

Title: Using the microscopeMaterials and Methods:

per lab group: one microscope, a sheet of newspaper, a pair of scissors, a water dropper bottle with water in it, blank microscope slides, one prepared slide of any type, cover slips, paper towels, sink, toothpick, a dropper bottle filled with methylene blue (can be ordered from various scientific catalogs)

Part A: Drawing of the e.

1. Determine the magnifying power of each of your objectives by multiplying the power of the eyepiece times the power of the objective. Fill in the chart accordingly. If there is no magnification stamped on the eyepiece assume that it is 10X.

power	magnification of objective	times	magnification of eyepiece (assume 10X if no number is stamped on the ocular)	equals	overall magnification
low	(3 points)	X	(1 point)	=	(4 points)
medium	(3 points)	X	(1 point)	=	(4 points)
high	(3 points)	X	(1 point)	=	(4 points)

2. Cut a lowercase e out of the sheet of newspaper. You will make a wet mount of the lowercase e. Place it in the center of the slide and put a drop of water on it. Carefully place a cover slip over the e and the water. With the low-power objective in place, position the slide under the stage clips so that the e is right side up when you look down on it from above *without* looking through the ocular.
3. Focus in on the e. Be sure to center the e in the field of view; you may need to move the slide around so that the e is directly underneath your line of vision under the ocular. Always start looking at your specimen on the lowest power. To focus turn the coarse focus, the large knob until you can see the image better. The coarse focus actually moves the ocular and the stage closer together. Be careful not to make them so close together that you break the slide. After you have used the coarse focus, turn the fine focus knob, the smaller knob, to focus in some more. If you cannot see the e, you may need to move the slide around some more to ensure the e is directly underneath your line of vision under the ocular.

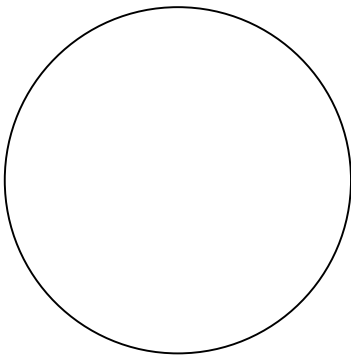
4. While looking through the microscope, move the slide away from you, and note which way the letter appears to move when seen through the ocular.

As you look down through the ocular, and move the e away from you, the e actually appears to move towards you or away from you? _____the e will appear to move towards you____(5 points)

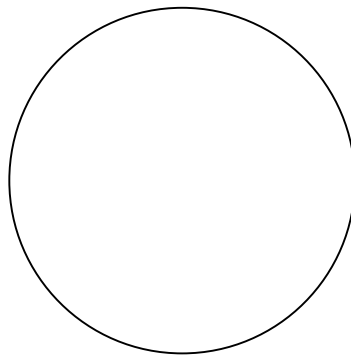
Draw what you see under the microscope when you are viewing the e under low power.

5. Switch to medium power and go through the same focusing process as before. Draw what you see under the microscope when you are viewing the e under medium power. Switch to high power and go through the same focusing process as before. Draw what you see under the microscope when you are viewing the e under high power.

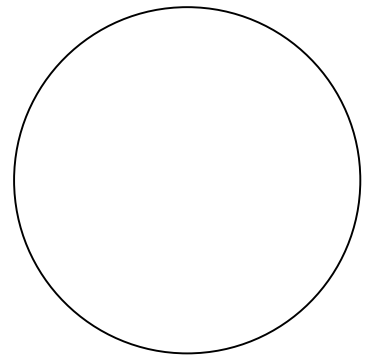
low (5 points)



medium (5 points)



high (5 points)



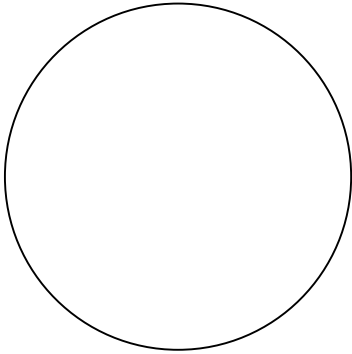
6. Remove the slide from the stage and clean and dry the slide and cover slip to use again.

Part B. Viewing a prepared slide.

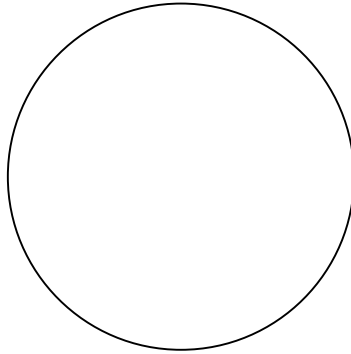
1. You will find a prepared slide at your station. These are slides that are pre-made and can be ordered from catalogs. There should be a little label that tells you what specimen is on the slide. Put the slide on the stage and focus in on it. Remember to use low power first. Draw what you see under the microscope when you are viewing the slide under low, medium, and high powers. Use colored pencils to make your drawing more accurate.

My prepared slide is a slide of _____(5 points).

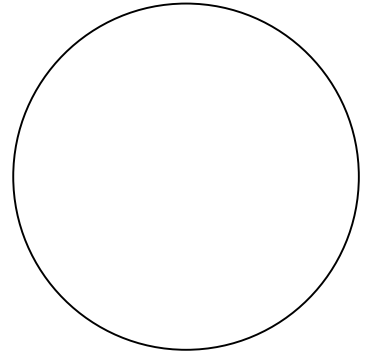
low (5 points)



medium (5 points)



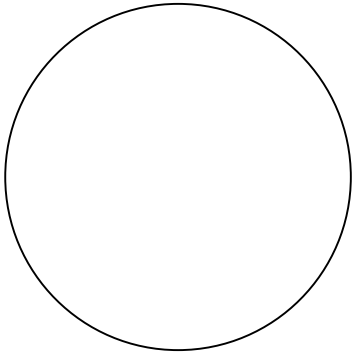
high (5 points)



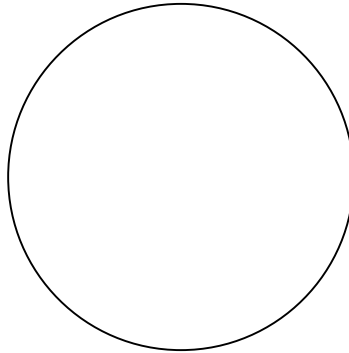
Part C. Observing a cheek cell.

1. Place a drop of water in the center of a clean slide.
2. With the blunt end of a toothpick, carefully scrape the inner lining of your cheek. The end of the toothpick will have several cheek cells stuck to it even though you can't see anything.
3. Swirl the end of the toothpick in the drop of water you put on the slide. Throw the toothpick away. Put a cover slip over the cheek cells and water.
4. Put a drop of methylene blue on the slide, to the left of the cover slip.
5. Put a paper towel up next to the cover slip on the right side to help draw the stain under the cover slip.
6. Focus and observe the cells under low, medium, and high powers. Draw what you observe under each of the powers.

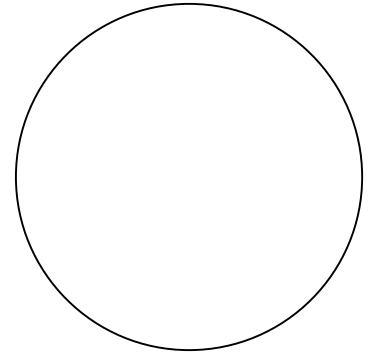
low (5 points)



medium (5 points)



high (5 points)



When you are done, clean up your station. Return your microscope to low power. Return your materials to the way you found them or follow your teacher's instructions. (10 points)

Participation: 11 points

Standards addressed:

6 and 7. I. Inquiry

A. Abilities Necessary to do Scientific Inquiry

2. Design and conduct a scientific investigation.

c. Obtain scientific information from a variety of sources (such as Internet, electronic encyclopedias, journals, community resources, etc.).

g. Organize data in tables and graphs.

3. Use appropriate tools and techniques to gather, analyze, and interpret data.

a. Select and use appropriate tools and technology (such as calculators, computers, probes, thermometers, balances, spring scales, microscopes, binoculars, and hand lenses) to perform tests, collect data, and display data.

4. Develop descriptions, explanations, predictions, and models using evidence.

b. Construct and/or use models to carry out/support scientific investigations.

7. Communicate scientific procedures and explanations.

a. Use drawings and written and oral expression to communicate information.

b. Create drawings, diagrams, charts, tables and graphs to communicate data.

d. Create and/or use scientific models to communicate information.

8. Use mathematics in all aspects of scientific inquiry.

a. Use mathematics to gather, organize and present data.

C/D. Understandings about Science and Technology

2. Many different people in different cultures have made and continue to make contributions to science and technology.

a. Describe examples of contributions people have made to science and technology.

3. Science and technology are reciprocal.

a. Explain how science and technology are essential to each other.

8. These standards are the same as the above with the following added:

8.I. Inquiry

B. Understandings about Scientific Inquiry

1. Different kinds of questions suggest different kinds of scientific investigations.
 - a. Relate how the kind of question being asked directs the type of investigation conducted (e.g., observing and describing, collecting, experimenting, surveying, inventing, and making models.)
3. Mathematics is important in all aspects of scientific inquiry.
4. Compare and contrast the quality of data collected with and without technological devices.
 - a. Compare and contrast the quality of data collected with and without technological devices.