

Compound Light Microscope Lab



Highlight (5 points)

Background: Many objects are too small to be seen by the eye alone. They can be seen, however, with the use of an instrument that magnifies, or visually enlarges, the object. One such instrument, which is of great importance to biologists and other scientists, is the compound light microscope. A compound light microscope consists of a light source that illuminates the object to be observed, an objective lens that magnifies the images of the object and an eyepiece (ocular lens) that further magnifies the image of the object and projects it into the viewer's eye.

Objects or specimens to be observed under a microscope are generally prepared in one of two ways. Prepared or permanent slides are made to last a long time. They are usually purchased from biological supply houses. Temporary or wet-mount slides are made to last only a short time – usually one laboratory period. The microscope is an expensive precision instrument that requires special care and handling.

Purpose: To learn the parts of the microscope.
To learn the functions of the parts and the proper use and care of the microscope.
To be able to prepare a wet-mount slide.

Procedure and Questions:

PART 1: Basics of the Microscope

- At your lab station you will find a labeled diagram of a compound light microscope and guidelines for the care and use of the microscope. Use this diagram to answer the following questions.
 - Why is the proper use and care of a microscope important? (2 points)
 - Why is it important to only use the fine adjustment to focus when you have the high power objective lens set into place? (2 points)
 - Why might it be a good idea to keep your microscope at least 10 cm from the edge of the table? (2 points)
- Record the magnification of the ocular lens and each of the objective lenses. Calculate the total magnification by using the following formula: (9 points)

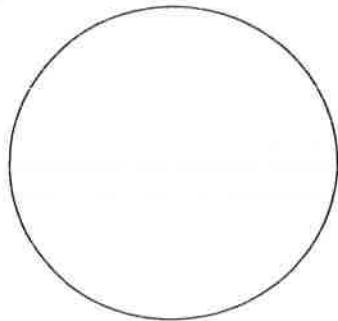
Total Magnification = (ocular lens magnification) X (objective lens magnification)

Objective Lens	Magnification of Eyepiece (ocular)	Magnification of objective lens	TOTAL Magnification
Low Power			
Medium Power			
High Power			

PART 2: Basic Microscope Techniques

3. At your lab station, you will find a prepared slide that has a newspaper letter "e" on it. Place the slide on the stage and hold the slide in place using the stage clips. Make sure you place the slide on the stage with the bottom of the "e" facing you. **DO NOT USE A CAPITAL "E."**

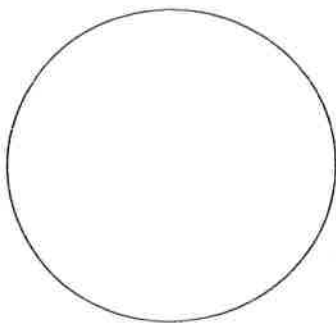
Start with the lowest (shortest) objective lens. Use the coarse adjustment to focus the "e." Use the fine adjustment to sharpen the image. Draw your field of view below and record the total magnification. **COLOR, label and draw neatly!** (10 points)



Slide: _____
 Power: _____
 Total Magnification: _____

Switch to either the medium or high power objective lens. Only use the fine adjustment to sharpen the image on this objective! Draw your field of view and record the total magnification. Again remember to **COLOR, label and draw neatly!** (10 points)

4.



Slide: _____
 Power: _____
 Total Magnification: _____

5. How is the letter "e" oriented in your field of view compared to how you actually see it on the stage of the microscope? (3 points)

6. Turn the objective lens back to the low power. Move your slide to the left while looking through the eyepiece. What direction does the image move? (3 points)

7. Once again on low power. Move your slide to the right while looking through the eyepiece. What direction does the image move? (3 points)

8. What happens when you move the slide up? What about when you move it down? (3 points)

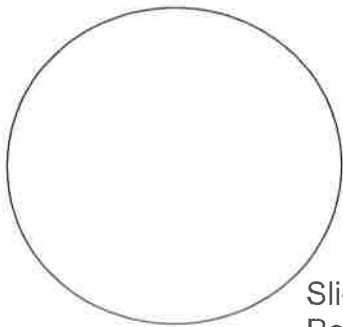
9. Suppose you were observing an organism through the microscope and noticed that its image moved toward the bottom of the slide and then it moved to the right. What does this tell you about the actual movement of the organism? (3 points)

10. When you change from low to high power objective lens, does your field of view (how much of the letter "e" you can see) increase or decrease? Explain. (3 points)

Part 3: Understanding the Depth of Field

Obtain the permanent thread slide, you will see three colors. Begin by viewing the threads under low power. Once the image is in focus, switch to the high power objective lens. Only use the fine adjustment on the objective. Draw the field of view below and record your total magnification. COLOR, label and draw neatly! (10 points)

11.



Slide: _____

Power: _____

Total Magnification: _____

12. Did you see all the threads in focus at the same time? Explain. (4 points)

