EGG-SPERIMENT (Egg-Cell Osmosis) **Mr. Galloway**

FILE: LS-Egg-Experiment-Osmosis-Galloway

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BACKGROUND: During this scientific experiment, you will determine whether solutions of different concentrations are hypotonic, isotonic, or hypertonic compared to the solution inside of a chicken egg/cell. If the solution outside the egg/cell is hypotonic then the solution inside the egg/cell is hypertonic by comparison (and vice/versa). **Hypotonic** = solution with less dissolved substances. **Hypertonic** = solution with more dissolved substances. Isotonic = solution with EQUAL amount. Water molecules will diffuse (osmosis) from mostly from the hypotonic side of a membrane to the hypertonic side. Mr. Galloway will soak the eggs in vinegar for a few days. This will remove calcium from the shell. This allows the egg to act as a single cell surrounded by a selectively permeable membrane. This allows molecules in solution to move across the membrane.

MATERIALS

- vinegar-soaked chicken eggs
- water (sink to rinse eggs)
- gram scale
- 1 disposable plastic cup
- 5 cm masking tape
- marker
- 500-mL beaker
- 50% Glucose solution
- 0% solution (Distilled Water)
- plastic wrap
- 2 rubber bands

PROBLEM/Question: Are the tested solutions hypotonic, isotonic, or hypertonic to the egg?

HYPOTHESIS: (testable prediction) IF _____, THEN _____

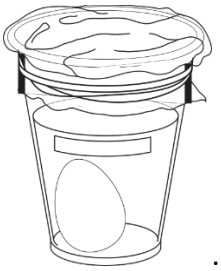
PROCEDURES:

1. You will test (compare) two SOLUTIONS: one is DISTILLED water and the other is a 50% GLUCOSE solution. You will determine whether each is hypotonic, isotonic, or hypertonic relative to the inside of a chicken egg.

2. Identify the VARIABLES you will measure and the constants you will maintain during the investigation. Examples of constants include the amount of solution used for each egg.

INDEPENDENT Variable = _____ DEPENDENT Variable = _____
CONSTANTS = _____-

3. **USE** the data **TABLE** on the next page to organize your results.
4. **RINSE** each egg, **WEIGH** them in a plastic cup. Record their INITIAL (starting) masses in the table below.
5. **LABEL** each cup with the appropriate **SOLUTION** name.
6. **POUR** one of the solutions you are testing into each cup until it **COVERS** the egg.



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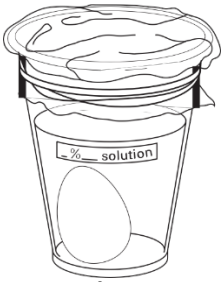
50% Glucose Solution



0% Solution (= Distilled Water)

6. **THE NEXT CLASS**, remove each egg and GENTLY dry it. Note any changes in APPEARANCE.
Then determine the FINAL mass of each egg and record it in the table below.
Record your findings in the table below.

TABLE 1. CHANGES IN EGG MASS		
	Type of Solution %	**Type of Solution %**
INITIAL mass of egg (g)		
FINAL mass of egg after soaking in solution (g)		
CHANGES in egg APPEARANCE		

ANALYZE AND CONCLUDE:

1. How can you determine whether a solution you tested was hypotonic, isotonic, or hypertonic?

2. Which solution made the egg swell or look bigger? _____
3. Which solution made the egg shrink or look smaller? _____

4. Calculate the changes in the mass of the eggs. Explain how this may relate to your findings.
Subtract the FINAL mass from the INITIAL mass (INITIAL Mass – FINAL Mass = CHANGE IN MASS).

- INITIAL mass of egg & cup BEFORE soaking	= _____ g	= _____ g
- FINAL mass of egg & cup AFTER soaking	= _____ g	= _____ g
- CHANGE in mass of egg	= _____ g	= _____ g

5. Which solution caused the egg to GAIN mass? _____, LOSE mass _____.

6. Which solution was hypotonic? _____, isotonic _____, hypertonic _____.

7. Experimental Design Evaluation: List possible reasons for inconsistent results you may have observed.

8. On the NEXT PAGE, **WRITE** a final paragraph summarizing WHY the results logically led to the conclusion.

THIS is the PAGE, where you are to **WRITE** a final paragraph summarizing WHY the results logically led to the conclusion.