

Microscope Lab

We have gone through the discussion of how to handle and care for the microscope and we have located key structures of the microscope. You and your partner are to be carefully paying attention while we learn and practice the use /function of the microscope.

PART I Let's learn how viewing under a microscope effects what we see...

YOU AND YOUR PARTNER MUST WORK TOGETHER FOR THIS PART!!! YOU WILL BOTH BE RESPONSIBLE FOR UNDERSTANDING THIS MATERIAL!!! You are **both responsible for observations**, so make sure both partners look at the specimen at each stage.

1. Remove the COVER from your microscope and arrange your MICROSCOPE so the back (the area of the ARM) is facing you.
2. If needed, carefully rotate the microscope so the EYEPIECE is pointed towards you for easy viewing.
3. Make sure the microscope is placed at least 8 inches from the edge of the desk.
4. Lower the STAGE using the COARSE FOCUS KNOB so it is in its lowest position. (Your microscope should already be set like this. Let Mrs. Averett know immediately if it is not)
5. Rotate the NOSEPIECE to center the LOW POWER OBJECTIVE LENS (the shortest objective lens) over the opening in the stage. (Your microscope should already be set like this. Let Mrs. Averett know immediately if it is not)
6. Plug in the microscope
7. Use the power switch to turn on the LIGHT SOURCE.
8. Prepare to select a SLIDE. When handling a slide always do so by holding the slide by the edges. This prevents fingerprints and smudges from getting on slides and interfering with the view of the specimen.
9. Select a slide of an "e" and set it on the STAGE making sure the specimen is centered over the opening in the stage and that the "e" is "right side up" when viewed **from the side of the microscope, not through the microscope – DO NOT LOOK THROUGH THE EYEPIECE YET**
10. Carefully anchor the SLIDE in place using the STAGE CLIPS.
11. Record on your OBSERVATION SHEET the name of your slide or specimen. (In this case you would write slide of letter "e")
12. While looking from the side of the microscope – NOT THROUGH THE EYEPIECE - use the coarse focus knob to raise the stage up as far as it will go. (Your stage should stop before hitting the objective lens. If the stage mechanism is broken please let Mrs. Averett know immediately)
13. While looking through the EYEPIECE, rotate the large COARSE FOCUS KNOB to get your specimen focused as clearly as possible.
14. Use the small FINE FOCUS KNOB to sharpen the image and make it as clear as possible
15. Draw what you see in the FIRST section of your lab OBSERVATION SHEET marked "e" drawings. Pay close attention to the difference in the way the "e" appears when viewed WITHOUT the microscope and how the "e" appears when viewed through the microscope! Answer 1.a on the Observation Sheet

16. At this time let's do an activity that will help us learn a little more about how a microscope effects what we see.
 - a. While looking through the microscope, push the slide away from you on the stage.
 - b. Continuing to look through the microscope, move the slide toward the left of the stage.
 - c. Record your observation about the movement of specimens under the microscope on your OBSERVATION SHEET in the section marked **Movement Observations.**
 - d. Re-center the "e" under the low power objective lens on the stage.
 - e. You may need to use the fine focus knob to sharpen the image.
17. To increase magnification, rotate the NOSEPIECE to center the next largest (MEDIUM) OBJECTIVE LENS over your specimen.
18. Use the FINE FOCUS KNOB **ONLY** to sharpen the image. **ONCE YOU HAVE A SPECIMEN FOCUSED USING THE COARSE FOCUS KNOB ONLY USE THE FINE FOCUS KNOB AS YOU INCREASE MAGNIFICATION!!!**
19. **Never** use the COARSE FOCUS KNOB with the medium and high power objective!!!
20. Record your observations by drawing what you see in the SECOND section of your lab OBSERVATION SHEET marked "e" drawings. Remember to record the TOTAL MAGNIFICATION being used while making your observations.
21. To increase magnification, rotate the NOSEPIECE to center the next largest (HIGH) OBJECTIVE LENS over your specimen.
22. Use the FINE FOCUS KNOB **ONLY** to sharpen the image. **ONCE YOU HAVE A SPECIMEN FOCUSED USING THE COARSE FOCUS KNOB ONLY USE THE FINE FOCUS KNOB AS YOU INCREASE MAGNIFICATION!!!**
23. Never use the COARSE FOCUS KNOB with the medium and high power objective!!!
24. Record your observations by drawing what you see in the THIRD section of your lab OBSERVATION SHEET marked "e" drawings. Remember to record the TOTAL MAGNIFICATION being used while making your observations.
25. At this time consider how the IMAGE of an object seen through the HIGH POWER OBJECTIVE LENS differs from the image of the same object seen through the LOW POWER OBJECTIVE LENS. Record observations about the amount of detail, size and field of vision on your OBSERVATION SHEET in the sections marked **1.b and Image Observations.**
26. **When you are finished viewing this specimen, rotate the NOSEPIECE so the LOW power objective lens is centered over the stage**
27. **Lower the stage to its lowest position. (This is how microscopes should always be configured when switching slides or putting the scopes away)**
28. Carefully remove the slide and return it to the correct position on the correct SLIDE TRAY.

PART II

YOU AND YOUR PARTNER MUST WORK TOGETHER FOR THIS PART!!! YOU WILL BOTH BE RESPONSIBLE FOR UNDERSTANDING THIS MATERIAL!!! You are **both responsible for observations**, so make sure both partners look at the specimen at each stage.

We are now going to practice focusing at different depths by using a prepared slide of three crossed strands of colored thread. The strands (one red, one yellow, and one blue) cross at the same point. Determine which is on top, which is in the middle, and which is on the bottom.

1. Using the COARSE FOCUS KNOB, make sure the STAGE so it is as low as it will go.
2. Check to make sure the LOW POWER OBJECTIVE LENS is centered over the stage. If it is not rotate the NOSEPIECE to center the LOW POWER OBJECTIVE LENS (the shortest objective lens) over the opening in the stage.
3. Prepare to select a slide. When handling a slide always do so by holding the slide by the edges. This prevents fingerprints and smudges from getting on slides and interfering with the view of the specimen.
4. Select a prepared slide of colored threads and set it on the STAGE making sure the specimen is centered over the opening in the stage. Carefully anchor it in place using the STAGE CLIPS.
5. Record on your OBSERVATION SHEET the name of your slide or specimen.
6. While looking from the side of the microscope – NOT THROUGH THE EYEPIECE - use the coarse focus knob to raise the stage up as far as it will go without running into the low power objective lens.
7. While looking through the EYEPIECE, rotate the large COARSE FOCUS KNOB to get your specimen focused as clearly as possible.
8. Use the small FINE FOCUS KNOB to sharpen the image and make it as clear as possible. At this point you will need to try and focus on each of the three different colored threads. You will not be able to get all 3 in focus at the same time. Practice focusing at different depths.
9. To increase magnification, rotate the NOSEPIECE to center the next largest (MEDIUM) OBJECTIVE LENS over your specimen.
10. Use the FINE FOCUS KNOB **ONLY** to sharpen the image. **ONCE YOU HAVE A SPECIMEN FOCUSED USING THE COARSE FOCUS KNOB ONLY USE THE FINE FOCUS KNOB AS YOU INCREASE MAGNIFICATION!!!** At this point try again to focus on each of the three different colored threads. You will not be able to get all 3 in focus at the same time. Practice focusing at different depths.
11. **Never** use the COARSE FOCUS KNOB with the medium and high power objective!!!
12. To increase magnification, rotate the NOSEPIECE to center the next largest (HIGH) OBJECTIVE LENS over your specimen.
13. Use the FINE FOCUS KNOB **ONLY** to sharpen the image. **ONCE YOU HAVE A SPECIMEN FOCUSED USING THE COARSE FOCUS KNOB ONLY USE THE FINE FOCUS KNOB AS YOU INCREASE MAGNIFICATION!!!** At this point try again to focus on each of the three different colored threads. You will not be able to get all 3 in focus at the same time. Practice focusing at different depths.
14. Never use the COARSE FOCUS KNOB with the medium and high power objective!!!
15. At this time consider which magnification provides the best view of your specimen.

16. Record your observations and answer the questions in the **Focusing at Different Depths** section of your lab report.
17. **When you are finished viewing this specimen, rotate the NOSEPIECE so the LOW power objective lens is centered over the stage**
18. **Lower the stage to its lowest position. (This is how microscopes should always be configured when switching slides or putting the scopes away)**
19. Carefully remove the slide and return it to the correct position on the correct SLIDE TRAY.

PART III If you have time you and your partner may select or create more slides to view under the microscope. Be sure to follow all the correct steps and procedures and record your observations by drawing what you see in the section of your lab OBSERVATION SHEET marked Slide Drawings. Remember to record the name of the slide or specimen and the total magnification being used while making your observations.

Select a slide....

1. Using the COARSE FOCUS KNOB, make sure the STAGE so it is as low as it will go.
2. Check to make sure the LOW POWER OBJECTIVE LENS is centered over the stage. If it is not rotate the NOSEPIECE to center the LOW POWER OBJECTIVE LENS (the shortest objective lens) over the opening in the stage.
3. Select a slide and set it on the STAGE making sure the specimen is centered over the opening in the stage. Carefully anchor it in place using the STAGE CLIPS.
4. Record on your OBSERVATION SHEET the name of your slide and specimen.
5. While looking through the EYEPIECE, rotate the large COARSE FOCUS KNOB to get your specimen focused as clearly as possible.
6. Use the small FINE FOCUS KNOB to sharpen the image and make it as clear as possible.
7. To increase magnification, rotate the NOSEPIECE to center the next largest (MEDIUM) OBJECTIVE LENS over your specimen.
8. Use the FINE FOCUS KNOB **ONLY** to sharpen the image. **ONCE YOU HAVE A SPECIMEN FOCUSED USING THE COARSE FOCUS KNOB ONLY USE THE FINE FOCUS KNOB AS YOU INCREASE MAGNIFICATION!!!**
9. **Never** use the COARSE FOCUS KNOB with the medium and high power objective!!!
10. Consider which magnification provides the best view of your specimen.
11. Using the best magnification for your specimen, record your observations by drawing what you see in the FIRST section of your lab OBSERVATION SHEET marked Slide Drawings. Remember to record the TOTAL MAGNIFICATION being used while making your observations.
12. **When you are finished viewing this specimen, rotate the NOSEPIECE so the LOW power objective lens is centered over the stage**
13. **Lower the stage to its lowest position. (This is how microscopes should always be configured when switching slides or putting the scopes away)**
14. Carefully remove the slide and return it to the correct position on the correct SLIDE TRAY.

CLEAN UP

1. When you are finished with lab and before you leave class you must clean up your area.
2. Please close down the microscope by making sure the stage is lowered and the low power objective is in place.
3. Turn off the light source and unplug and coil up the power cord.
4. Place the cover securely over the microscope.

Hand in your Microscope Lab Observation Sheet

HOMEWORK

1. Complete all questions on your QUESTION AND ANSWER SHEET.

