

Microscopy:

1. eyepieces or oculars

lenses that magnify 10 times

2. objective lenses

low/high-power lenses to be clicked in place by rotation, the magnification is indicated on the side of each lens

3. stage

with clamps and knobs for holding and moving the slides

4. condenser

lens system below the stage to concentrate light in the plane of the object, fixed in place or adjustable (keep near uppermost position)

5. iris diaphragm

regulates the amount of light that passes through the condenser, adjust with protruding lever

6. fine/coarse adjustment

use coarse and then fine adjustment to focus the image

7. lamp and switch

light source, intensity can be modified on some models



Calculation the total magnification of a viewed object:

Multiply the magnification of the ocular (usually 10 times) by the magnification of the objective lens (variable), for example: 10 (ocular) x 40 (objective) = 400

Handling the microscope:

- Microscopes must be handled with care. Carry the microscope with one hand under the base and one hand grasping the arm.
- When you are done using the microscope remove any slide from the stage and wrap the power cord around the base of the microscope and put the lowest-power objective lens (4x) in place.
- Never touch the lenses. If you think your lenses need cleaning, let me know. Styrofoam and lens paper are available for cleaning. Normal tissue is too course and may scratch the lenses.

Using the microscope:

1. Always begin with the lowest-power objective in place. The high-power objectives are longer and can crack the slide, which will scratch and damage the objective lens.
2. Turn on the lamp (medium intensity).
3. Adjust the distance of the oculars to your eye distance, so that you can use both eyes to look through the oculars.
4. Put your object in place on the stage. Center it over the light hole in the center of the stage.
5. Use the coarse focus knob to find your object on the slide. When it comes into view and is roughly focused, improve the image by using the fine focus.

6. If your condenser is adjustable, move it until the image is the brightest possible. The correct setting will put it near its uppermost position, just below the stage.
7. Set the iris diaphragm. Start by opening it all the way, then gradually close it until the image has the best contrast and detail.
8. When you switch to higher-power lenses, watch from the side to avoid hitting the slide with an objective lens. Repeat steps 5 (6 and 7) to optimize the image. If you lose the specimen you should move back to a lower- power objective lens and re-focus, then change objective lenses again.

Preparing a wet-mount slide:

- Place a drop of water on the slide.
- Place an extremely thinly-sliced specimen into the water. Reduce your cut to the tissue area of interest. Hold the blade at the correct angle for the section you want to do (90 degree angle to the stem axis for a stem cross section, in parallel to the surface for an epidermis cell layer, etc.). Do several cuts, combine them in the drop of water, and select the best one for your study.
- Hold the cover slip against the water at an angle of 45 degrees, then release. This will reduce the number of air bubbles. Air bubbles may obscure portions of the specimen. Do not squeeze your tissue by applying pressure onto the cover slip.