

Lab 3- Cell Biology

CELL THEORY

- The Cell Theory states the following:
 - All living organisms are composed of one or more cells
 - Cells are the fundamental units which possess all the characteristics of living things
 - New cells can only come into existence by the division of previously existing cells

METRIC SYSTEM

- When we look at cells under the microscope, our usual measurements fail to work. In science, the metric system is used to measure objects and, as you will see, is vastly superior to our antiquated English system of measurement. Here are the basic units:

Length: meter (m)
 centimeter (cm) = 10^{-2} m or 1/100 m
 millimeter (mm) = 10^{-3} m or 1/1,000 m
 micrometer (μm) = 10^{-6} m or 1/1,000,000 m
 nanometer (nm) = 10^{-9} m or 1/1,000,000,000 m

Volume liter (L)
 milliliter (ml) = 10^{-3} L

Temperature 100°C Centigrade (C) = water boiling
 0°C = water freezing

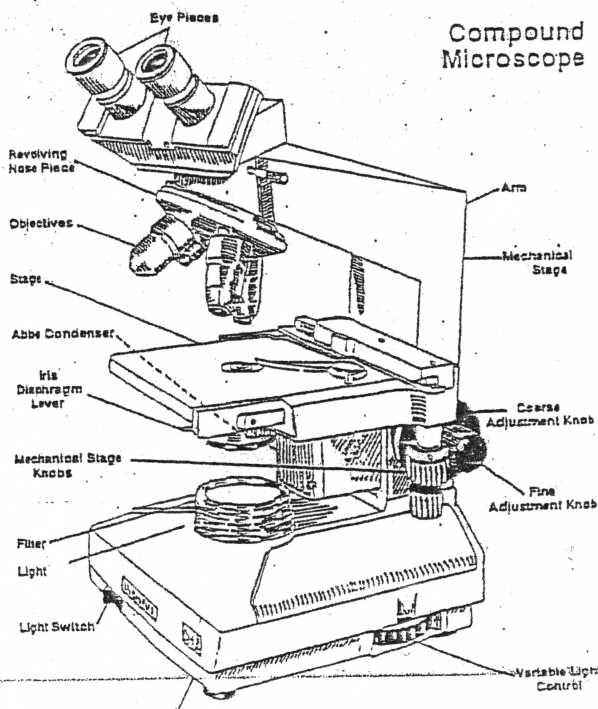
Questions:

670 nm = _____ μm ; 0.224 m = _____ mm; 0.023 L = _____ ml; 750 ml = _____ L

USING THE MICROSCOPE

- Features of compound microscope:

- eyepieces (10X magnification)
- revolving nosepiece
- objectives (4X, 10X, 40X and 100X)
- arm
- stage with calipers
- condenser with iris diaphragm
- coarse and fine focus knobs
- mechanical stage knobs
- light switch
- variable light control
- base



Steps for using the compound microscope.

Finding and focusing on a subject:

1. Carry the microscope with both hands, one on the base and the other on the back.
2. Plug it in and turn the light on. If the light intensity is adjustable set it to 8.
3. Place your slide on the stage and secure with the slide clamp. Center the subject over the light coming through the stage using the stage control knobs. Make sure the condenser is all the way up.
4. Put the 4X (scanning) objective in place. Make sure it clicks.
5. Look through the oculars and adjust the focus by turning first the coarse and then the fine adjustment knobs.
6. Most microscopes have one fixed and one adjustable ocular. Focus first looking through the eye with the FIXED ocular using the main focus knobs. Then adjust the focus of the other eye using only the ocular adjustment for that eye by turning it.
7. Center the subject in the field of view using the stage control knobs.
8. Turn the nosepiece until the 10X (low power) objective clicks into place.
9. Focus using ONLY the fine adjustment knob.
10. Center the subject again using the stage control knobs.
11. Repeat steps 7-9 for the 40X (high power) objective.

Putting the microscope away:

1. Turn off the light and unplug the microscope.
2. Remove the slide and clean the stage of any water or oil
3. Turn the coarse focus knob to put the stage all the way down.
4. Put the 4X objective in place.
5. Center the ends of the slide clamp so it is not sticking too far out either side.
6. Wrap the cord around the base and carefully replace the microscope in the cabinet.

