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Experiment: Parts and Use of The Compound Light Microscope (B. Science 10-1-4c)

Purpose: To learn the parts of the microscope, how to properly use the microscope, and to prepare a wet mount.

Materials: microscope lens paper
slide cover glass medicine dropper
clean cloth water paper towel
newspaper dissecting needle

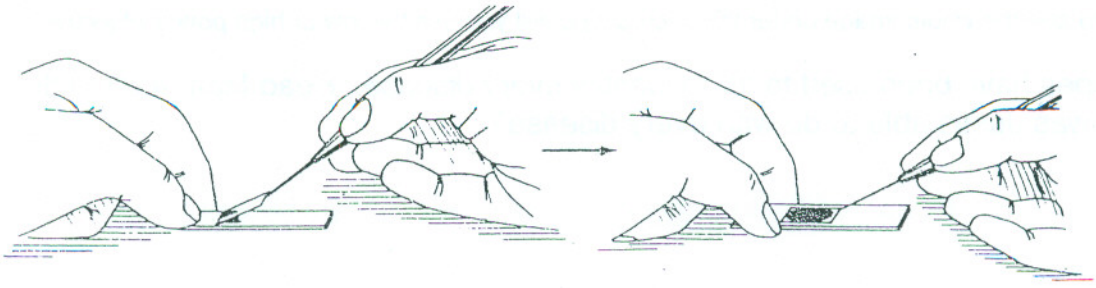
Methods: (Label the figure with the words that are printed in bold as you proceed through the lab.)

Part A: Parts of the Microscope

1. Place the **base** of the microscope five centimeters from the edge of the table, and have the **arm** of the microscope facing you.
2. Use paper towel to wipe off the **stage** of the microscope. The stage is where the slide to be viewed is placed. *Do not use a clothe or paper towel to wipe the lenses.*
3. Locate the **mirror** of the microscope. Wipe it with the paper towel. Turn the mirror so that the curved surface is facing a good light source, such as a microscope lamp, ceiling fixture, or daylight. Some microscope have their own light source, so the mirror is not needed. *Never use direct sunlight as a source of light, it could be harmful to the eyes.*
4. The **eyepiece** is the lens at the top of the microscope. The **objective lenses** are located on a revolving nose piece at the bottom of the microscope tube. *Use only special lens paper to clean the lenses.*
5. Locate the **high - power** and **low - power** objectives. The low - power objective is shorter than the high - power objective. Also the low - power objective will have a lower magnification marked on it.
6. Turn the low - power objective until it is directly over the opening of the stage. Record the magnification of the lowest - power lens, the eyepiece, and then the total magnification.
7. Do the same as number six but with the highest - power magnification.
8. Locate the **diaphragm** of your microscope. The diaphragm regulates the amount of light passing through the specimen. Record the type of diaphragm does your microscope has (iris or disc).
9. Open the diaphragm or turn the disk to the largest opening so that the greatest amount of light is admitted. Now you are ready to look through the eyepiece. It is easier to use if both eyes are open. Record what you see through the eyepiece.
10. The **course adjustment** is to get things roughly in focus and then the **fine adjustment** is to get things precisely in focus. Record the differences that you observed between the two.
11. Be prepared for a 5 pt. oral quiz on the parts of the microscope or on how to use the microscope.

Part B: Wet mount observation

1. Rinse a microscope slide with water and wipe both sides with a clean soft cloth. Hold the slide by the edges.
2. Rinse and dry a cover glass as you did the slide.
3. Cut out a small piece of newsprint which contains a lower case "e".
4. Using a medicine dropper, place a drop of tap water in the center of the slide, then place the newsprint in the drop of water.
5. Lower the cover glass as shown in the figure. This will prevent the formation of air bubbles.
6. Place the wet mount on the stage of the microscope an position it so that the letter "e" is facing you as you would read it. Clip it into place on the stage.
7. Using the coarse adjustment, raise the stage to the low- power objective as far as it will go without hitting the slide. Be sure to watch the bottom lens as you do this. Never raise the stage while looking through the eyepiece. Why should this not be done?



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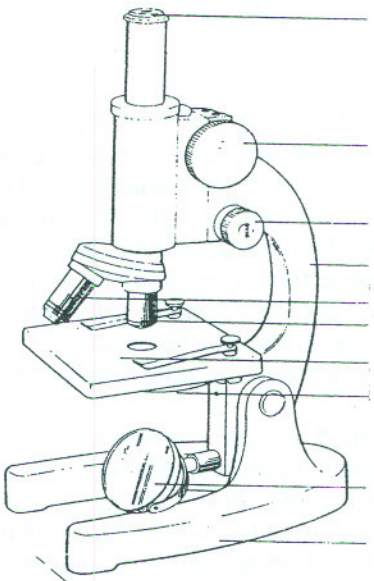
8. Look through the eyepiece. Adjust the low - power objective by turning the coarse adjustment toward you. The letter "e" will soon come into view. Sharp focus can be achieved by using the fine adjustment. If you are having difficulty seeing the "e" clearly, check the positions of the low - power objective and slide. Describe the position of the "e" to the real image.
9. Draw a picture of what you see under the microscope in the first circle provided. Record the magnification
10. Record what happens if you move the slide to the right.
11. Record what happens if you push the slide away from you.
12. Move the "e" into the exact center of the low - low power field. Focus and turn the higher - power objective (yellow) into position. Use the fine adjustment to correct the sharpness of the focus. Record your observations of the "e" and the total magnification of the high - power lens beside the second circle.
13. Record the change of area of the slide included in the high- power field.

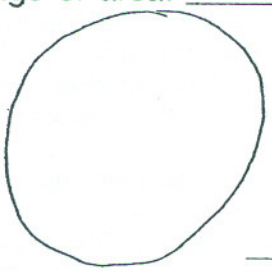
Results: **Part A: Parts of the Microscope**

Low power magnification _____ x
Eyepiece magnification _____ x
Total power of low magnification _____ x
High power magnification _____ x
Eyepiece magnification _____ x
Total power of high magnification _____ x
Type of diaphragm _____
Eyepiece observation _____
Coarse _____ Fine _____

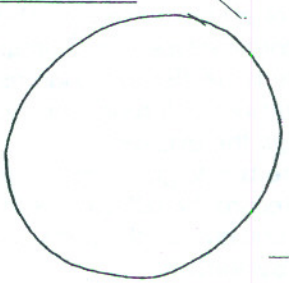


Part B: Wet mount observation

7. Why never to raise the stage: _____
8. Position of the "e": _____
10. Moving the slide to the right: _____
11. Moving the slide away from you: _____
13. Change of area: _____



____ x



____ x

Conclusions:

1. What is the difference between the low - powered and high - powered objectives?
   low powered - high - powered -
2. If you cannot see light through the eyepiece what two things could you do to correct this?
   a. b.
3. What should you use to clean the body of the microscope?
4. What should you use to clean the lenses of the microscope?
5. Why should you hold the microscope slides by the edges?
6. Why do you place one edge of the cover glass on the wet mount then drop the other end as shown in the diagram for methods Part B#5.
7. About how many times was the magnification increased when you changed from low power to high power?

Discussion:

1. If you want to see the whole image under the microscope will you use the low or high power objective? Why?
2. Microscopes have been used to try to identify every disease. Read Matt. 4:23, 9:35, 10:1. What was Jesus able to do with every disease?