



Curiosity Guide #510

Diffusion and Osmosis

Accompanies Curious Crew, Season 5, Episode 10 (#510)

Wilted Veggies

Investigation #5

Description

What in the world is going on with these veggies? Can you figure it out?

Materials

- Raw potatoes
- Celery
- Cutting board
- Knife
- Clear containers
- Distilled water
- Water
- Salt
- Spoon
- Measuring cups
- Measuring spoons

Procedure

- 1) Fill one cup with 100 milliliters of distilled water.
- 2) Fill a second cup with 100 milliliters of tap water. Add 5 teaspoons of salt. Stir the salt mixture.
- 3) Slice the potato into round slices. Place 2 or 3 potato slices in each of the glasses.
- 4) Let sit for an hour.

- 5) Lift each slice out of the liquid and compare how the slices feel.
- 6) What do you notice?
- 7) Compare the slices that sat in water to slices that were not submerged.
- 8) Run the experiment again with celery.
- 9) Is there a pattern?

My Results

Explanation

The cells in the vegetables have a lot of water in them. When the vegetables are submerged in the liquids, the concentration of the amount of water in the vegetables' cells is different than the concentration of water in the glass. Diffusion is the movement of particles from a higher to lower concentration. In these examples, water is passing through the semipermeable membranes of the vegetables' cells, and this kind of diffusion is called osmosis.

The sliced vegetables from the distilled water get more rigid and have little flexibility, while the ones from the salt water get limp.

This is because the distilled water is moving into the potato, from the higher concentration of water in the container to the lower concentration in the cells. In the salt water, there is a higher concentration of water in the cells, so the water exits the vegetables and makes them limp. Cells try to maintain a balance with their surroundings. Because the salt molecules are too big to pass through the cell membranes, the only way to achieve better balance is for the water to leave.

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