

RAFT IDEAS

Topics: Surface Tension, Forces, Properties of Matter

Materials List

- ✓ 2 spice jars, empty & clean with lids containing several holes (alternately, use cups with lids & poke at least 5 small holes in the same pattern in each lid.)
- ✓ Water
- ✓ Rubbing alcohol
- ✓ Trays to catch liquids

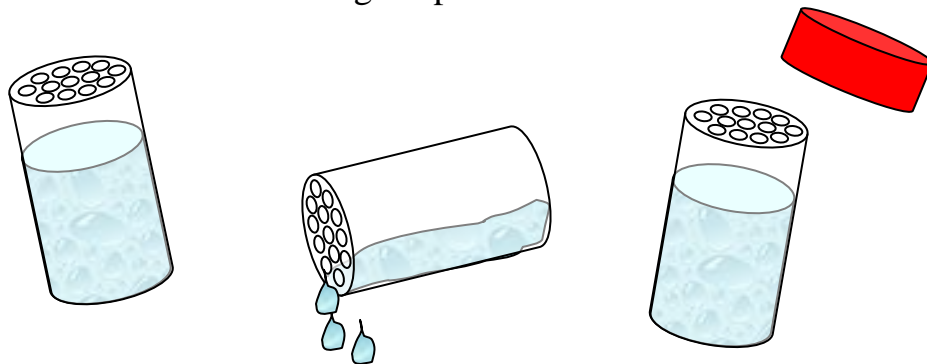
This activity can be used to teach:
Next Generation Science Standards:

- Structure of matter (Grade 5, Physical Science 1-1)
- Property of materials (Grade 5, Physical Science 1-3)



Stop the Drop

Amazing Properties of Water



Students are challenged to tip the containers but retain the liquids in this wonderful, but counterintuitive investigation into properties of water and other liquids.

To Do and Notice (Safety note: Because of the fumes associated with using rubbing alcohol, it is best to do this activity in a well-ventilated area.)

1. Fill a spice container or cup halfway with water. Cover securely with lid.
2. Fill another identical container halfway with rubbing alcohol. Cover securely with lid.
3. Slowly turn each container over above a catch tray and observe what happens.
4. Continue to turn each container over until each container is completely inverted. What happens? Describe what happens to each liquid. Do the liquids behave the same?

The Science Behind the Activity

Water molecules are attracted to other water molecules. This attraction is called cohesive force and is responsible for the phenomenon known as surface tension. Molecules at an air/water boundary lack water molecules on all sides, and therefore cohere more strongly to the adjacent water molecules on the other sides. These attractions form a “skin” or “film” at the boundary. The spice jar containers and cup lids have small enough holes so that the mass on the contained water will not break through this skin. When completely inverted, the water will stop flowing out of the holes in the lid! Water exhibits higher surface tension than many other liquids. For example, water (surface tension = 72.8 mN/m) has a much “thicker skin” than ethyl alcohol (surface tension = 22.3 mN/m). Because of the lower surface tension, the alcohol will continue to flow out of the second container until it is empty.

Taking it Further

For other properties of water investigations, see the RAFT Idea Sheets *Wired on the Water* and *Water in an Ice Box*.

Web Resources - (Visit www.raft.net/raft-idea?isid=417 for more resources!)