



INVESTIGATING STATIC ELECTRICITY

Discover how to use static electricity to make things move without touching them!

Overview



Make household objects move without touching them! All you need for these static electricity investigations are a balloon, a sheet of toilet paper or a can, a straw, a toilet roll tube and a running tap.

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What you'll need

- Jumper or your hair
- Can or a sheet of toilet paper/ tissue paper
- Balloon (any balloon works, but water balloons are great for this activity)
- Straw
- Toilet roll tube
- Running tap

What to do

Step 1



Blow up a balloon and tie a knot in the bottom. Younger children may need help with this.

Grab your empty can and lie it on its side on a table or other flat surface.

Duration

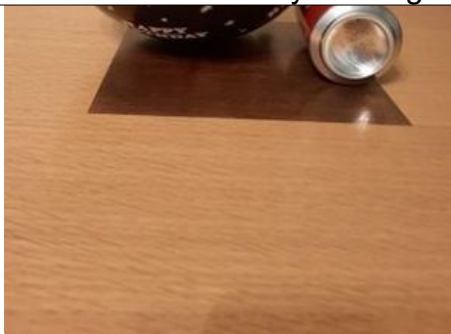
5 minutes or so.

Suitable for...

Age 3+

Safety notes

You know your



children better than anyone, and you should judge whether they're ready for this activity. You might want to think in particular about:

- Supervision: the activity involves small parts, so there's a choke hazard.
- The can can be sharp so don't touch the opening
- Balloons can be dangerous, ask an adult to blow it up for you
- Beware of latex allergies

Career link – Electrical Technician

Electrical technicians are responsible for designing, developing, testing, maintaining and repairing electrical wiring and equipment. Work can vary from dealing with circuit breakers and electrical wiring to working in research and development, conducting experiments, testing new designs, and collecting data.

Attributes: focused, organised, attention to detail

Career link – Particle Physicist

Step 2



If you are using a sheet of toilet paper, peel the two layers apart and tear it into pieces. Spread the pieces out on a table or flat surface.

Step 3



Rub the balloon on your jumper or on your hair for a few seconds to charge the balloon with static electricity. When you rub two different materials against each other, they become electrically charged.

Step 4



If you are using a can, hold the balloon close to, but not touching, the long side of the can and watch the can move!

A particle physicist is someone who studies the subatomic particles that make up matter and radiation to discover how they exist, interact and shape the natural world. They seek to identify the smallest objects of which matter is composed of, and to understand the integral forces that drive their interactions and combinations.

Attributes: imaginative, patient, tenacious

Step 5



If you are using paper, hold the balloon above the paper and watch it move!

Things to discuss

- Why is the can moving along the table towards the balloon?
- Is there a way to make it move faster?
- Does the surface you are working on impact the experiment?
Try doing the activity on a table then try it again on the carpet. Is there a difference?

How it works

Everything is made up of tiny particles. These particles may have positive or negative charge. Electricity is what we call the movement (flow) of these charged particles.

You have probably made an electrical circuit at school. An electric current is when the negatively charged particles called electrons flow around a circuit. We use electric currents to operate devices like phones, computers and light bulbs.

Static electricity is the build-up of an electrical charge on the surface of an object. It doesn't easily flow or move to a different place, so it is called static.

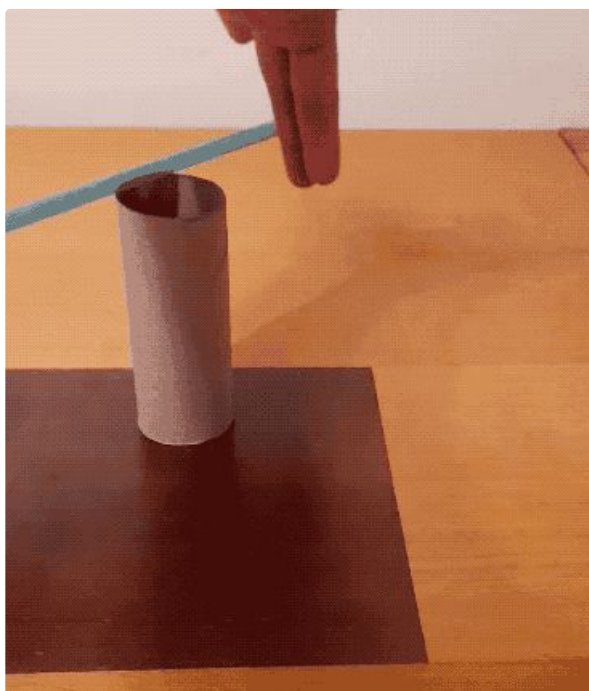
When two objects (like the balloon and your jumper) are rubbed together, electrons move from one object to the other. One object becomes positive and the other negative.

Objects with different charges (positive and negative) will attract each other, while items with similar charges (positive and positive) will push away, or repel, each other.

When you bring the negatively charged balloon near the can, the negative electrons on the surface of the metal can are free to move, and are repelled away from the negative balloon. This makes the side of the can nearest the balloon slightly positive, and so the can is attracted towards the balloon.

Other things to try

Moving Straw



You will need: a straw, toilet paper tube and a jumper.

Rub the straw with a jumper in the same direction several times then balance it on the

Bring your hand close to the straw without touching it and watch it follow you.

Does one end of the straw react to your hand more than the other?

Does using two hands make a difference compared to using one hand?

Do you think your hands and the straw have the same or different charges?

Bending Water

You will need: a straw and a very thin stream of water from a tap.

Rub the straw with a jumper in the same direction several times and then hold it next to the stream of water.

Try not to wet the straw because it will lose its static and you will need to rub it on your jumper again.

Can you make the water bend more or less?

Do you think the water and the straw have the same or different charges?

