

Name \_\_\_\_\_ Class Period \_\_\_\_\_  
Lab Partner's Name \_\_\_\_\_ Date \_\_\_\_\_

## Microscope Lab #3

### Part A: Use of the Diaphragm

- Prepare a wet mount slide ( See page 1041 of textbook for reference) of a few strands of absorbent cotton.
- Observe the cotton fibers with low power. While looking through the microscope, change the amount of light entering the microscope by adjusting the diaphragm.

1. Under what diaphragm setting (maximum, medium, or little light) are the cotton fibers sharpest? \_\_\_\_\_

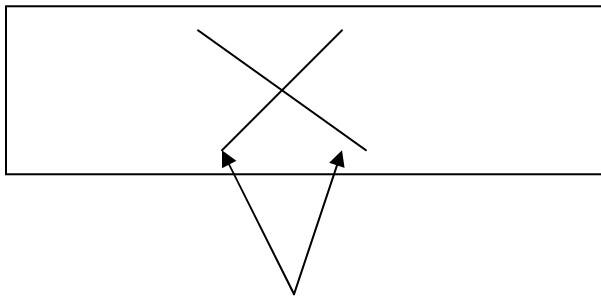
- Change to high power and observe the cotton fibers. Again readjust the amount of light entering the microscope.

2. Under what diaphragm setting (maximum, medium, or little light) are the cotton fibers now the sharpest? \_\_\_\_\_

All objects viewed under the microscope will require readjustment of light. Many problems associated with microscopic observation can be overcome by adjusting the diaphragm for proper lighting.

### Part B: Depth of Field

- Get a tread slide.



Threads (There will be three treads)

- Locate the strands under low power. Center the slide so you are looking at the point where the strands cross. Adjust the diaphragm for proper lighting.

3. Can all the strands be observed clearly at the same time under low power?

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- Change to high power and observe both strands where they cross.

4. Can all strands be observed clearly at the same time under high power?

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5. Explain why it is impossible to observe objects clearly at different depths at the same time? \_\_\_\_\_

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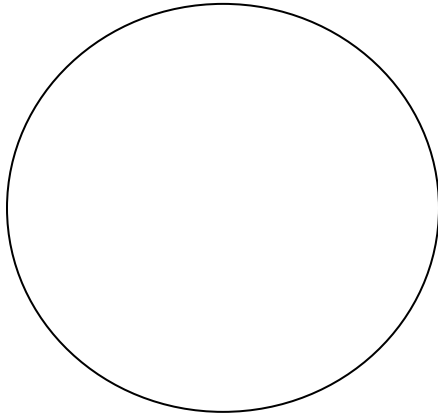
- Turning the fine adjustment back and forth by a quarter of a turn while looking through the microscope under high power will give a three-dimensional view of the object. Try this technique while looking at the crossed threads. Note that first one strand is in focus and then the other.

### **Part C: Stains as an Aid to Microscope Work**

Many objects observed with a microscope are colorless. Thus, they appear almost transparent and are difficult to see. Stains often are used in microscope work to darken objects for easier observation. Stains can be added to a wet mount without disturbing the slide.

- With a razor blade gently scrape the edge of an exposed section of potato. DO NOT scrape the skin.
- Add a drop of water to a glass slide, Mix the potato scrapings with the water.
- Add a cover slip.
- View the wet mount with low power. You are looking at starch grains.
- Sketch what is seen in the field of view in the circle below.

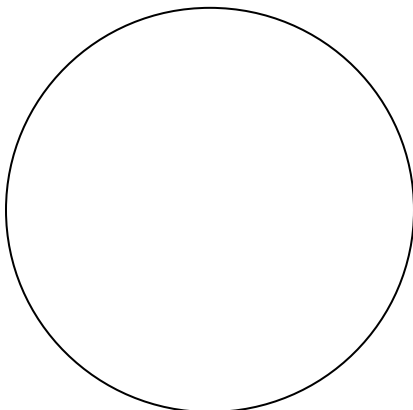
- Record the power the field is seen on.



Unstained Grains

Power= \_\_\_\_\_

- Remove the slide from the microscope.
- Add a drop of iodine solution along one edge of the cover slip. Do not get any iodine on top of the cover slip.
- Place a piece of tissue paper along the edge of the cover slip opposite the iodine solution. Allow the tissue paper to touch the water of the wet mount. Water will soak into the tissue paper. This will draw the iodine stain under the cover slip and into contact with the starch grains.
- Observe the stained grains with low power.
- Sketch what is seen in the field of view in the circle below.
- Record the power the field is seen on.



## Stained Grains

Power= \_\_\_\_\_

6. Briefly describe the value of staining objects to be observed under a microscope.

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### Part D: A Comparison of Fields of View

Field of view is the area seen through a microscope. Is the field of view with low power greater than with high power, or are they the same? This exercise will help you answer the question.

- Examine the stained starch grains with low power.
- Move the slide to a less crowded area of starch grains. This is usually near the outer edge of the cover slip.

7. Count and record the number of grains observed under low power. \_\_\_\_\_

8. Count and record the number of grains observed under high power. \_\_\_\_\_

9. How do the number of grains observed under low power compare to the number under high power? \_\_\_\_\_

When using low power, the total area of your field of view is greater than when using high power.

How much greater this area can be observed by using the number on your objectives. For example, if low power is 10X and high power is 40X, divide 40 by 10. The answer is 4. This means that the area observed under low power is four times as large as the area observed under high.

10. Calculate the number of times greater low power is than high power for your microscope. \_\_\_\_\_

Don't confuse the total area observed with total magnification. As magnification increases, total area observed decreases.

11. Did you observe more or fewer starch grains under low power as compared to high power? \_\_\_\_\_

12. Did you observe more or less area under low power as compared to high power? \_\_\_\_\_

13. Your answer to questions 10 and 12 should show about four times more starch grains viewed under low power as compared to high power. Explain why.

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## **Analysis**

*Answer the following questions as true or false.*

\_\_\_\_\_ 1. Objects viewed under the microscope appear upside down.

\_\_\_\_\_ 2. When moving the slide toward the left, objects viewed through the microscope will move toward the left.

\_\_\_\_\_ 3. The diaphragm is used to adjust light entering the microscope.

\_\_\_\_\_ 4. All objects in different depths will appear in focus at the same time while using high power.

\_\_\_\_\_ 5. Stains are used to help make clear objects appear lighter under the microscope.

\_\_\_\_\_ 6. Low power shows more area than high power.

\_\_\_\_\_ 7. High power shows more detail than low power.

\_\_\_\_\_ 8. Observers see about 10 times more area under low power than under high power.