

Microscope Lab 1: Total Magnification and Field of View Observations

Safety



To avoid damaging a microscope, follow the rules that are stated in this lab and in your “How to Use a Microscope” guide.

Handle slides gently to avoid breaking them and cutting yourself. Alert your teacher if you break a glass object.

To avoid electrical shocks, make sure that cords, plugs, and your hands are dry when using the light source.

Use the scissors only as instructed. Do not direct the points of the scissors toward yourself or others.

Never touch a lens with your finger. Oils on your skin can attract dust that could scratch the lens. If a lens needs cleaned, obtain a clean piece of lens tissue.

Part A:

1. The magnification for an objective lens is etched on the side of the objective lens housing. Find the magnification for each objective lens and record this data in the table. (Often, there will be multiple sets of numbers. The one you want is the one with the first big number.)
2. Then find and record the magnification for the ocular lens. It will be listed on the eyepiece with an “X” after it.
3. Calculate the total magnification under each power. To do this, multiply the objective lens magnification by the ocular lens magnification. Record the results in data table 1.



Total magnification = (Magnification of the objective lens)(Magnification of the ocular lens)

ie:

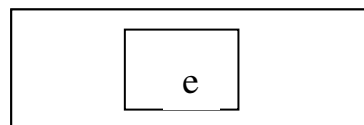
Total magnification = (Magnification of the objective lens)(Magnification of the ocular lens)

Total magnification = (60X)(20X)

Total magnification = 1200X

Data Table 1:

Our NF Microscope Magnification			
Objective	Magnification of Objective Lens	Magnification of Ocular Lens	Total Magnification
Scanning Power			
Low Power			
High Power			



Part B:

4. Prepare a wet mount slide of a **lowercase letter “e”** from a piece of newspaper. (Make sure it is normal font, not a title font.)
5. (Do not look into the microscope yet. This step is done with the naked eye.) Place the wet mount slide of the letter “e” onto your microscope stage in such a way that the “e” faces you as it would on a newspaper page.
6. Now look into your microscope’s eyepiece and observe the letter “e” on scanning power. (Use your microscope procedures to focus it.)

What is the position of the letter “e” when viewed under the microscope compared to its position on the stage?

7. Make a sketch of your specimen on a microscope sketch sheet.
8. Now view the letter “e” under low power, being sure to follow all microscope procedures.
9. While looking into the eyepiece, move the slide slowly from left to right, right to left, slowly toward you and then away from you.

In what direction does the letter “e” move in your field of view under the microscope?

10. How could you position specimen on the microscope stage so they are viewed correctly?

11. Make a sketch of your specimen on a microscope sketch sheet.
12. View the letter “e” under high power now. Again, being sure to follow all microscope procedures.

When you changed from low power to high power, the magnification of the letter was increased 4 times (100X to 400X.) How does this alter the area of the slide that is included in the high power field of view?

Why is it necessary to move the letter to the center of the field of view before changing to a higher powered objective lens?

13. Make a sketch of your specimen on a microscope sketch sheet.
14. Choose another lowercase letter (of your choice) to view and view it under all powers. (not c, l, o, s, x, or z)
15. Make a sketch of your specimen at each power on a microscope sketch sheet.

Part C:

16. Why are you allowed to use the coarse focus adjustment knob when you focus the scanning-power objective lens but not when you focus the low or high-power objective lens?

17. The adjective *compound* means “made by the combination of two or more parts.” In a compound microscope, which are the parts that are being combined, and why?

18. A microscope has a 20 X ocular lens and three objective lenses of 10 X, 25 X, and 43 X respectively. Calculate the low power magnification of this microscope.

Part D:

19. Make a formal microscope drawing (following all the rules) of the letter “e” under low power. Label ink, letter “e”, and paper fiber.