

Magic Pepper Sinker

Science IDEAS Project
 Student Activity

Goal:

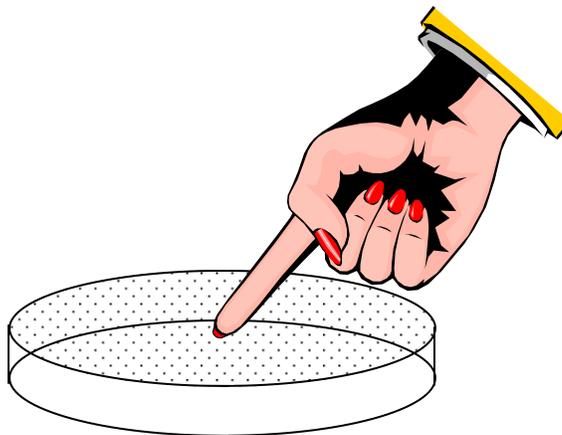
To demonstrate how soap can eliminate water's **cohesive** properties.

Materials:

- Petri dish or other small, shallow container
- Water
- Pepper
- Soap (liquid dishwashing)
- Paper cup

Procedure:

1. In the paper cup, mix a strong solution of soapy water. Several students or groups can share one cup.
2. Clean the dish, and fill it half way with water.
3. Sprinkle pepper over the water so that it is evenly coated.
4. Dunk your finger in the solution of soapy water, taking some of the solution with you.
5. Gently touch the top of the pepper-coated water with your finger. Observe what happens, and record your observations in your journal.



Journaling Opportunities:

- What did you observe when your finger touched the water? How did the pepper move? Illustrate your observations.
- What force caused the pepper to move the way that it did?
- Can you think of any other time where you have seen something in water act the way that the pepper did?
- What other substances could you put on your finger that would make the water and pepper act in a similar way?

What Happened?

The pepper floats on top of the water due to cohesive properties of the water and the resulting surface tension. The pepper flakes (which are more dense than water, and therefore should sink) do not fall through the water's surface because of the strong bonds between water molecules there.

When the soap is introduced to the water, it breaks the cohesion between molecules. This affects the pepper in two different ways. First, as the soap moves from the center to the outside of the dish the cohesive forces break in the same pattern, and water molecules are pulled towards the edges of the dish. The water pulls the pepper with it, causing it to rush out from the center. In addition, because the surface tension of the water has been broken the pepper now sinks.