



Curiosity Guide #510

Diffusion and Osmosis

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

Molecular Dance

Investigation #4

Description

Who is going to win the dance contest—the hottie or the coldie?

Materials

- 2 clear cups
- Hot water
- Cold water
- Food coloring
- Stopwatch
- Friend

Procedure

- 1) Fill one clear glass with hot water.
- 2) Fill the other clear glass with cold water.
- 3) Give your friend the stopwatch.
- 4) At the same time, drop one droplet of food coloring in each glass of water. Your friend should start the stopwatch when the dye hits the water.
- 5) What do you notice? Why?
- 6) Compare how long the effect took to complete in each glass.

My Results

Explanation

The food coloring in the cup of hot water starts to spread out right away, while the coloring in the cold water moves much more slowly. Eventually, both cups of water will fully change color. The process of particles spreading out from where they started is called *diffusion*. In this case, the colored particles move throughout the water. The colored particles collide with water particles and spread out the color. Diffusion of the color happens more quickly in the glass of hot water because particles move more quickly when the temperatures are higher. As a result, even though the dye diffused, or spread out, in both glasses, diffusion happens faster in the hot water.

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