

Osmosis Inquiry Lab

Imagine you entered a biology lab skills olympiad. You have been given three glucose solutions of unknown concentration and have been asked to rank them from least concentrated to most concentrated.

1. Write a hypothesis.
2. Design a protocol to test the hypothesis.
3. Have your protocol approved before you continue.
4. Carry out your protocol.

Questions

1. Identify the independent and dependent variable in your experiment.
2. Identify two variables that you will control.
3. What control group does your protocol use?
4. Do you accept or reject your hypothesis?
5. Describe and explain the changes that occurred in each solution.
6. How were you able to distinguish between the different solutions?

Additional questions:

7. Compared to tap water, would the inside of a potato be considered hypertonic, hypotonic, or isotonic?
8. Imagine a carrot is 60% water and 40% solutes. Carrot A is placed in distilled water while carrot B is placed in a solution of 50% solutes.
 - a) Which will happen to each?
 - b) Which carrot would have cells similar to cells in a plant that has wilted?
9. If the concentration of solute molecules outside a cell is lower than the concentration in the cytosol, is the external solution hypotonic, hypertonic, or isotonic?
10. Using what you know about osmosis, explain what would happen to a marine jellyfish placed in a freshwater lake. Make sure you discuss what will happen to the **cells** of the jellyfish.
11. Imagine a plant cell has been in an isotonic solution for several minutes. Predict what would happen to the vacuole if the cell was moved to a hypertonic solution. What about a hypotonic solution?
12. You planned on including grapes on a fruit tray at a party you are hosting. However, the grapes were bought a little early and you noticed they are now wrinkly instead of plump. What could you do to solve this problem and still serve the same grapes?