

Lab 3 Cells

Name _____

Seat number _____

Objectives:

- A. Background on diffusion and osmosis
- B. Osmosis experiment
- C. Cheek cell
- D. Questions

A. Background on diffusion and osmosis

Diffusion is a process that involves the movement of substances from high to low concentration. Imagine a drop of ink in a bathtub of water. Ink will gradually diffuse into the bathwater.

Osmosis is the diffusion of water across a membrane. It is a type of passive transport because no energy is required for the cell to allow this movement of water. Water diffuses out of the cytoplasm when cells are in a hypertonic solution (concentrated, like salt water). This loss of water causes the cytoplasm to shrink. You will notice that the chloroplasts, the little green organelles that carry out photosynthesis, will either be tightly grouped together or will be farther apart, depending on the solution.

B. Osmosis experiment

This experiment works best if done in pairs. One person has the leaves soaked in regular water and the other person has leaves soaked in salt-water. In this way, you can compare the 2 side by side on the 2 microscopes at the same time.

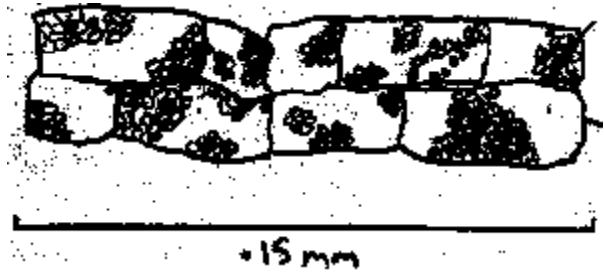
- 1) Pull off a small leaf, put it wet on a microscope slide, and plop a cover slip on top. This is the **control** leaf soaked in regular water.

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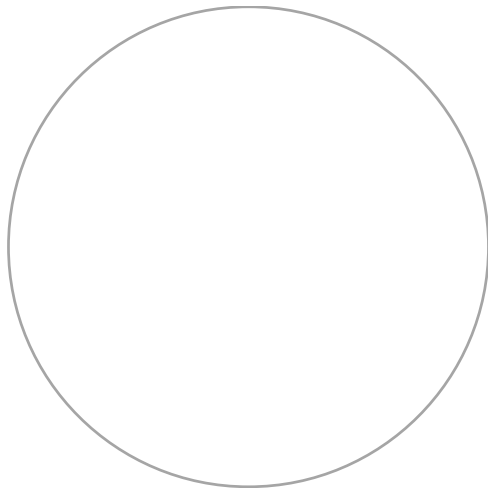
2) Using 40x total magnification, locate the brick-like cells and switch to 400x total magnification. Draw 4 cells like the image to the right.



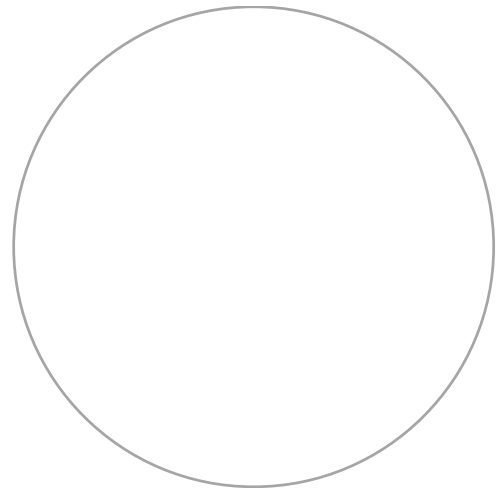
3) The other lab partner should prepare the leaf by soaking the leaf for 2 minutes in saltwater (hypertonic solution). This causes water to leave the cell, and the organelles to clump (like pollywogs stranded in a puddle in late summer). Draw 4 cells.



Label the cell wall (rigid outer wall of plants) and the chloroplasts for both specimens (in the water and in the saltwater)



Leaf in water



Leaf in saltwater

Dry your slide. You'll need it for part C, below

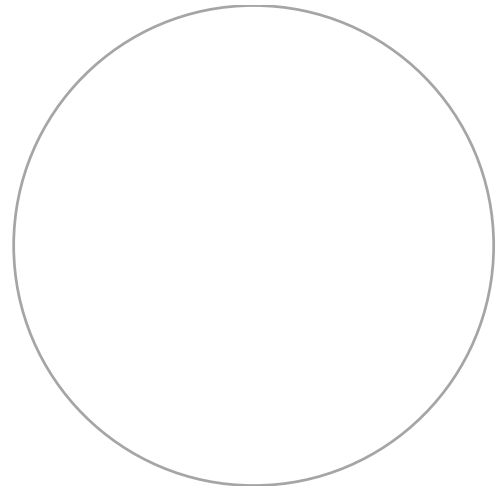
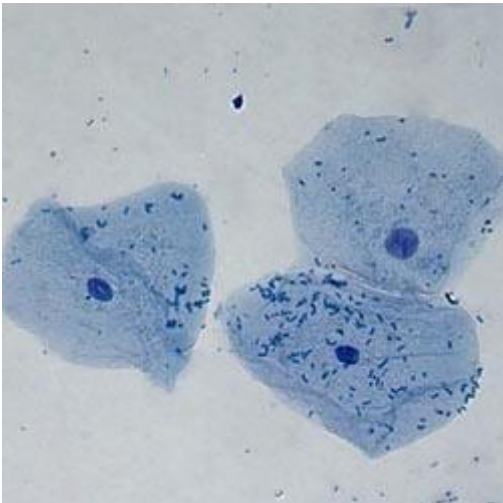
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- 4) *Write* a brief discussion relating the background information to your observations of the effect of salt-water on the leaves.

C. Cheek Cell

- 1) *Add* a drop of methylene blue (MB) dye to a clean dry microscope slide. Gently scrape the inside lining of your cheek with the flat end of a clean toothpick. Smear this into the dye on the microscope slide. Put on a cover slip.
- 2) *Draw* 2 cells on high power.

Label the nucleus, the cytoplasm (the liquid part of the cell), and the cell membrane.



Cheek cells

- 3) Put the slides in bleach and then rinse and dry the slides. Dispose of toothpicks with care.

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D. Questions:

- 1) _____ is a process in which substances move from high to low concentrations.
- 2) _____ is the movement of water across a membrane which is called _____ transport.
- 3) _____ transport describes a type of transport that requires energy.
- 4) What caused the hypertonic condition in this lab?