**AP Biology    Name_____**

**Osmosis in Potato Cells**

**Introduction:**  Maintaining water balance is one important function that cells must accomplish in order to maintain _**homeostasis**_.  When placed in different solutions, cells change their water content.  _**Osmosis**_ is the diffusion of water through a selectively permeable membrane.  Plant cells respond differently to surrounding solutions due to their cell wall.  In this investigation, you will:
- Observe osmosis in French fries
- Graph the percent change in mass the fries after being placed in six solutions

**Materials:** Potatoes, French-Fry Maker, Potato Peeler, Portion Cups or small plastic cups, Balance, Water, Sucrose Solutions, Paper Towels, Sharpie, Plastic Wrap, Sharpie, Knife or Scalpel, Calculator.

**Procedure:**

1. Make the following solutions of sucrose with a volume of 200 mL; 0.0M, 0.2M, 0.4M, 0.6M, 0.8M, 1.0M.
2. Peel potatoes and make 12 "fries" by cutting your potato with the vegetable cutter.
3. Cut each fry to 3cm long.
4. Blot potatoes with a paper towel and record the mass of 6 groups of 2 fries (initial mass).  Record mass in **Data Table 1**. _Do not include the mass of the cup._
5. Label cups as follows:  water/0.0 M sucrose, 0.2M sucrose, 0.4M sucrose, 0.6M sucrose, 0.8M sucrose, and 1.0 M sucrose.
6. _After recording mass_, place 3 fries in each cup.  Fill cups with sucrose solutions that you have made. Make sure that the potatoes are covered with solution.
7. Cover cups with plastic wrap and leave until the next class period at room temperature.
8. The next time we meet, remove fries; gently blot dry, record mass in **Data Table 1**.
9. Determine the percent change in mass for your potatoes **[(Final Mass-Initial Mass)/initial mass] x100**.
10. Record in **Table 1**.
11. Record classmates' data and compute averages on **Data Table 2**.
10.Graph your average _or_ class averages; label axes with appropriate variables.
11. With your lab group, agree on a title for your graph that reflects both axes.

**Experimental Model: Below is an illustration of your experimental set up.**
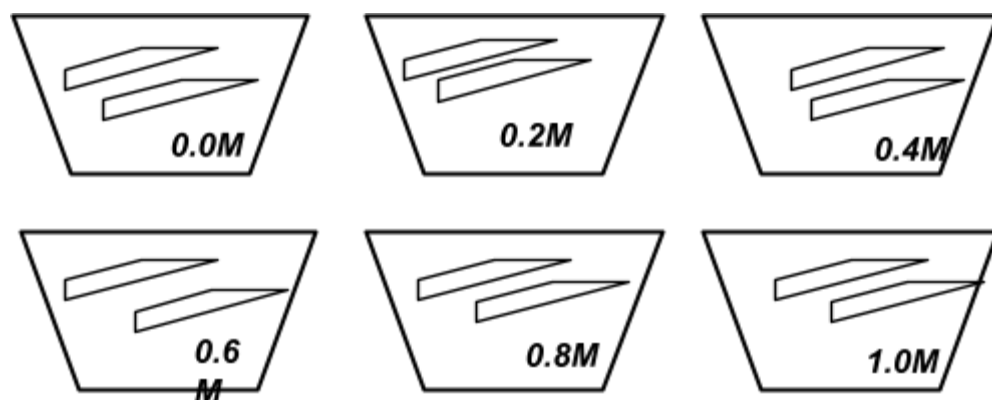


**Data Table 1: Mass of Fries and % Change**

| Solution Concentration | Initial Mass (Of 2 fries) | Final Mass | Loss or Gain? | % Change |
|---|---|---|---|---|
| **0.0 M Sucrose (distilled water)** | | | | |
| **0.2 M Sucrose** | | | | |
| **0.4 M Sucrose** | | | | |
| **0.6 M Sucrose** | | | | |
| **0.8 M Sucrose** | | | | |
| **1.0 M Sucrose** | | | | |

**Data Table 2: Class Average**

### Percent Change in Mass of Potato Fries

| Group | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Average |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 M Sucrose (tap water) | | | | | | | | | |
| 0.2 M Sucrose | | | | | | | | | |
| 0.4 M Sucrose | | | | | | | | | |
| 0.6 M Sucrose | | | | | | | | | |
| 0.8 M Sucrose | | | | | | | | | |
| 1.0 M Sucrose | | | | | | | | | |

**Title: _____**


**Graph**
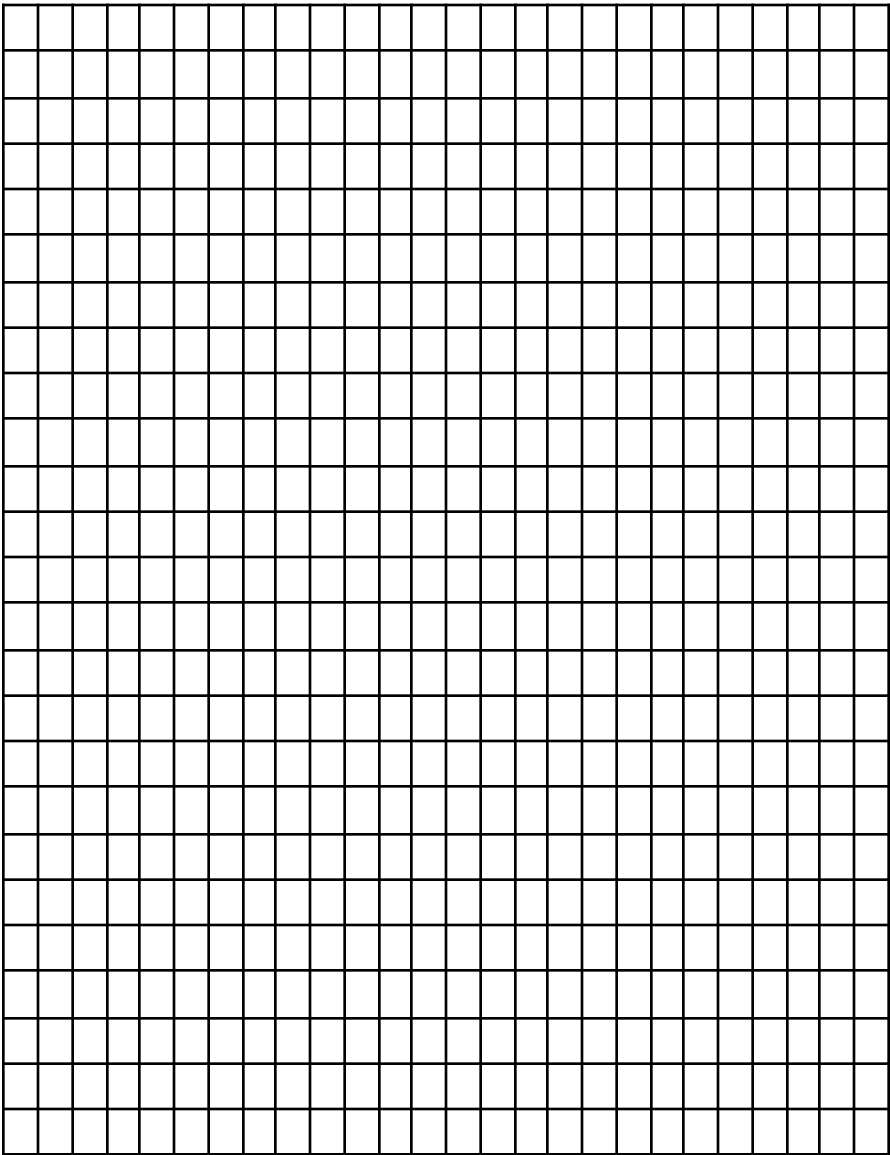
**Analysis Questions**

1. Which potatoes gained/lost mass?

2. Explain why they gained/lost.

3. What solution is isotonic for potatoes? How did you determine this?

4. Go back to the figure above with pictures of the cups with solutions. Next to each solution type, label the solutions as hypertonic, isotonic, or hypotonic.

5. What question(s) were we investigating in this experiment? .

6. What is the independent variable for this investigation?

7. What is the dependent variable for this investigation?

8. What factors were controlled in this investigation?

9. Did we have a positive or negative control in this investigation? Why or why not?

10. If you were to conduct this investigation again, what would you "tweek" to improve it?