Get $_2$ Know H_2O

EXPERIMENT 17: CAPILLARY ACTION

Objective: Can you make water run uphill?

WHAT IS CAPILLARY ACTION?

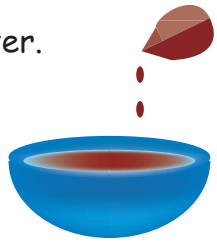
- Capillary action is defined as the movement of water within the spaces of a porous material due to the forces of adhesion, cohesion and surface tension.

WHAT YOU NEED:

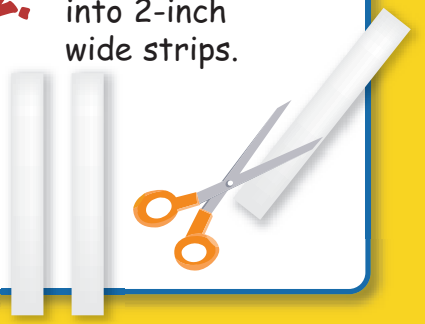
- Bowl of water
- Food coloring
- Two types of paper towels (choose ones with a different thickness or pattern)
- Scissors, ruler

STEP-BY-STEP:

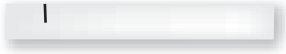
1. Add two or three drops of food coloring to water.



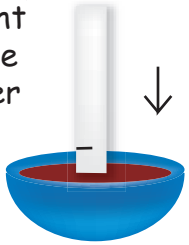
2. Cut paper towels into 2-inch wide strips.



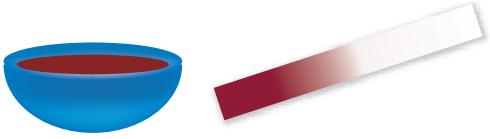
3. Place a mark on each type of paper towel 1-inch from the edge.



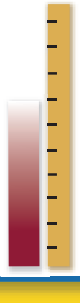
4. Carefully dip each paper towel straight down into the bowl of water just to the 1-inch mark.



5. Slowly lift the towel straight up out of the water and watch the water "climb" onto the paper towel.



6. Measure how far the water rises after 30 seconds.



QUESTIONS:

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- Which type of paper towel did the water rise higher on? Why?
- What would happen if you put the paper towel into the water up to 2-inches?
  Do you think the water would rise more, less or the same amount?
- Would the same thing happen with another liquid? Soda? Milk?
- What other times might capillary action be used?

For more fun and conservation-related experiments, please visit **www.plumbingexcellence.org**

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EXPERIMENT 17: CAPILLARY ACTION

Instructor's Guide

ALIGNMENT WITH ILLINOIS STATE BOARD OF EDUCATION GOALS

State Goal 11:
Section A: 2a, 2b, 2c, 2d, 2e and 2f

State Goal 12:
Section D: 2b

State Goal 13:
Section A: 2b and 2c

WHAT'S HAPPENING?

Everyone knows that moving water tends to flow downhill and standing water will seek its own level, but sometimes water can run uphill. In fact, in this experiment, the water will continue going up the paper towel until the pull of gravity is too much for it to overcome.

WHAT COULD GO WRONG?

Be very careful that the students dip the paper towels just to the 1-inch mark so they can get a fair comparison of results.

WHY IS CAPILLARY ACTION IMPORTANT?

Students need to understand that even if they've never heard of capillary action, it is still important in their lives. Capillary action is important for moving water (and all of the things that are dissolved in it) around.

AN EVERY-DAY-EXAMPLE

Capillary action plays a helpful role when you spill your glass of soda (which is, of course, mostly water) on the kitchen table and are rushing to wipe it up. First, you can thank surface tension, which helps to keep the liquid in a nice puddle on the table, instead of a thin film of sugary goo that spreads out onto the floor. Then, when you place a paper towel onto your mess, capillary action causes the liquid to attach itself to the paper fibers, and that helps you clean up fast!

WHAT ELSE CAN KIDS LEARN?

Capillary action also works like a straw for trees and plants. Plants put down roots into the soil that are capable of carrying water from the soil up into the plant. Water, which contains dissolved nutrients, gets inside the roots and starts climbing up the plant tissue. As water molecule #1 starts climbing, it pulls along water molecule #2, which, of course, is dragging water molecule #3, and so on. Plants and trees couldn't thrive without capillary action.

LINKS

http://ga.water.usgs.gov/edu/

CREDITS

United States Geological Society

EXPERIMENT 17: CAPILLARY ACTION

Instructor's Guide

YOUR FEEDBACK

Were the instructions clear?
Did the class stay interested?
Email us at **feedback@Get2KnowH2O.org** and let us know what you think. We would like to share your suggestions with other teachers and give you credit for your great ideas!