



Curiosity Guide #510

Diffusion and Osmosis

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

Tea Bag Wonder

Investigation #1

Description

Would you like a cup of tea?

Materials

- Clear mug
- Tea bag
- Tea kettle
- Water
- Stove
- Spoon

Procedure

- 1) Fill the tea kettle with water and heat it up on the stove.
- 2) Pour the hot water into the clear mug.
- 3) Lower the tea bag into the water. You may need to carefully submerge the tea bag with a spoon.
- 4) Observe.
- 5) What do you notice?

My Results

Explanation

The water starts to change color from the tea bag, and fairly quickly, all of the water has changed colors without even stirring the cup. How can that happen?

All matter is made of molecules. Molecules are always in motion and colliding with one another. The tea bag has holes in it and is therefore *permeable*, so the water moves through the bag and interacts with the dry tea leaves. Water can move through permeable membranes. If there are more water molecules outside the tea bag than inside, the water moves inside the bag and makes the concentration of water molecules more similar. This movement of water through a membrane is called *osmosis*.

At the same time, tiny particles from the tea leaves begin to dissolve and move throughout the cup, wherever there is a lower concentration of tea particles. The process of particles moving from higher to lower concentration is called *diffusion*. By the time the water has changed color, the water has saturated the tea bag, and the tea particles have been bounced all around the cup.

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