

UNDERSTANDING OSMOSIS

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Today's teachers often wonder how to help their students understand the concept of osmosis. As a seventh grade science teacher, I faced the same dilemma. As our class discussed the chemistry of living things, the difference between solutions and suspensions, and the methods by which atoms combine, I explained to my students that materials enter and leave cells constantly. There is always some process being carried out at any given moment. I attempted to explain the process of osmosis and, to my surprise, all of the students had blank looks upon their faces! I continued to answer their questions for the remainder of the class period and I gave a homework assignment over diffusion and osmosis. We discussed the directions for the assignment and we even completed a few sample problems together. At the end of the day, I sat at my desk and thought about an activity that the students could complete to see the effects of osmosis. After thumbing through many lab experiment books, I devised the perfect activity!

The next day, the students came to class and found two paper cups, two pieces of string, and two mini carrots on each desk. Puzzled looks overcame the students; some even teased that they were going to lunch early. I explained to them that they were going to observe osmosis during a science experiment that would take two days to complete. I asked each student to walk to the water fountain and fill two cups each halfway - - approximately one-fourth of a cup of water. I passed a permanent marker around the classroom and asked each student to label one cup as "fresh" and the other cup as "salt." Each student then was asked to tie a piece of string to each carrot and place one of the carrots in each cup. As the students went through each step, they hypothesized as to why the cups were labeled with two different names. I asked the students what they thought would happen when I placed salt into the cup labeled "salt." Many of them commented that the texture of the carrots would change because of the two different types of water. Questioning the students forced them to explain the difference between osmosis and diffusion. It allowed them to utilize a hands-on experience to grasp the information. They were actually telling me



what osmosis was without even realizing it! At the end of the class period, each student placed both of the cups on the counter and the carrots were left to sit in the water for twenty-four hours.

On the second day of the experiment, each student wrote exactly what was observed. I asked the students to touch both carrots and distinguish between the ones in freshwater and the ones in salt water. Many students noted that the carrots in the salt water were very flimsy and somewhat dry, but the freshwater carrots were firm. Using texts and notes, the students were able to explain that osmosis had occurred in the carrot placed in the salt water because the water molecules from inside the carrot needed to balance the number of molecules in the salt water. Through the property of cell permeability, much of the water from the carrot in the salt water diffused through the carrot and spread into the salt water. At the end of the lesson, the students seemed to have a firm grasp on the concept of osmosis. It was an interesting way for the students to learn a science concept while having a fun, hands-on experience.

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