Types of microscope

A microscope magnifies an object many more times than a magnifying glass by using two lenses. The objective lens magnifies the object and produces an image of it. This image is then magnified by the eyepiece (the second lens) to produce another image, the one you see when you look through the microscope. See page 43 to find out how the lenses work. Optical microscopes can normally magnify from about 50 to about 1000 times, but 2000 times is possible.

A simple optical microscope

The microscope shown here is a simple optical microscope which you would buy for use at home or find in the school laboratory. More advanced and expensive microscopes work in the same way, but may have other special features.

The eyepiece (or eye lens) magnifies the image from the objective lens (see below) to form the image you see. On some microscopes you can swap the eyepiece for one with a different magnification.

Some microscopes are fitted with a zoom eyepiece. If you twist this, the magnification changes, so that you "zoom" in on the image.

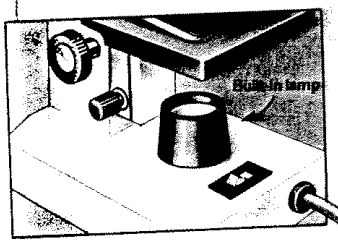
The objective lens magnifies the object to make the image "seen" by the eyepiece. There are normally three objective lenses, with different magnifications, which screw into a plate called the nosepiece. You rotate this to choose the lens.

Focusing knobs

The object to be looked at is placed on the flat stage under the objective lens in the nosepiece. The stage is normally fixed in position. The object is usually mounted on a glass slide, and this is held in place with two springy clips. There is a hole in the centre of the stage through which light passes when an object is being lit from underneath.

Turning the focusing knobs changes the distance of the objective lens from the object (to get the image in focus).

Many objects which are looked at under the microscope are cut into very thin slices (see pages 24-25) and light is shone through them from underneath. The illumination system which does this is under the stage.



The simplest illuminator is a mirror which you rotate to reflect light from a window or a lamp up through the hole in the stage and onto the object. Some microscopes have a lamp built into the base instead.

More advanced microscopes may have an aperture control under the stage. This controls the amount of light which goes through the stage onto the object. They may also have a condenser, which concentrates the light onto the object.