

# LAB:1

# INTRODUCTION TO THE MICROSCOPE

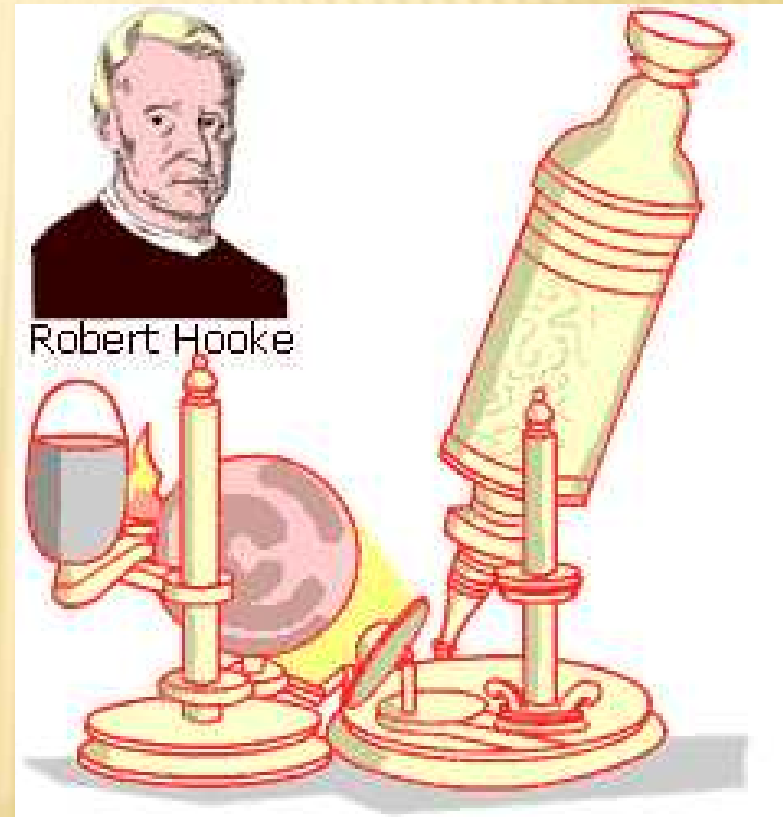
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- **History**
- **Types**
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- **Parts & functions**
- **Focusing**



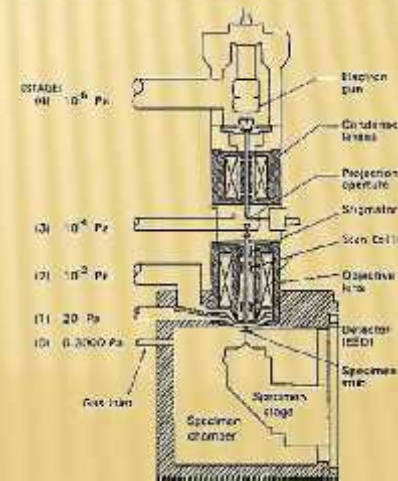
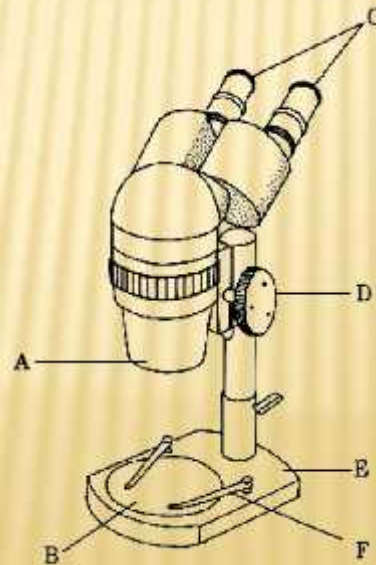
# Microscope History

**1665** – English physicist, Robert Hooke looked at a sliver of cork through a microscope lens and noticed some "pores" or "cells" in it.



# Types of Microscopes

- ✘ Light microscope
- ✘ Electronic microscope



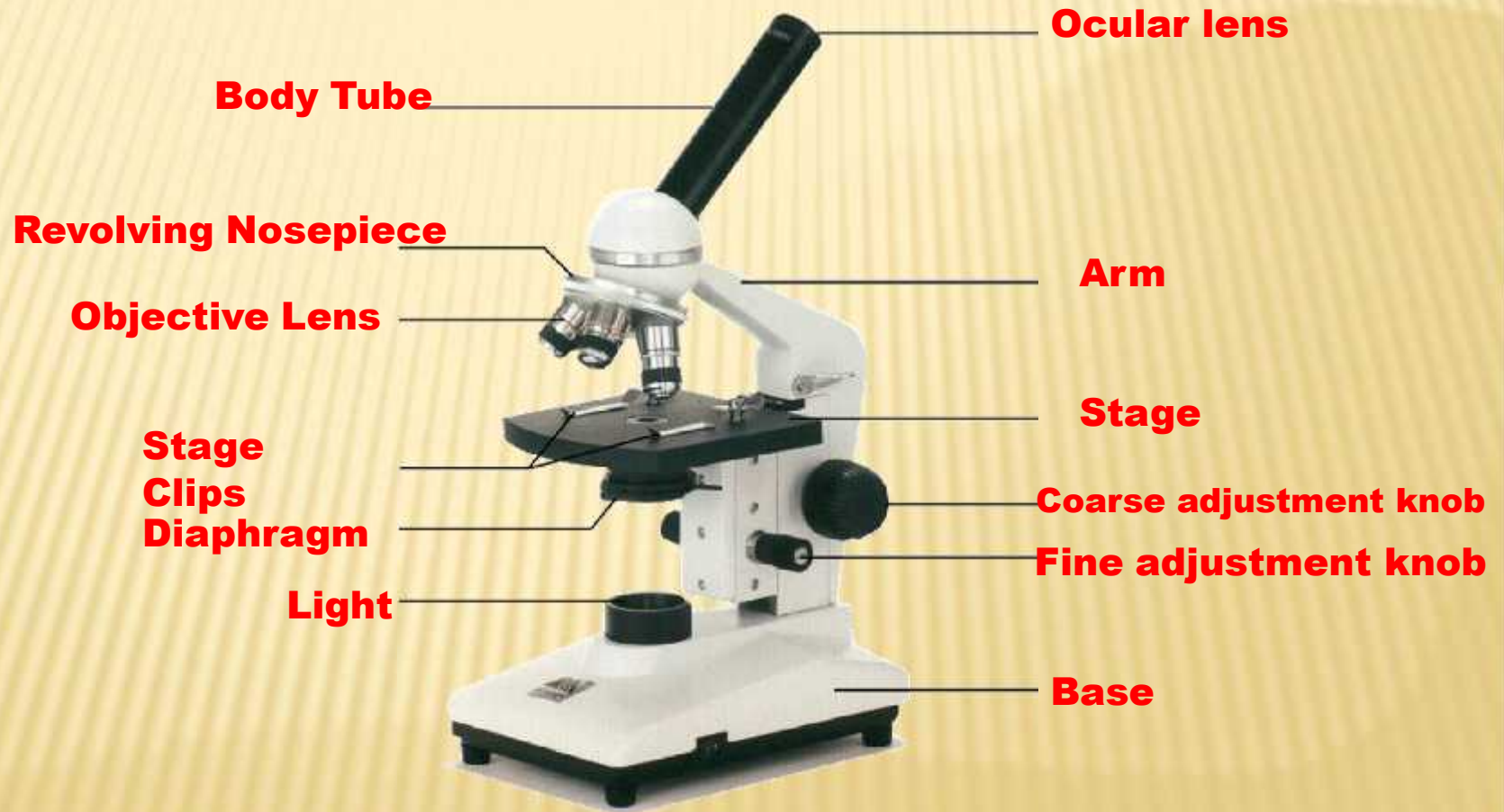


# Microscope Care

- ✗ Always carry with 2 hands
- ✗ Never touch the lenses with your fingers.
- ✗ Only use lens paper for cleaning
- ✗ Keep objects clear of desk and cords
- ✗ When you are finished with your "scope", rotate the nosepiece so that it's on the low power objective, roll the stage down to lowest level, rubber band the cord, then replace the dust cover.



# Microscope Parts



# Microscope Parts

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**A- STRUCTURAL COMPONENTS**

**B- OPTICAL COMPONENTS**

# a- structural components

## HEAD

This part of the microscope contains a delicate prism system which helps to send an image to the oculars and your eyes.





## a- structural components

# base



the bottom of the microscope, used for support

**base**



# a- structural components

## ARM



supports the tube and connects it to the base

# B- optical components

## Ocular Lens



### Ocular lens

magnifies; where you look through to see the image of your specimen.

They are usually 10X or 15X power. Our microscopes have an ocular lens power of 10x.

# Stage



the flat platform  
where you place  
your slides

# Ocular or eyepiece tube

Ocular or eyepiece tube

connects the eyepiece  
to the objective  
lenses





# objective lenses

Usually you will find 4 objective lenses on a microscope.

**objective lens**

They consist of 4X, 10X, 40X and 100X powers. When coupled with a 10X (most common)



# objective lenses

eyepiece lens, we get total magnifications of 40X (4X times 10X), 100X, 400X and 1000X.

The shortest **objective lenses** lens is the lowest power, the longest one is the lens with the greatest power. Lenses are color coded.



# fine adjustment knob



small, round knob on the side of the microscope used to fine-tune the focus of your specimen

**fine adjustment knob**

after using the coarse adjustment knob



# coarse adjustment knob



moves stage (or body tube) up and down

**coarse adjustment knob**



# revolving nosepiece

the part that holds four objective lenses

**revolving nosepiece**

and can be rotated to easily change power



# stage clips

Stage clips hold the slides in place. If your microscope has a mechanical stage, you will be able to move the slide around by turning two knobs. One **stage clips** moves it left and right, the other moves it up and down.



# Light

makes the specimen  
easier to see



# Using the Microscope

The proper way to focus a microscope is to start with the lowest power objective lens first and while looking from the side, crank the lens down as close to the specimen as possible without touching it. Now, look through the eyepiece lens and **focus upward only** until the image is sharp. If you can't get it in focus, repeat the process again.



# Using the Microscope

Once the image is sharp with the low power lens, you should be able to simply click in the next power lens and do minor adjustments with the focus knob. If your microscope has a fine focus adjustment, turning it a bit should be all that's necessary. Continue with subsequent objective lenses and fine focus each time.

# Using High Power

**Rotate to 40x objective**, locate desired portion of specimen in the center of the field. Refocus very carefully so that the specimen is focused as sharply as possible. (*Do not alter focus for the following steps* )



# Using High Power

Partially rotate so that 40x and 100x objectives straddle the specimen.





# Using High Power

Place a small drop of oil on the slide in the center of the lighted area. (Take care not to dribble on the stage.)

Put the small drop of oil directly over the area of the specimen to be Examined.





# Using High Power

Rotate so that the **100x oil immersion objective** touches the oil and clicks into place.



# Using High Power

Focus **only** with fine focus. Hopefully, the specimen will come into focus easily. Do not change focus dramatically.



# Using High Power

**Clean up!:** When you have finished for the day, wipe the 100x oil immersion objective carefully with lens paper to remove all oil. Wipe oil from the slide thoroughly with a Kimwipe. Cleanse stage should any oil have spilled on it. Recap the immersion oil container securely, replace in drawer.