

Unit 1 Handout _____

Lesson 5: Osmosis in Carrots

Purpose: To observe how osmosis affects plants.

Research/Background:

Osmosis is the diffusion of water particles from a higher concentration to a lower concentration. An easy way to observe this is by using plants. Plant shape and firmness can be changed based on how much water is in the plant. You have seen this before when a plant wilts. It wilts because it does not have enough water to keep itself upright. In this lab, we will place carrots in a solution that contains a concentration of water higher or less than the concentration of water in the carrot.

Procedure

1. Label two ribbons with your period number.
2. Tie the ribbon as tightly as you can around the carrot without damaging the carrot.
3. Make observations about the ribbon and the carrot in the table below.
4. Designate one carrot for freshwater and one for salt water.
5. Leave the carrots in their assigned solutions for at least 24 hours.
6. Record observations of the ribbon and the carrot in the table below.

Observations of Carrot Before Solution
<p>Describe how the ribbon is tied around the carrot:</p> <p><i>We will do the next two measurements together as a class.</i></p> <p>Mass of all freshwater carrots: _____ My carrot FW: _____</p> <p>Mass of all saltwater carrots: _____ My carrot SW: _____</p>

Observations of Fresh Water Carrot after 24 Hours	Observations of Saltwater Carrot after 24 Hours
<p>Class Mass: _____ My Mass: _____</p> <p>Describe the carrot.</p> 	<p>Class Mass: _____ My Mass: _____</p> <p>Describe the carrot.</p>

Analysis

FRESH WATER CARROT DATA ONLY!

- 1. Did the mass of the carrots change after 24 hours? How? _____
- 2. Did the carrot (overall) shrink or grow? _____
- 3. Was the carrot placed in a hypertonic or hypotonic solution? _____
- 4. Which had a higher concentration of water: the solution or the carrot? _____
- 5. Where did the water move from and to? _____
- 6. How did the carrot change after sitting in the fresh water solutions for 24 hours?

- 7. In one or two complete and detailed sentences, describe what happened that caused the fresh water carrot to change. Your answer should include the following words: osmosis, water, mass, concentration, and solution.

SALTWATER CARROT DATA ONLY!

- 8. Did the mass of the carrots change after 24 hours? How? _____
- 9. Did the carrot (overall) shrink or grow? _____
- 10. Was the carrot placed in a hypertonic or hypotonic solution? _____
- 11. Which had a higher concentration of water: the solution or the carrot? _____
- 12. Where did the water move from and to? _____
- 13. How did the carrot change after sitting in the salt water solutions for 24 hours?

- 14. In one or two complete and detailed sentences, describe what happened that caused the salt water carrot to change. Your answer should include the following words: osmosis, water, mass, concentration, and solution.

