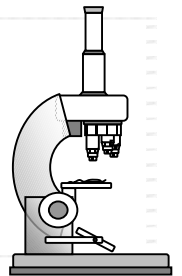
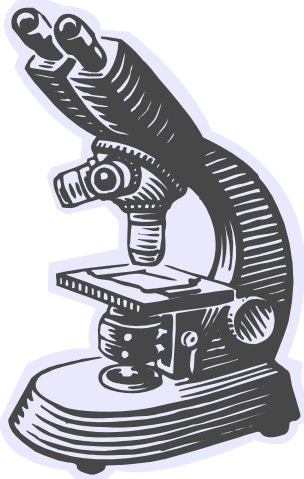


Development of the Microscope



Modern science uses the microscope for a number of different tasks. But how does it work and how did the development of the microscope change the way in which scientists viewed the structure of living things?



Development of the microscope

A microscope is an instrument for viewing objects that are too small to be seen by the unaided eye.

Microscopes magnify extremely small objects so that we can see them. Before microscopes were invented, scientists were limited in their view of the world. They could only make observations based on what they could see with the naked eye or through a magnifying glass.

Scientists like Dutch national Anton van Leeuwenhoek and Englishman Robert Hooke pioneered the use of microscopes in the 17th century.

Leeuwenhoek taught himself new methods for grinding and polishing tiny lenses. He discovered that by placing these lenses at

certain distances from each other he could enlarge objects in his field of vision. He examined a drop of water using this primitive microscope and was startled to discover it was teeming with life.

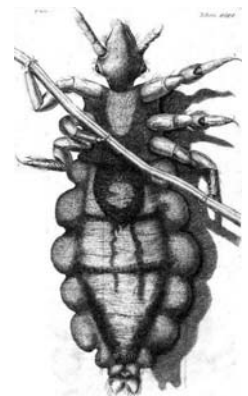
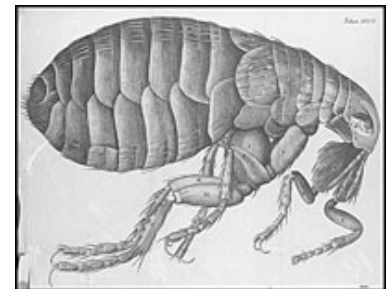
In 1665 Hooke looked at a sliver of cork under a microscopic lens and noted that small rectangular shapes were present in the material. He thought that they looked like the cells in a monastery. This led to the modern day use of the word 'cell' in biology.

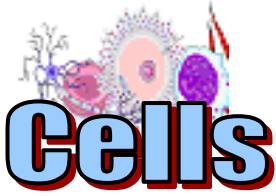
Both men understood that while technology can progress without science, science needs technology. Improved measuring instruments were needed for researchers to make new observations of things at a 'microscopic' level.

The scientific community tried to dismiss the early results as elaborate optical illusions. They initially snubbed the discovery of this new 'cellular' world. It was difficult for academics of the time to visualise the microscopic world; they believed only in what you could see. However, over time they came to accept the new discoveries. For the first time, they were able to accurately determine the shape of tiny animals such as fleas and other parasites. Microscope technology has now resulted in an amazing amount of knowledge concerning the structure of plants and animals on Earth.

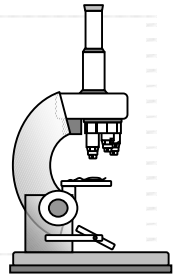
Tasks

1. Where does the word cell come from?
2. Which English scientist helped pioneer the use of the microscope?
3. How do microscopes help scientists?
4. Which insect do you think is shown in the pictures?
5. Write down a few things we know about the world because of microscopes.





Development of the Microscope



Development of the microscope (continued)

While development of microscope technology slowed over the following two hundred years, modern science now uses a number of different microscopes. They can be used to look at human cells, identify minerals, solve crimes, study metals, and find the causes of crop diseases.

Microscopes are also used as an essential medical tool. They can identify the causes of many deadly diseases and help discover why a person or animal died.

In addition, scientists can use microscopes to aid society. For example, they can help to prevent drug trafficking. Looking at opium crystals under the microscope reveals a variety of crystalline shapes. These shapes can help identify where the original opium poppies were grown. This can help pinpoint the source of the drugs.



Tasks

6. Name three things that microscopes are used for in modern science.
7. How was the first microscope made?
8. How did microscopes change scientific perception?
9. Place these events in order:
 - The observation of cork under a microscope.
 - The discovery of how to grind lenses.
 - The examination of blood and insects under the microscope.
 - The development of the first microscope.

Timeline

14th Century
Italian scientists discover the art of grinding lenses.

1590
Dutch lens grinders make first microscope by putting two lenses in a tube.

1665
Robert Hooke examines cork under a microscope.

1675
Anton van Leeuwenhoek uses a simple microscope with only one lens to look at blood, insects and many other objects.

