

4 Simple Experiments You Can Do At Home Today

Materials:

- Play dough or marshmallows
- toothpicks
- plastic comb or a balloon
- penny
- transfer pipette or medicine dropper
- paper clip
- dish soap

Safety:

None

Building a Model of a Water Molecule

Roll three balls of play dough and connect in a v-shape using toothpicks. Discuss the molecular formula (H_2O), and explain that the shape of a water molecule is bent. This bent geometry leads to polarity. A polar molecule has partial positive and partial negative charge build up.

Bending Water

Turn on your faucet to a trickle. Hold a plastic comb (or a balloon) about 1/4 of an inch from the trickle. There should be no effect. Now run the comb through your hair to build up a charge (or rub the balloon against your hair). The comb will pick up electrons from your hair and obtain a negative charge. Now hold the plastic comb near the trickle of water again. The negatively charged comb will cause the water to bend. The bending is due to the negatively charged comb attracting the partially positive ends of the water molecules.

Exploring Surface Tension

Ask your kids how many droplets of water will fit on a penny. Now use a pipette or dropper to add one drop at a time. Count to see how many droplets you can fit on the penny before breaking the surface tension. It's a lot more than you think! Explain that the attractive forces between the water molecules are able to keep the droplet together. This is called surface tension. You can also try this experiment with rubbing alcohol which has a weaker surface tension than water.

Breaking the Surface Tension

Fill a bowl with water. Carefully place a paperclip on top without breaking the surface tension. Now dip a q-tip in dish soap and touch it to the surface of the water. The soap breaks up the surface tension of the water and causes the paper clip to sink immediately. Soaps and detergents have both a polar and a non polar region. The polar regions attract the polar water molecules, and this breaks up the attractive forces that create the strong surface tension in water.