

Microscope Lab #1

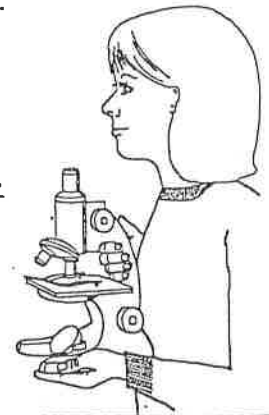
Figure 1.

Materials:

Light microscope
Magazine page
Slide
Coverslips
Lens paper

Thread
Eyedropper
Cork shavings
Scissors

Always
carry microscope
like this!

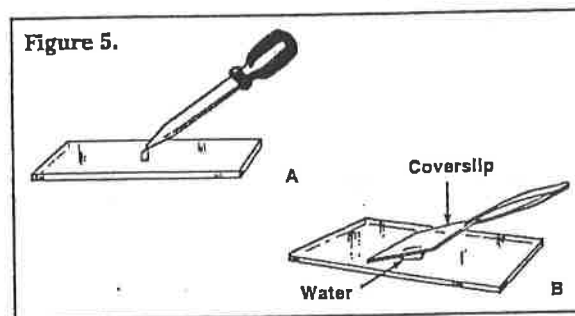


Part A: Using the Microscope

1. The objective and eyepiece lenses should be cleaned with lens paper at the beginning of each laboratory period. Use one piece of lens paper and gently wipe each lens.
2. Plug in the microscope and turn on the lamp. Remember, some outlets do not work, so please try some others if the lamp does not turn on the first time.
3. Turn and click the low-power objective so that it is directly over the stage opening. An objective is in proper viewing position when it is directly over the stage opening. Most microscopes will "click" when the objective is in place.
4. Look through the eyepiece of the microscope. A circle of bright light should now be visible.
5. Adjust the diaphragm under the stage to make the circle of light as bright as possible.
6. Look at the side of the microscope. Slowly turn the coarse adjustment toward you until it stops. Then turn away from you until it stops. Answer #1 in Analysis.

Part B: Preparation of a Temporary Wet Mount

1. Cut out a lowercase letter "e" from regular magazine text.
2. Add a small drop of water to a slide as shown in Figure 5A, below.
3. Place the "e" in the water drop.
4. Touching only the edges of the coverslip, like you would a CD, position the coverslip as shown in Figure 5B, below.
5. Lower the edge of the coverslip down slowly over the water drop and "e". This procedure will prevent the trapping of air under the coverslip.



Part C: Positioning an Object Under the Microscope

1. Click the low-power objective into viewing position. Always locate an object on low-power magnification first!
2. Place the wet mount of the "e" on the stage so that the "e" is upright, as if to be read.
3. Looking at the side of the microscope as shown in Figure 4, above, lower the low-power objective by turning the coarse adjustment until the objective almost touches the glass slide. Never lower the objective while looking through the eyepiece.
4. While looking through the eyepiece, move the slide until you can see the "e".
5. While looking through the eyepiece, turn the coarse adjustment so the objective rises until the "e" comes into focus.

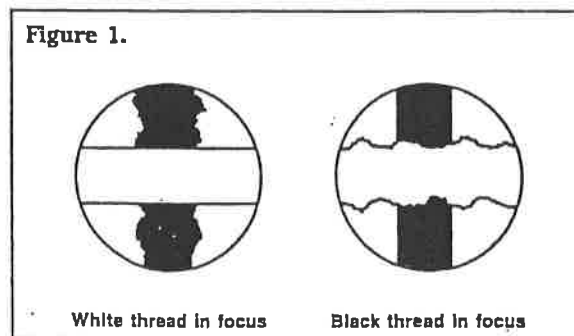
- Continue focusing, if necessary, with the fine adjustment. Answer #2 in Analysis.
- Draw the "e" in the microscope field provided in Data and Observations. Label it with what it is and the TOTAL magnification.
- While looking through the eyepiece, move the slide slowly to the right. Answer #3 in Analysis.
- While looking through the eyepiece, move the slide slowly toward you. Answer #4 in Analysis.

Part D: Increasing the Magnification of the Microscope

- Throw away coverslip and "e", and dry off your slide. Reuse the slide for this section.
- Make a new wet mount with cork shavings.
- Any object to be viewed under high-power magnification is always located first under lower power and focused. Find the cork shavings under low power, like you did when finding the "e". Make certain one is centered in the microscope field, and focus on it.
- Draw the cork shavings in the microscope field provided in Data and Observations. Label the drawing with what it is and the total magnification.
- Change to the middle power objective and observe the cork shavings. You may need to recenter the shavings and refocus with the fine adjustment.
- Draw the cork shavings in the microscope field provided in Data and Observations. Label the drawing with what it is and the total magnification.
- Change to the highest power objective and observe the cork shavings. You may need to recenter the shavings and refocus with the fine adjustment.
- Draw the cork shavings in the microscope field provided in Data and Observations. Label the drawing with what it is and the total magnification.

Part E: Depth of Field

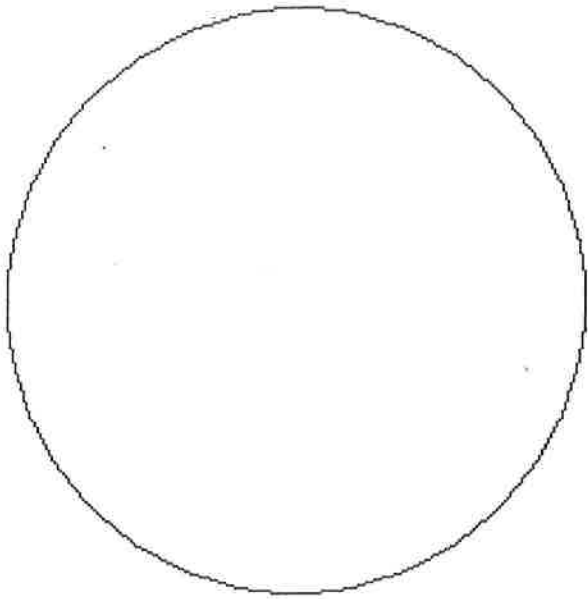
- Throw away coverslip and cork shavings, and dry off your slide. Reuse the slide for this section.
- Cut short lengths of black and white thread.
- Make a new wet mount, crossing the threads with white on top of black, as shown in Figure 1, below.
- Locate the strands under low power. Center the slide so you are looking at the point where the strands cross. Answer #5 in Analysis.
- Change to the highest power objective and observe both strands where they cross. Answer #6 and #7 in Analysis.
- Using the fine adjustment, focus on each thread separately.



Part F: Clean-up

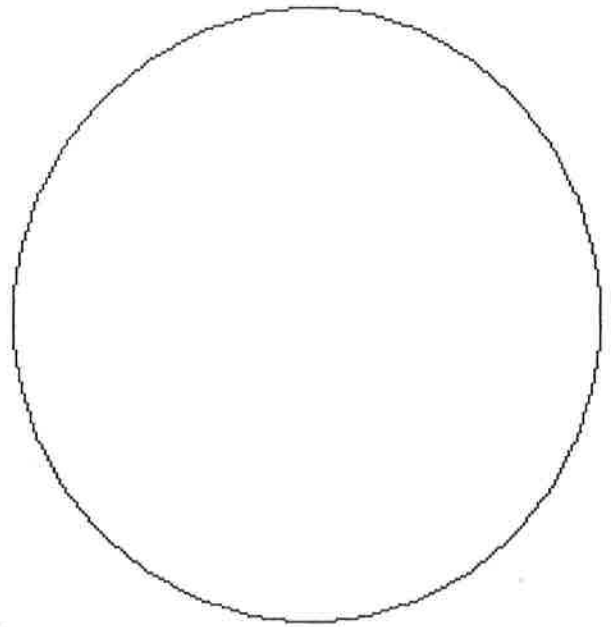
- Slides and coverslips are to be thrown away.
- Microscopes are to be covered and placed on the counter top under the shelves for use next class.
- Eyedroppers are to be returned.

Data and Observations:



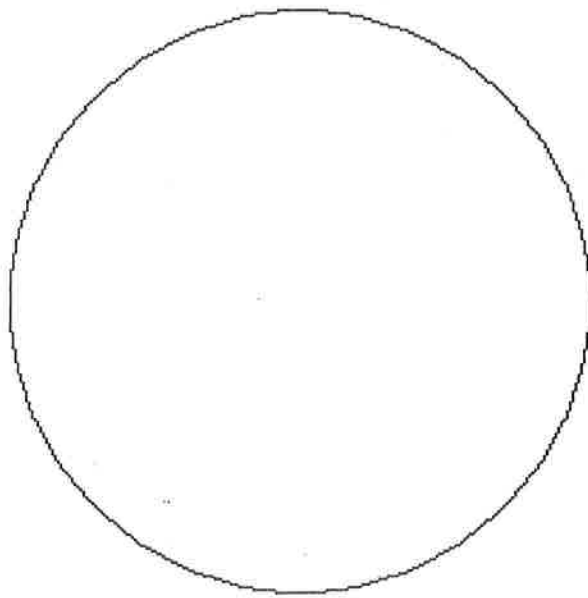
Item:

Total magnification:



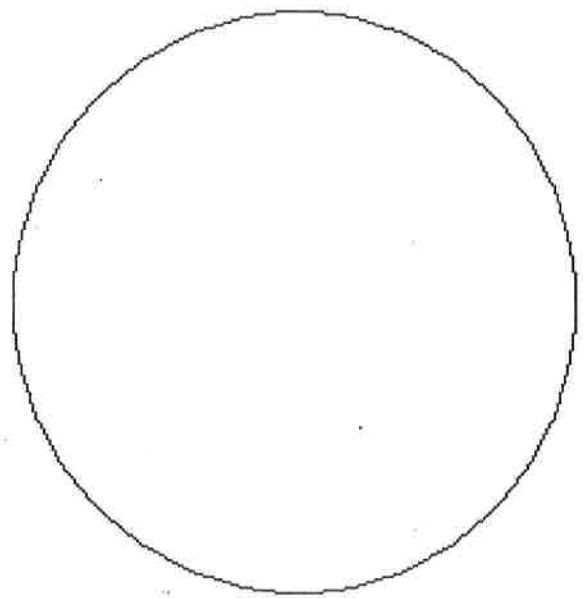
Item:

Total magnification:



Item:

Total magnification:



Item:

Total magnification:

Analysis:

1. In what direction does the objective move when you turn the adjustment wheel towards you? _____
In what direction does the objective move when you turn the adjustment wheel away from you? _____
2. How does the orientation of the "e" viewed through the eyepiece compare with its orientation on the stage?

3. In what direction does the "e" move as seen through the microscope when the slide moves right?

4. In what direction does the "e" move as seen through the microscope when the slide moves toward you?

5. Can both strands be observed clearly at the same time under low power? _____
6. Can both strands be observed clearly at the same time under high power? _____
7. As you change the fine focus away from the strands, which comes into focus first – the top or the bottom?

8. What should be done to the lenses before you use the microscope at the start of any lab day using it?

9. Why do you need to look at the microscope from the side when turning the coarse adjustment?

10. How should microscopes be stored?

11. How do you calculate the total magnification of a microscope?

12. Why do you place one hand under the base of the microscope as you carry it?

13. Why should a microscope slide and coverslip be handled by their edges?

14. Why must a specimen that is to be viewed under a microscope be sliced very thin?
