Macro Photography

The world of macro and close-up photography gives us a new view of the minute and the everyday.

True macro photography makes the image on the sensor life-size (1:1). Some zoom lenses say they are macro but can only make half life-size (1:2) or sometimes quarter life-size (1:4). You would then crop in to make the image larger but you are throwing away lots of pixels by doing this.

So what do we need to get that little bit closer?

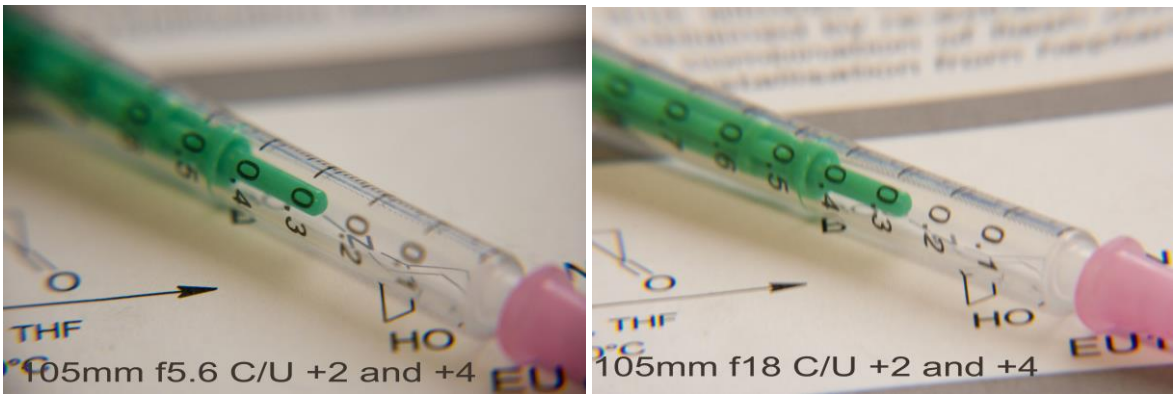
Using a Compact camera – many compact cameras have a macro facility which allows us to focus really close to an object. The smaller sensor might give a slightly less quality image than a DSLR, but the smaller sensor has the advantage of increasing the **depth of field** (the area of the image in sharp focus).

Using a DSLR – the problem with using a DSLR for macro photography is that the standard lens just can't get close enough to render the image life-size. The other key points to remember are the **minimum focus distance** (MFD) which is the sensor to subject distance and the **minimum working distance** (MWD) which is the distance front the front of the lens to the subject. Some manufacturers state the MWD and some the MFD but remember to take into account the length of the lens barrel. With my Nikon 18-105mm standard lens the MFD is 45cm so I can't focus closer than about 16inch. With my 70-200 zoom lens the problem is worse and I can't focus closer than 140cm (about 4 ½ feet). The depth of field (DoF) gets progressively smaller the more you zoom and the closer you get so at the 200mm end the DoF at f8 is only 1.3cm. With my 18-105mm at the 105mm end the DoF is only 0.5mm at f8 so focusing gets more and more critical.

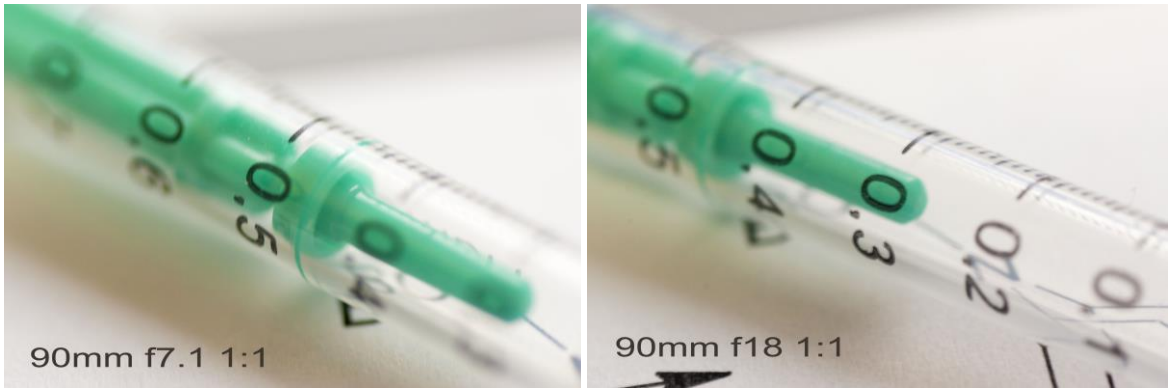
Extension tubes and Bellows – to make a standard lens into a close-up lens then you can make the distance between the lens and body longer. Extension tubes, bellows (or even a Pringles can!) can be used for this. I have seen extension tubes on the internet for about £8, bellows sometimes come with a focus rack for precise focusing and cost considerably more.

Reversing rings and Coupling rings – adaptors which allow a standard lens (usually a 50mm) to be mounted backwards onto the camera or couple a second lens onto another one are another fairly cheap way of getting closer.

Close-up filters – these are really little magnifying lenses which either screw onto the lens or slot into a filter holder. They come in various strengths and can be mounted on top of one another to increase the magnification.



Macro lenses – for the best quality and convenience (but also the most expensive option) a true macro lens is the best option. I showed a Tamron 90mm macro lens which has MFD 29cm and gives 1:1 reproduction. As I said earlier, focusing becomes more important as you get closer to the subject. With this lens at 1:1 magnification at f7.1 the DoF is only 2mm and even by stopping down to f18 the DoF is still only 5mm!



Shorter macro lenses are cheaper and have a smaller MWD (1.6in for a Sigma 50mm, 4.7in for 105mm macro and 9in for a 150mm macro). So if you are thinking of taking insect photographs this is an important point to consider as you may want to take the picture from further away so as not to disturb it.

So how can you get everything sharp?

A lot of the time we don't need everything sharp – just the main parts (insect eyes, flower stamen) and we let the edges blur out of focus. However, there are software packages which can come to our rescue. These work by combining a series of shots where the focus point has been moved slightly (for example, from the tail of an insect to the head), the software combines the sharp areas from each into one 'Focus stacked' image. Combine ZM is a free focus stacking package which can be downloaded from the internet for this.

Lighting – using extension tubes/bellows/coupled lenses or small apertures means less light is hitting the sensor. This might not be a problem in a controlled environment where you can stick your camera on a tripod but could be a problem if you are chasing butterflies in a field or your subject moves. Ringflash, or a flashgun modified to extend over the front of the camera lens and having some sort of diffusion to make it less harsh, can be used.

There are plenty of macro photography tutorials on the internet. Have a look if you want to learn more.

http://www.youtube.com/watch?v=wqRn3at0H60 macro

http://www.youtube.com/watch?v=gSi6pS4VFSE&feature=related macro

http://www.youtube.com/watch?v=fJiEw4VCcYU focus stacking.