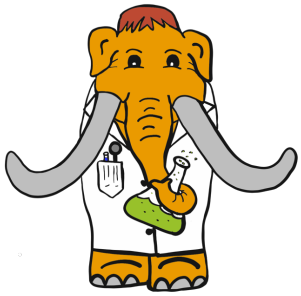
Science Saturday @ Home
Exploring Cohesion & Surface Tension



Gathering Supplies:

Shallow medium to large container
Water Paper
Scissors Salt Pencil
Dish Detergent Paper Towel
Penny Dropper, pipette or cotton ball

How To Steps:

Explore some of water's physical properties: Cohesion and Surface Tension!

Drops On A Penny

1. Place a penny on a plate or paper towel and add drops of water on top of it with the pipette or dropper, one drop at a time. If you don't have a pipette or dropper you could gently squeeze a cotton ball soaked in water.
2. Look carefully at the drops. The water will form a "dome" that can build relatively high on the penny.
3. See how many drops you can fit on the penny before it spills over.
4. Try it a few more times! Challenge other family members!
5. Then try adding a few drops of dish detergent to the water you're using. How does that affect the surface tension? How about using water that you have added a tablespoon of salt to. Does the number of drops you can put on the penny change? Does that mean that the surface tension is increasing or decreasing?

Swimming Fish Race!

1. Fill a shallow container with just enough to cover the bottom of the container.
2. Draw a couple of small fish onto a piece of paper, about 1 ½ inches long. Cut them out.
3. You can race 2 – 3 fish at a time in one container. Challenge family members to a race.
4. Get a small amount of dish detergent ready in a container.
5. Place your fishes gently in the water, along one end of the container. They float because of the surface tension of the water. Now let's see if you can race them!
6. Have each person dip the tip of a finger into the detergent then gently touch the surface of the water just behind their fish. Do this on the count of 3 so that everyone touches that water at the same time.
7. This only works one time and then the water has to be emptied and replaced!

Please remember when you are done, don't waste the water!
Water a plant or if there is dish detergent in the water use it to wash dishes!

Exploring Properties of H_2O with Max

Did You Know?

Water is a special kind of liquid called a polar liquid. That means that molecules of water act like tiny magnets, sticking together with all the other water molecules around them. Along the surface of the water, there are no water molecules above to stick to, so the molecules on the surface grab onto the ones next to them even more strongly. This extra-sticky force is called surface tension and makes the water act like it has a rubber "shell" around it. Surface tension is what lets bugs walk on water, and what makes drops of water "jump" together when they touch, or makes your Cheerios bunch together as they float on the milk in your bowl.

Adding certain other kinds of things to water, like soap or alcohol, will decrease the "stickiness" of the water molecules and weaken the strength of surface tension, making the "shell" act thinner. Others, like salt, will make the water molecules even stickier and increase the strength of surface tension.

The physical properties of soap are what move our fish! Soap is what is called a surfactant. Surfactants are agents that break up surface tension. Soap can easily break up the surface tension of the water because it is part hydrophobic (water repelling) and part hydrophilic (water attracting). This is what makes soap clean so well! It can spread apart the molecules of the water, which allows the water to clean better.

By adding a few drops of soap behind your fish, the surface tension of the water is broken, and the water spreads away from the soap. When the water moves away from the molecules of the soap, the fish moves with it! Just remember this trick only works once.