Microscope

I. Bright microscope:

Bright-field microscopy (BF): is the simplest of all the optical microscopy illumination techniques.

it contains:

A: Simple Microscope:

Magnifying glass

Simple microscope

B: Compound Microscope:

It is microscopes which uses visible light anda system of lenses to magnify images of small samples.

Main parts of light microscope:

A: Optical parts:

1- Ocular Lenses:

The eyepiece consists of a series of lenses mounted in a tube at the upper end of the microscope. It magnifies 10 times.

2- Objective Lenses:

The objectives are the lens system closest to the specimen.
Most compound microscopes have three or four objectives lenses:

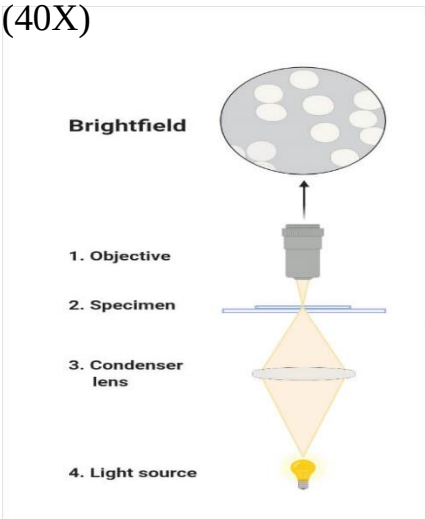
a. The scanning lens (4X).
b. The low-power lens (10X).
c. The high-power lens (40 X)
d. The oil-immersion lens (100 X).

3- The illuminator (Light source): to get light bands and we can control it by brightness adjustment.

4- Condenser: to condense the light.

B: Mechanical parts:

1- Body tube: to carry eye pieces.
2- Arm: to carry eye pieces, objective lenses, stage.
3- Revolving disc: for fixing and choosing objective lenses.
4- Stage: to carry slide.
5- Clips: to fix the slide.
6- Adjustment stage: to move the slide right &left --- Forward & backward.
7- Course adjustment: rise stage up & down to get image. (4X,10X)
8- Fine adjustment: rise stage up& down to get clear image. (40X)
9- Diaphragm: control of bands light.
10- Switch on/off.
11- Base :to install the microscope.



Principle of the light microscope:

Bands of light fall on the sample and then to the lenses.

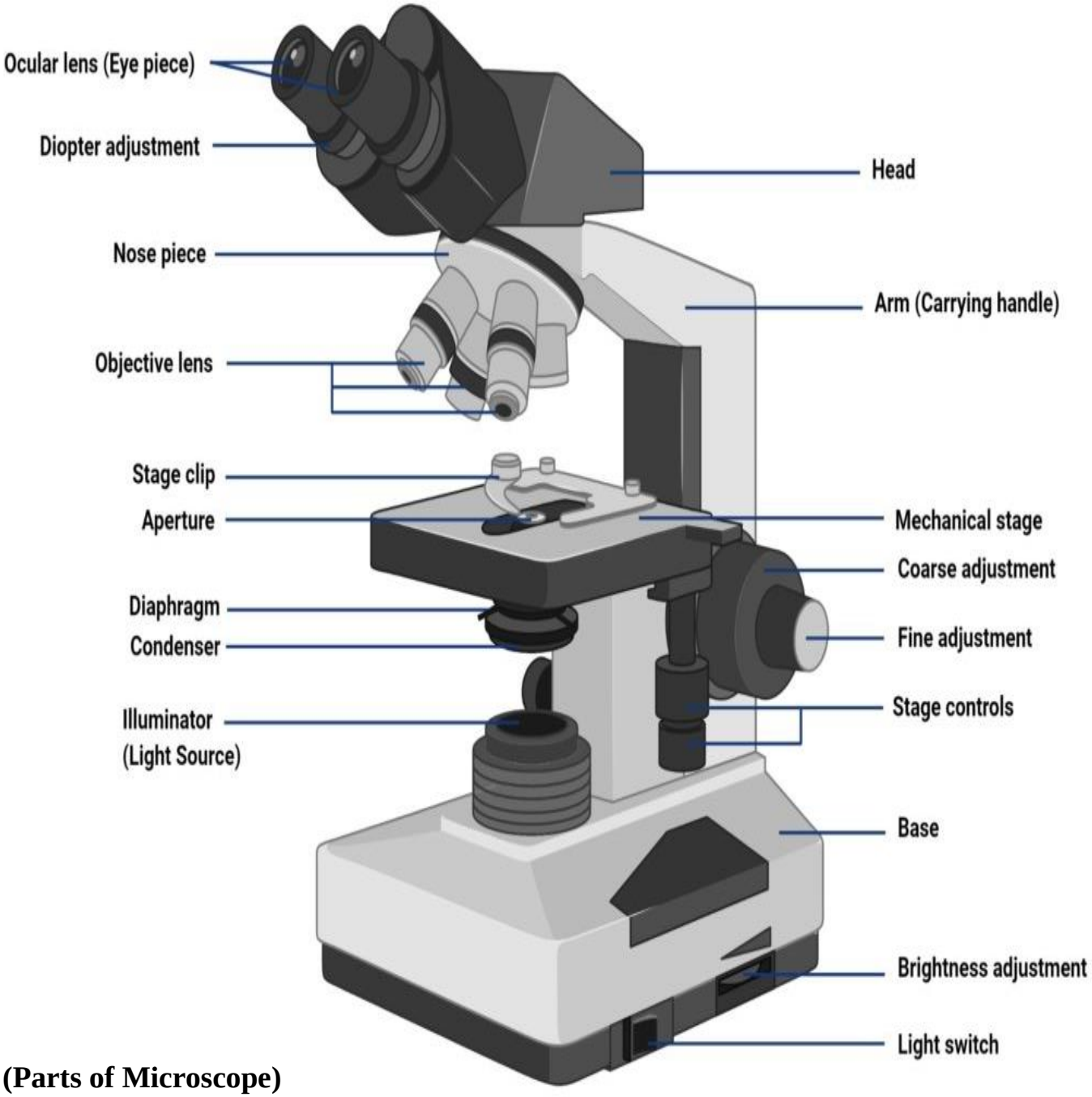
Magnification& Resolution:

Total magnification = ocular × objective

Type of lens	Magnification	Ocular lens	Total Magnification
The scanning lens	4X	10X	40X
The low-power lens	10X	10X	100X
The high-power lens	40 X	10X	400X
The oil-immersion lens	100 X	10X	1000X

Uses:

1- Study of living cells.
2- Study all microorganisms such as bacteria, viruses and protozoa.
3- Criminal investigations.
4- Environmental studies.
5- laboratory analyses.
6- Atomic studies



(Parts of Microscope)

How to use a compound microscope?

- Place a slide on the stage and fix it with the stage clips.
- Switch at on.
- Adjust the light and canter it on the specimen.
- Adjust the distance between the eyes.
- Use X10 Using the coarse adjustment, lower the objective lens down
- without Touching the slide.
- Look through the eyepiece and rise the stage slowly by using course
- adjustment Until appeared image.
- Change to X40 and use only fine adjustment until get very clear and
- Magnification image.
- Round the revaluation disc.
- Put one drop of oil on the specimen.
- Change to X100.
- Use only fine adjustment.
- When finished, lower the stage, click the low power lens into position and remove the slide.

Care & Safety:

❖ Holding the microscope:

Always use two hands to move the microscope. Place one hand around the arm, lift the scope, and then put your other hand under the base of the scope for support.

❖ Storing the Microscope:

- Bring the platform back down.
- Return the lowest power objective in place.
- Put it under a protective cover.
- Store in a low humidity environment (a dry place).

❖ Cleaning the Microscope

- Do not let the microscope get too dirty.
- Always use the dust cover when not in use. You can use distal water to remove dust.
- To clean the lenses, use a high-quality lens paper (Xylol paper). Do not use facial tissues.

- Clean oil immersion lens with suitable chemicals like Xylene, Naptha and Turpentine.
- Do not use water, alcohol, or acetone because oil does not dissolve in it.