Slug Murder

An Investigation of Osmosis

**Essential Question: Why does salt spell imminent death for a slug?**

**Introduction**

*Highlight or underline the 3 most important facts that are relevant to the laboratory.*

Land slugs belong to the 2nd largest class in the animal kingdom; *gastropods (*which literally means stomach foot). The trademarks of a slug’s anatomy include the mantle, foot, and the *radula*, a tongue-like organ containing rows of tiny teeth. The slug’s body is composed mainly of water, and because they are shell less they face a constant risk of *desiccation*. In order to prevent drying out, slugs produce mucous which is secreted all over the body and wraps the slug in an envelope of moisture. Slugs are considered to be harmless to humans, but can wreak havoc in a garden.Creative gardeners have devised many ways to eliminate this pest, one of which is called “slug salting”. A couple pinches of salt sprinkled on the exterior of a slug will diminish its life expectancy to a few seconds.

In this lab we will be investigating a membrane's permeability and solution types in order to answer our essential question. We will use an egg's membrane to demonstrate the properties of isotonic, hypertonic, and hypotonic solutions.

**Prelab**

 **Fill in the Blank**

1. In an **isotonic** solution, one solution has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (equal, more, less) solutes when compared to another solution.
2. A solution is **hypertonic** when it has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (equal, more, less) solutes when compared to another solution.
3. A solution is **hypotonic** when it has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (equal, more, less) solutes when compared to another solution.
4. A **semi-permeable** membrane is one that allows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (some, all, no) materials to pass through.

**Practice Quiz**

1. What is the term for the diffusion of water across a semipermeable membrane? A. osmosis B. equilibrium C. transport D. isotonic
2. The difference in the concentration of dissolved particles from one location to another is called a A. concentration gradient B. concentrated solution C. saline solution D. dynamic gradient
3. The cell membrane is A. fully permeable B. non-permeable C. semi-permeable

*For the following illustrations, fill in the blank using the terms* ***hypotonic, hypertonic, and/or isotonic.*** *Then, draw an arrow showing the direction in which water is moving.*

The cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the solution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Observations:

**Observations and Data**

Draw the experimental setup at each station.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Station 1: Water | Station 2: Corn Syrup | Station 3:Salt Water |
| Describe the appearance of the egg |  |  |  |
| Difference in Mass (final mass – initial mass) |  |  |  |
| Did the egg grow, shrink, or remain the same size? |  |  |  |
| Is the solution hypertonic, hypotonic, or isotonic? |  |  |  |

**Conclusion**

*Write a conclusion identifying the given solutions as either isotonic, hypertonic, or hypotonic. In each situation, describe the movement of water. Support your claim using evidence (quantitative and qualitative) gathered during your observations. \*It may be helpful to use the illustrations at the bottom of page 2\**

Water (station 1) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corn syrup (station 2) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Salt water (station 3) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Answer your essential question: Why does salt spell imminent death for a slug?**

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