

★ Write Report IN LAB BOOKS ... FOLLOW "A, B, C..." Order ★

Name: \_\_\_\_\_

Date: \_\_\_\_\_

(A)

Gummy Bear Osmosis

Lab #: 3

⊕ Carrot Osmosis  
Extension

(B)

Purpose: to investigate the movement of water into and out of a Gummy Bear

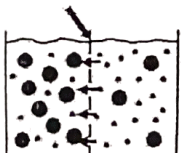
Problem: Where is the concentration of water molecules highest, tap water or salt water?

Background Information:

Molecules are in constant motion, and tend to move from areas of **higher concentrations** to **lesser concentrations**. **Diffusion** is defined as the movement of molecules from an area of **high** concentration to an area of **low** concentration. The diffusion of **water** molecules through a **selectively permeable membrane** is known as **OSMOSIS**.

**Selectively permeable** means that some molecules can move through the membrane while others cannot. Movement through membranes is called **transport**. Diffusion and osmosis are **passive** forms of transport; this means that do not need energy to move areas of high concentration to areas of low concentration. **Active** transport requires energy to transport molecules from low concentration to high concentration.

Selectively Permeable Membrane



Osmosis is the movement (transport) of water (small dots) through a selectively permeable membrane from an area of high concentration to an area of low concentration.

(C) Background

Vocabulary: define the following terms

1. Concentration:
2. Diffusion:
3. Osmosis:
4. Membrane:
5. Selectively Permeable:
6. Transport:
7. Active Transport:
8. Passive Transport:

Answer the following predictions:

(D)

QUESTION 1: How will soaking gummy bears in tap water affect the size of the candy?

Prediction: explain your prediction based on your knowledge and the background information

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(D)

QUESTION 2: How will soaking gummy bears in salt water affect the size of the candy?

Prediction: explain your prediction based on your knowledge and the background information

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Materials:

1 beaker with tap water  
Ruler

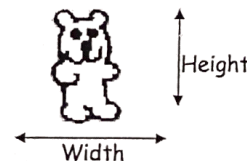
1 beaker with salt water  
Scale

Masking tape  
Wax paper

Marker  
Spoon

Procedure: DAY 1

1. Label each of the beakers with one group member's name and class period.
2. Choose one of the colored gummy bear to enter tap water and one to enter salt. Record which color will enter each solution in the data table on page 3
3. Use the ruler to find the height & width of each bear. Record your results in the data table on page 3. Round your measurements to the nearest tenth



4. Use the scale to weigh each gummy bear. Record your results in the data table under on page 3. Round your answers to the nearest tenth.
5. Record any other qualitative observations about the gummy bear in the data table on page
6. Place one gummy bear into the tap water and the other gummy bear into salt water. Let them sit over night.

Procedure Day One

(7) Also see Carrot Setup Lab Day 1... Set Up Carrot Lab Day 1 Data

Procedure: DAY 2

1. Use the scale to weigh the piece of wax paper. Record the mass here \_\_\_\_\_
2. GENTLY take your gummy bear that was in tap water out of the beaker using a spoon and place it on wax paper.
3. Use the ruler to find the height & width of the tap water bear. Record your results in the data table below. Round your measurements to the nearest tenth
4. Place the tap water bear on the wax paper and weigh it. SUBTRACT the weight of the gummy bear + wax paper from the wax paper alone.  
(bear and wax paper - wax paper alone = mass of bear alone)  
Record your results in the data table below. Round your answers to the nearest tenth.
5. Record any observations for the tap water bear on the data table below
6. Place this bear aside on a paper towel
7. Follow steps 2-6 for the gummy bear in salt water. Record the results in the data table below

DATA TABLE (E) + Cannot Osmosis Data Table (E)

Measurements	TAP WATER		SALT WATER	
	Gummy Bear 1: Color	Gummy Bear 2: Color	Gummy Bear 1: Color	Gummy Bear 2: Color
	INITIAL: DAY 1 (before soaking in tap water)	FINAL: DAY 2 (after soaking in tap water)	INITIAL: DAY 1 (before soaking in salt water)	FINAL: DAY 2 (after soaking in salt water)
Width (cm)				
Height (cm)				
Mass (g)				
Observations				

Analysis (F) + Cannot Analysis Questions (F)

1. Which bear(s) served as the control group(s) in this experiment?
2. Which bear(s) served as the experimental group(s) in this experiment?

3. What happened to the bear after soaking it in tap water overnight? Why?
4. What happened to the bear after soaking it in salt water overnight? Why?
5. What do you think would happen to the salt water bear if it was placed back into tap water overnight? Why?
6. Write a short paragraph (about 5 sentences) to explain the results of this investigation using the concept of osmosis. Include specific data to support what you say.

# Carrot Osmosis Procedure (Part II of Osmosis Lab)

## Day One Procedure

Our job is to determine which of the solutions will keep our cell models in balance (homeostasis).

First, let's gather some data about our model cells.

Fill in the initial mass and initial texture of all three carrots in Data Table 1.



Label 3 cups: Solution A, Solution B, and Solution C. Add the last name of one team member, and you class period. Now, place carrot A in solution A, carrot B in solution B, and carrot C in solution C. Fill each cup halfway with their respective solutions. Each of these solutions have a different level of electrolytes. Place your cups in the designated area in the back of the room. We will let the models sit for 24 hours.

## DATA

<u>Table 1. Carrots</u>		<u>Carrot A</u>	<u>Carrot B</u>	<u>Carrot C</u>
Day one	Initial Mass of Carrot (g)			
Day one	Initial Texture of Carrot (hard, soft, smooth, squishy, etc.)			
	Final Mass of Carrot (g)			
	Final Texture of Carrot			
	% Change in Mass (New-old/old) 100			
	Explain how mass & texture changed			

# Analysis Questions : (Day 2)

When a person is in the hospital, he or she is sometimes given an IV that is made of water, .9% salt, 4.5% sugar, and sometimes calcium and magnesium. Using the results of your investigation, explain why the chemical makeup of the solution is so important.

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Consider this: If you eat something very sugary you get very thirsty. Using the results of this investigation, explain what is happening between your blood and your cells.

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Your cousin has a saltwater aquarium. She decided to put goldfish in there, since they were cheap. The goldfish died within 24 hours. Explain to your cousin why the goldfish, a freshwater fish, should not be in the saltwater aquarium.

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Finally, do you think it is a good idea for people to drink electrolyte drinks? When is it a good idea? When is it a bad idea?

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