

Homeostasis Potato Investigation

Materials

- 3 Potato cubes
- 3 plastic baggies
- 50mL Tap water
- Electronic balance
- 50mL Salt water
- 50mL Distilled water

Data Table

Solution	Initial Mass (g)	Final Mass(g)	Change in Mass(g)	Initial Texture of Potato	Final texture of Potato
Salt water					
Tap water					
Distilled water					

Procedure

1. **Baggie #1: Predict** whether the mass of the potato will increase, decrease, or not change when placed into a **salt water solution**. Explain your predictions. If you predict a change in mass, where does the extra mass or loss of mass come from?

2. Measure the initial mass of the potato using the electronic balance and put the potato in a baggie.

3. Record the initial mass and initial texture (feeling) of the potato into the data table.

4. Measure 50mL of salt water and pour the salt water into the baggie. Leave for 24 hours.

5. **Baggie #2: Predict** whether the mass of the potato will increase, decrease or not change when placed into a **tap water solution**. Explain your predictions.

6. Measure the initial mass of the potato using the electronic balance and put the potato in a baggie.

7. Record the initial mass and initial texture (feeling) of the potato into the data table.

8. Measure 50mL of tap water and pour the tap water into the baggie. Leave for 24 hours.

9. **Baggie #3: Predict** whether the mass of the potato will increase, decrease, or not change when placed into a **distilled water solution**. Explain your predictions.

10. Measure the initial mass of the potato using the electronic balance and put the potato in a baggie.

11. Record the initial mass and initial texture (feeling) of the potato into the data table.

12. Measure 50mL of distilled water and pour the distilled water into the baggie. Leave for 24 hours.

13. **The next day:** After 24 hours, remove each potato from the baggie and dry it gently with a paper towel. Using the electronic balance, measure and record the potato’s final mass. Calculate the change in mass and observe the potato’s final appearance/texture. Discard according to your teacher’s instructions and answer all analysis questions.

Performance assessment: Part of your grade will be determined by your ability to properly mass objects on an electronic balance (5pt).

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|-------------------------------------|-------|--------------------------------------|-------|
| Dry off excess solution from potato | _____ | Record correct mass (nearest tenths) | _____ |
| Check that scale is clean | _____ | Clean scale after finished | _____ |
| Zero the scale before using | _____ | | |

Post-lab Analysis Questions

- What is diffusion? _____
- What is osmosis? _____
- Which solution(s) caused the potato to shrink? Explain what caused that to happen. Did this match with your prediction(s)? Why or Why not?

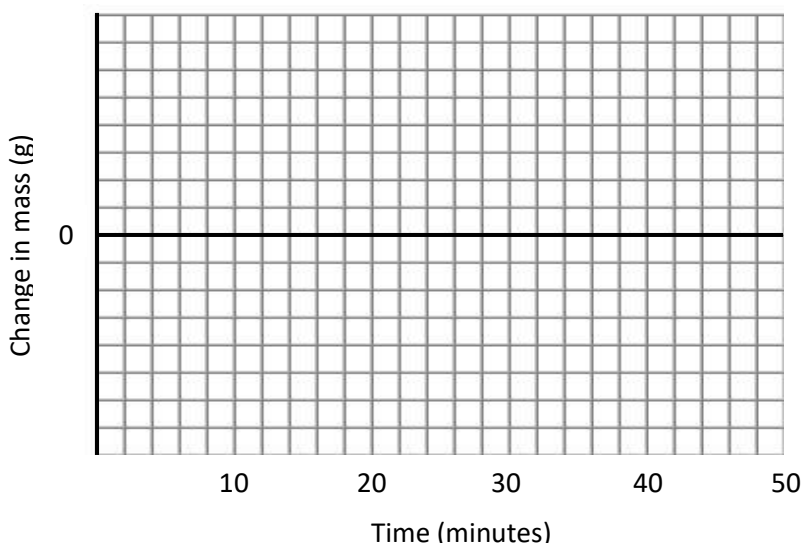
- Which solution(s) caused the potato to swell? Explain what caused that to happen.

- What osmotic effect would eating too much salt have on human body cells?

- When animal cells swell up too much, they could lyse (burst) and die. Plant cells will become turgid (rigid) but do not burst. What specialized cell structure gives plant cells the extra protection? _____

- In this experiment, which was the dependent variable (what you are testing)?
 - The concentration of water in the solution
 - The change in mass of the potato
 - The mass of the solution
 - The number of beakers used in the experiment
- In order to draw a valid conclusion, it is most important that the experimenters
 - Used the same concentration of water in each beaker
 - Weighed the amount of solution left in the beaker after 24 hours
 - Massed each potato before placing them into each beaker
 - Used different brands of salt in each beaker

Predict Future Outcomes: The data in the table shows how three potatoes (A, B, and C) in three separate solutions **changed** when measured at different time points. The number in the data table represents the **total change** from the initial mass at each time point. Create a line graph with the given data using three separate colors (one for each potato). Now extend the line for each potato to predict how the mass would **continue to change** after 30 minutes, 40 minutes, and 50 minutes. **Be sure to label the Y axis.**



	A	B	C
0m	0g	0g	0g
10m	+0.3g	0g	-0.3g
20m	+0.5g	0g	-0.5g
30m			
40m			
50m			

12. What type of solution (hypertonic, hypotonic, isotonic) was each potato placed in?

A) _____ B) _____ C) _____