Showing others your exciting samples

It can be really easy. Hold a simple digital camera over the top lens of a magnifier or the eyepiece of a microscope and watch as the image is seen on the screen. When it looks good – ‘click’ and capture it.

Soon you will want to take more difficult shots. Perhaps run a movie clip or use special lighting for the microscope to show the detail more clearly in the sample. The camera needs to be more stable. A simple support to hold the camera near to the eyepiece can be easily fitted.

When the images are input to a computer, they can be stored and shared via e-mail.

To learn more about microscopes, get links to useful websites and see great images visit www.quekett.org.

Presented by the Quekett Microscopical Club – Registered charity No 232476

Getting started in microscopy

Magnifiers

Microscopy is a means of magnifying an object so that detail within is made visible. Many people start using microscopes to look at things in nature. Getting started can be very simple, a magnifying glass is the simplest microscope and is often used outdoors to look at samples where they grow.

This is the simplest type of magnifier. It’s easy to hold and there is a large area to look through. Hold the lens near the sample and peer though it. The magnification of the main lens is ×4 with a small area giving ×6. (×4 means the feather appears 4 times bigger).

A better option for taking on nature walks is the folding magnifier as it can be carried in a pocket. A simple folding lens may give a magnification of ×6 but there are better lenses often described as a triplet lens which can give magnifications of ×8. Hold the lens near the eye and move close to the sample.

Other types of magnifier are self supporting so they can be placed over a sample. These often have a scale at the base so parts of a sample can be measured.

A simple microscope to start with

A simple microscope may give a magnification of ×20–×40. This needs a stable base to hold it steady and some way of getting light onto the sample.

This type of microscope is available from the Natural History Museum. It has two lenses, one at the top of the microscope close to the eye – called the eyepiece and another near the sample called the objective. There is another lens which changes the magnification from ×20–×40. The microscope can also be focused – that is, the objective lens adjusted to give a sharp image. There is a built in LED light to illuminate the sample.

If a sample appears to be solid, perhaps a piece of lichen, the surface can be examined by lighting it from above the surface. Just put the microscope over the sample.

To see all the detail in a small organism in some pond water, the best images are seen by shining light through a drop put onto a clear piece of glass or plastic called a slide. There is a slot in the base of the microscope to hold the slide and the light is reflected back from a small screen below.

Although these microscopes can be used outdoors, we can often see more if we collect a very tiny sample and take it home to examine it later. But always be careful when collecting anything – many things in nature are rare and should be preserved in their habitat.

A proper microscope

These are the types of microscope you may use to examine things back home. There are the two lenses to give a good image, the eyepiece and objective, but the magnification can now be higher. Many nature samples can be examined at up to about ×50 using a stereo microscope – a dual lens system means a stereoscopic image is formed so it is easy to manipulate samples viewed with top light or by light transmitted through the sample. For examination at higher magnifications, from ×50–×400 a compound microscope is needed. Most people will start with a simple transmitted light microscope where the light is directed up through the sample using a condenser lens.

A modern stereo microscope

A modern compound microscope

A ‘second-hand’ compound microscope

There are many microscopes to choose from. Old ‘second hand’ microscopes are often available. Get advice from a Club, a shop or the Internet on the best microscope for you.

Many samples in nature have to be prepared so they can be examined at the higher magnifications. They may be cut or dissected to give thin sample which may need to be stained with special dyes. This is another skill to learn.