Stopping Water with Cheesecloth

Science IDEAS Project
Teacher Science Demonstration

Goal:

To demonstrate the strength of water's cohesive and adhesive properties.

Materials:

- Water
- Cheesecloth
- Several bottles with different sized openings (soda bottle, Erlenmeyer flask, etc...)
- Index cards
- Bucket or sink to catch the water

Procedure:

1. Dunk the cheesecloth in water, making sure that the water soaks through.
2. Fill the bottle with the smaller opening with water, as close to the top as possible.
3. Stretch the cheesecloth over the opening, and hold it tight to the sides of the bottle with your hand.
4. Place the index card over the cheesecloth to hold the water in while you turn the bottle over.
5. Over the bucket or sink, slowly turn the bottle upside down and then slide the index card off of the opening. Other than a few drops, the water should stay in the bottle.
6. Repeat with the other bottles. If the opening is too large, the demonstration will fail.

Journaling Opportunities:

- Observe and record what happened to the water in each of the different bottles. What difference in the bottles caused the water to be held in or to escape?
- Why was it important to soak the cheesecloth in water first?
- Would this work with a regular drinking glass that has a wide opening?
- Would this work with substances other than water? Why or why not?

What Happened?

When you soaked the cheesecloth, the adhesive forces between the cloth and the water made the cloth damp. The water held onto the cloth. After you tipped the bottle over, the cohesive forces between the water in the bottle and the water soaked into the cloth created a "lid" over each of the squares of the cheesecloth. As long as the bottle opening is small enough, the cohesive forces holding water molecules together have enough strength to hold all of the other water in the bottle. If the opening is too big, then force of all of the water molecules being pulled down by gravity overwhelm the cohesive and adhesive forces and water gets through the cheesecloth.

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