**AP Biology: Diffusion and Osmosis Lab**

This lab is a compilation of several investigations intended to lead you to a conclusion about diffusion and osmosis. It will be conducted over several class but all of your learning will be summarized in one report.

Day 1 – Gummy Bear and Cell Size

Day 2 (double block) – Collect Gummy Bear data collection. Red Onion and Potato core set up

Day 3 – Potato core data collection

Day 4 – Cell Size

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Title** | **Objective** | **Assessment** |
| Part A | Gummy Bear | Concentration and rate of diffusion | Data & Observations (lab book), Data Analysis (lab book) |
| Part B | Red Onion Cells | hyper/hypo/isotonic properties and observations | Data & Observations (lab book) |
| Part C | Cell Size | rate of diffusion and cell size | Data Analysis (lab book) |
| Part D | Potato Glucose Concentration | Determining concentration using diffusion | Experimental Design (google classroom)  Data & Observation (lab book),  Graphs (lab book OR classroom)  Data Analysis (lab book) |
| Your Discussion and Conclusion should reference all relevant labs and learning that you’ve had over all parts of the investigation (google classroom). This section only should include a works cited and in text citations. | | | |

**Discussion Questions**

1. Peter was preparing some potatoes for cooking. He put some water in a pot and added some salt. He cut up the potatoes and put them in the salt solution. Then the telephone rang and he spent 30 minutes talking to George. When he returned to put the potatoes on the stove they were flaccid (soft). Explain what happened to the potatoes.
2. A salt water fish may die if placed in fresh water. Why?
3. Explain why a salt solution is a good antiseptic (kills bacteria)?
4. A small amount of fertilizer will make the grass of a lawn grow. Too much fertilizer will “burn” kill the grass. Why?
5. The red blood cells in our blood are suspended in a solution called blood plasma. Is the blood plasma isotonic, hypertonic or hypotonic? Explain your answer.
6. How can fish live in salt water without becoming dehydrated?
7. Why do you think the cell membrane collapsed when you added a salt solution to the onion cells?
8. Predict what would happen to the mass of a potato core if it was placed in a 0.7M sucrose solution.  Explain your response using water potential calculations.
9. Why did you calculate the percent change in mass rather than simply using the change in mass for your potato cores?
10. A dialysis bag (semi permeable) is filled with distilled water and then placed in a NaCl solution.  The bag’s initial mass is 20g and its final mass is 18g.

* 1. Calculate the percent change of mass, showing your calculations.
  2. Is the solution isotonic/hypertonic/hypotonic distilled water in the bag?

1. Based on what you’ve learned, how could you determine the solute concentration of a living cell?
2. When potatoes are in the ground, do they swell with water when it rains?  If not, how do you explain that, and if so, what would be the advantage or disadvantage?