

Name _____
 The Living Environment – Microscopy Lab #5

Date _____
 Period _____

Microscopy Lab #5 – Animal Cells Vs. Plant Cells

INTRODUCTION:

The work of Matthias Schleiden and Theodor Schwann was instrumental in the development of the cell theory. Their work helped prove that all living things were made of cells. Today, with the help of instruments such as the compound light microscope and the electron microscope, organelles that lie within plant and animal cells are more visible. They both have structures in common with each other, but they do, however, have distinct differences. In this laboratory investigation, you will make observations of the similarities and differences between plant and animal cells, the basic units of structure and function in all living things.

OBJECTIVES:

To compare and contrast plant and animal cells.

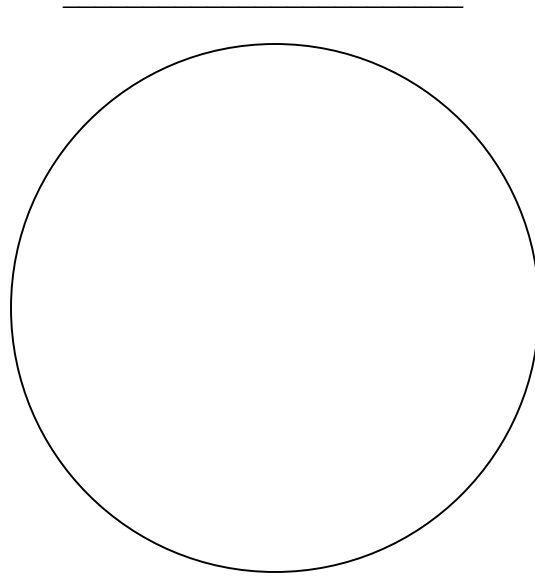
MATERIALS:

Compound light microscope	Lugol's iodine solution	Methylene blue
Glass slide	Cover slip	Pipette
Elodea leaf	Forceps	Water
Toothpick	Onion	

PROCEDURE AND OBSERVATIONS:

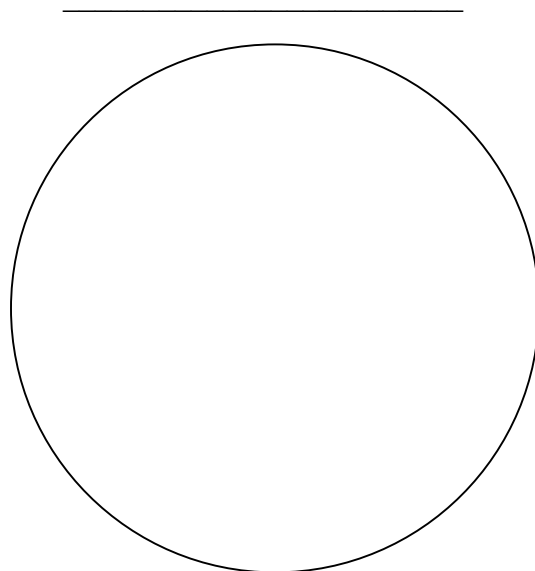
Part A – ANIMAL CELLS (Human Cheek Cells)

1. Take a clean slide and place a drop of water on that slide.
2. Gently scrape the inside of your cheek with a clean toothpick to obtain epithelial (skin) cells that line the inside of your cheek.
3. Stir the material from the toothpick in the drop of water on your slide. Add one drop of Methylene blue stain on the slide and stir again. Place a cover slip on the slide.
4. Examine the slide under LOW POWER. Find cells that are separated from each other.
5. Switch to HIGH POWER and examine these cells.
6. Diagram TWO cells under HIGH POWER in the space on the following page. Be sure to include *title, total magnification*, and label the following structures: *nucleus, cytoplasm*, and the *cell membrane*.



PART B – PLANT CELLS (Elodea Cells)

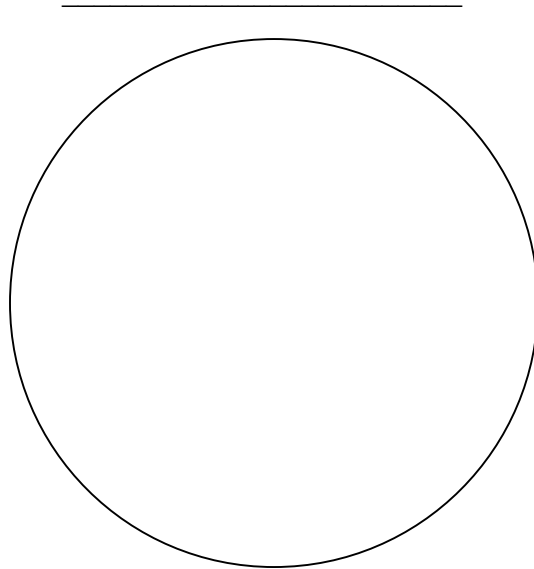
1. Break off a small leaf near the tip of an elodea plant. These leaves are thinner, allowing more light to pass through them.
2. Prepare a wet mount of the elodea leaf on a clean slide.
3. Examine the leaf under LOW POWER.
4. Warm the slide under a bright lamp or by sandwiching the slide between the palms of your hand.
5. Observe the slide under LOW POWER again. Look carefully at the elodea cells. You may observe cyclosis (the streaming of the cytoplasm). This will be evident because the chloroplasts will be slowly circulating the perimeter of the cell.
6. Remove the cover slip and place a drop of Lugol's iodine solution on the elodea leaf and replace the cover slip.
7. Observe the elodea cells under LOW POWER and then switch to HIGH POWER. Diagram a few cells in the space below. Be sure to include ***title, total magnification***, and label the following structures: ***cell wall, cell membrane, chloroplasts***, and ***nucleus***.



PART C – PLANT CELLS (Onion Cells)

1. Obtain a small piece of onion epidermis from your teacher and make a wet mount.
2. Examine the wet mount under LOW POWER and then switch to HIGH POWER.
3. Adjust the diaphragm to provide the best contrast.

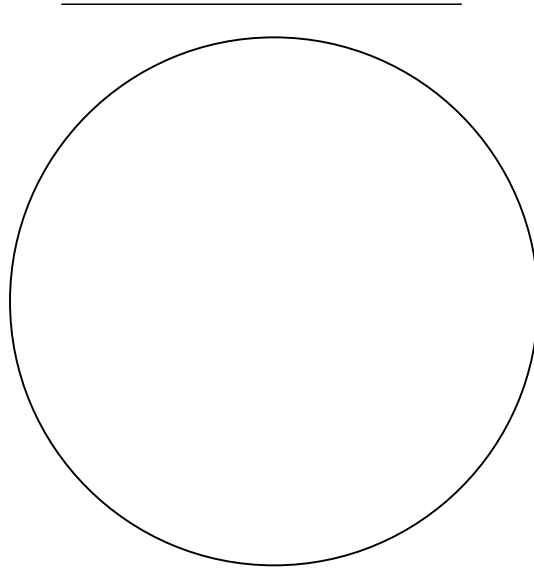
- Are the shapes of the onion cells similar to that elodea cells? _____
 - What organelles are visible? _____
4. Draw several onion cells under high power. Be sure to include ***title, total magnification*** and ***label the structures that you see.***



5. Add a drop of Lugol's iodine solution to one side of the cover slip.
6. Take a piece of paper towel and touch it to the opposite edge of the cover slip. This will draw the iodine across the onion cells. If more stain is needed, repeat the procedure.
7. Observe the slide under LOW POWER and then switch to HIGH POWER.

- Can you see more organelles after staining the specimen? _____
- What structures can you see NOW that you were unable to see before staining? _____
- _____

8. Draw several cells in the space below under HIGH POWER. Be sure to include *title*, *total magnification*, and *label all the organelles you observed*.



CONCLUSIONS:

1. What structures, do the human epithelial cells have in common with the elodea and onion cells?

2. How do human epithelial cells differ from elodea cells and onion cells?

3. What organelles are very visible in elodea cells but not easily seen in onion cells? What reason can you propose for this observation?

4. What benefit does staining a cell offer? What negative effect do you think staining has on the cell?
