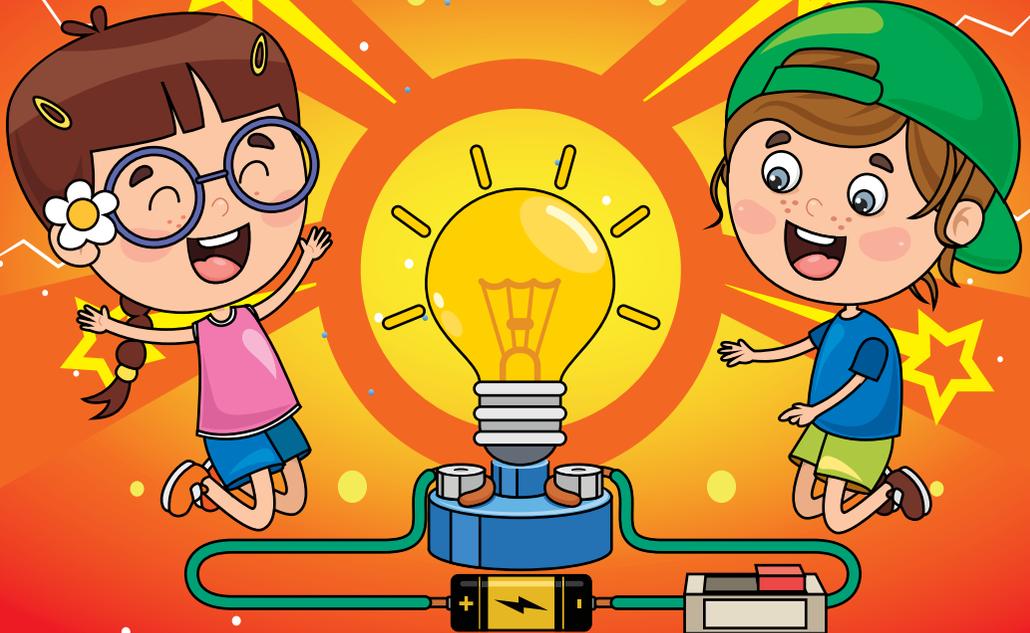


EINSTEIN
BOX

MY FIRST BOOK OF

ELECTRICITY

FOR LITTLE SCIENTISTS



ELECTRICITY

Have you wondered why a bulb lights up when you turn the switch on? This happens because of electricity. The lights, fans, television and refrigerator at your home all work on electricity.



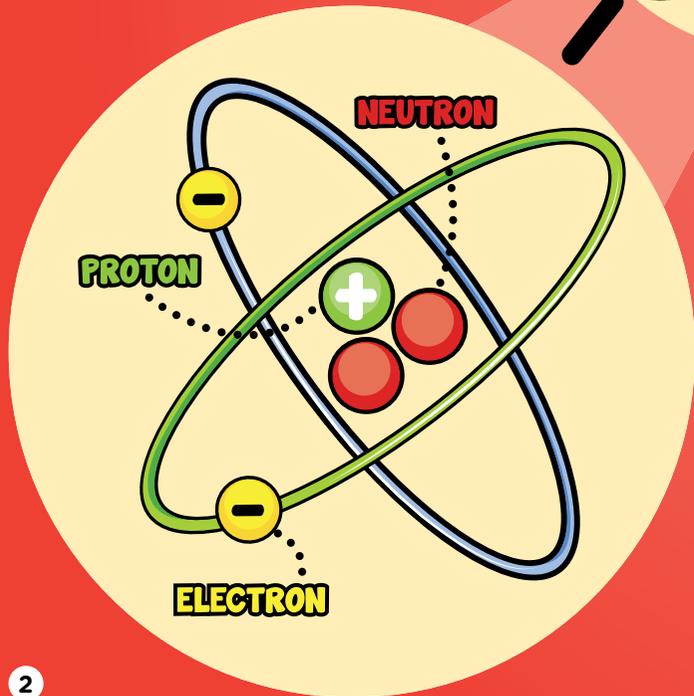
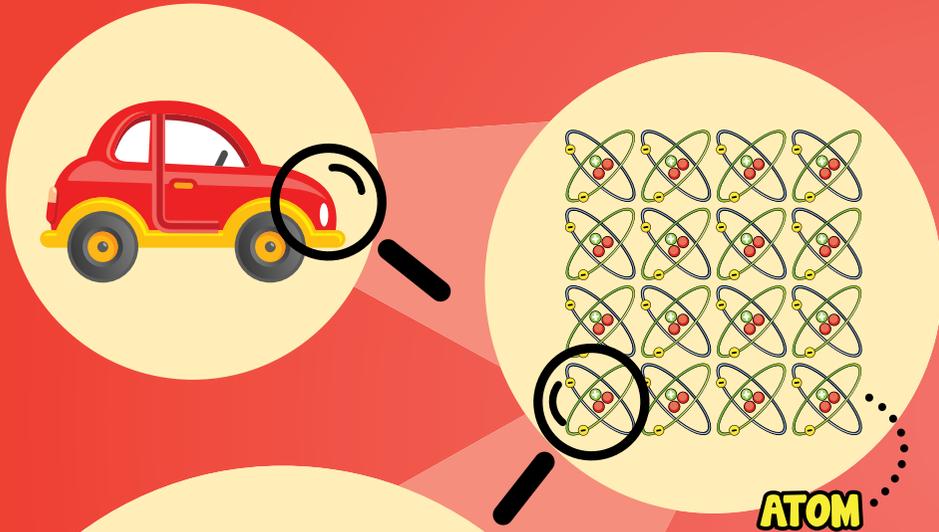
ACTIVITY

Look around your house. Can you identify which appliances use electricity?



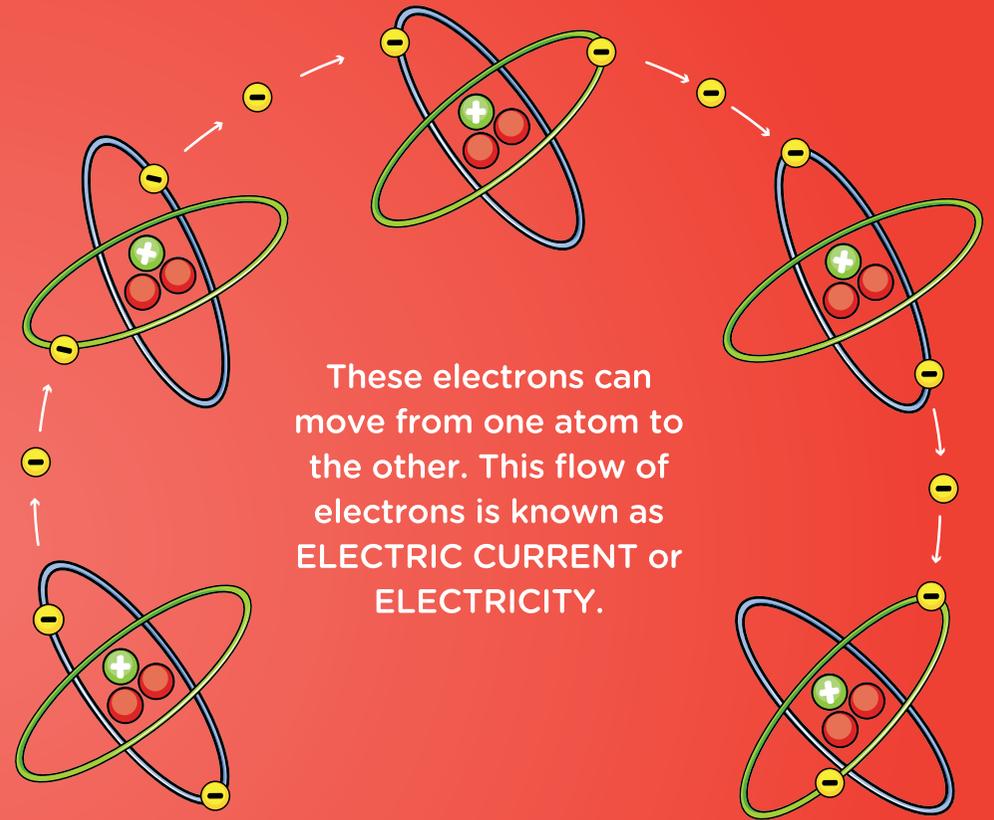
WHAT IS ELECTRICITY?

To understand electricity, we must understand atoms. Everything in the world is made of very small particles called atoms. These are too small to be seen from the naked eye



ATOM

Each atom is made up of 3 parts. Protons (positively charged particles), electrons (negatively charged particles) and neutrons (particles with no charge). Protons and neutrons are at the centre of the atom, with electrons circling around them.



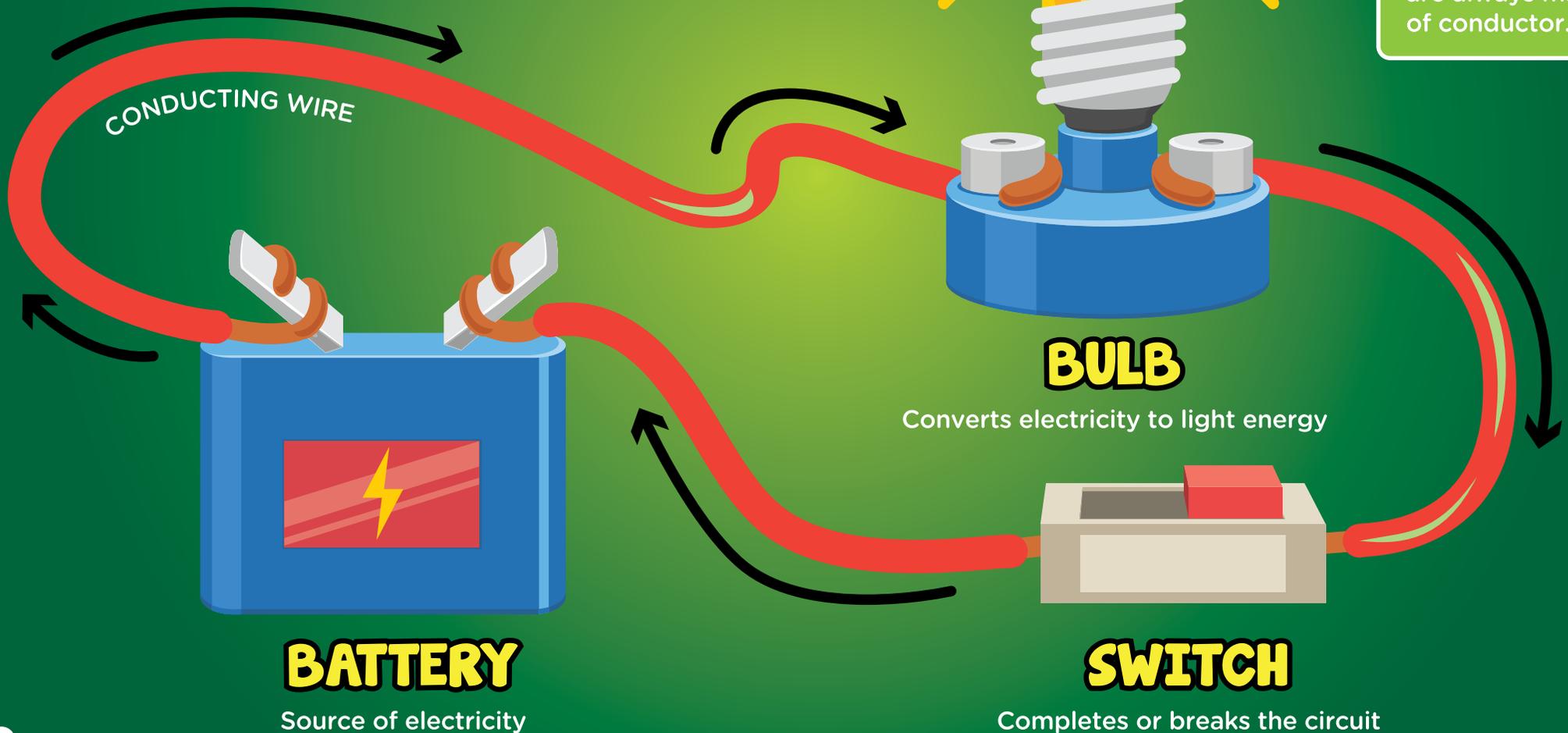
These electrons can move from one atom to the other. This flow of electrons is known as **ELECTRIC CURRENT** or **ELECTRICITY**.

DID YOU KNOW

Sometimes a lot of electrons can gather in one place. This results in another type of electricity called **STATIC ELECTRICITY**.

HOW DOES ELECTRICITY FLOW?

For an electric current to flow from one place to another, there must be a circuit. A circuit is a closed path or loop around which an electric current flows.

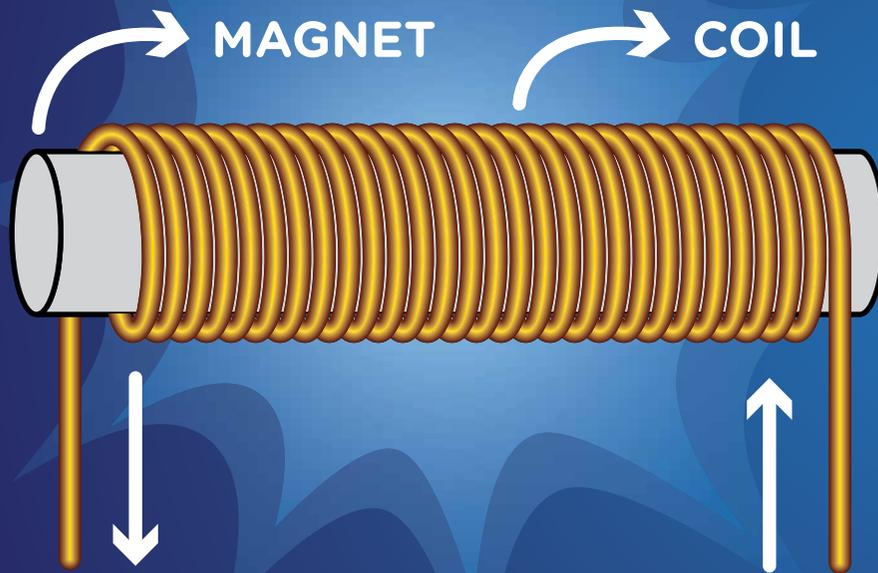


DID YOU KNOW

Electric current does not flow through every material. The materials which allow electric current to travel are called conductors. Circuit pathways are always made of conductor.

SOURCES OF ELECTRICITY

There are 2 main sources of electricity: generators and batteries.



GENERATORS

In a generator, a magnet is placed inside a coil of wire. When the magnet is moved back and forth, it causes the electrons in the wire to also start moving. This produces electric current in the wire.

DID YOU KNOW



Nowadays, a new source is becoming popular: the Sun. The Sun is full of energy that reaches us in the form of sunlight. We can use special panels called solar panels, that have photovoltaic cells, which turn sunlight directly into electricity.



BATTERIES

A battery is a container with certain chemicals inside it. Chemical reactions inside it create a flow of electrons when connected to a circuit.

HOW DOES ELECTRICITY REACH OUR HOMES?

Electricity is generated in large power plants. It reaches our homes through transmission and distribution lines. This system is known as the electricity grid.

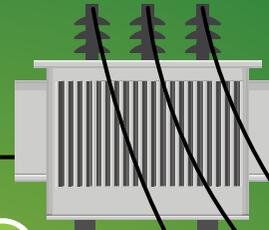
1

Power plants generate electricity.



2

Transformer steps up the voltage for transmission.



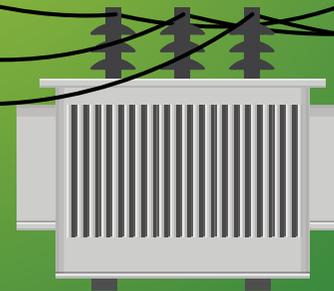
3

Transmission lines carry electricity over long distances.



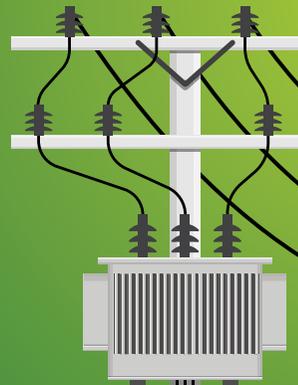
4

Neighbourhood transformer steps down voltage.



5

Distribution lines carry electricity to houses.

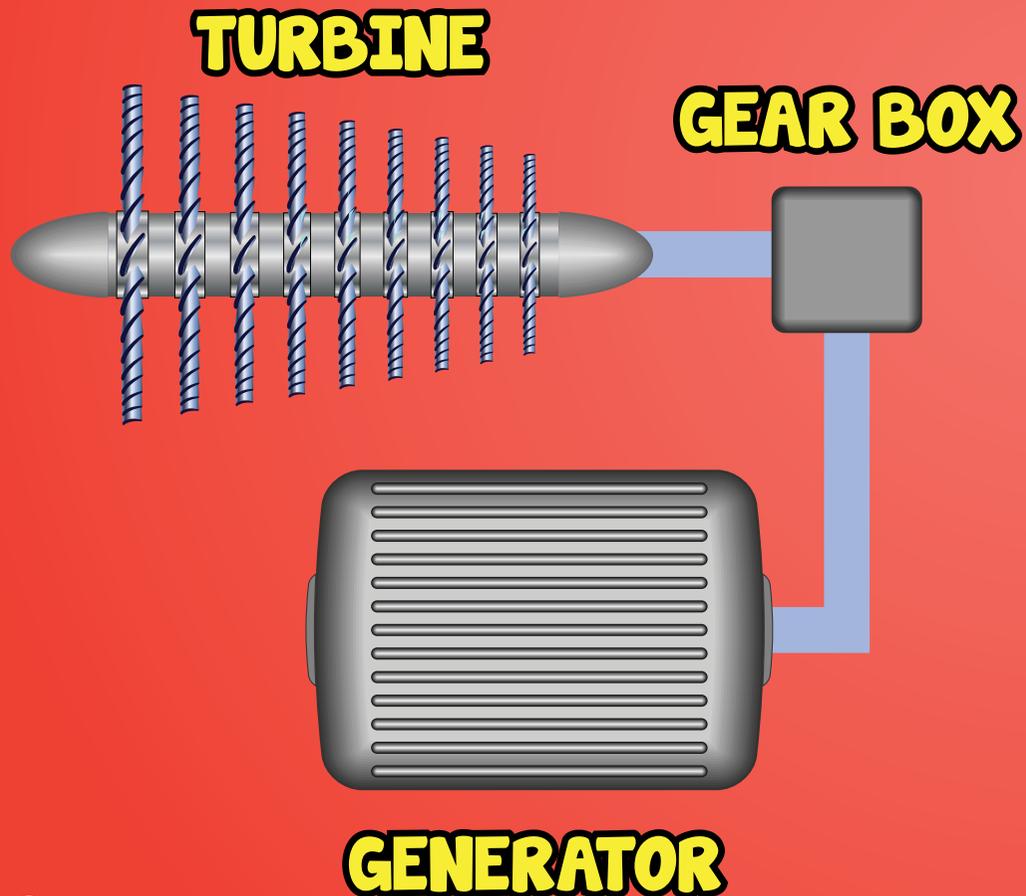


ACTIVITY

When you go outside, can you try spotting transmission lines?

HOW DO POWER PLANTS GENERATE ELECTRICITY?

Electricity is made in power plants using turbines and generators. A turbine contains large blades attached to a single rod. The rod is attached to a gear box, which is connected to a generator. As the blades of the turbine move, the magnet in the generator also moves. This creates electricity.



SOURCES OF ENERGY FOR POWER PLANTS

Multiple energy sources are harnessed to produce the energy required to run the generator.



FOSSIL FUELS

Fossil fuels are burnt to boil water. The resulting steam is used to spin the blades of a turbine.

WIND

Wind turbines use the power of the wind to turn its blades.



RIVERS

Dams are built on rivers. They release water from a height which spins the turbines.

DID YOU KNOW

Other sources include heat from sunlight, nuclear energy & even ocean tides.

SAFETY AROUND ELECTRICITY

If any part of your body comes in contact with electric current, it can flow through your body. This can give you a shock. You must follow these safety tips whenever you are near electricity.

DON'Ts



Don't put your fingers or any metal object into a plug outlet.



Don't use electricity near water.



Don't fly kites near power lines.

DOs



Switch off the appliances after you are done using them.



Pull by the plug, not the wire.



When in doubt, always ask an adult.

Electricity is all around us! This book is designed for curious children to learn about electricity and how it reaches our homes.

Note: Basic concepts of electricity have been simplified in this book to facilitate ease of understanding. To build a child's interest and curiosity, as a next step, you can consider showing online videos which delve deeper into these concepts as well as explain how different appliances work using electricity.



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