Cells in Action: An Eggsperiment in Osmosis

Background:

In this activity, we will explore some "containers" of living systems and compare the inside to what is outside of each compartment. We will examine some eggs that were exposed to different outside conditions. The way the eggs change depending on their "environment" is similar to the way your cells would change in each environment because eggs are surrounded by a semi permeable membrane that is very similar in its properties to the plasma membrane surrounding living cells.

Purpose: Write a purpose for this experiment. Write in your own words.

Hypothesis:

Read the procedure very carefully and make your prediction of what will happen to the mass of each egg in the different solutions (corn syrup, distilled water, vinegar). Remember that osmosis is the movement of water from areas of high concentration to low concentration.

Your hypothesis for each egg must be in If....Then format as follows:

Your hypothesis for each egg (total of 3 hypotheses) must be in If.....then format as follows:

If ...(the egg is placed in _____ solution)...Then ...... (make your prediction as far as what will happen to the mass of the egg) .... BECAUSE ...(state your reasoning for your prediction in relation to osmosis)

Solutions the eggs will be placed in:
A. corn syrup
B. distilled water (100% water)
C. vinegar solution that is was soaking in

Set-Up Drawing: Make a drawing of each set up (3 drawings) which include labels. Be sure to label which set up is the control.

Data: Make a data table using a ruler with the following columns: Type of solution, Initial Mass (grams), Final Mass (grams), % increase or decrease (+ or -), Class Average of % change. Be sure to title your table!

Calculations: % increase or decrease = \( \frac{\text{Final Mass} - \text{Initial Mass}}{\text{Initial Mass}} \times 100 \)
5) **Analysis:** Write the full question out and then answer on a separate sheet of paper!

1) How did your result compare to your hypothesis? To the class average? Explain possible reasons for differences.

2) Based on the class average % increase or decrease which direction was the net flow of water in each of the solutions?

3) Why did we choose the control that we did? Why are controls important in experiments? (look in your text book for help!)

4) Which solutions were Hyper-, hypo- and isotonic? Explain how you know (include info about concentrations)

5) Apply what you have learned to explain the following:
   a) Why is it important for our kidneys to regulate water balance in our blood?
   b) Roads are often salted to melt ice. Explain how the salt can affect plants that grow alongside the roads.
   c) Why are fresh fruits sprinkled with water at the supermarkets?