

How Electricity Works

Electricity is a source of energy that is abundant in the natural world. Even though humans have only been using it in their homes for roughly a hundred years, that doesn't mean there was no electricity before then. Lightning is created by electricity and has been flashing from the sky since the Earth was first formed. Static electricity is the type you get when you rub a balloon on your jumper and use it to make your hair stand up. Lightning is also a type of static electricity.

All electricity is caused by unimaginably small particles called electrons. These are found in atoms, which make up everything. Electrons have what is called a "negative" charge. Atoms also contain protons, which have a "positive" charge. If you look at a battery, you will see a + and a - sign; these mean positive and negative.

Most atoms have the same number of electrons and protons. This means that they are balanced. Let's think about our balloon again. The rubber in the balloon is made up of atoms which are balanced. When you rub it against your jumper, some of the electrons are transferred from the balloon to your jumper. This means that the balloon's atoms now have too many protons, and your body has too many electrons. When you put the balloon near your hair, the negative charge of your body is attracted to the positive charge of the balloon. This makes it stick up!

Sometimes, electrons move. When they do, they take electrical energy with them. This is called an "electrical current". This is the type of electricity you get from batteries or from a plug socket. An electrical current flows through a circuit. This is made up of wires, lights, buzzers or whatever else you want to power. It might even be a fridge or a washing machine! If the electrical current can't get all the way back round to the beginning, then the circuit is "broken". If this happens, then the current won't flow at all. When you turn off a switch, you break the circuit.

If something "conducts" electricity, it means that an electrical current can flow through it. Everything conducts electricity, but



some materials are much better than others. Copper and some other metals are very good conductors. That's why wires are made from these materials. Plastic and rubber are very poor conductors. That's why plugs and wires are coated in these materials. If a plug was made of metal, you would be electrocuted every time you touched it.

The air around us is a very poor conductor. However, if the electrical current is powerful enough, then it will still conduct it. This happens when lightning strikes. Water is a very good conductor. That's why you mustn't have any electrical appliances in a bathroom. Humans are made up of about 60% water, which is why we conduct electricity really well and get electrocuted easily. It's why it's always important to be safe around electricity.

RETRIEVAL FOCUS

1. What type of electricity is lightning?
2. What are the two signs you will see on a battery?
3. Which type of particle carries electricity?
4. Give an example of a poor conductor from the text.
5. What can you rub against your jumper to generate electricity?

VIPERS QUESTIONS

V

Find and copy a word that means "equal on both sides".

S

Why do humans conduct electricity well?

S

What happens if you "break" a circuit?

V

Find and copy a phrase that tells you what size electrons are.

I

Why do you think wires are made from copper?