



Osmosis Egg Lab

Hen eggs can be used as a model of a cell, because they are enclosed in a membrane similar to a cell. Cells are enveloped in a semi-permeable membrane also called a plasma membrane. Large molecules such as sugar, proteins, and starch cannot pass through easily, but small molecules such as water and salt may. This lab shows the importance of controlling the transport into and out of a living cell in order to maintain homeostasis, and what happens if the cell cannot do this.

Write down the meaning of these vocabulary terms:

<u>Root</u>	<u>Root meaning</u>	<u>Word</u>	<u>Word meaning</u>
Hypo-		Hypotonic	
Hyper-		Hypertonic	
Iso-		Isotonic	
Tonic		Tonicity	
Lysis		Cell-lysis	
		Diffusion	
		Osmosis	
		Permeable	
		Solute	

Lab goal: What happens to a cell in a hypertonic vs. hypotonic solution?

Part I: prepare the egg

Soak an egg in vinegar overnight.

Use the formula below to write a paragraph to explain your observations.

Where did the egg shell go?

Acetic acid (vinegar) + calcium carbonate (solid) = calcium acetate + carbon dioxide

+ water

Part II: perform the experiment

1. Dry your deshelled eggs.
2. Label your beaker of deshelled egg with a sharpie: Sugar OR water.
3. In the sugar cup put Karo syrup. This is a hypertonic solution because it has a lot of sugar in it. In the water cup put water. This is a hypotonic solution because it has not got a lot of sugar in it. Cover each egg with each solution. Allow the eggs to sit overnight.

Part III: What happened to your egg?

4. Record your observations of egg volume.
5. Which solution had a larger egg? A smaller egg?
6. Explain your observations using the vocabulary from the first page.

7. Draw a diagram of each egg. Use squares for sugar molecules, dots for water molecules, and a dotted line for the cell/egg membrane. Label the solution outside the egg hypotonic or hypertonic. In which direction does water always flow? (to hyper- or hypotonic?) Draw arrows to show the movement of molecules, if any.

EGG IN SUGAR:

EGG IN WATER:

Conclusion Questions:

8. People who are stranded at sea often die of dehydration even though they are surrounded by water (ironic). Explain what happens when a person drinks sea water.

9. If the egg represents a red blood cell, what might happen if you inject someone with an IV of pure water?