

Name: _____ Period: _____

Date: _____

Comparing Cells Investigation (7.LS.1, 7.LS.5)

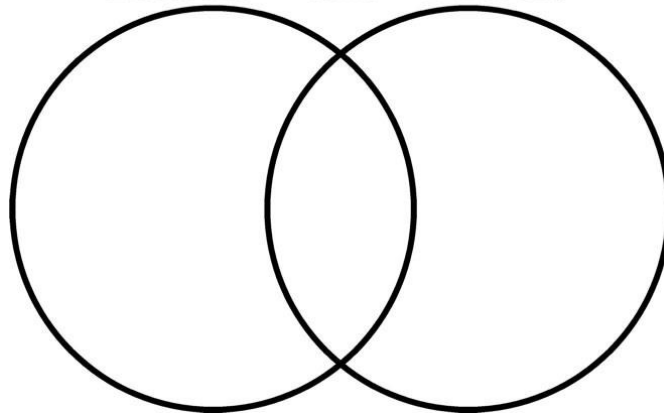


Warm-Up:

1. Why is it important to use the lowest power (magnification) objective to locate cells on the slide first?
2. What would happen if you started on the highest power (magnification) first?
3. Fill out the Venn diagram below with what you already know about plant and animal cells.

VENN DIAGRAM

Different **Same** **Different**



Vocabulary:

- organelle
- chloroplast
- cell wall

(continue on next page →)

□ vacuole

□ nucleus

~~~~~  
Focus Question:

How do human cheek (animal) cells and onion or Elodea (plant) cells compare and contrast?

~~~~~

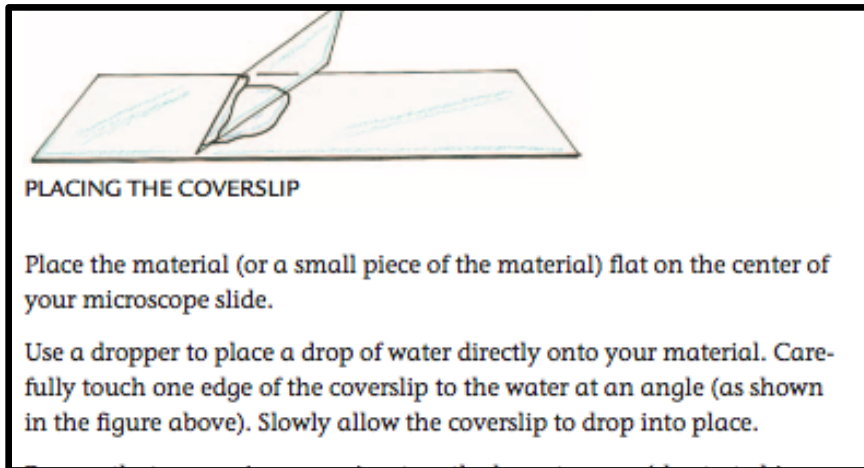
Materials:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> toothpicks | <input checked="" type="checkbox"/> razor blade | <input checked="" type="checkbox"/> Elodea sample |
| <input checked="" type="checkbox"/> slides | <input checked="" type="checkbox"/> forceps (scientific tweezers) | <input checked="" type="checkbox"/> onion sample |
| <input checked="" type="checkbox"/> coverslips | <input checked="" type="checkbox"/> Human Cheek Cell card (optional) | <input checked="" type="checkbox"/> pipets |
| <input checked="" type="checkbox"/> paper towels | | <input checked="" type="checkbox"/> crystal violet stain |
| <input checked="" type="checkbox"/> microscope | | <input checked="" type="checkbox"/> Lugols solution |

Procedure:

NOTE

If any of these cells or materials to obtain these cells are not available, use the Internet to search for images of these cells prepared as slides.



(continue on next page →)

Procedure For: Observing Elodea Leaf Cells

1. Remove a leaf from near the growing tip of an Elodea plant. The leaf should be bright green, not dark green in color.
2. Place the leaf in a drop of water on a clean slide. Add a coverslip.
3. Examine the preparation under low and high magnification. Observe the large, green chloroplasts and other structures within the plant cell.
4. Record your observations (draw or insert image into data table).
5. You may notice movement inside some of the Elodea cells. This movement is called "cytoplasmic streaming." Observe the cytoplasmic streaming under high magnification. (Or use the Internet to find videos of this event taking place)
6. Clean the slide and coverslip with soap and water.

Procedure For: Observing Onion Skin Cells



1. With forceps, peel a thin strip of onion skin from the inner, **concave** surface of an onion section.
2. Place one drop of water on a clean slide. Place the onion skin flat in the drop of water. Make sure it doesn't overlap itself.
3. Cover the onion skin preparation with a coverslip.
4. Locate the onion cells on low power magnification.
5. Switch to a higher power magnification and observe the visible structures of the onion cells.
6. Record your observations (draw or insert image into data table).
7. Remove the coverslip. Blot away any excess water on the slide and coverslip with a paper towel.
8. Place one drop of **crystal violet stain** on the onion skin. ***CAUTION* Crystal violet stain will stain your hands and clothing!**
9. Wait one minute. This will allow the stain to soak into the onion cells.
10. Rinse the slide with water. Be careful not to wash the cell sample off of the slide.
11. Add one drop of water to the sample and replace the coverslip.
12. Examine the slide again under low and high power magnification. You may see tiny droplets of oil within the cytoplasm. The oil is an energy reserve for the onion cell.
13. Add to your observations (draw or insert image into data table).
14. Clean the slide and coverslip with soap and water.

Procedure For: Observing Human Cheek (epithelial) Cells

1. Obtain a CLEAN toothpick, a clean slide, and a coverslip.
2. Gently wipe the toothpick across the inside of your cheek. Do not poke the toothpick into your cheek. **NOTE:** Because cells are microscopic, you may not see anything on the toothpick.
3. Place a drop of water on the slide and swirl the toothpick in the water to remove any epithelial cells.
4. Add one drop of **crystal violet stain** to the smear on the slide and cover it with a coverslip.
5. Observe the slide under low power magnification until you locate epithelial cells. Due to the method of preparation, many cells will be separated, folded, overlapped, and/or deformed.
6. Once you have found the cells, switch to high power and observe the cells more closely.
7. **Record your observations (draw or insert image into data table).**
8. The outer layer of the cell is the cell membrane, a thin, flexible barrier that is too thin to be visible with your microscope. You will see only the boundary between the cell and its exterior. Locate this boundary in the cells under the microscope.
9. Clean the slide and coverslip with soap and water

*Data and Observations on next page...

Data and Observations:

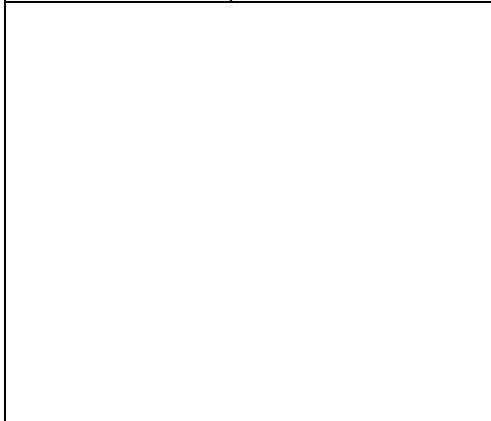
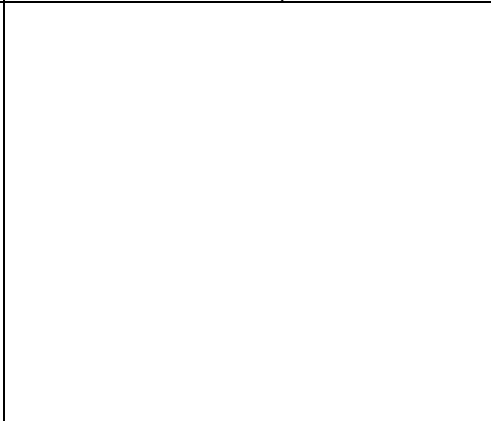
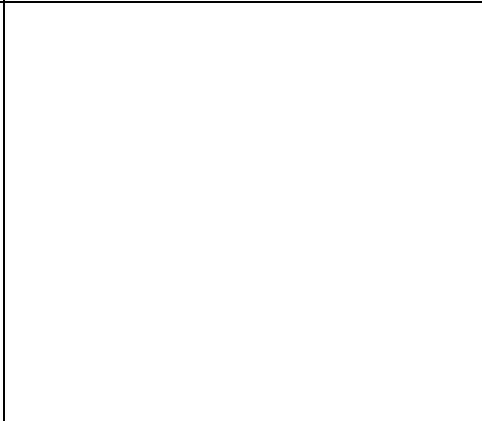
Part A:

Draw (or insert an image you take through the microscope) what you see. If drawing on PAPER, review Act. 35 A License to Learn Part B, "Microscopy Drawing Made Easy."

Make sure to be:

- a. neat
- b. detailed
- c. accurate
- d. colorful

REMEMBER You will be staining these cells in order to see their parts easier. Even if you know that a cell really isn't that color, still include the color that you stained it since that is exactly what you are observing.

Elodea Cells (plant)	Onion Skin Cells (plant)	Human Cheek Cells (animal)
 Power: _____	 Power: _____	 Power: _____

Part B:

Use your drawings/images, the text, and the Internet to determine what organelles are found in each cell type observed. Mark as a "yes" or a "no."

ORGANELLE/PART	ELODEA (plant)	ONION SKIN (plant)	CHEEK (animal)
cytoplasm			
nucleus			
chloroplasts			
cell wall			
cell membrane			
vacuole			

Name: _____ Period: _____ Date: _____

Comparing Cells: Analysis and Conclusion

1. How did the cells look before and after staining? (How did the staining the cells affect how you see them?) Explain the purpose of the stain.
2. Contrast the SHAPES of the plant and animal cells you observed.
3. Do plant and animal cells have the same organelles? YES NO (circle one)
4. (Use RACE.) Explain which organelles are similar and which are different between plant and animal cells. Support your answer with evidence you collected from this lab.
5. Is there evidence you collected from this lab that prove humans are multi-cellular organisms? Explain.