Lab: Potato Osmosis
Biology A

Name_____Per_____

Introduction:

Osmosis is the diffusion of water through a semi-permeable membrane. Since water is the *solvent* in most biological solutions, but solutions are described in terms of the concentration of *solute,* you must think carefully to accurately understand and describe the process of osmosis in a given situation. In the this lab, you will set up an experiment to determine the molar concentration of sucrose in a potato core. You will infer this concentration using your understanding of osmosis and the behavior of water molecules in *hypotonic, isotonic and hypertonic* solutions.

Materials:

Electronic balance
Plastic wrap
Potato
Cork borer tool
250 ml beakers (or plastic cups) - 6

Procedure:

1. Pour approximately 50 ml of the appropriate solution into a labeled 250 ml beaker or plastic cup. (You really just need enough liquid to cover the potato cores). You will need 1 container each of 0.0M sucrose (distilled water), 0.2M sucrose, 0.4M sucrose, 0.6M sucrose, 0.8M sucrose, and 1.0M sucrose.

2. Slice a potato into discs that are about 3 cm thick.

3. Use a cork borer tool to cut 4 potato cores. Do not include any skin on the cores. You need 4 potato cores for each beaker or cup.

4. Keep you potato cores in a covered beaker or cup until it is your turn to use the electronic balance.

5. Determine the mass of just the 4 potato cores together and record in Table 1.1. This is your initial mass for this solution. Place these 4 cores into the appropriate beaker or cup of sucrose solution. *It is critical that you are keeping accurate records of which potato cores have been placed into each solution.*

6. Repeat steps 3 – 5 for each solution. Clearly mark each beaker with its respective concentration and group member's names.

7. Cover the beakers with plastic wrap to prevent evaporation.

8. Let the beakers stand overnight.

9. On Day 2, remove the 4 cores from a beaker and blot them *gently* on a paper towel and determine their total mass. This is your final mass for this solution. When blotting, do *not* squeeze liquid out of the cores.

10. Record the final mass in Table 1.1.

11. Repeat steps 9 & 10 for each solution. *Again, it is critical that you are keeping accurate records of which potato cores have been placed into each solution.*

12. Calculate the percent change in mass between Day 1 and Day 2.

    $$\text{Percent change in mass} = \frac{\text{Final Mass} - \text{Initial Mass}}{\text{Initial Mass}} \times 100$$

13. Report this data to the teacher for inclusion in the class data table.

14. Record class data in Table 1.2.

15. Graph both your group data and the class average for the percent change in mass from Table 1.2. Plot both data sets on the same set of axes. You will need to include 2 quadrants in the graph if you have negative values for percent change in mass. Attach the graph to the back of this lab packet.

16. Once completed, you will be able to use the graph and your knowledge of osmosis to answer the question posed in the introduction: what is the molar concentration of sucrose in a potato cell?

Results:

Table 1.1

Title: _____

Sucrose Concentration	Initial Mass (g)	Final Mass (g)	Change in mass (g)	Percent change in mass
0.0M				
0.2M				
0.4M				
0.6M				
0.8M				
1.0M				

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Table 1.2
Title_____

Sucrose conc.	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Total	% change in mass
0.0M											
0.2M											
0.4M											
0.6M											
0.8M											
1.0M											

For Lab Quiz: Be able to answer the following questions.

1. What is the molar concentration of sucrose in a potato cell?
2. How did you determine the answer to question #1?
3. Using the class average graph, predict the result of placing a potato in a 0.1M sucrose solution.
4. Using the class average graph, predict the result of placing a potato in a 0.7M sucrose solution.