

# Home School with Charnwood Museum

## Marvellous Microscopes!

### What is a microscope?

A microscope is a scientific instrument that can be used to observe small objects. There are many different types of microscope and this is because they use different methods to enlarge the object being looked at. The most common type of microscope is an optical one, which uses lenses (thin curved strips of glass) to bend or 'refract' beams of light.

The image of an object is magnified through at least one lens in the microscope. This lens bends light toward the eye and makes an object appear larger than it actually is.

The earliest microscopes had only one lens and are called simple microscopes. Compound microscopes have at least two lenses. In a compound microscope, the lens closer to the eye is called the eyepiece and the lens at the other end is called the objective.

These two lenses together multiply the amount by which an object can be viewed. For example, if the eyepiece is 10x and the objective lens is 40x, together they provide a magnification of 400x. This means that when you look at something using this microscope, the image you see is 400 times its actual size!

Most microscopes can display objects to about 1000 times larger than their actual size. This is much stronger than a handheld magnifying glass which works just like a simple microscope does.

### What has been the impact of microscopes?

Many scientific discoveries have only been possible because of microscopes. For example, discovering that diseases are caused by bacteria and viruses instead of 'bad humours' or 'evil spirits'!

Taste buds, red blood cells and animal and plant cells were all first seen under a microscope.

Another area of science where microscopes are really important is botany, or the study of plants and an early local pioneer in botany was Richard Pulteney (1730-1801). He was born in Loughborough and studied at the Grammar School. He then became an apprentice for seven years to Mr Harris the apothecary in Loughborough and Mountsorrel and eventually went on to become a surgeon after studying in Edinburgh.



As well as having his own apothecary business in Leicester, Pulteney became a well-respected and eminent botanist and introduced the Linnaean classification system to British science in 1790. This is the way that plants are named and sorted by their type.

He provided the first accounts of Leicestershire botany, writing notes on over 600 species and left many plant collections for future botanists to study. We have one of his microscopes and notebooks where he wrote down some of his observations on display at the Museum.

If you are interested in finding out more about microscopes, take a look at some of these websites:

[www.microscopeworld.com](http://www.microscopeworld.com) or <https://www.sciencelearn.org.nz/resources/1692-history-of-microscopy-timeline>



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- 1) What is the most common type of microscope? Why do you think it is the most common?
- 2) What is the main difference between simple and compound microscopes?
- 3) What is a lens?
- 4) If you could design a microscope what extras (if any!) would you add? Draw your design in the box below



- 5) What jobs require the use of microscopes? Have a go at writing a list, how many can you think of?
- 6) What was the name of the local botanist who first recorded information about plants, flora and fauna in Leicestershire?
- 7) Why not have a go at looking at some leaves, flowers and have a go at drawing them in detail. Use the box below to sketch—just what can you see with your eye? What do you think you might see if you had a microscope?

