Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

Egg-cellent Osmosis Lab

**Background:**

Some particles can pass through the cell membrane while others cannot. Not all particles are able to pass through a cell membrane with equal ease. The cell membrane determines which particles can diffuse into or out of the cell.

As particles pass into and out of the cell, they move from areas of high concentration to areas of low concentration. Cells in hypertonic solutions have solute concentrations lower than the solution that surrounds them. This concentration difference causes water to move out of the cell and into the surrounding solution. Cells in hypotonic solutions have solute concentrations greater than the solution that surrounds them. The concentration difference causes water to move from the solution into the cell. The movement of water into and out of a cell through the cell membrane is called osmosis.

**Purpose:**

In this lab, you will use eggs with a dissolved shell as a model for the living cell. You will then predict the results of an experiment that involves the movement of water through a membrane.

**Materials:**

|  |  |  |
| --- | --- | --- |
| beaker or cup | vinegar | water |
| triple beam balance | 1 fresh egg |  |
| safety goggles | Corn syrup |  |

**Procedure:**

Day 1:

1. After 24 hours, put on your safety goggles, and empty out the vinegar from your container.

2. Carefully remove the egg from the container and rinse it with water using the bucket of water on your table.

3. Gently remove the remaining parts of the dissolved shell using the flat part of your thumb to VERY GENTLY rub off the shell in small circular motions. Rinse often in your bucket of water.

4. Measure the mass of the egg and record that measurement on your data table.

5. Return the egg to the container and add syrup to the container with the egg still in it.

6. Store the egg in the same place as before for 24 hours.

7. Clean up your workspace and wash your hands before leaving the lab.

Day 2:

1. After 24 hours, put on your safety goggles, and empty out the syrup from your container.

2. Carefully remove the egg from the container and rinse it with water using the bucket of water on your table.

3. Measure the mass of the egg and record that measurement on your data table.

4. Return the egg to the container and add water to the container with the egg still in it.

5. Store the egg in the same place as before for 24 hours.

6. Clean up your workspace and wash your hands before leaving the lab.

Day 3:

1. After 24 hours, put on your safety goggles, and empty out the water from your container.

2. Carefully remove the egg from the container and rinse it with water using the bucket of water on your table.

3. Measure the mass of the egg and record that measurement on your data table.

4. Carry your egg to the sink while holding your egg over the sink, carefully stick a pin into the egg and remove it.

5. Clean up your workspace and wash your hands before leaving the lab.

Data Table:

|  |  |  |  |
| --- | --- | --- | --- |
| Day | Mass of Egg in grams | What does the egg look like?  What does the egg feel like? | % Change in Mass |
| Day 1  After 24 hours in Vinegar |  |  | N/A |
| Day 2  After 48 hours in Syrup |  |  | ( \_\_\_\_\_\_\_\_\_\_- \_\_\_\_\_\_\_\_\_\_\_\_) ÷ \_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_  (Day 2 Mass - Day 1 Mass) ÷ Day 2 = Decimal Answer  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ % Change  Decimal Answer |
| Day 3  After 24 hours in Water |  |  | ( \_\_\_\_\_\_\_\_\_\_- \_\_\_\_\_\_\_\_\_\_\_\_) ÷ \_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_  (Day 3 Mass- Day 2 Mass) ÷ Day 3 = Decimal Answer  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ % Change  Decimal Answer |

Analysis: (2 points per question)

1. What was the purpose of putting the egg into the vinegar in the first place? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Did the egg gain or lose mass after 24 hours in the syrup? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. a. Did osmosis occur while the egg was in the syrup? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What evidence proves this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. a. Did the water move into or out of the egg? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What evidence proves this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. a. Was the syrup solution hypertonic or hypotonic? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What evidence proves this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. a. Did the egg gain or lose mass after 24 hours in the water? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Did Osmosis occur while the egg was in the water? How do you know? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. a. Did the water move into or out of the egg? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What evidence proves this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. a. Was the water hypertonic or hypotonic? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What evidence proves this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Conclusion:** (11 points Total)

The ending lab report must be typed, PRINTED OUT, and handed in! You are to TYPE an essay that will summarize what happened to the egg over the course of the experiment. Please format your essay in this way:

Paragraph 1 (5 points): Summary references the *data and percent change in mass* for EACH DAY!

Day 1 Mass, Day 2 Mass, Day 3 Mass

% Change in mass from day 1 to day 2

% Change in mass from Day 2 to day 3

Refer to your data tables for this information!

Paragraph 2 (6 Points): Summary references and uses the terms osmosis, hypertonic solution, and hypotonic solution correctly.

Make sure to explain what term matches with each solution of the experiment and WHY!

For example: “Day 2 the solution outside of the egg was a \_\_\_\_\_\_\_\_\_\_ solution. I know this because the egg \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and this means that the water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.”

Please use the lines below to write out your OPTIONAL rough draft.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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