

On My Way Up



The Science of Capillary Action



◆ **9th-12th Grade**

◆ **Common Core Objective(s)**

Earth Science, Standard 4, Objective 1.d
Chemistry, Standard 3, Objective 3.c

◆ **10 Minutes**

◆ **Key Skills**

Observing
Measuring
Predicting
Experimenting
Interpreting data

◆ **Key Vocabulary**

Capillary action
Water vapor
Liquid
Gas

Activity Summary

While gravity works hard to pull everything down, the ability of a drop of water to resist gravity, stay still or even move upward is critical to life on earth. In today's experiment, students will witness surface tension in action and be able to watch as capillary action moves water out of a cup.

Materials

- ◆ Student worksheets
- ◆ Coffee filters
- ◆ Water
- ◆ Cup
- ◆ Food coloring
- ◆ Paper plate

Instructions

1. Divide class into teams of 2-to-3 students.
2. Give each team a coffee filter and a cup with one-inch of water in the bottom.
3. Put several drops of food coloring in the water and swirl it around until the color is mixed.
4. Fold the coffee filter in half, in half once again, and then in half one last time until it forms a wedge shape.
5. Twist the bottom of the coffee filter.
6. Quickly dip the bottom tip of the coffee filter into the water, pull it out, and observe what happens.
7. Unfold the coffee filter and lay it on the paper plate. Be sure not to allow the coffee filter to touch or drip on the table as the food coloring may stain.
8. On the worksheet, sketch the pattern the water made and make notes of your observations.
9. As a group, discuss the results and what you have learned

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Discussion Questions

1. Imagine if you dropped water into the middle of a coffee filter that was laid flat on a plate. Would capillary action affect the water? What type of patterns do you think you would see on the coffee filter?
2. One of the most common places to find capillary action in nature is in plants. How do you think plants use this force to survive?
3. Capillary action is also seen in soils. Based on what you know about capillary action, do you think liquids would flow upward more easily through clay (with small spaces between the particles) or sand (with larger spaces between the particles)?



Dive Deeper

Capillary action doesn't just happen here on Earth; it also plays a role on the International Space Station. In this 'Take Your Classroom into Space' Video <https://www.youtube.com/watch?v=v85keaWuxlo> learn how capillary action affects microgravity, observe an experiment, and explore how astronauts use capillary action to complete tasks in orbit.

Additional Resources

- ◆ USGU Water Science School- <https://water.usgs.gov/edu/capillaryaction.html>
- ◆ National Groundwater Association- <http://www.ngwa.org/Fundamentals/hydrology/Pages/Forces-controlling-water-in-rocks.aspx>
- ◆ Capillarity and Gravity- <http://web.mit.edu/nnf/education/wettability/gravity.html>

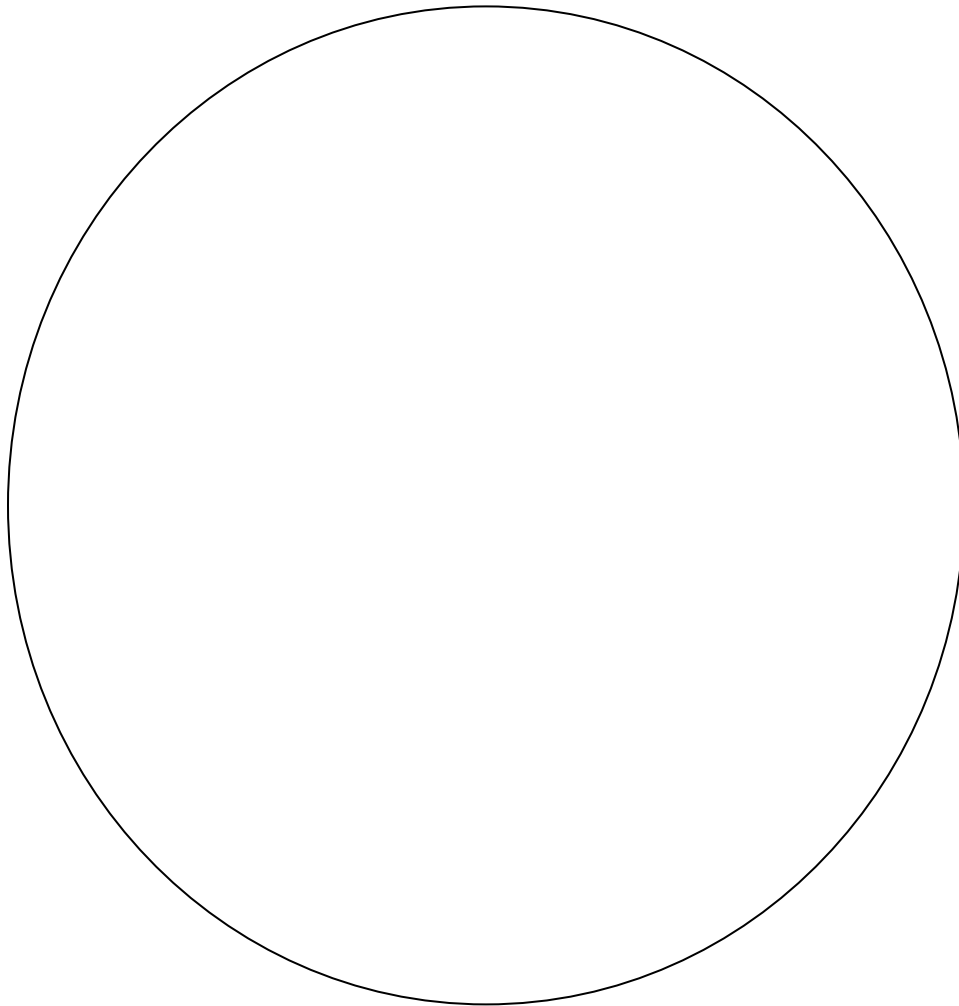


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1. Sketch the pattern the water makes on the coffee filter.



2. Write a description of the pattern the water created.
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