

1. Microscope

THE STUDY OF HISTOLOGY IS DONE WITH THE HELP OF LIGHT/STUDENT'S MICROSCOPE

The light microscope/student's microscope is used to examine the stained specimens by means of light that courses through the specimen.

Light microscope is composed of optical and mechanical parts. The optical components comprise 3 systems of lenses:

Condenser, Objective and Eyepiece

The condenser lens collects and focuses light, emitting a cone of light that illuminates the tissues to be observed.

The objective lenses enlarge and project the illuminated image of the tissue towards the eyepiece.

The eyepiece further magnifies the image received and projects it to the viewer/photographic plate. The total magnification is obtained by multiplying the power of the objective lens with that of the ocular/eyepiece lens.

Resolving power: It is critical factor for obtaining ideal image. The resolving power (RP) is the smallest distance between two particles at which these can be seen as separate objects. The maximum RP of a light microscope is $0.2\ \mu\text{m}$. This RP can be magnified up to 1000–1500 times. The details of the tissue depend on the RP of the microscope. Magnification is of value when RP is high. Video cameras increase the power of light microscope. Usually two objectives are provided in student's microscopes 10X and 40X, or low power and high power.

Eyepiece lens usually have 10X. Magnification obtained by low power objective is 10 when multiplied by 10X = 100 times. Magnification obtained by high power objective is $40 \times 10 = 400$ times.

Mechanical parts: Microscope consists of a joint or base which is 'U' shaped. The base is connected to an 'arm'. At the upper end of arm is the tube for supporting the lenses. The tube can be moved up and down by coarse and fine adjustment knobs.

At the lower end of the arm is fastened a square plate/stage. The stage has an opening in the centre for light to pass through the tissue. The stage is further provided with 2 clips to keep the slide stationary or there is movable mechanism to move the slide in both axes.

At the lower end of the tube is a revolving nosepiece with 2 objectives, low power and high power.

A mirror is placed below the condenser lens directs the light from the lamp/sun towards the specimen. The mirror has two surfaces, one plane and other concave. The plane mirror is used with the condenser and concave mirror is used when condenser is not in use.

Viewing the slide: Place lamp 6 inches away from the microscope. Use substage condenser and plane mirror. Adjust mirror so get uniform light. Put the slide on stage and strap it with clips. Lower the tube, till the lower power objective is about 5 mm above the slide. Use coarse adjustment knob to gently move the tube upwards till the specimen is viewed. Now use fine adjustment knob to see the details.

For viewing with high power objective, rotate the high power objective on nosepiece above the tissue till a click sound is obtained. Use fine adjustment knob to see greater details.

Precautions: Microscope should be held and carried by both hands.

It should be 6 inches/15 cm away from the edge of the table.

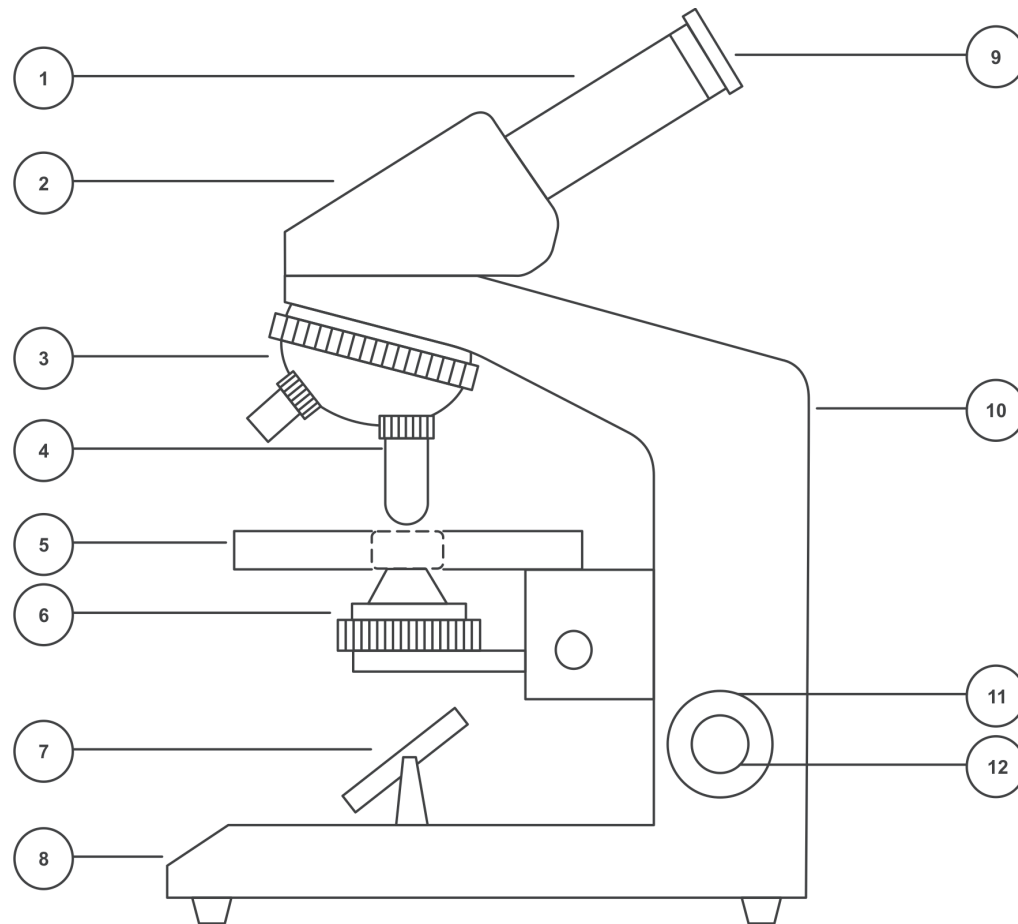
The arm should be kept straight or tilted slightly only.

The microscope to be cleaned before use with a silky cloth and never a handkerchief.

Cover slip of the slide should face upwards.



Microscope



Label the diagram

1. _____
3. _____
5. _____
7. _____
9. _____
11. _____

2. _____
4. _____
6. _____
8. _____
10. _____
12. _____



Notes