

Name _____

Date: _____

Biology

Cell Lab - Plants, Animals (Eukaryotic Cells), and Bacteria (Prokaryotic Cells)

Cell Theory states that all living organisms are made of cells. With the invention of microscopes scientists were able to discover this unifying characteristic of all life. Although cells are the building blocks of all living organisms and share some common characteristics, different types of organisms have different types of cells. In this lab, you will be examining and comparing plant, animal, and bacterial cells.

Part A: Plant Cells: Elodea Cells

1. Make a wet mount of a single Elodea leaf on a microscope slide. Make sure you pick a newer, green leaf to view.
2. Use the low power objective to focus. Observe under low power in the microscope and scan the slide. Once you find a good specimen of cells then turn to medium power and observe further.
3. Once you think you have located a cell, switch to high power and refocus. (Remember, do **NOT** use the coarse adjustment knob at this point)
4. Make a nice, clear drawing of the cells in the space below and label any identifiable structures. Be sure to find the **cell wall**, **cell membrane**, **cytoplasm**, **chloroplasts**, and **central vacuole**. Use a colored pencil to complete your drawing.
5. Now focus on one or two cells and watch the cells carefully to see if you see movement within the cells.

<u>Size Estimate:</u> (Remember, the medium power field of view is 1500µm, the high power field of view is 500µm.)	<u>Magnification:</u>

Part B: Animal Cells: Human Cheek Cells

1. Put 1 drop of water and 1 drop of methylene blue on a slide. **Caution:** methylene blue will stain clothes & skin.
2. Gently scrape the inside of your cheek with the flat side of a toothpick.
3. Stir the end of the toothpick in the stain and throw the toothpick away.
4. Place a coverslip onto the slide by dropping it at an angle of 45 degrees.
5. Use the low power objective to focus. You probably will not see the cells structures well at this power.

6. Switch to medium power. Cells should be visible, but they will be small and look like nearly clear purple/blue blobs with a dark spot in the center. If you are looking at something dark dark purple, it is probably not a cell. Make sure cells are centered in the field of view at this point.
7. Once you think you have located a cell, switch to high power and refocus. (Remember, do NOT use the coarse adjustment knob at this point)
8. Make a nice, clear drawing of the cells in the space below and label any identifiable structures. Be sure to find the cell membrane, cytoplasm, and nucleus. Use a colored pencil to complete you drawing.
9. Discard your cheek cell slide in the appropriate container according to the teacher.

<u>Size Estimate:</u> (Remember, the medium power field of view is 1500 μ m, the high power field of view is 500 μ m.)	<u>Magnification:</u>

Part D: Bacteria Cells

1. Make a nice, clear drawing of a bacterial cell in the space below and label any identifiable structures. Try to find the **cell wall**, **cell membrane**, and **cytoplasm**.
2. List the type of bacteria you are drawing: _____

<u>Size:</u> Remember, prokaryotic cells are very simple and very small. They are much, much smaller than eukaryotic cells. Typical bacterial cells are 1-5 μ m in diameter. Eukaryotic cells are typically 10-100 μ m in diameter.

Summary Questions

1. Look back at your drawings and size estimations and complete the chart below:

CELL	ESTIMATED SIZE
Animal (Cheek Cell)	
Plant (Elodea)	
Bacteria _____)	

2. What cell structures or organelles were visible in the plant and animal cells?
3. The light microscope used in the lab is not powerful enough to view other organelles. List and describe the function of two more cell structures that must be in the plant and animal cells even if you could not see them.

<u>Plant:</u>	<u>Animal:</u>
1.	1.
2.	2.
4. What stain did you use to better see the animal cell?
5. Which cells are eukaryotic and which cells are prokaryotic? How do you know?
6. Is the animal cell in the shape of a perfect geometrical circle? Why or why not?
7. Describe how the green plant cell is different than the cheek cell in at least 2 ways.
8. Do you see any type of movement when you view the green plant cells? If yes, what is moving in the cells? Why?
9. Can you see chloroplasts? If yes, where are they located and why?
10. Do plant cells have a cell membrane? If yes, where is the cell membrane of a plant cell?

11. What shape were the bacteria cells?

12. Compare the size of the bacteria cells to the plant and animal cells.

13. Why didn't you see any organelles in the bacterial cells?

14. You are given an unknown cell to identify as plant, animal, or bacteria cell. In a paragraph, describe how you would be able to use a compound microscope to identify what type of cell it is.

15. Neatly draw a generalized **plant cell**. Label the organelles.

16. Neatly draw a generalized **animal cell**. Label the organelles.