

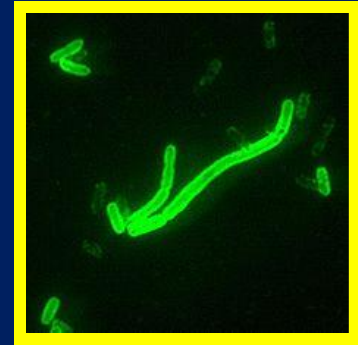
# MICROSCOPE

phillipmartin.info



Our tool for viewing cells

Before microscopes were invented, people had no idea that organisms were made up of cells or that bacteria cells even existed



*Yersinia pestis*  
Bacteria carried by fleas

People used to think supernatural curses and spirits caused disease & blamed the Jews for the Plague.



Spread of the plague, Black Death



Burning of the Jews

# First Compound Microscope



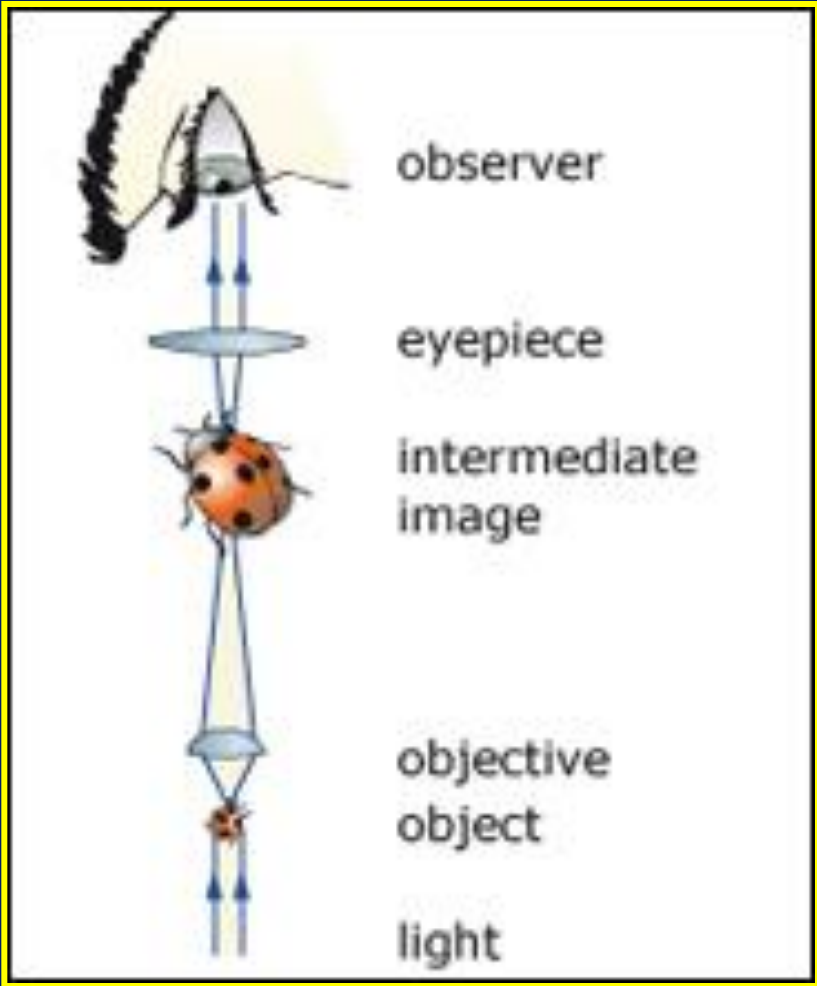
Janssen



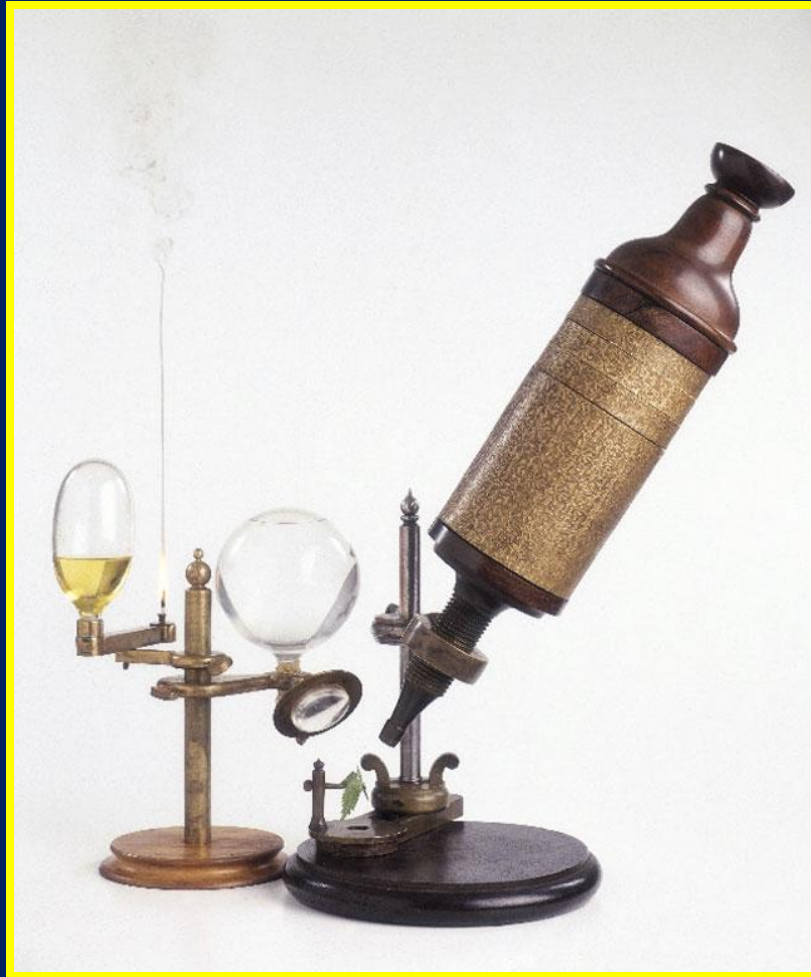
**The First  
Compound  
Microscope  
(circa 1595)**

The first compound microscope was created by Hans Janssen, in the late 1500's, and was used for military purposes such as being able to see approaching armies

Compound microscopes have more than one lens which allows for better magnification

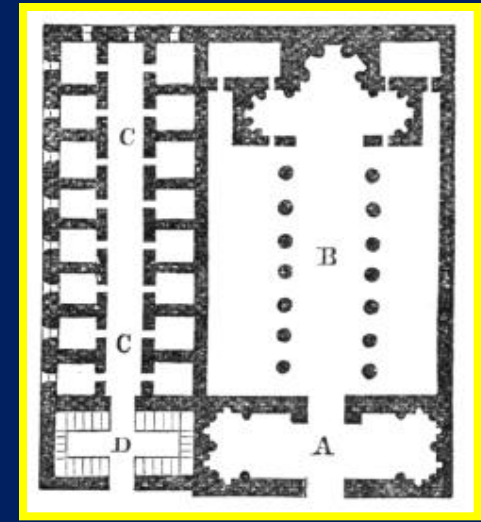
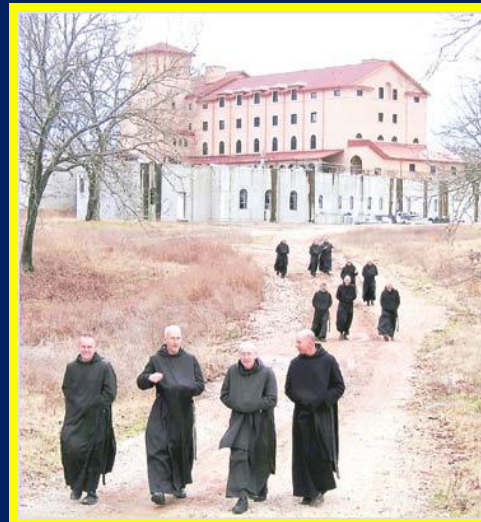
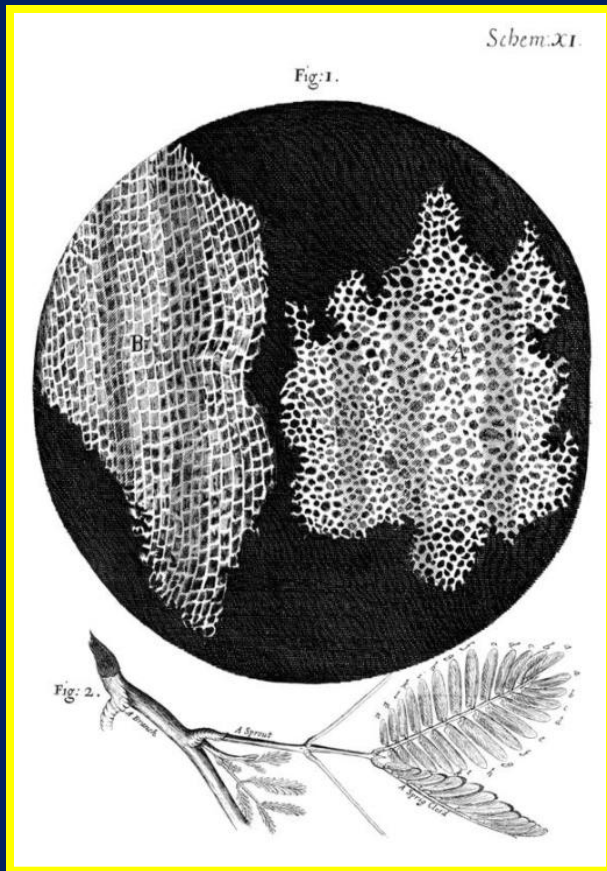


In 1665, an English scientist, named Robert Hooke, designed a light microscope and used it to look at a piece of cork, the dead cells of oak bark.





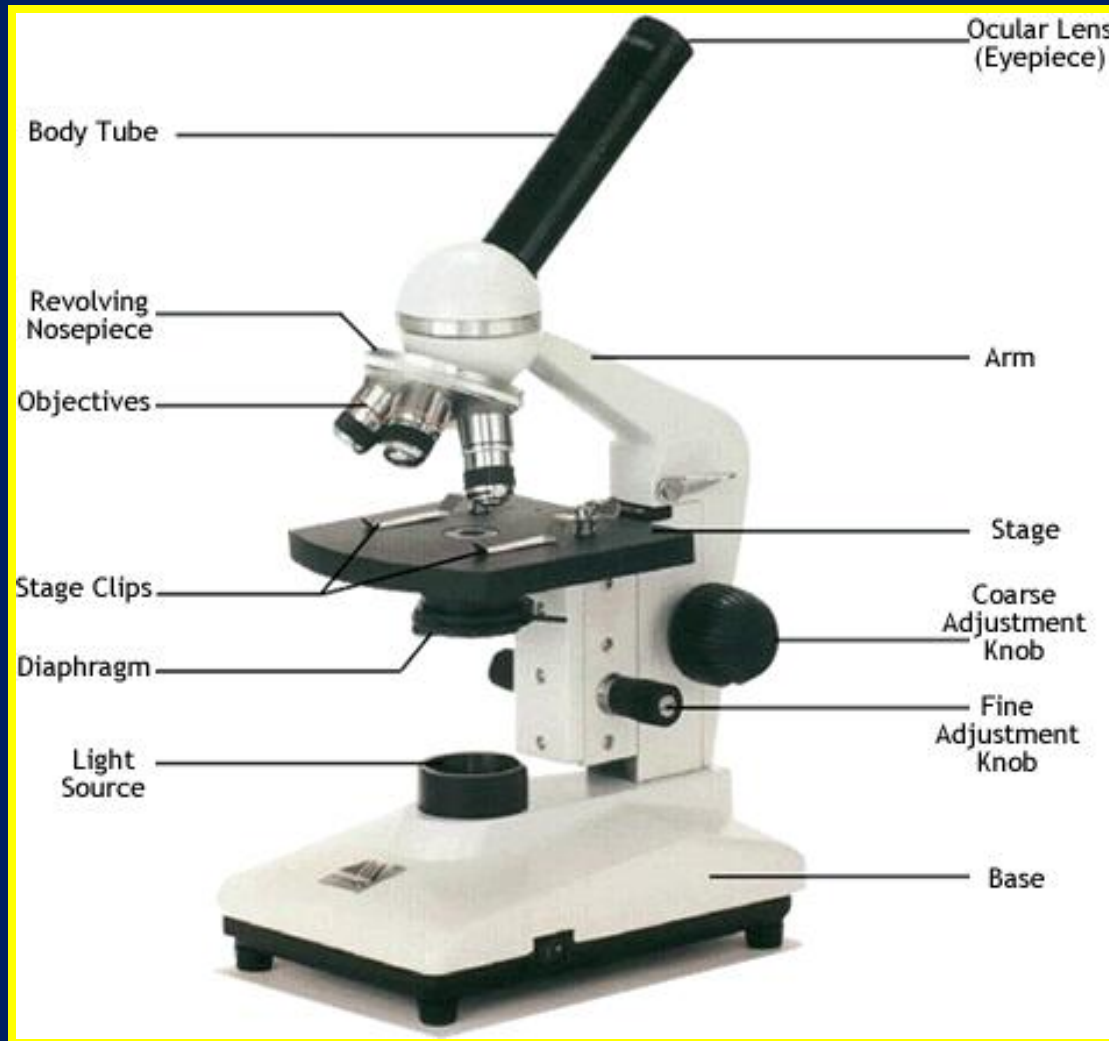
Hooke observed that the cork consisted of tiny box like shapes that he called “cells” because they reminded him of the plain, small cell rooms that catholic monks lived in at a monastery.



In 1684, a Dutch naturalist named Anton van Leeuwenhoek created a single lens microscope that he used to observe the first living cells in pond water, blood, even living bacteria cells in teeth plaque



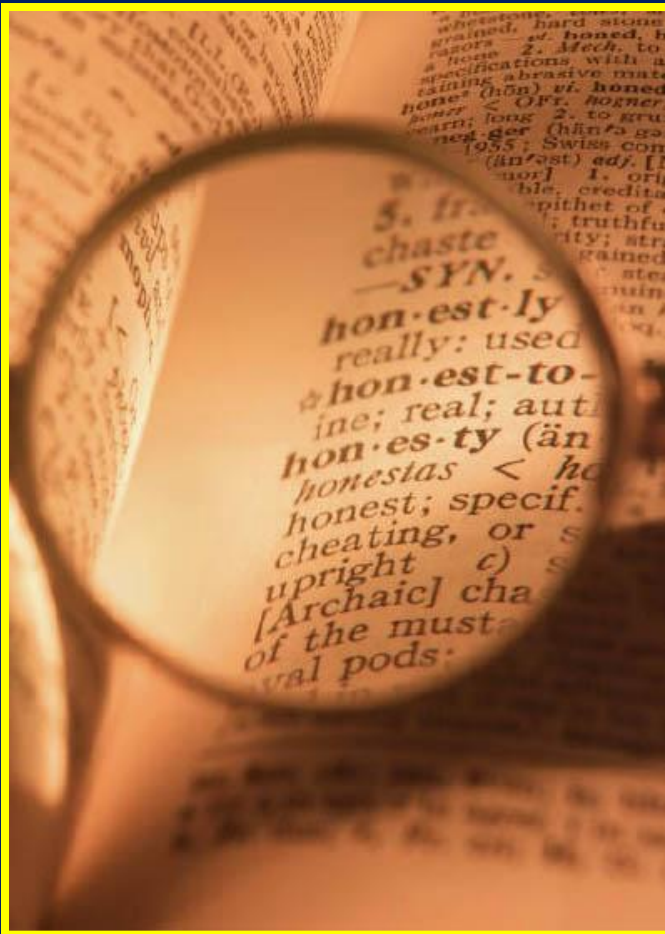
Today we use compound light microscopes to observe magnified cells and cell structure





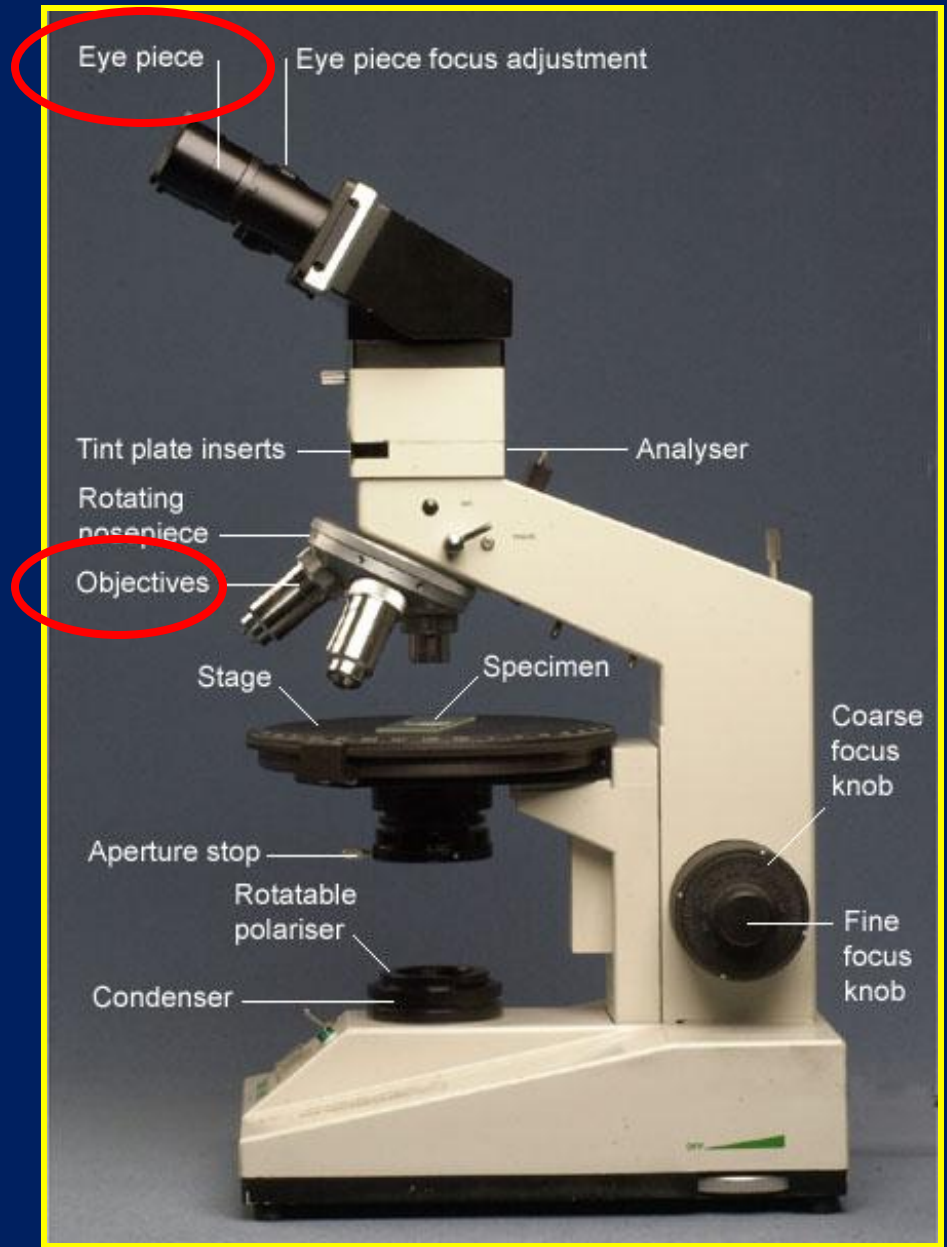
Magnification is the ratio of an object's image to its real size

Best magnification is 1,500X due to the limit set by the size of light wavelengths



To calculate magnification, multiply the magnification of the eye lens by the magnification of the objective lens

$$10 \times 40 = 400$$



Due to the properties of the lens, the image seen under the compound microscope is always upside down and reversed.



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In the 1950's, Electron microscopes were invented  
which focus beams of electrons through a  
specimen or onto its surface magnifying objects  
up 500,000 times

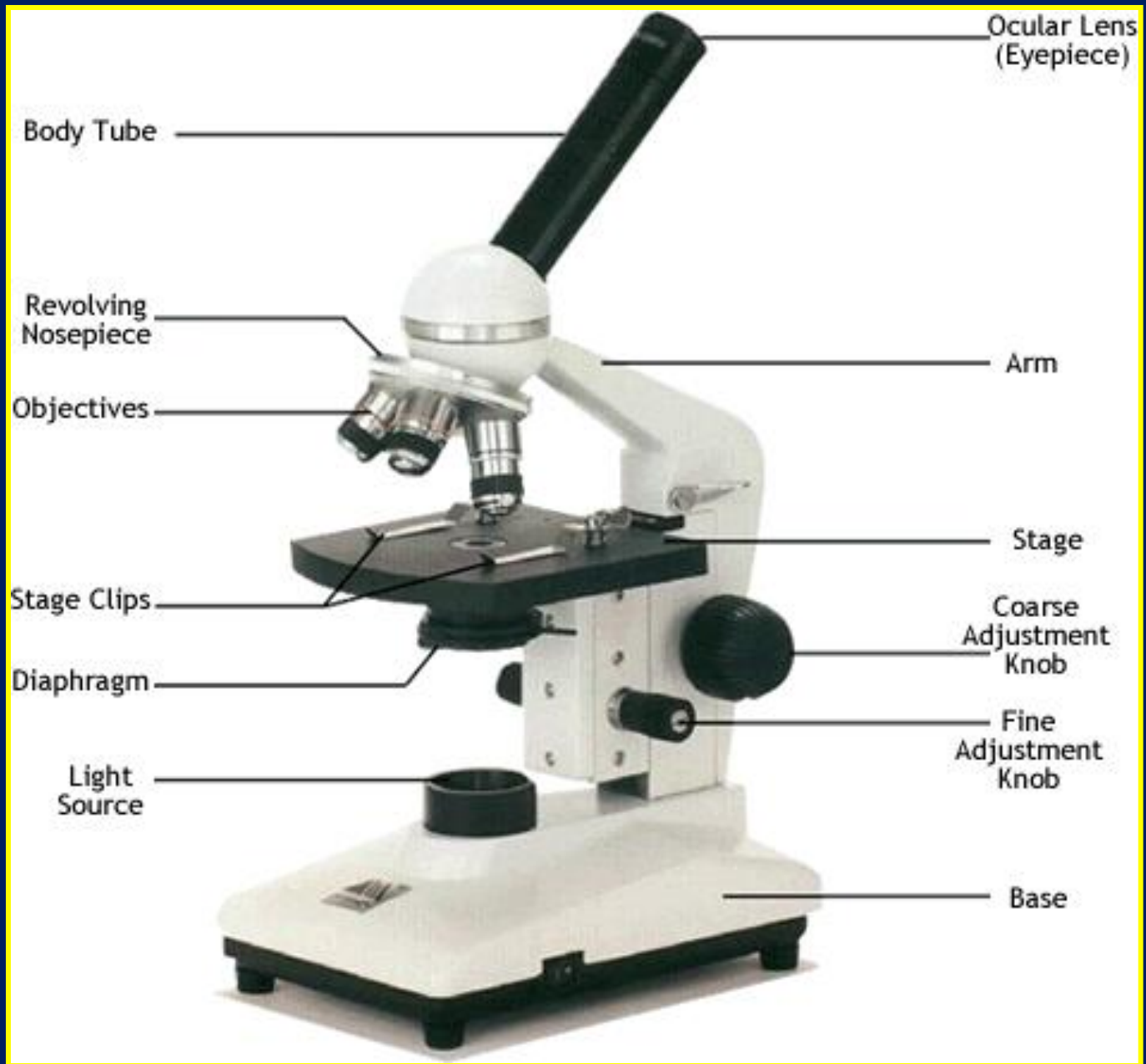




Electron microscopes enabled us to see organelles in cells for the first time. However, the dyes that are necessary destroy cells in the process.







# The End

