



# Static magic

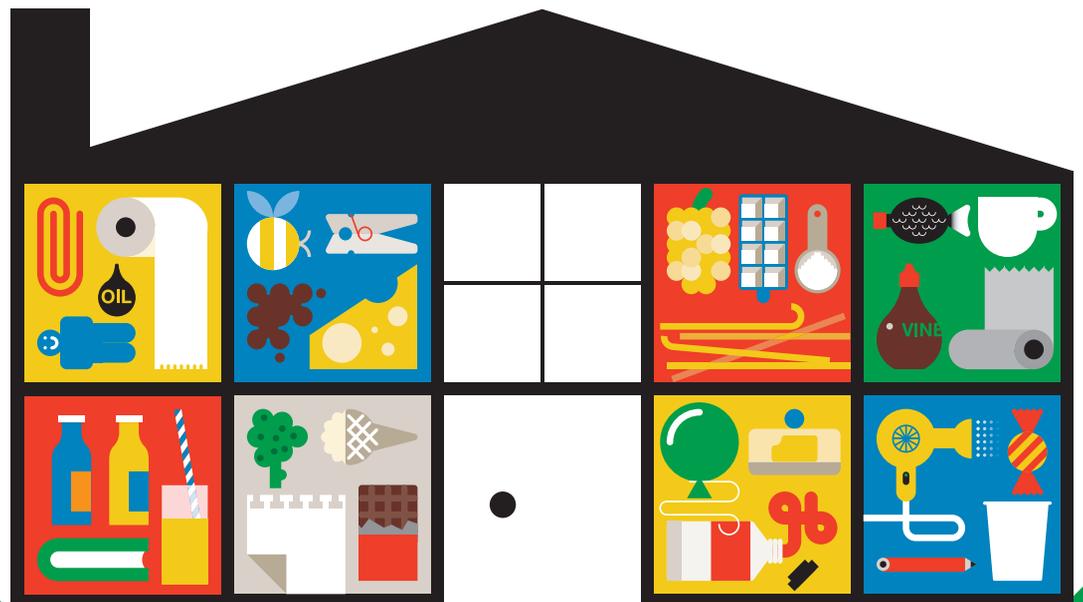


## The activity

Make objects move without touching them by charging them with static electricity.

ExpeRiment with different objects to see how static electricity affects them.

Learn about charged particles like electrons and how things gain or lose charge.





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### What you'll need

- A balloon
- A cotton towel or T-shirt or a woolly jumper
- Some scrap paper
- A plastic drinking straw (optional)
- An empty 500ml plastic drinks bottle (optional)
- A hard plastic comb or ruler (optional)
- Other household objects to test



### Special materials

*You can do this activity with all sorts of things you have in the house, but a balloon works really well and a plastic straw lets you do the 'magic' trick Sophie does at the start of the film.*

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### What to do

**Charge up a balloon** and try picking up scraps of paper with it.

**Investigate** whether the amount you rub the balloon affects how much paper it can pick up.

**Investigate** whether the size of the scraps of paper makes a difference.

**Find out** how close you have to be to the paper before the balloon makes it move.

**Try** bending a stream of water like Hector does in the video.

**Try** balancing a straw on top of a bottle lid and seeing if you can make it spin like in the video.

**Find out** which objects are attracted to the charged up balloon and which are repelled by it.

**Try** holding a charged balloon near your hair or your skin.

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### Questions to ask children

- What's the best way to charge up the balloon?
- What other objects can you charge up by rubbing?
- What kind of objects are attracted to the charged up balloon?
- What kind of objects are repelled by the charged up balloon?
- Does the weight of an object make a difference to how the balloon affects it?
- Does the distance you hold the charged up balloon affect whether or not it can make something move?
- What happens when you hold a charged balloon close to a stream of water from the tap?
- What happens when you have more or less water flowing from the tap?
- Do you think this would work with other liquids? How would you find out?

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### The science

- When you rub two things together, like the balloon and the cloth, one gets a positive electric charge and the other gets a negative electric charge. When things are charged up, they may attract other things or repel other things.
- If two things have opposite charges, they attract, or pull towards each other.
- If two things have the same charge (both positive or both negative), they repel, or push away from each other.
- It's a bit like the way that magnets can attract or repel other things, but static electricity is definitely not the same.
- A charged balloon can attract a stream of water or a pencil because the balloon has a negative charge and there are positive charges in the water and the pencil which are attracted towards the balloon.



#### Being safe

*There are no specific risks with this activity but we always recommend that you use common sense and take general care.*



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The science (continued)

Everything contains electric charge, a mixture of positive and negative. Normally these cancel each other out.

But when we rub the balloon with the cloth, some of the negative charge from the cloth rubs off on the balloon. The balloon gains a negative charge and the cloth is left with a positive charge.

As you rub, tiny particles called electrons are rubbed off the cloth onto the balloon. Electrons are very, very tiny, much tinier than the atoms that make up everything. Each electron has a negative charge and that's why the balloon becomes negatively charged.

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**Going Further**

Try rolling an empty soft drink can along the ground using a charged up balloon <http://bit.ly/StaticCanRoll>

Try lighting up a fluorescent lightbulb with a charged up balloon – as described here: <http://bit.ly/LightBulbBalloon>

Try tying two balloons to strings and seeing if you can charge them up with static electricity then hang them up so they repel each other.

Read more about static electricity <http://bit.ly/MoreStaticScience>