petal or leaf in focus then you’ll need to make your aperture a lot smaller. The knock on effect of this is that it becomes impossible to handhold and you’ll be forced to use a tripod.

This is all well and good if your subject doesn’t move, but in practice even a reasonably stationary subject, like a flower on a still day, will show small amounts of movement when you’re that close up to it. On a windy day the whole thing becomes even more problematic, as it does too if you’re aiming your lens at something that’s likely to move, like insects. Obviously a fast shutter speed helps a lot, but then that often entails using a wide aperture and brings us back to the DOF problem. As always, it’s a balancing act and you just have to do the best you can.

You can, of course, increase your ISO to get the faster shutter speed you need and this is often the best solution. It’s true that there will be some degree of quality lost but recently manufactured cameras have become so good at minimising noise that this shouldn’t be too much of a drawback.

If you are stuck with less DOF than you’d ideally like, there are a couple of things to keep in mind. The first is to make sure that the focus is on the most important part of what you’re looking at. If you’re photographing an insect then focus on its eye; if you’re photographing a flower, then decide which part of it is most important and keep that sharp.

The second thing is to see if you can find a way round it by changing your point of view. For example, if you photograph an insect head on with shallow DOF then only its head, or perhaps eye, will be in focus and the rest of it will be soft. However, if you photograph it from above then the whole of its body is on the same plane and will therefore all be sharp.
Focus stacking
It is possible to take multiple images at different focussing distances and then combine them later using software – similar to combining multiple exposures in HDR photography. In this way you can increase the available depth of field quite significantly.

There are lots of software choices when it comes to this and some of them are free. However, as always you tend to get what you pay for. If you’re interested in the possibilities of focus stacking, do a google search to see the software options and have a look at this article to see how it’s done:

http://extreme-macro.co.uk/focus-stacking/

Lighting
Of course, the other way to get a fast shutter speed is to use artificial lighting and if you get seriously into macro you’ll probably want to go down that road. The built-in flash on your camera isn’t going to hack it for this – you’ll need off-camera flash units or a ring flash.

If you have an existing flash unit with an extension cord you can hold it a few inches off to the side of your subject, and arrange a reflector (or even a white piece of paper) on the opposite side to balance the light out. You’ll need some way of fixing the reflector in place – as assistant is ideal, but failing that you can use a clamp or something similar. If you need a softer light, then you can add some kind of diffusing material or a proper diffuser over the flash unit.

This is quite a good way to light your subject, but the macro lighting of choice is something called a ring flash. This is a circular flash unit that fits round the lens and fires an even, shadowless, light onto your subject. Again, this is a bit of an investment but if you become really enthusiastic about macro you may want to get one of these. Artificial lighting is a large subject and needs more space than we can give it here, but have a look at the Resource section at the end for some useful links.

Let’s assume for the moment that you’ll settle for using natural light. The biggest problem is that you have to get so close to your subject that you and/or your lens is likely to cast a shadow over it. If the shadow is even then it might not matter, although it will reduce the amount of available light you have to work with and lead to slower shutter speeds. If there are uneven shadows on your subject then you may have to use a reflector to bounce some light into the shadowed area.

The shadow problem means that it’s easiest to get good results by avoiding bright sunlight and shooting in overcast light or early in the morning/late in the evening. You can make life easier for yourself when you start out by bringing your subject inside and taking your shots there. You still have to pay attention to lighting, but you’ll have a lot more control over it.

Focussing
One of the most awkward things about macro photography is getting the focussing right. Most of the time you’ll probably be better off using manual focussing, as autofocus can struggle a bit in these conditions. If you shoot using Live View, you may be able to magnify the image on the LCD screen and then manually focus till you get it exact.

Because everything is magnified when it comes to macro, including the tiniest movement, it’s best to have your camera on a tripod and then take the shot with a remote shutter release. Another good reason for doing this is that if you touch your camera after you’ve fixed the focus, you may move it infinitesimally and this might be enough to throw your subject out of focus when you’re dealing with
such limited depth of field. When DOF is 1mm or less, it doesn’t take much to knock your focus out. If you don’t have a remote shutter release, use the self-timer on your camera.

If you’re handholding your camera, there are other techniques you can try to get a sharply focussed shot. First of all, be prepared to take many, many shots and throw most of them away – this is just how it is with macro shooting. Setting your camera to continuous shooting and firing off a burst of shots will give you the best chance of one of them being correctly focussed. Many photographers also find that rocking slightly backwards and forwards, while at the same time firing off a number of shots, usually results in success.

If you’re using flash then the ‘burst’ technique won’t work as it will take a little while for your flash to recharge after each shot, but the flash itself should make it more likely that you’ll get a sharp shot.

What can I photograph?
The quick answer is ‘anything you like’! The most common macro subjects are overwhelmingly flowers and insects, but don’t let yourself be limited to these – have some fun thinking outside the box.

Food – bubbles in champagne, fruit, garlic cloves, sweets, vegetables, or these rather yummy chocolate brownies
Toys – small toys can make good macro shots, especially if they’re shot from a low level as it confuses our sense of scale and gives them greater stature.

Shells – extreme close-ups of shells can give surprising results. Shooting this abalone shell in macro has turned it into an alternative universe with the suggestion of a small spaceship being propelled through it.

Also try: coins and banknotes, flowers, insects, pencils, water droplets, cutlery, feathers, kitchen equipment, books, eyes, jewellery
Beginners Guide to Macro Photography

Resources
Up Close by Andrew S Gibson is a very reasonably priced ($7) ebook in the excellent Craft and Vision series, that covers all you need to know about macro.

130 Stunning Examples of Macro Photography – yes, plenty of insects and flowers but the shots are gorgeous and there are some other more unusual shots in here too.

DPReview’s ‘Macro: no insects, plants or flowers’ challenge – plenty of inspiration here

5 tips for getting fresh ideas for macro photography – some good suggestions here for coming up with new ideas on what to shoot

Focus Stacking – comprehensive article on the Extreme Macro site

Extreme Macro – macro site aimed at intermediate macro photographers. Lots of good articles, help and advice

Macro Photography Lighting Options – an interesting article that shows you a variety of different shots taken with different lighting setups

Flash techniques: insect macro photography – although written about macro with insects as its subject, there’s lots of good advice here that applies to other subjects as well

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