Lab1:

Microscope

Microscope Definition

An optical instrument uses a lens or a combination of lenses to produce magnified images of small objects. Micro" refers to tiny, "scope" refers to view or look at.

Types of microscope

1. Compound light microscope.
2. Electron microscope.
3. Dissecting microscope.

The compound light microscope is the most common instrument used in education today.

1. Compound light Microscope :-

parts and functions

- **Arm**: supports the tube and connects it to the base.
- **Base**: the bottom of the microscope, used for support.

- **Eyepiece**: where you look to see the image of your specimen.
- **Body tube**: connects the eyepiece to the objective lenses.
- **Revolving Nosepiece**: holds two or more objective lenses and can be rotated to easily change power.
- **Stage**: the flat platform where you place your slides.

- **Fine adjustment knob :** small, round knob on the side of the microscope used to fine- tune the focus of your specimen.
- **Coarse adjustment knob :** large, round knob on the side of the microscope used for focusing the specimen.
- **Stage Clips**: hold the slide in place.
- **Iris Diaphragm**: controls the light going through the aperture.
- **Mirror/light source:** to reflect light to the specimen/source of light.

➢ Objective lenses may have:

A. Scanning objective (4x or 4.5x)

B. Low –power objective (10x)

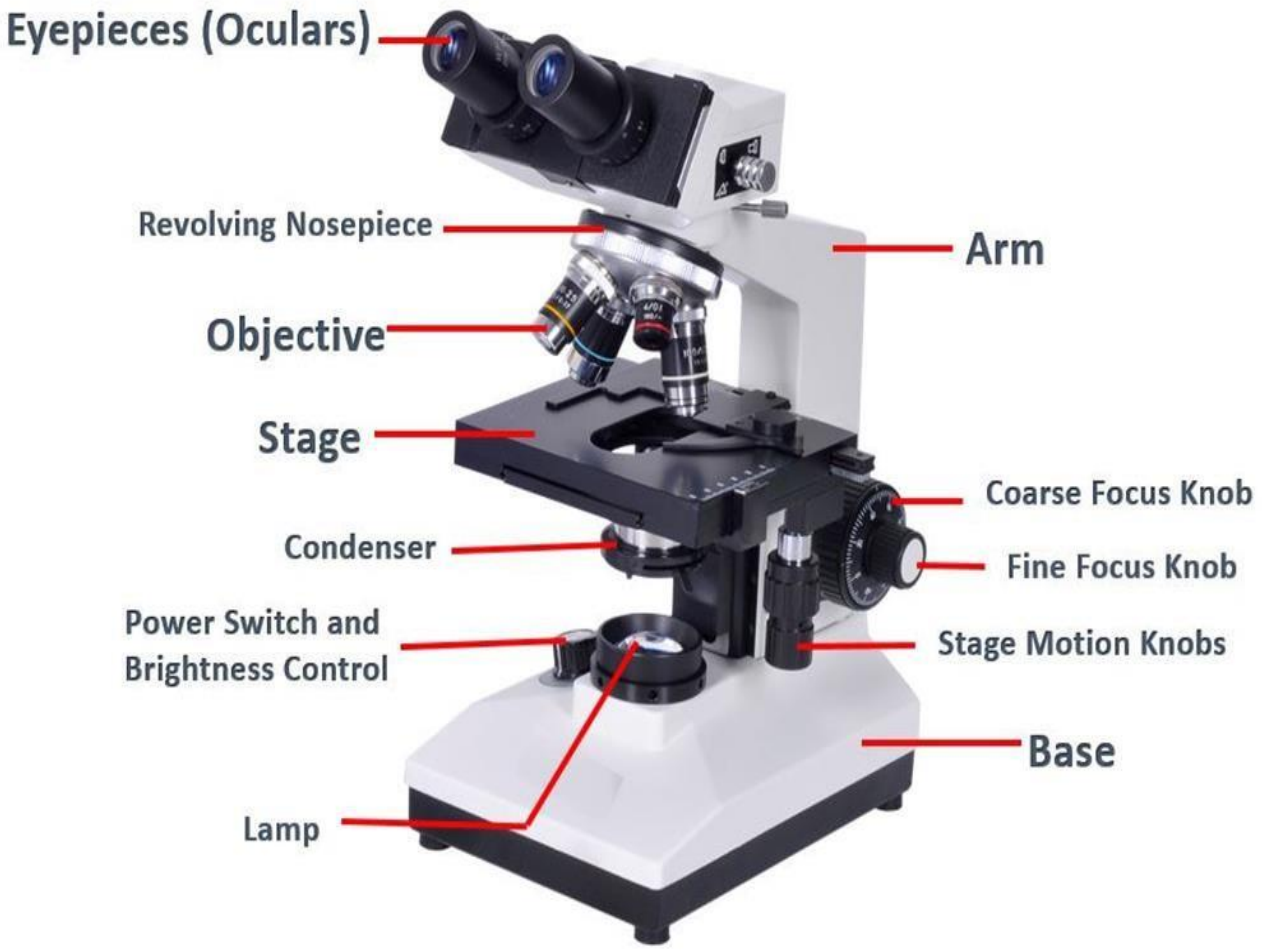
C. High- power objective (40x)

D. Oil-immersion (100x):

which must always be used with a drop of oil to form a liquid bridge between the lens and the surface of the slide being viewed.

4 3 2 1

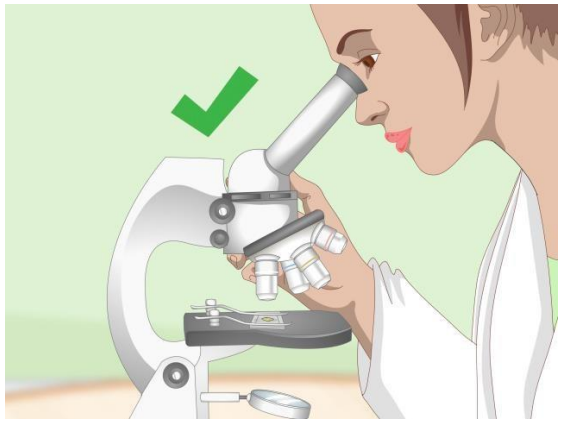
Anatomy of a Compound Microscope



Proper way of focusing the Microscope

a. Keep both eyes open to reduce eyestrain, keep eye slightly above the eyepiece to reduce eyelash interference.

b. To find out the total magnification of the object, multiply the power of eyepiece lens (10x) by the power of the objective.

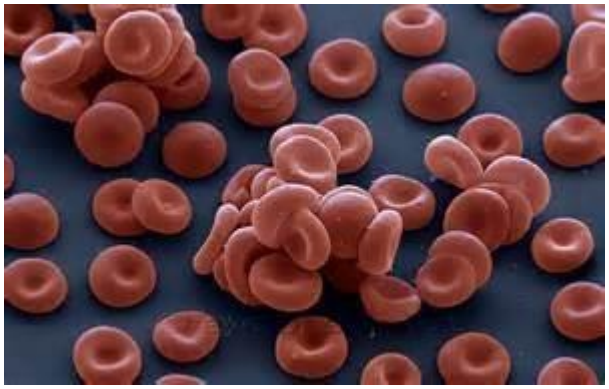


2-Electron microscope:

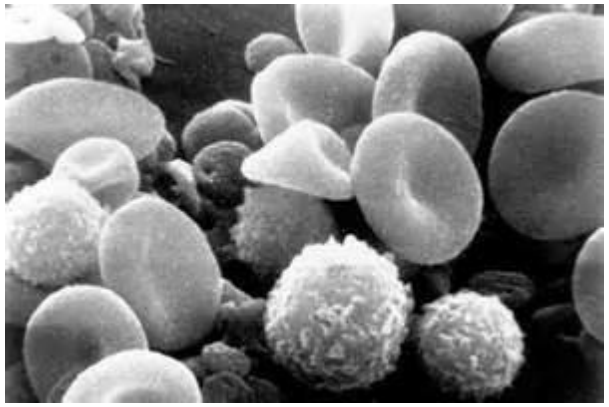
this microscope provides better magnification than light microscope; magnify objects with a beam of electron.

- **A transmission electron microscope**

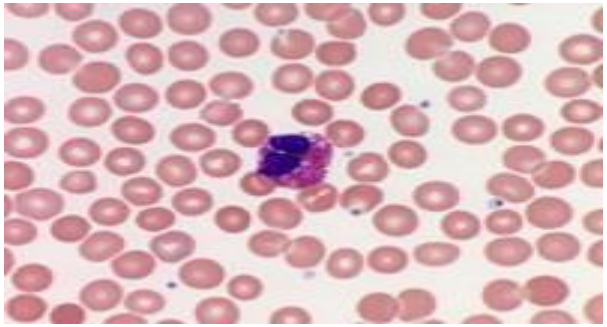
can achieve magnifications of up to about 10,000,000x whereas most light microscopes are limited by diffraction to about 200 nm resolution and useful magnifications below 2000x.



A



B

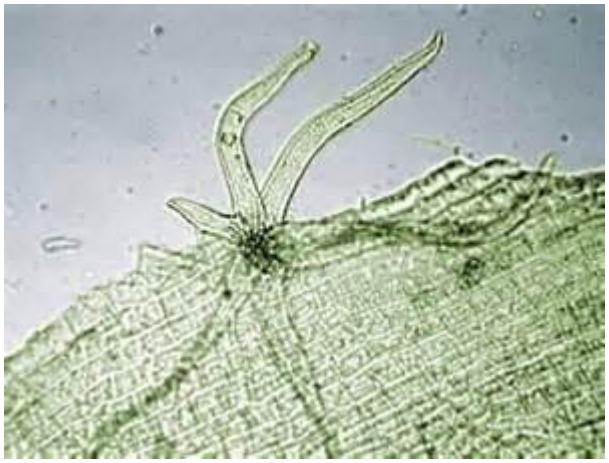


C

RBCs under electron microscope (A and B) , while in C the RBCs magnified by the compound light microscope

3- Dissecting microscope:

This microscope has relative low magnification; it is used for viewing large objects in three–dimension



A

B

C

A and B plant trichrome under dissecting and electron microscope, C head of insect under dissecting microscope