

Name: _____ Period: _____ Seat #: _____ Date: _____

LAB: Comparing & Contrasting Cells

Objective: The purpose of this lab is to identify the similarities and differences between cell types including prokaryote/eukaryote and animal/plant. (Indiana State Academic Standards: Biology, 1.1, 1.2, 1.5, & 1.12)

Instructions: Follow each step of the procedure below, label the diagrams, and complete the analysis questions.

Background: Since the introduction of the first microscope, biologists have been interested in studying the cellular structure of all living things. After hundreds of years of observation, the cell theory was developed. The cell theory states that the cells is the structural and functional unit of living things. Cells contain structures called organelles that carry out the processes required for life. Cells can be classified by the organelles they contain. In plant and animal cells, similarities and differences exist because of the varied functions of life.

Materials:

Compound Light Microscope	Slides	Cover slips	Toothpicks
Forceps	Methylene Blue	Water w/ Dropper	Elodea Leaf
Prepared Slides (Paramecium, Bacteria)			

Procedure:

Part I: Human Cheek Cells

1. Using the flat end of a clean toothpick, gently scrape the inside of your cheek. (CAUTION: Do not use force when scraping your cheek. Only a few cells are needed. Then end of the toothpick will have several cells stuck to it even though you may see nothing but a drop of saliva.)
2. Gently smear the slide with the used end of the toothpick. (**Dispose of the toothpick in the designated receptacle.**)
3. Place a small drop of Methylene blue stain on top of the drop of water containing the cheek cells and smear with the end of the toothpick. CAUTION: Use care in using Methylene blue to avoid staining your skin or cloths.
4. Wait for 1 minute, then rinse the stain off by holding the slide indirectly under running tap water. Then blot the slide dry. Do NOT wipe over the stained area. If you hold the slide up to the light, you should see faint blue stains. This is the area where the cheek cells will be visible. Get the slide in focus under high power.
5. Make a sketch of ONE cell under HIGH POWER and label the following structures in the space labeled "Diagram 1: Human Cheek Cell": **cell membrane, cytoplasm, nucleus, and nuclear membrane.**

Part II: Plant Cells

1. Clean your slide and coverslip. Place a drop of water in the center of your slide.
2. Using your forceps, gently remove a very small part of an elodea leaf and place it on the water on your slide.
3. Place a cover slip at a 45° angle over the specimen and get it in focus under HIGH POWER.
4. Make a sketch of ONE cell and label the following structures in the space labeled "Diagram 2: Elodea Leaf Cell": **cell wall, cell membrane, cytoplasm, chloroplast, nucleus, and nuclear membrane.**

Part III: Protist and Bacterial Cells

1. Obtain a prepared slide of *Paramecium caudate* and get it under focus under HIGH POWER.
2. Make a sketch of ONE cell and label the following structures in the space labeled "Diagram 3: Paramecium Cell": **cell wall, cell membrane, cytoplasm, nucleus, and nuclear membrane.**
3. Obtain a prepared slide of *Bacteria Spear (3 Types)* and get it under focus under HIGH POWER.
4. Make a sketch of ONE cell and label the following structures in the space labeled "Diagram 4: Bacteria Cell": **cell membrane and cytoplasm.**
5. Clean up lab station, return all supplies to the correct place and complete the analysis questions.

Data:

Diagram 1: Human Cheek Cell

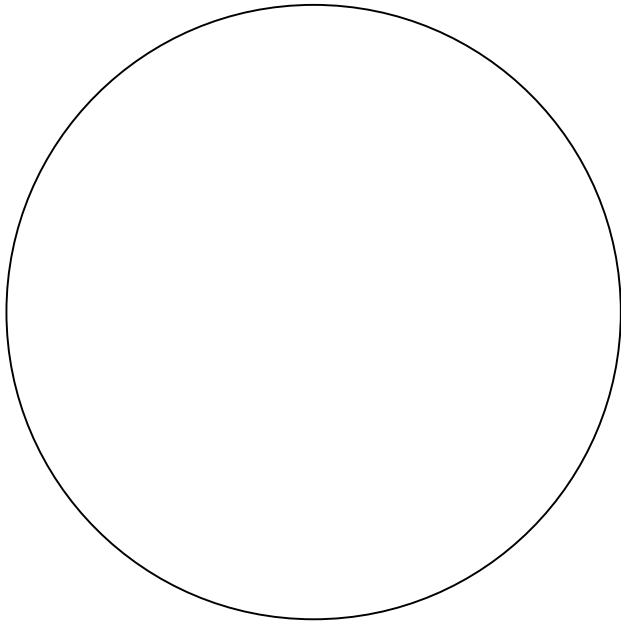


Diagram 2: Elodea Leaf

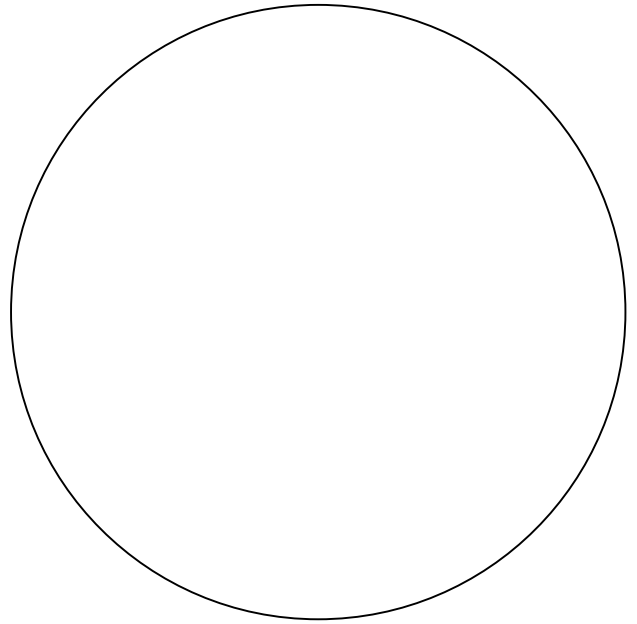


Diagram 3: Paramecium Cell

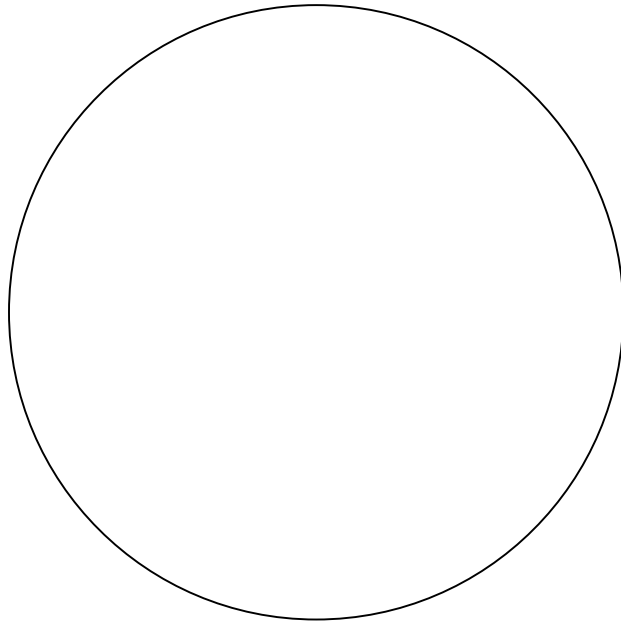
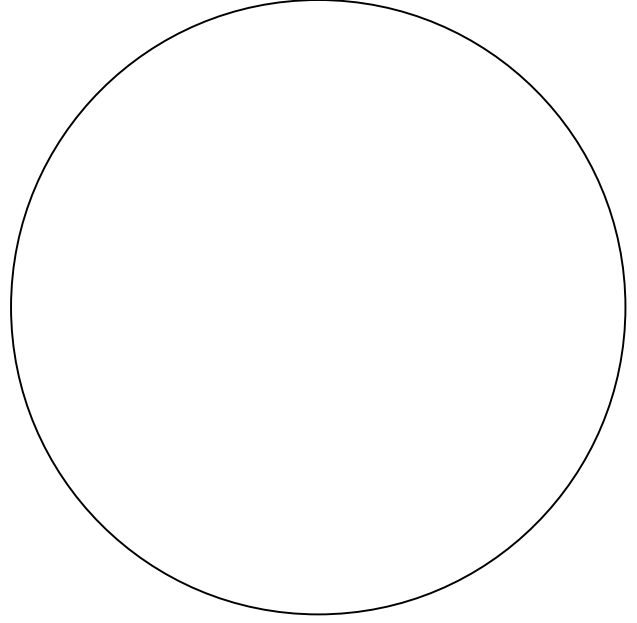


Diagram 4: Bacteria Smear



Analysis: (Complete sentences are required.)

1. List 3 structures that the human cheek cell (animal cell) and the plant and protist cells had in common.
2. Plant, animal, and protist cells are eukaryotic. What are the similarities and differences between those cells and prokaryotic (bacterial) cells?
3. What type of organelle, typically in green plant cells, was not present in the other cells? What is the function of that organelle?
4. Using what you know about the differences between animal and plant cells, explain why a dog feels different than a tree.
5. Complete the chart by placing a "X" in the box to show which type cells can contain the following structures.

Observed Structure	Prokaryotic Cells	Plant Cells (Eukaryotic)	Animal Cells (Eukaryotic)
Cell Membrane			
Cell Wall			
Nucleus			
Cytoplasm			
Chloroplasts			
Vacuoles			
Nuclear Membrane			
Mitochondria			

6. In one paragraph, describe what organelle is most like you and why. (No less than 6 sentences.)