

## The microscope

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

### Parts of a microscope:

#### 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: there are 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 power lenses:** 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.

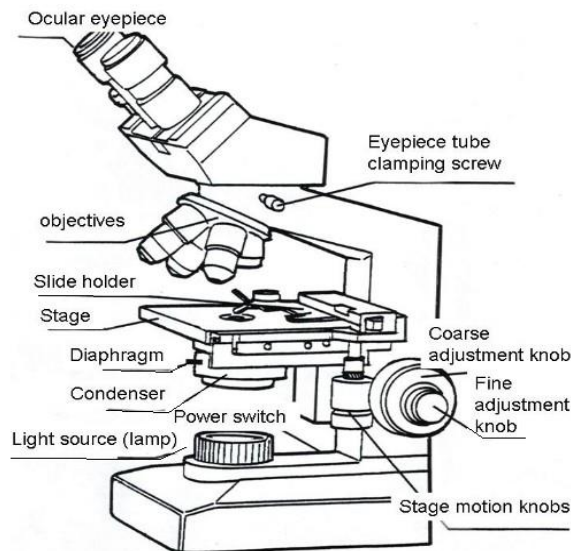


Fig. 13 Compound microscope

### 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. Look through the eye piece and raise the condenser until light is seen as a circle in the center of the field called “a bright full moon”.
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.
5. 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:**



4X Scanning Objective 10X Eyepiece



10X Objective 10X Eyepiece



40X Objective 10X Eyepiece