

Lab: Comparing Plant and Animal Cells

BIOLOGY

I. PURPOSE:

1. Use staining techniques to identify some of the basic structures found in animal and plant cells.
2. Describe the similarities and differences between plant and animal cells.

II. MATERIALS:

- Microscope, slides
- cover slips
- toothpicks
- onion
- potato
- elodea
- iodine stain
- methylene blue stain

III. PROCEDURE & IV. DATA:

PART I ONION CELLS

Prepare a wet mount slide of a thin skin of onion cells and add one drop of iodine.

Observe the cells under low, medium and high power.

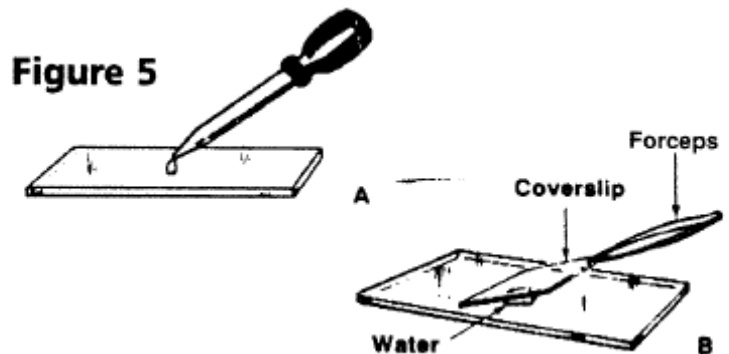
1. Do the cells appear to have **cell walls**?

2. Where is the **cell membrane** located in relation to the **cell walls**?

3. If materials are able to go in and out of cells, why are the holes in the cell not visible?

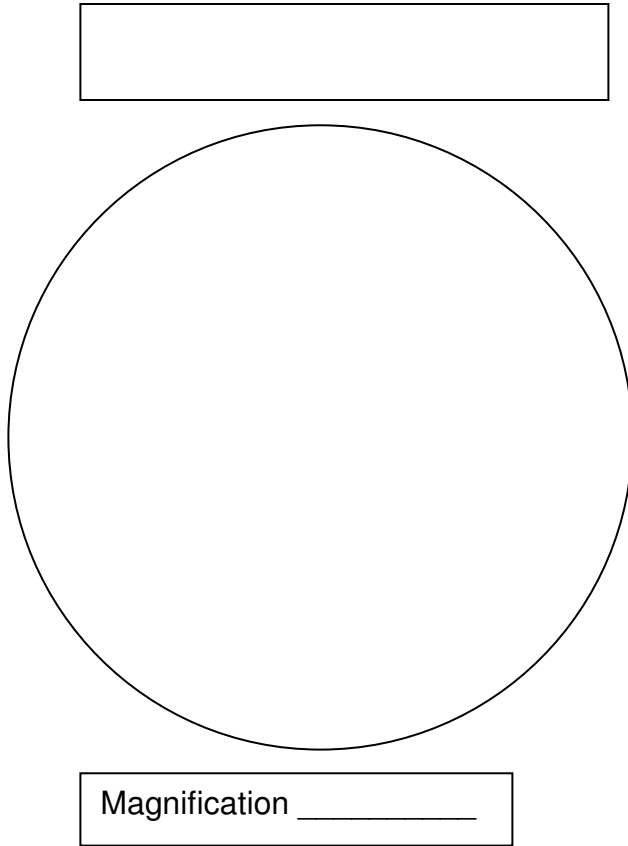
4. Describe the **nucleus** in most of your cells.

5. What structures are found in the **nucleus** of a cell? (Some you may not see at this time)



6. What is a ***vacuole*** and why are they so much larger in plant cells than animal cells?

7. **Draw three large connected onion cells under high power and label:** cell wall, cell membrane, nucleus, cytoplasm, and vacuole



PART II ELODEA CELLS

Prepare a wet mount slide of a single elodea leaf. Add a drop of iodine to assist in finding the nucleus. Observe under low and high power.

8. What are all the green structures that you see?

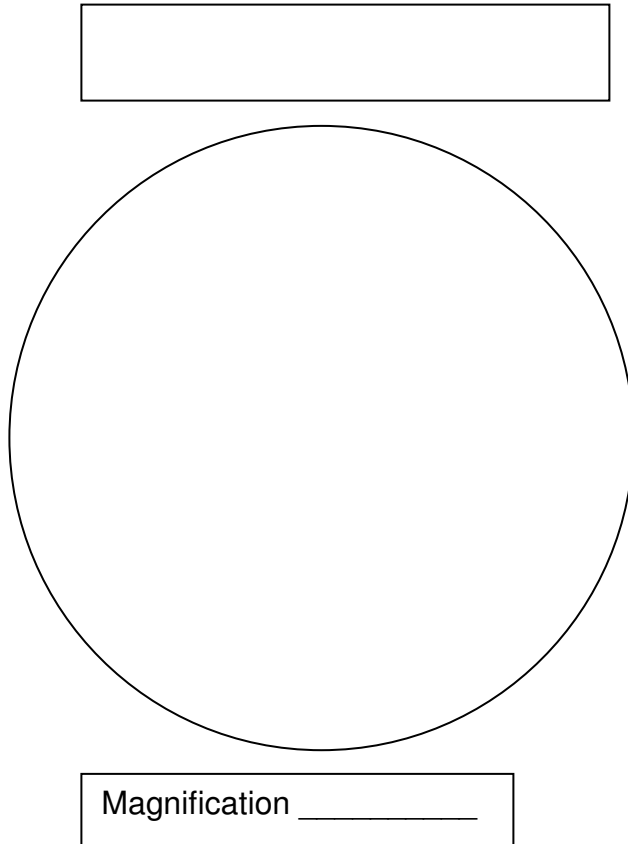
9. What process takes place in these green structures?

10. Do ***animal cells*** have these green structures?

11. Is it possible to see any ***nuclei*** in any cells? If you cannot see nuclei in most or any of the cells, why do you think this is so?

12. What do you think is causing many of the **chloroplasts** and nuclei to appear around the edges of the cell? Think about the structures in plant cells.

13. **Draw 3 connected elodea cells under high power and label:** cell wall, cell membrane, chloroplasts, cytoplasm and nucleus



PART III HUMAN CHEEK CELLS

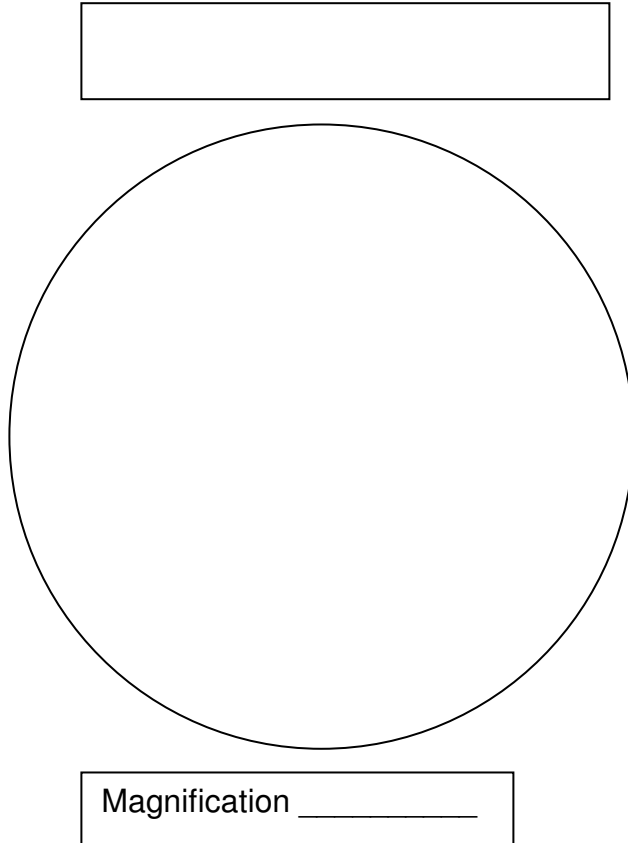
Place a drop of water on a clean slide. Gently scrape the inside of your cheek with the blunt end of a clean toothpick. Smear the material collected from the inside of your cheek in the drop of water on the slide. Add a drop of methylene blue stain to the smear. Cover it with a cover slip and observe under low, medium, and high power of the microscope.

14. Why are the **cheek cells** more irregular in shape than that of the onion or elodea cells?

15. Why don't you see any **chloroplasts**?

16. Are these cells *eukaryotic* or *prokaryotic*?

17. Draw 3 connected human cheek cells under high power and label: cell membrane, cytoplasm, and nucleus



PART IV. POTATO CELLS

Gently scrape the white part of the potato with a razor blade and mix the white part in a drop of water on a slide. Add a drop of *iodine* stain then place a cover slip over the preparation. Examine under low and high power.

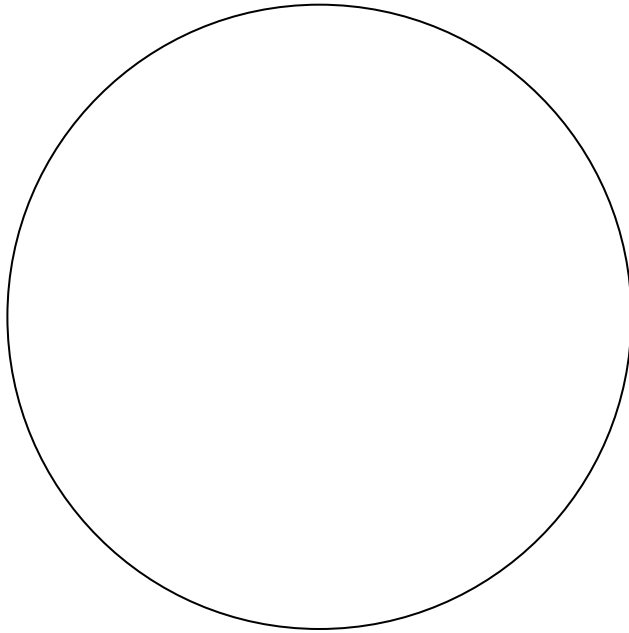
Repeat these steps with *methylene blue* stain.

18. What organelles are most visible with iodine stain?

19. What organic molecules do they contain?

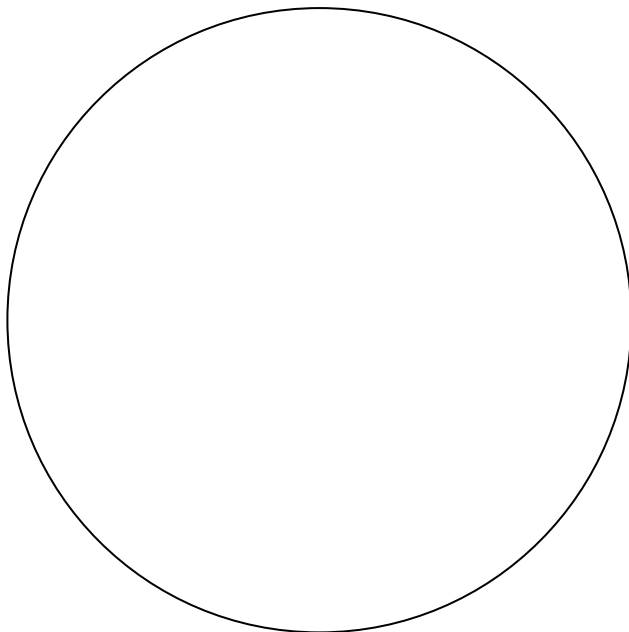
20. What organelles are most visible with the methylene blue stain?

21. **Draw 3 connected potato cells under high power with iodine stain and label:** cell wall and leucoplasts.



Magnification _____

22. **Draw 3 connected potato cells under high power with methylene blue stain and label:** cell wall and leucoplasts.



Magnification _____

V. CONCLUSION:

1. What structures or **organelles** were not visible in any of the cells you observed?

2. The potato and onion cells are both plant cells, why were their no **chloroplasts** observed in either cells?

3. What are three cellular or structure differences between **plant cells** and **animal cells**?

4. Why did we not look at any **prokaryotic** cells in this lab?

5. What are 3 of the cells (tissues) that make up the human hand?