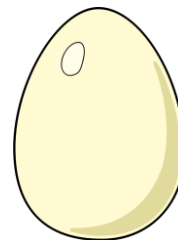


Egg Osmosis Lab

Lab Directions and Rubric

In this lab, you will investigate the osmotic behavior of a cell. A chicken egg is just one giant cell - so let's use it to test out some ideas about osmosis!

Note: This experiment takes place over a period of (at least) 3 days. Please start on it immediately as you will have to wait to collect data.



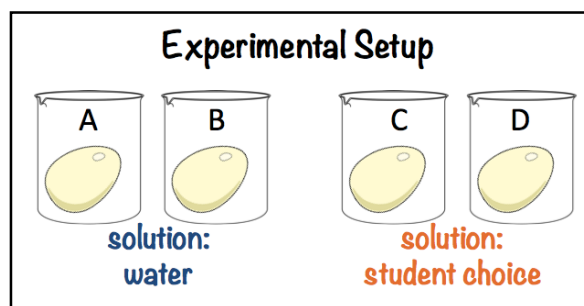
Materials:

- 4 raw eggs, medium size
- a tape measure (or string and a ruler)
- white vinegar
- salt or pure syrup (corn syrup works best, maple syrup works as a good substitute)
- optional: another solution of your choosing

Task:

You will design your own experiment to examine osmosis in chicken eggs:

- All students will place two eggs in water
- Each student will also test (at least) one other solution **of their own choosing** on two other eggs; you may even choose different concentrations of sugar or salt solutions.



Think about types of solutions that might affect cells (and therefore eggs.) Choose the variable you want to test:

- sugar
- salt
- other: _____

Write a hypothesis. Be sure it describes what will happen to the egg in both solutions:

Procedure:

Step 1 - Expose cell membrane by dissolving shell with vinegar.

1. With a tape measure, determine the circumference of each egg at its widest point. Record this metric data.
2. Place eggs in separate glasses of white vinegar for 24 to 48 hours. Label the glasses to keep track of measurements. Cover the container with plastic wrap. Vinegar is 5% acetic acid and will



- slowly dissolve the egg shell, leaving the plasma membrane underneath intact.
- After 24 to 48 hours, gently rinse eggs in water to remove what remains of the shell. You may have to rub a little, *gently*.
 - Carefully* use the tape measure to check the circumference of the egg. Record this data.

Step 2 - Osmosis Experiment

- Gently* place 2 eggs into separate glasses and cover with water.
- Make enough of your solution (salt, sugar, syrup, other) to cover each remaining egg in a separate glass. Write down how you made your solution (measurements: 1 part X to 1 part Y, for instance)
- Wait 24 hours. Pour out each of the four glasses, catching the eggs with your fingers.
- Use the tape measure to determine the circumference of the egg.

Results:

Use the following sample to construct your own data table for this experiment. Be sure you are measuring in metric units.

	Egg A Circumference (cm)	Egg B Circumference (cm)	Egg C Circumference (cm)	Egg D Circumference (cm)
Initial (shell on)				
After Vinegar (shell off)				
After Water				
After _____ solution				

Prepare Lab Report

You will prepare a mini-lab report with the sections listed below. See the Grading Rubric below to find out what to include for each section. Complete sentences and correct spelling and grammar are expected.

Please submit all of the following sections in *one* file, if possible.

Introduction (Hypothesis only)

Results: Data Table Only

Discussion: Answer Questions

- Did your data support or refute your hypothesis?
- What evidence/explanation do you have for this decision?
- Indicate whether each solution (water, your own) was hypertonic/hypotonic/isotonic and explain why.
- List one confounding (unexpected) variable or experimental error that may have affected reaction times.
- What could you do to eliminate this if you were to repeat this experiment?

Grading:

The following criteria will be used to evaluate your lab:

Criteria	Points Possible
Introduction State Hypothesis only <ul style="list-style-type: none">● If-then statement● Directly relates to experiment● Includes prediction for both solutions● Testable● Full sentence, proper spelling/grammar	3
Results Data Table only <ul style="list-style-type: none">● Properly set up● Data included for both groups	5
Discussion <ul style="list-style-type: none">● Hypothesis supported or refuted● Explanation/evidence: why hypothesis was supported/refuted● Indicate whether each solution (water, your own) was hypertonic/hypotonic/isotonic and explain why.● Identifies a confounding variable or error and explains how to eliminate● Paragraph format, proper spelling/grammar	12
TOTAL	20