



WALKING WATER



Curriculum Topic: Understanding Life Systems

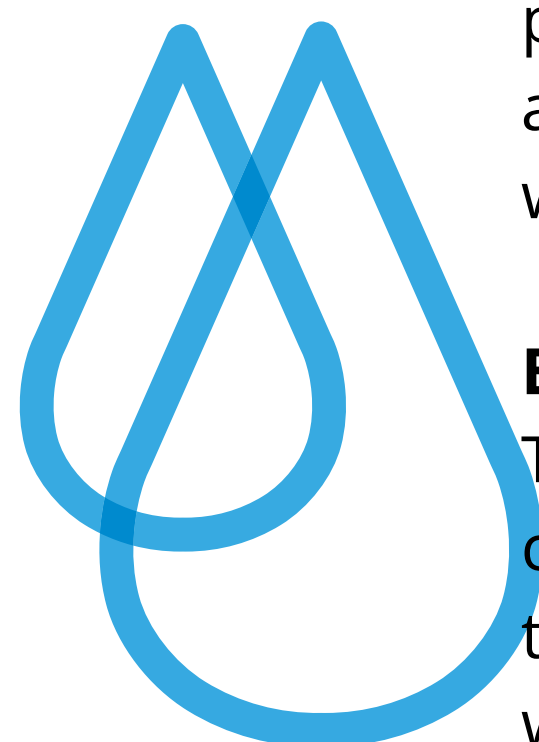
Grades and Topic: Three – Growth and Changes in Plants

Key Concepts:

- Growth in trees
- Physics (extra)
- Gravity
- Molecules
- Surface tension

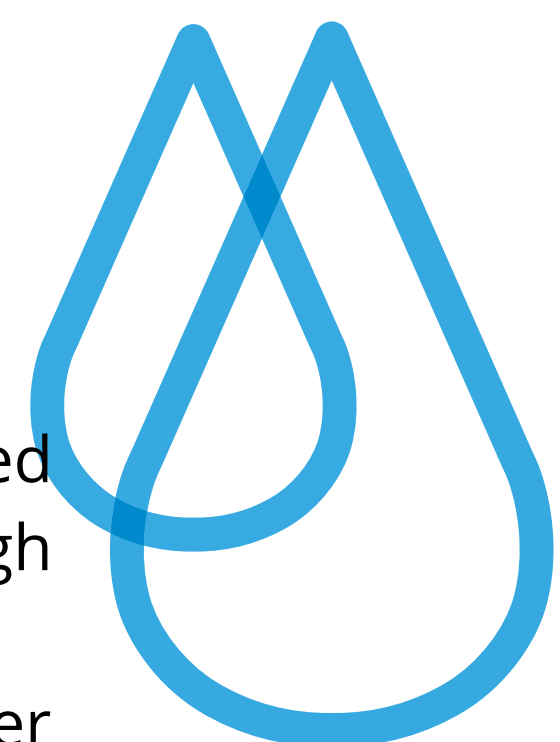
Introduction

In this experiment, you will see how water can travel from one cup to another, all through just a sheet of paper towel! The science behind this experiment is particularly advanced for those in elementary school, but it explores a fun analogy for children to understand how trees and plants can get water all the way up to their leaves from their roots.



Background

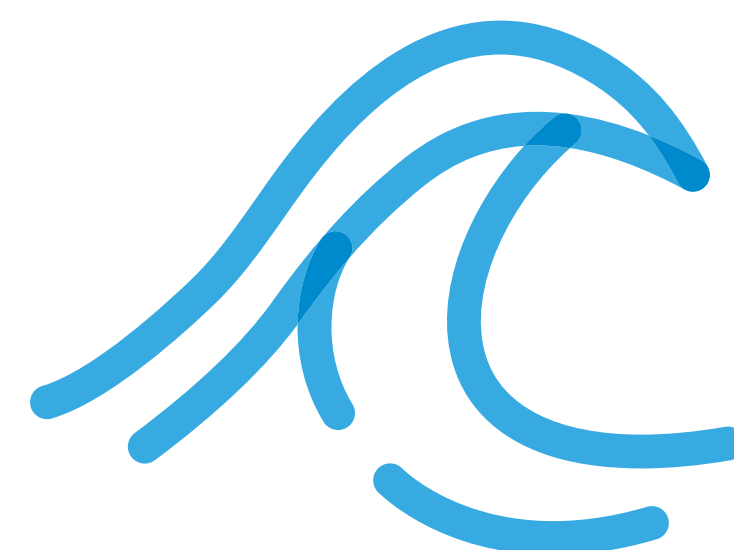
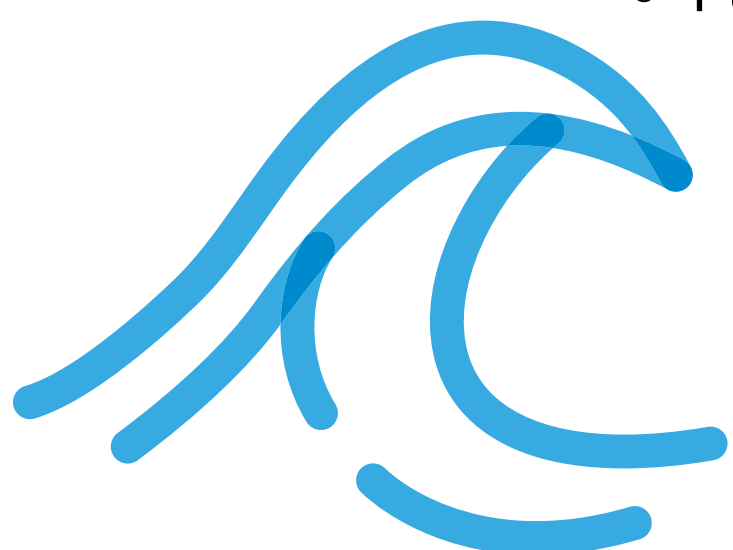
The process that allows the water to “walk” from one cup to the other is called capillary action. The paper towel is made from fibers, and the gaps through these fibers is what the water travels through. These gaps act like capillary tubes and pull the water upward. This is also what helps water climb from a plant’s roots, all the way up to its leaves.



Capillary action is fueled by something called surface tension, which is caused by cohesion (water molecules being attracted to each other). Surface tension allows water to get sucked up into the gaps of materials. This isn’t a concept you need to know yet, but it never hurts getting a bit ahead of the game.

Materials

- Odd number of glasses
- Water
- Food colouring
- Spoon
- Paper towels





Preparation

1. Line up all your glasses in a row, so that they are an equal distance apart. In the video, I used three glasses.
2. Starting with the glass on one end, fill every other glass with water almost to the top. Since I used three glasses, I filled the first and last glass, but not the middle.
3. Put a few drops of food colouring into the glasses filled with water. Make sure to use a difference colour each time. In the video, I added my colouring before filling the cups.
4. Mix the colouring in with the spoon, making sure to wipe it before mixing another glass.
5. Fold each sheet of paper towel you need in half twice, to get a narrow strip about an inch wide.
6. Fold each paper towel in half to make a "V" shape. The "V" should only be slightly taller than your glasses, so cut a little off the end of the paper towel before folding to make sure it fits. I had to do this in the video.

Procedure

Place each end of the paper towel into a pair of glasses, as shown in the video. What do you notice right away?

This experiment takes time, so come back every few minutes and check on it. What colour is the water in the middle cup? The experiment is done when all the cups have an equal level of water. If your cups are the same size as mine, this will take about 30 minutes.

Record your observations and talk about it with your friends or parents.

Bonus

Try this activity using more than three cups. You can even make a rainbow! Try filling the cups to different levels. What happens if you don't fill it almost to the top? What happens if you don't fill the cups to the same level? Record your observations.

Cleanup

Dispose of the paper towel properly and empty the glasses carefully. Be careful and make sure the food colouring does not stain any counter tops.

