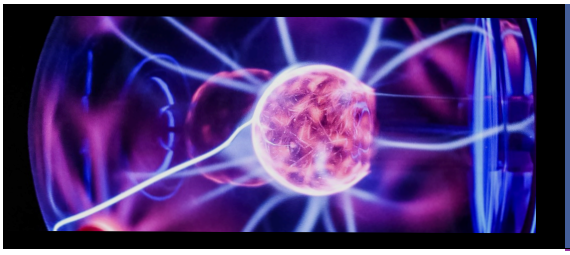

April 2023
15-Minute Family STEAM: Static Electricity

Balloon Experiment

--2 balloons -Head of hair or sweater -- yarn/string --assorted materials--tissue paper, aluminum foil, cardboard, paper

1. Blow up the balloons.
2. Ask your child what they think will happen when we touch the balloon to the objects?
3. Touch a balloon to each of different materials including the other balloon. {Notice none of the materials is attracted to the balloon.
4. Have your child rub one balloon onto the their hair or on a sweater.
5. Ask your child what they think will happen when we touch the balloon to these objects now that you have rubbed it on their hair/ sweater?
6. Now touch the balloon again to each of the materials. Observe what happens.
7. For some of the objects, you may hear a pop. Some of the objects will be picked up only to fall right back down. {Either the charge was transferred or the object weighed too much to remain attached to the balloon.}

Questions to Ask:
What other objects might stick to the balloon? What about or the wall?
What objects will be pushed away by the balloon? (try an aluminum can)

Bending Water

--Two small paper cups --Balloon --Water
--Food coloring --Head of hair or sweater --Pushpin -- Mixing bowl

1. Use a pushpin to poke a small hole in the bottom of one of the cups. Before beginning the activity, test the cup to make sure a small, but steady, stream of water flows from the cup when it is filled with water.
2. Inflate the balloon and tie off the end
3. Fill up one paper cup with water and added a couple drops of food coloring. Have your child take the balloon and rubbed it vigorously on their hair (or on a woolen cloth) to create static electricity
4. Hold the cup with a hole in it directly over the mixing bowl. Pour the colored water into the cup with a hole in the bottom so there is a steady stream of water flowing out into the bowl.
5. Hold the charged balloon close to, but not touching, the stream of water. The stream of water should veer off toward the balloon (if it doesn't happen try rubbing the balloon on your hair or the sweater some more)

***Bending water with static electricity works best on a dry day. If the air is too humid it may not work, for reasons explained below.

The Science Behind Static Electricity Experiment
Basically, static electricity is all about the electrons. Electrons can move about from atom to atom and object to object. When there is an excess amount of electrons, there is a negative charge. The extra electrons will move to an object with a lesser or opposite charge. You can hear a pop when the electrons move and even see a spark. You can also feel the shock when the charge is neutralized.
Rubbing a balloon on a head of hair or a sweater generates static electricity. This means that some of the electrons from the hair or sweater move onto the balloon. This gives the balloon a slight negative charge that makes it attract or repel other objects, not unlike a magnet.
Water is composed of an oxygen atom and two hydrogen atoms that share their electrons unequally. This causes the hydrogen atoms to carry a slight positive charge. When the balloon is held close to a stream of water, the slightly negative balloon attracts the slightly positive hydrogen atoms in the water, making the stream of water bend toward the balloon.
If the air is too humid, water molecules in the air will stick to the extra electrons on the balloon, basically taking away its static charge.

Attleboro Public Library

Attleboro Public Library
74 North Main St
Attleboro, Massachusetts 02703 | (508) 222-0157
attleborolibrary.org