

Name
Class
Date
Microscope Lab

Introduction

"Micro" refers to **tiny**, "scope" refers to **view or look** at. Microscopes are tools used to enlarge images of small objects so as they can be studied. The compound light microscope is an instrument containing **two lenses**, which magnifies, and a variety of **knobs to resolve (focus)** the picture. Because it uses more than one lens, it is sometimes called the compound microscope in addition to being referred to as being a light microscope. In this lab, we will learn about the proper use and handling of the microscope.

Objectives: Students will be able to...

- Prepare and use a wet mount.
- Determine the total magnification of the microscope.
- Properly handle the microscope.
- Describe changes in the field of view and available light when going from low to high power using the compound light microscope
- Explain why objects must be centered in the field of view before going from low to high power using the compound light microscope.
- Explain how to increase the amount of light when going from low to high power using the compound light microscope.
- Explain the proper procedure for focusing under low and high power using the compound light microscope.

Materials

- Compound microscope
- Glass slides
- Cover slips
- Eye dropper
- Beaker of water
- The letter "e" cut from newsprint
- Scissors

Procedures

I. Microscope Handling

1. **Carry the microscope with both hands** --- one on the arm and the other under the base of the microscope.

2. One person from each group will now go over to the microscope storage area and properly **transport one microscope to your working area.**
3. The other person in the group will **pick up a pair of scissors, newsprint, a slide, and a cover slip.**
4. **Remove the dust cover** and store it properly. Plug in the scope. Do not turn it on until told to do so.
5. **Examine the microscope and give the function of each of the parts** listed on the right side of the diagram.

Give the function(s) for the numbered parts of the compound microscope.	
MICROSCOPE	FUNCTIONS
	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____

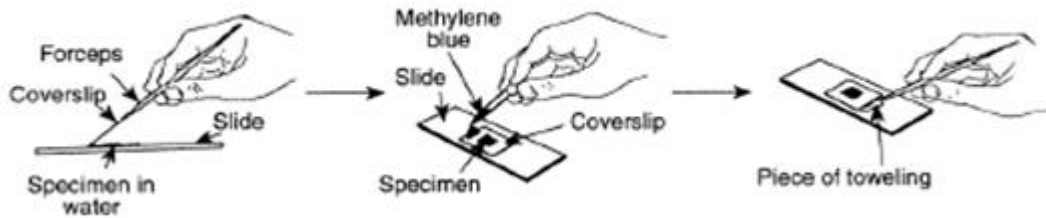
Part II. Preparing a wet mount of the letter "e".

- With your scissors **cut out the letter "e" from the newspaper.**
- Place it on the **glass slide** so as to look like (e).
- **Cover it with a clean cover slip.** See the figure below.

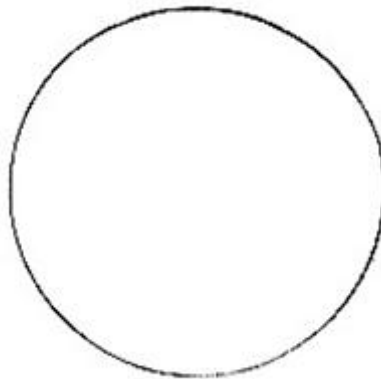


- **Using your eyedropper, place a drop of water on the edge of the cover slip** where it touches the glass slide. The water should be sucked under the slide if done properly.

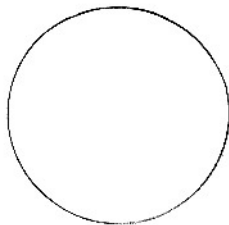
Technique for Adding a Stain when making a Wet Mount



6. Turn on the microscope and place the slide on the stage; making sure the "e" is facing the normal reading position (see the figure above). Using the course focus and low power, move the body tube down until the "e" can be seen clearly. Draw what you see in the space below.

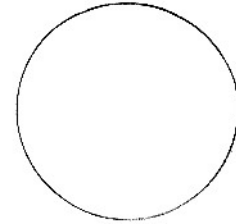
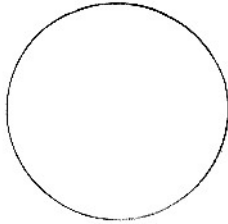


6. Describe the relationship between what you see through the eyepiece and what you see on the stage. _____
7. Looking through the eyepiece, move the slide to the upper right area of the stage. **What direction does the image move?** _____
8. Now, move it to the lower left side of the stage. **What direction does the image move?** _____
9. Re-center the slide and change the scope to high power. You will notice the "e" is out of focus. **Do Not** touch the coarse focus knob, instead use the fine focus to resolve the picture. Draw the image you see of the letter e (or part of it) on high.



10. **Locate the diaphragm under the stage.** Move it and record the changes in light intensity as you do so. _____

11. Create another slide for a piece of your hair! Draw what you observe under low power (4x) and high power (40x)



III. Determining Total Magnification:

1. Locate the numbers on the eyepiece and the low power objective and fill in the blanks below.

Eyepiece Magnification _____ X Objective Magnification _____ = Total Magnification _____ X

2. Do the same for the high power objective.

Eyepiece Magnification _____ X Objective Magnification _____ = Total Magnification _____ X

3. Write out the **rule for determining total magnification of a compound microscope.**

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- **Remove the slide and clean it up.** Turn off the microscope and wind up the wire so it resembles its original position. Place the low power objective in place and lower the body tube. Cover the scope with the dust cover. Place the scope back in its original space in the cabinet.

Conclusion Questions:

1. **State 2 procedures which should be used to properly handle a light microscope.**
2. **Explain why the light microscope is also called the compound microscope.**

- 3. Images observed under the light microscope are reversed and inverted. Explain what this means.**

- 4. Explain why the specimen must be centered in the field of view on low power before going to high power.**

- 5. A microscope has a 20 X ocular (eyepiece) and two objectives of 10 X and 3 X respectively:**
 - a.) Calculate the low power magnification of this microscope. Show your formula and all work.**

 - b.) Calculate the high power magnification of this microscope. Show your formula and all work.**

- 6. In three steps using complete sentences, describe how to make a proper wet mount of the letter e.**

- 7. Describe the changes in the field of view and the amount of available light when going from low to high power using the compound microscope.**

- 8. Explain what the microscope user may have to do to combat the problems incurred in question # 7.**

- 9. How does the procedure for using the microscope differ under high power as opposed to low power?**

