



Curiosity Guide #206

Liquid Forces

Accompanies Curious Crew, Season 2, Episode 6 (#206)

Droplets on a Penny

Investigation #5

Description

Have you ever heard the saying, "Like attracts like?" It's true, but what about when like attracts different? Find out what happens!

Materials

- Some friends
- Pennies, one for each person
- Pipette, one for each person
- Paper towels
- Small containers of water
- Liquid soap

Procedure

- 1) Secretly cover one penny with liquid soap. Pat the penny dry with a paper towel.
- 2) Pass out a penny to several friends. Have them place the penny flat on a paper towel on the table.
- 3) Challenge your friends to see how many droplets they can balance on the penny, using a pipette filled with water.
- 4) Have your friends count each droplet as it is balanced on the penny.
- 5) What do you notice? Do the droplets form a large water bubble?
- 6) What happens when the water spills off?
- 7) What do you notice on the paper towel?

My Results

Explanation

This activity demonstrates a number of liquid forces. First, the big water bubble from dropping water onto the penny seems to hang over the edge of the penny and crest up and over to the other side. This is a good way to see the **cohesive force**, which is the attraction of the water molecules to each other. You can also see the skin-like layer on the top of the water bubble from the **surface tension**. At the same time, when the droplet spills, the rest of the water flows off as well. This is also an example of **cohesion**, as the droplets follow each other off.

Once the paper towel gets wet, the water starts to move through the paper towel. The water is being attracted to the different paper fibers through the principle of **adhesion**, the attractive force between different molecules. The water is also following other water molecules. You guessed it; that's **cohesion**! Together, that movement of the water is called **capillary action**, the same thing we see when a towel soaks up a spill or when a plant brings water through its roots and stem.

Finally, what about the secret penny that was tainted with soap? That person will not be able to get as many total droplets on the penny before the water spills off. A good example of this action at work in daily life is doing the laundry. Adding soap breaks the cohesive force among the droplets and can eliminate surface tension. Adding soap to a washing machine eliminates the cohesive nature of the water, so the droplets are no longer sticking together. Instead, the water droplets are contacting the fabric and washing the clothes clean!

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