

USING THE MICROSCOPE

BACKGROUND INFORMATION:

In the life science laboratory, the microscope is used to examine organisms and objects that are too small to be seen with the unaided eye. In this course, the microscope is especially useful in examining cells.

However, before we can use the microscope to view cells, we must become more experienced in analyzing what we see when using the microscope. We need to understand the ideas of focusing, field of view, resolving power, and depth of view.

MATERIALS:

Microscope	Microscope slide
Scissors	Cover slip
Letter "e"	Plastic dropper
	Water

PROCEDURE:

PART A – MAKING A WET MOUNT SLIDE

- _____ 1. Cut out a lower case "e" from the paper provided. You should end up with a piece of paper about half the size of your little fingernail with the "e" in the center (or close to it).
- _____ 2. Place the paper in the center of a clean microscope slide in the normal reading position.
- _____ 3. Using the plastic dropper, carefully place a small drop of water over the letter without actually touching the paper. If adding the drop of water moved your "e", reposition the "e" so it is in the normal reading position in the center of your slide.
- _____ 4. Now cover the drop with a clean coverslip as shown in the diagram. Hold the coverslip at a 45° angle to the slide and move it toward the drop. As the water touches the edge of the coverslip, it will spread along the edge. Gently lower the coverslip into place.

(NOTE: Air bubbles can be confusing when looked at under the microscope. If your slide has too many bubbles, take off the coverslip and repeat steps 1-4.)

- _____ 5. Absorb excess water by touching a folded piece of paper towel to the water that comes out around the edges of the coverslip.
- _____ **6. On your record sheet, make a drawing of your slide as it appears WITHOUT THE MICROSCOPE.**
- _____ 7. Check your microscope to be sure the LOW POWER objective is clicked into place of the hole in the stage. **(ANSWER question #1 on your record sheet now.)**

PART B – FOCUSING

- _____ 8. Turn the coarse adjustment knobs so that the stage and objective are as close together as possible.
- _____ 9. Place your prepared slide onto the microscope stage. Move the slide to center the letter “e” over the hole in the stage. Use the stage clips to hold the stage in place.
- _____ 10. Look through the eye piece. Although it may be out of focus, you should be able to see the entire “e”. If you cannot see the “e”, you must move your slide until the “e” is centered inside the FIELD OF VIEW (circle of light) you see when looking through the microscope.
- _____ 11. While looking through the eyepiece, turn the coarse adjustment knobs (together in the same direction at the same time) until the “e” comes into focus.
- _____ **12. In the first “Field of View” circle on your record sheet, make a drawing of the letter “e” as seen through the scope. Be sure to label your field of view circle with the name of the object and the total magnification being used (eyepiece magnification X objective magnification).**
- _____ **13. Answer questions 2 and 3 now.**
- _____ 14. While looking through the microscope, move the slide to the left and note which way the “e” appears to move. Move the slide forward and note which way the “e” appears to move.
- _____ **15. Answer questions 4, 5, and 6 now.**
- _____ 16. Carefully turn the medium power objective into place. **(ANSWER question #7 on your record sheet now.)**
- _____ 17. Look through the eyepiece and use the coarse and fine adjustment knobs to focus the “e”.
- _____ **18. In the second circle on your record sheet, make a drawing of the letter “e” as seen through medium power. Be sure to label your field of view circle with the name of the object and the total magnification being used.**
- _____ 19. While still under medium power, move your slide so that a dark portion of the “e” is in the exact center of your slide.
- _____ 20. While looking from the side of the scope carefully move the high power objective into place. If it looks as if the objective will hit the slide, STOP and ask the teacher for help.
- _____ 21. Looking through the eyepiece, use the FINE adjustment knob to bring the “e” into focus. Turn the knob very slowly as the “e” will come into and out of focus very quickly and you might miss it.
- NEVER USE THE COARSE ADJUSTMENT KNOB WITH THE HIGH POWER OBJECTIVE.
 - NEVER TURN THE FINE ADJUSTMENT KNOB MORE THAN ONE FULL TURN IN EITHER DIRECTION.
 - **(ANSWER question #8 on your record sheet now.)**
- _____ **22. In the third circle on your record sheet, make a drawing of the letter “e” as seen through high power. Be sure to label your field of view circle with the name of the object and the total magnification being used.**
- _____ **23. Answer all remaining questions now.**

Name _____

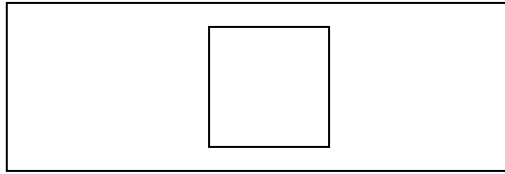
Date: _____

Period: _____

FOLLOW THE PROCEDURE CAREFULLY TO MAKE SURE YOU ANSWER THE QUESTIONS AND COMPLETE THE DRAWINGS BELOW IN ORDER. DO NOT USE THIS RECORD SHEET AS YOUR GUIDE – USE THE PROCEDURE! PLEASE : ^)

DRAWINGS

Without The Microscope:

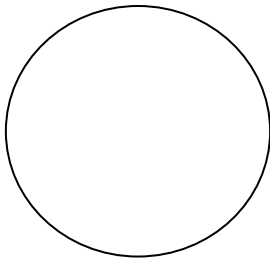


After you make your wet mount slide, draw the letter “e” as it looks WITHOUT the microscope

With the Microscope:

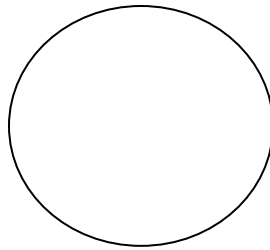
Field of View Circles

(Objects drawn below should be as **detailed** as seen through the eye piece)



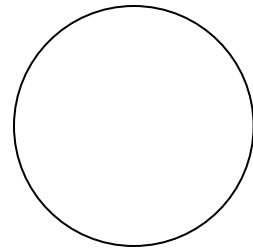
Specimen _____

Total Magnification _____



Specimen _____

Total Magnification _____



Specimen _____

Total Magnification _____

QUESTIONS:

1. a. What color is the ring on the low power objective? _____

b. What is the magnification of the low power objective by itself? _____

2. Which way do you turn the coarse adjustment knob to move the slide and objective away from each other – toward you or away from you?

3. Compare your drawings of the “e’ with and without the microscope. What happens to the position of the image when looking through the scope?

4. If you are looking through the scope, in what direction does the slide appear to move if you move the slide to the left?

5. In what direction does the slide appear to move when you move it forward?

6. If you were looking through the scope and an object appeared to be moving to the right, which way would it really be moving?

7. a. What color is the ring on the medium power objective? _____

b. What is the magnification of the medium power objective by itself? _____

8. a. What color is the ring on the high power objective? _____

b. What is the magnification of the high power objective by itself? _____

9. Can you see all of the letter "e" while observing it under high power? Why or why not?

10. What precautions must you take when using the high power objective?

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