

Movement of Molecules In or Out of Cells (Osmosis and Diffusion) Investigation

A student put a drop of blood on a microscope slide and then looked at the cells under a microscope. As you can see in the Figure below, the magnified red blood cells look like little round balls. The student then accidentally spilled some sugary drink they had from Starbucks on their microscope slide. The student looked at the red blood cells under the microscope again and noticed that the cells appeared to become smaller.

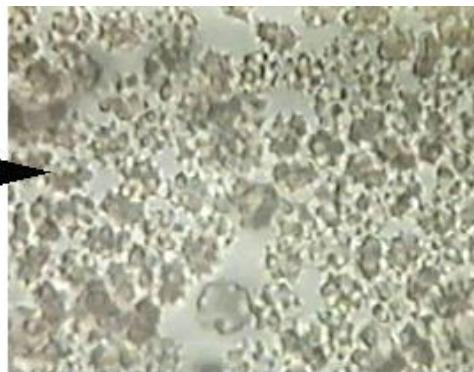
Figure 1.

Red Blood Cells



Figure 2:

Red Blood Cells After Adding Sugar Water



This observation raises an interesting question: **WHY DO THE RED BLOOD CELLS APPEAR SMALLER?**

Here are three possible explanations:

Explanation 1: Water molecules move out of the cell because the concentration of water is greater inside the cell than it is outside the cell, causing the cell to shrink in size.

Explanation 2: Sugar molecules push on the cell membranes and make the cells appear smaller.

Explanation 3: Sugar molecules enter the cell and take the place of the water. The cells appear smaller because the sugar molecules take up less space.

With your group, determine which explanation provides the best answer to the research question. You can use as many of the supplies available to you to test your ideas. Make sure that you generate evidence you will need to support your explanation as you work. You can record your method and any observations/data you make on the back of this page. Once your group has decided which explanation is the most valid or acceptable answer to the research questions, prepare the argument page that follows.

You can use the following materials to test the three explanations:

- Microscope
- Purple onion
- Slide and cover slip
- Sugar water
- Salt water
- Tap Water
- Deionized water
- Carrot sitting in regular water
- Carrot sitting in salt water
- Beaker
- Gummy bear

Our Prediction: What do you think is going to happen and why?

Our Methods: Write step by step directions on the procedures you want to perform. *Make sure to include a description of the control and experimental groups in your methods.

Our Observations and Data