

## The Microscope :

Microscope is the combination of two words; "micro" meaning small and "scope" meaning view.

Microscopes are instruments which enable the human beings to see those substances and organisms, which cannot be seen with the naked eye. there are different types of microscopes, the three basic types are light (optical), electron and scanning microscopes. The different types of microscopes have a common aim, i.e, enlargement of images. The only difference between them is that the method of illuminating the objects vary as per the type.

### The Microscope

The microscope: instrument used to obtain magnified image of minute objects or minute details of objects, the most widely used microscope are optical microscope, which use visible light to create a magnified image of an object.

#### **A / Mechanical Parts**

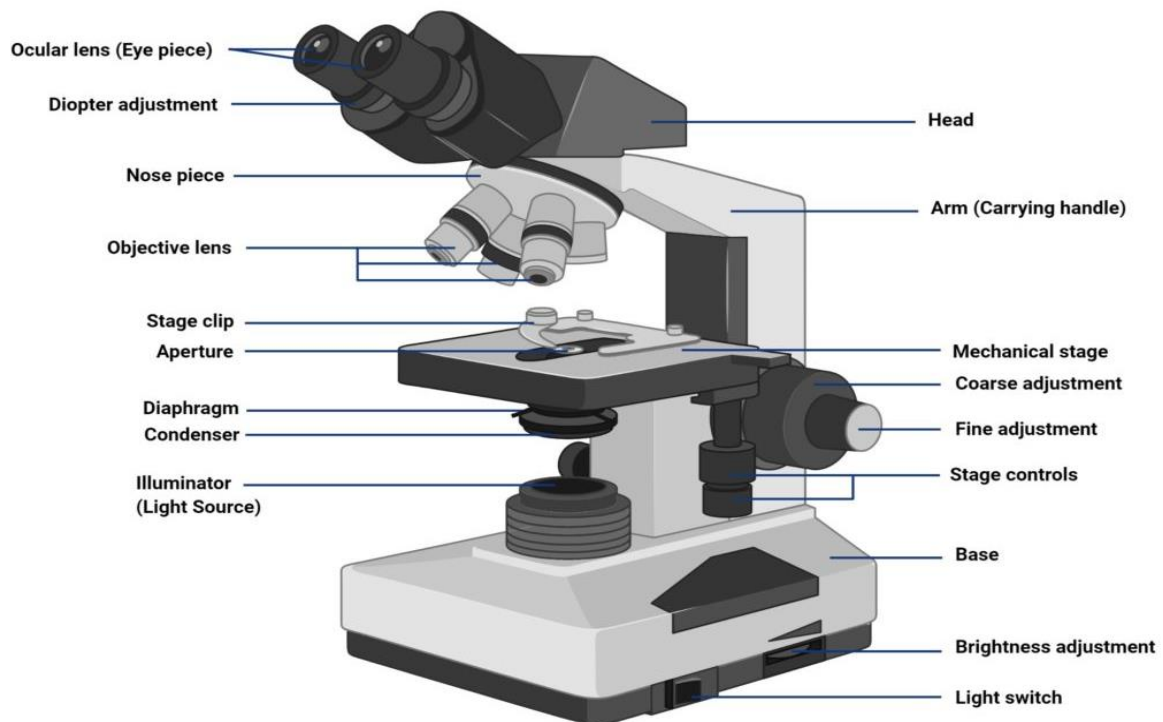
1. The base: supports the microscope.
2. The arm: used for handling and transporting the microscope.
3. The stage: to place the slide on it.
4. Head or body tube: supports the objective lens system and the eyepiece.
5. Nosepiece: movable piece that carries the objective lenses.
6. Light source: located in the base of the microscope, the light passes directly upward through the specimen.
7. The knobs : they are of two kinds :  
    **a-Coarse adjustment knob**: to bring the microscope field to view, and any movement of this knob moves the stage

a large distance, and this knob used with low power objective lenses.

**b- Fine adjustment knob:** to bring the microscope field to focus, and this knob is used with high power objective lenses

## B / Optical parts:

1. **The condenser**: located under the stage and it concentrates the light on the specimen.
2. **Iris diaphragm**: increases or decreases the opening of condenses lens.
3. **Objective lenses** :
  - a-**low power lenses**: it has a magnification power of (4X) and (10X) .
  - b-**high dry lens**: it has a magnification power of (40X) .
  - c-**oil immersion lens**: it has a magnification power of (100X) and with this power the oil must be used.
4. **Ocular eyepiece**: located at the superior end of the body tube, this lens has specialized magnification power such as (12X, 8X,...), this lens some time have pointer used to pointed on some parts of specimen.



### How it works:

1. When viewing a slide through the microscope make sure that the stage is all the way down and the 4X scanning objective is locked into place.
2. Place the slide that you want to view over the aperture and gently move the stage clips over top of the slide to hold it into place.
3. Beginning with the 4X objective, looking through the eyepiece making sure to keep both eyes open (if you have trouble cover one eye with your hand) slowly move the stage upward using the coarse adjustment knob until the image becomes clear. This is the only time in the process that you will need to use the coarse adjustment knob. The microscopes that you will be using are parfocal, meaning that the image does not need to be radically focused when changing the magnification.
4. To magnify the image to the next level rotate the nosepiece to the 10X objective. While looking through the eyepiece focus the image into view using only the fine adjustment knob, this should only take a slight turn of the fine adjustment knob to complete this task.

To magnify the image to the next level rotate the nosepiece to the 40X objective. While looking through the eyepiece focus the image into view using only the fine adjustment knob, this should only take a slight turn of the fine adjustment knob to complete this task.

## Total Magnification:



**X**



**= 40 X**

4X Scanning Objective 10X Eyepiece



**X**



**= 100 X**

10X Objective

10X Eyepiece



**X**



**= 400X**

40X Objective

10X Eyepiece

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