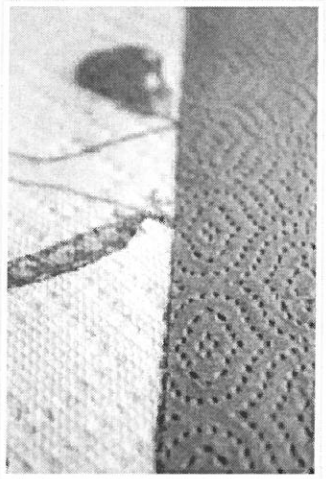
Paper Towel Science Project: Capillarity



Yikes! You've just spilled water all over the table! Never fear, there are paper towels nearby. As you clean up your mess you notice that water is spreading throughout the paper towel. What is going on here? The water is being **absorbed,** or soaked up, by the paper towel material through a process called **capillary action.** Capillary action, also known as **capillarity**, is the rising or absorption of liquids through small gaps and holes certain materials.

Paper towels are permeable and porous, meaning that they contain small spaces that both liquid and air may pass through. Liquid is able to rise through a property of water called **cohesion**—that is, water molecules like to stay close to one another (which also helps to explain surface tension). Water also likes to bind to certain other materials through a process called **adhesion.** In this paper towel science project, we will be testing which type of paper towel contains the highest rate of **capillarity** (or ability to absorb water into its many small spaces).

Problem: Which of your 5 paper towels demonstrates the highest level of absorption or capillary action?

Materials

- 5 different types of paper towels cut into 3"x3" rectangular strips (be sure that you use a variety: rough, soft, brown, white, recycled material, etc.)
- 5 cups filled with a small amount of water
- 1 marker
- Notebook

Procedure

1. Cut a 3"x8" strip from each type of paper towel.
2. Observe any differences you see between the paper towels. (*Are some more "quilted" than others? Rougher? Softer?)* Take note of any differences.
3. Fill each of 5 cups halfway with water.
4. Note which bowl you will be testing which paper towel in. (make small labels if this is helpful)
5. Carefully dip 1st strip about 1 inch into the cup of water.
6. Use marker to note how much water is absorbed upwards into the towel. Be sure to mark it right above the damp part so that it is dry and doesn't smear.
7. Repeat steps 4-6 with each paper towel strip.

Observations & Results

What happened? Did you notice any major differences in terms of absorption levels? If you used a largely quilted, soft paper towel, you may have noticed that it absorbed more than others.

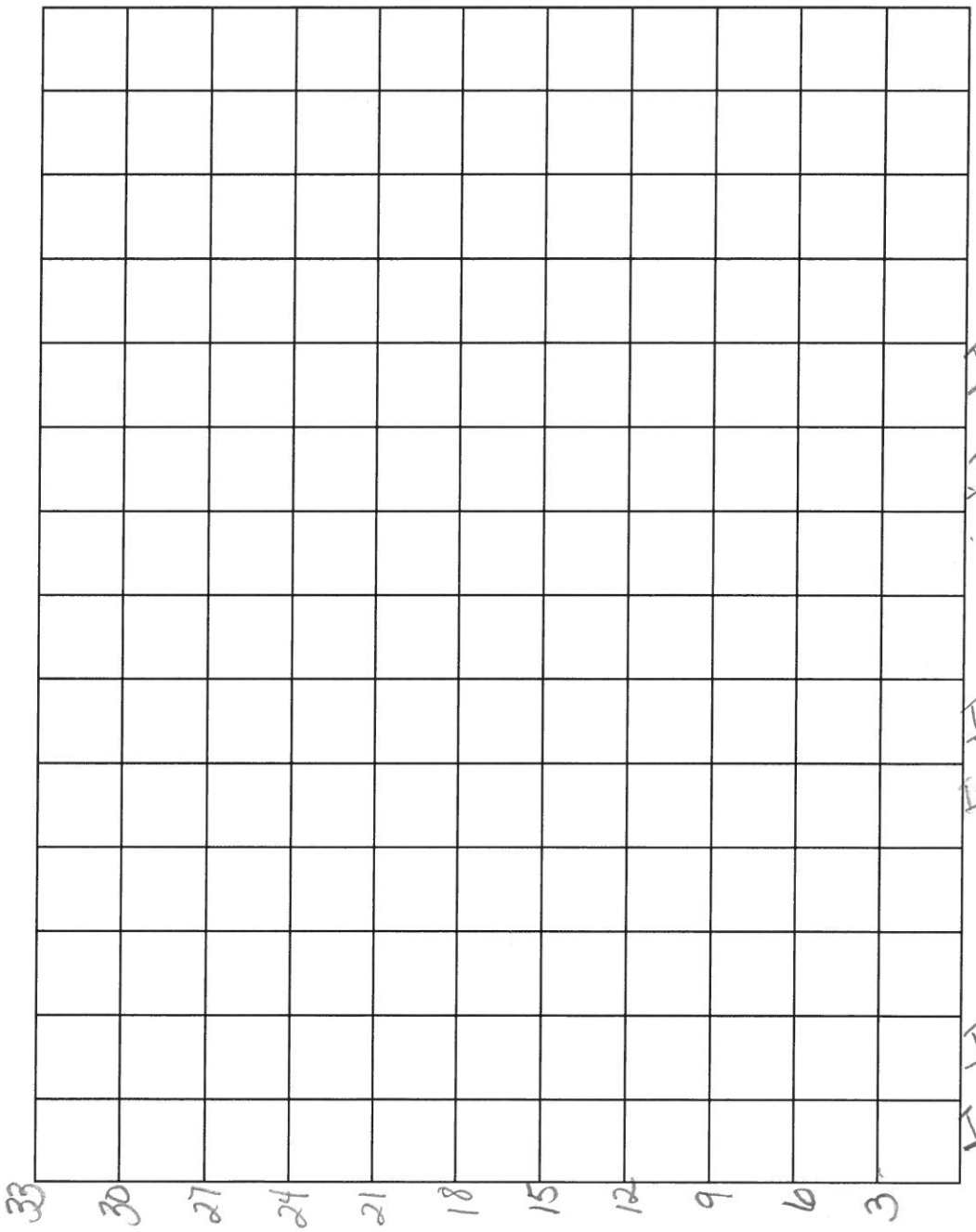
Why?

Water wants to be wherever it can be held and kept together through cohesion and adhesion. In this case, the puffier, softer paper towels were able to hold more water because their capillarity was greater. This is due to their larger holes and pockets, which can hold more water than standard paper towels. Ever notice how rough and flat the brown paper towels in your school restrooms are? They're not very absorbent because they do not have the soft, puffy, quilted texture of other types of paper towels.

Paper towels are a great way to explore **capillary action** because they show the ways in which water and other liquids can move upwards through a material at different rates and quantities. Feel free to keep investigating!

Have any celery in the refrigerator? Celery can also be a great example of capillary action. Mix water and food coloring in a cup. Submerge a freshly cut end of a stalk of celery and watch the color be pulled up through the stalk!

How much water is absorbed



Milliliters of water absorbed.

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