

Topic: Elodea Osmosis Lab

Summary: Students will learn about osmosis using a microscope and what happens to the plant cells in two different solutions: fresh water and salt water.

Goals & Objectives: Students will be able to focus the microscope. Students will be able to make a wet mount slide. Students will learn to use the microscope properly.

Standards: CA Biology *1a*. Students know that cells are enclosed within semi-permeable membranes that regulate interaction with their surroundings.

Time Length: 90 minutes

Prerequisite Knowledge: How to use the microscope. Review the cell membrane, osmosis, and plant cell structure.

Materials:

- Pond water or fresh water
- Elodea – can be purchased from pet/fish store
- Saline solution
- Beaker
- Cover slips
- Blank microscope slides
- Microscope cleaning cloth
- Compound microscope
- Pipette

Lab Setup:

Place microscopes either on students' desks if you have electrical access or on the lab tables around the room with electrical access. Plug in the microscopes. Place a blank microscope slide, cover slip, two pipettes, a beaker with fresh water, and a beaker with salt water on each desk. Place the Elodea plant in a beaker with the fish tank or fresh water. Elodea beaker needs to be placed in a convenient location because each lab group will come to it for their leaf and pond water sample.

Procedures:

1. Group students as lab partners. The groups are assigned to a microscope.

2. Students will make a wet-mount of the elodea and fish tank water. Students will draw what they see at medium power. Then students will blot (remove the water) from the slide with a paper towel and make a second wet mount using a drop of saline solution. Students will draw what they see at medium power. Then students will blot the slide with a paper towel and make a third wet mount using a drop of tap water. Students should be able to witness the vacuole or cytoplasm shrinking and growing. Have students pay attention to where the chloroplasts are located and the size of the cell wall.

Accommodations: Students with an IEP can take the handout home if they need extra time or draw one cell instead of four. If they need help with the microscope, let their lab partner make the wet mounts and focus the microscope.

Evaluation:

Each drawing is worth 5 points, for a total of 15 points. Questions 1-5 in the analysis section are worth 2 points each, for a total of 10 points. Each question in the conclusion is worth 5 points, for a total of 15 points. This assignment is worth a total of 40 points.

Elodea Osmosis Lab Instructions

Problem Statement:

In this lab, you will be observing with a microscope how the fresh water plant Elodea is affected by fresh water and salt water.

Hypothesis:

If I place plant cell into two different solutions, then I can witness osmosis.

Materials:

- Pond water or fresh water
- Saline solution
- Beaker
- Pipette
- Cover slips
- Blank microscope slides
- Microscope cleaning cloth
- Compound microscope

Procedures:

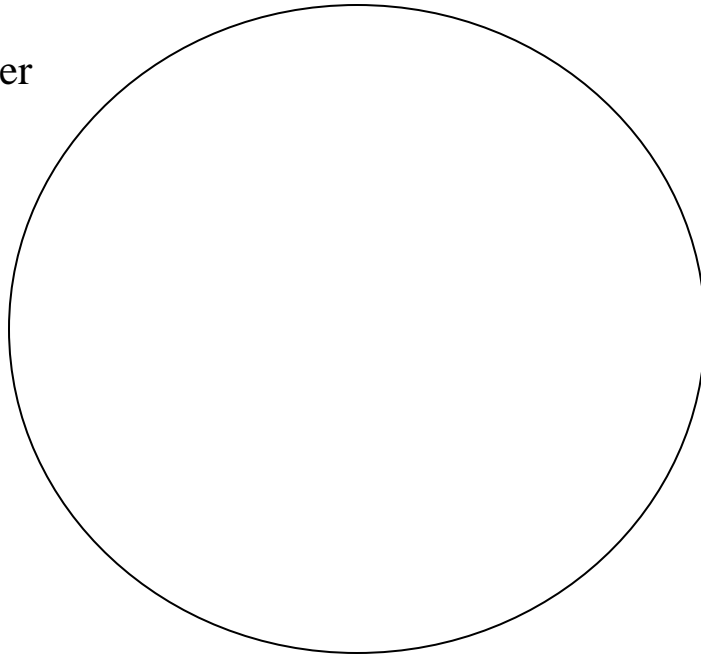
1. You and your lab partner are assigned to a particular microscope. You may only use this microscope. Do not touch other students' microscopes without teacher permission.
2. Clean the microscope objectives and eyepiece using the special microscope cloth.
3. One group member may go to the Elodea (fresh water plant) station with a pipette. Make a wet mount slide using fresh water and Elodea: Place a drop of pond water onto the center of a slide. Place a small piece of Elodea onto the drop. Place the cover slip on top of the water. It is important to place the cover slip on the edge of the water at a 45-degree angle. Lower the cover slip slowly to prevent air bubbles. If you get any air bubbles, you need to tap the cover slip and use a paper towel to remove the excess water.
4. While starting with the 4x lowest objective, focus the microscope using the course objective. Then focus the microscope with the 10x medium objective.
5. Draw **four cells** and label the cell wall and chloroplasts in circle #1.
6. Remove the cover slip and blot the pond water with a paper towel. Place a drop of saline solution onto the Elodea leaf and replace the cover slip. Focus the microscope, starting with the 4x lowest objective and then focus with the 10x medium objective.
7. Watch where the chloroplasts go and what happens to the cell wall. It may take one minute. Draw and label the four cells once again in circle #2.

Name: _____ Row: _____

Date: _____ Period: _____

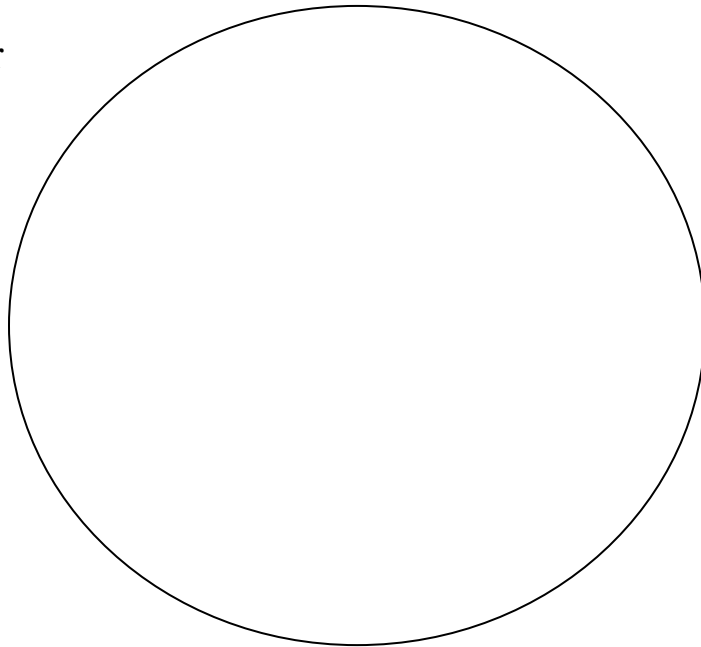
Elodea Osmosis Lab

Experiment:
#1 Fresh Water



Magnification

#2 Salt Water



Magnification

Analysis:

1) What type of solution was the fresh water solution? _____

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2) Chloroplasts are not found in the central vacuole, where are they located? _____

3) Where is the largest amount of water found in a plant cell? _____

4) When you added the fresh water, what happened to the water in the central vacuole?

5) When you added the saline solution, what happened to the water in the central vacuole?

Conclusion:

Explain what you observed happen to the cells when you made a wet-mount with just water compared to when you made a wet-mount with saline solution. _____

Explain what happens to your hands and feet when you swim in a swimming pool for over a half an hour. _____

Explain what happens to plants on the side of a road when salt is sprayed to melt ice on the road?

Explain what happens to salmon cells when salmon leave the ocean to swim up rivers?
