

RAINBOW PAPER TOWELS

LEARN ABOUT CAPILLARY ACTION

What you'll need:

- 6 wide-mouth glasses or jars
- Food coloring
- 6 paper towels

How to do the experiment:

1. Fold each paper towel in thirds lengthwise. Test that they fit properly in the glasses. Fold each paper towel so that each forms a bridge between two glasses, touching the bottom of both glasses. You may need to cut the length to fit better. The smaller the "bridge" between the glasses the better.

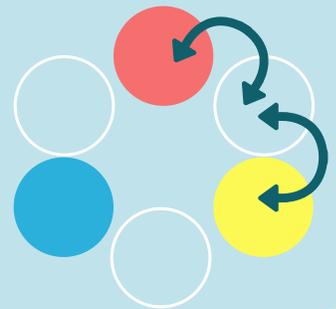
2. Remove paper towels and line up glasses. Add several drops of red food coloring to the 1st glass. Repeat with yellow food coloring to the 3rd glass, and with blue food coloring in the 5th glass. Add water to these cups with food coloring almost to the top of the cup.

3. Arrange glasses in a circle (shown at right).

4. Place all 6 paper towel "bridges" into glasses so that each glass is connected by paper towel to its two neighbors.

5. Wait and watch the colored water "walk" up the paper towel! Make some predictions while you wait. What will happen in the empty glasses? How many colors do you think you'll see?

*Note: If the colored water is moving really slowly up the paper towel, try adding a little water at a time so that the colored water cup is nearly full.



What to expect:

The water will "walk" up the paper towel bridges by a phenomenon called capillary action. After 20 minutes or so, the water will have distributed to all 6 glasses until all are filled equally. You will get to see color mixing in action too! Read more below about the **science** behind why this happens!



Science Saturday
is made possible
through the
generosity of Pfizer
Croton Labs

RAINBOW PAPER TOWELS

LEARN ABOUT CAPILLARY ACTION

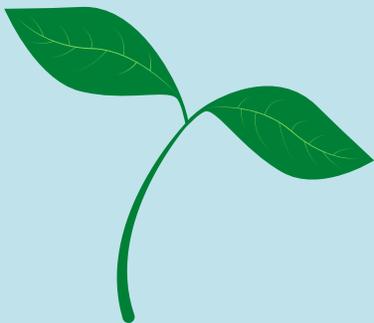
How it works:

Capillary action is the ability of a liquid, like water, to flow upward, against gravity, in narrow spaces. Capillary action uses the properties of **adhesion** and **cohesion** to allow the liquid to move.

Water molecules, the small parts that make up water, are "sticky": they can stick to each other and to other things.

Adhesion is when water molecules stick to other substances.

Cohesion is when water molecules stick to each other.

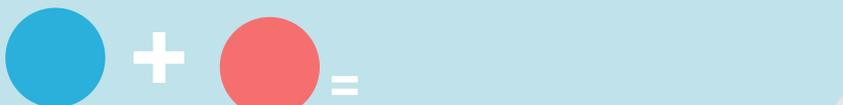


Plants use capillary action every day to get the water and nutrients they need to live!

Plants get their water and nutrients from their roots in the ground. However, their leaves need water and nutrients to stay healthy. So plants use capillary action to move water and nutrients dissolved in the water through tiny tubes up their stalks. Imagine sucking up water through a straw. That's what plants do, except they suck water up from their roots to their leaves!

You can watch capillary action happen with your rainbow paper towels! Paper towels are made from fibers from plants called cellulose. The colored water clings to the cellulose through **adhesion**. As the water molecules start to move up the paper towel, **cohesion** causes the water molecules to stick to each other and pull more and more water up the paper towel. Adhesion and cohesion are strong enough to overcome gravity so the water can move UP the paper towel.

You can also see color mixing happen in the empty glasses in between the red, yellow, and blue glasses! What colors do you get?



Science Saturday
is made possible
through the
generosity of Pfizer
Croton Labs