

# The history of the microscope

Four hundred years ago, the world of the microscope was unexplored. The structure of the plants and animals we knew was a mystery, and there were thousands more tiny plants and animals

we did not even know about. The causes of disease could only be guessed at and medical science was unknown. The invention of the microscope brought about a revolution in scientific knowledge.

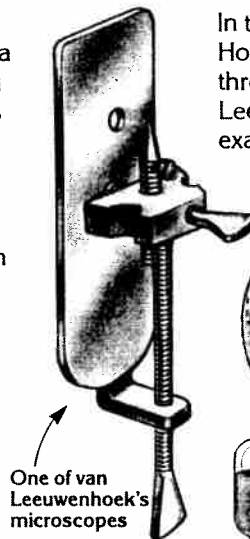
It has been known for over 2000 years that glass bends light, but the first accurate lenses were not made until about the year 1300. Around the year 1600, it was discovered that optical instruments could be made by combining lenses.



Elaborate 1755 microscope

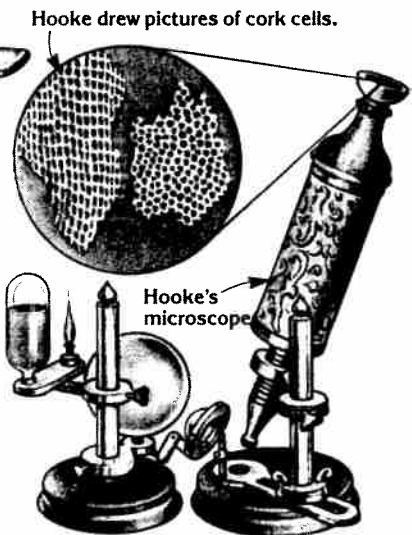
The word microscope comes from the words micro, meaning very small, and scope, meaning an instrument for looking at objects. Anything which is too small for the eye to see is known as microscopic.

Antonie van Leeuwenhoek was a Dutch scientist and one of the pioneers of microscopy in the late 17th century. He made his own simple microscopes which had a single lens and were hand-held. He made many drawings of what he saw and discovered bacteria, although he did not know what they were.



One of van Leeuwenhoek's microscopes

In the mid 17th century, Robert Hooke drew pictures of cork seen through his microscope. Like van Leeuwenhoek, he did not know exactly what he had seen.



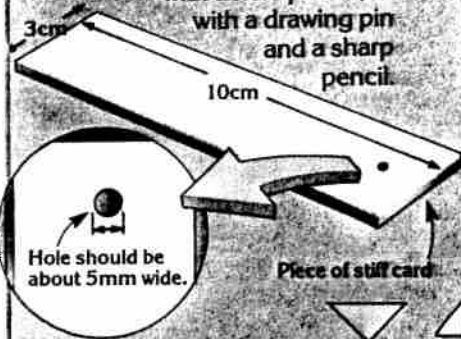
Hooke drew pictures of cork cells.

Hooke's microscope

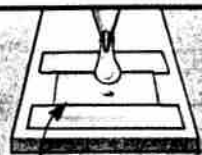
## Make a simple microscope

Here you can find out how to make a model of van Leeuwenhoek's single-lens microscope. It uses a water droplet instead of glass. It will show you how difficult life was for early microscopists.

Cut a piece of stiff card 10cm by 3cm and make a hole at one end with a hole punch, or with a drawing pin and a sharp pencil.



Dip a pencil into some water and hold it above the plastic over the hole. Try to get a drop of water to fall over the hole.



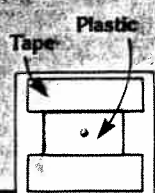
Drop water over hole.

Hold the microscope very close to your eye and look through the drop. Move very close to the object you want to look at. It should appear greatly magnified.

Newspaper print is a good thing to start with.

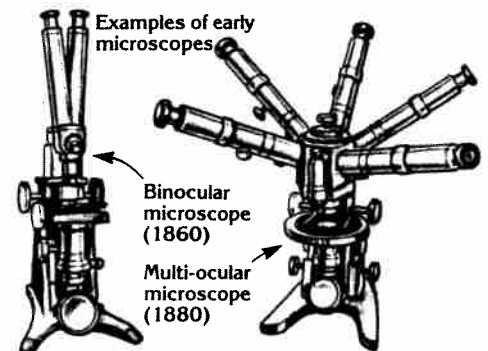


Put a small piece of clear plastic (possibly from food packaging) over the hole, and stick it down with sticky tape.



Your image will not be very bright or very clear, but it is probably as good as the ones seen by early microscopists. If it is very distorted, your water drop is probably not round, so try again.

All the early microscopists saw very distorted images due to the low quality of the glass and imperfect shape of their lenses. Lenses improved a lot through the 19th century, and the microscope as we know it was gradually developed.



Examples of early microscopes

Binocular microscope (1860)

Multi-ocular microscope (1880)

In 1933, the first electron microscope was built. This type of microscope can magnify things hundreds of times more than optical microscopes (see pages 44-45).