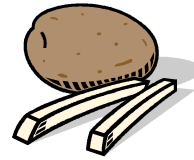


## Osmosis Lab



### **Purpose:**

Your lab group will design an experiment to test the effects of osmosis on potatoes. The following materials will be available to you:

**Title:** *Generate a title that describes the lab in detail.*

**Question:** *Write a question for what you are testing.*

**Hypothesis:** *Form a hypothesis to explain how the weight of a potato piece will change in **pure water** and **low salt concentration** and **high salt concentration** of salt water. Write the hypothesis in **if, then, because** format. Explain your reasons for forming this hypothesis. (Underline your **If, then, because...**)*

**Experimental Design:** As a group, think about ways you might go about testing your hypothesis using the materials that are available to you (see materials list below). Come to an agreement regarding what you are investigating. Make sure that you are only testing one variable.

**Experimental Set-up:** *Describe the set-up for what you are testing/varying in this investigation. Create a rough draft drawing of what this setup will look like below.*

**Variables:**

**Manipulated Variable:** *What is your manipulated variable? Why? (The one variable that you are testing/changing in your experimental setup.)*

**Responding Variable:** *What is your responding variable? Why? (The response that you observe from the one variable that you are testing/changing in your experimental setup.)*

**Controlled Variables:** *What are your controlled variables? Why? All of the other variables that you want to control (keep the same) so they do not interfere with your investigation. (These are things that could change that you don't want to change.) At least two are required.*

**Control Set-up:** *Describe the set-up for your control which you will use to compare the results of your experiment to. (The control set-up does not contain the manipulated variable.) Create a rough draft drawing of your control set-up below.*

**Validity Measures:** *What procedures need to be in place to ensure that your data will be valid or accurate? Why? (In other words, what do you need to incorporate into your procedure to prevent contamination.)*

**Materials:**

- \_\_\_\_\_ potato pieces with a mass of \_\_\_\_\_ grams each
- \_\_\_\_\_ beakers
- \_\_\_\_\_ ml of pure water
- \_\_\_\_\_ ml of low concentration salt water
- \_\_\_\_\_ ml of high concentration salt water
- electronic balance
- graduated cylinder

**Procedure:** *Write a procedure in a numerical list format with detailed step-by-step directions. Your procedure should be explained in detail so that someone could read your directions and conduct the investigation themselves. (Remember this is a numbered list of directions.)*

**Multiple Trials:** *How many trials should be conducted in this experiment in order to have enough data to analyze? Why?*

**Teacher Approval:** In order to proceed with the lab, you need my initials here:

<b>Teacher Initials:</b> _____
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**Data:** Take your measurements, and record the weight (in grams) of your potato pieces in the table below.

**Table Title:** Generate a title that describes the table content.

<b>TRIAL 1</b>	<b>Pure Water</b>	<b>Low Salt Concentration</b>	<b>High Salt</b>
<b>Initial Mass of Potato</b>			
<b>Final Mass of Potato</b>			

<b>TRIAL 2</b>	<b>Pure Water</b>	<b>Low Salt Concentration</b>	<b>High Salt</b>
<b>Initial Mass of Potato</b>			
<b>Final Mass of Potato</b>			

**Observations:** Carry out your experiment, record observations about potatoes below.

**Calculations and Graph:** Show your calculations and graph your results. Calculate the change in mass of the potato for each solution in the space below.

Example:

**Low Salt Initial Mass = 2g ; Low Salt Final Mass =1.5g**  
**Final Mass – Initial Mass =  $\Delta$  in Mass**  
**1.5g – 2g = - 0.5g**

**\*\*\*Graph the change in mass for pure water, low salt, and high salt concentrations for both trials using a bar graph. Color the graph using blue for trial one and orange for trial two. Label all axes and bars. Provide a color key.**

**Discussion of Results:**

1. Was your hypothesis supported by your data? Restate your hypothesis and **use data** to support or refute your hypothesis (use NUMBERS!).
  
2. Use the process of osmosis to explain exactly what happened in your experiment. Use data to support your explanation.
  
3. Draw and label a picture of the potato's cell membrane showing where the water molecules moved for the pure water, low salt, and high salt concentration solutions. In the caption box, using the data, and what you know about osmosis, explain what happened in each situation.

Pure Water		Low Salt		High Salt	
Before	After	Before	After	Before	After
<b>Caption:</b>		<b>Caption:</b>		<b>Caption:</b>	

**Sources of Error:**

1. What are your sources of error?
2. How did they alter/affect your data?
3. What would you do differently if you were to conduct this investigation again to avoid errors?
4. What could you do as a spin-off of this experiment to further investigate the principles of osmosis and how different solutions can affect this process.