



# Science

## Electricity

**It's Electrifying**



# Aim

- I can explain the importance of the major discoveries in electricity.

# Success Criteria

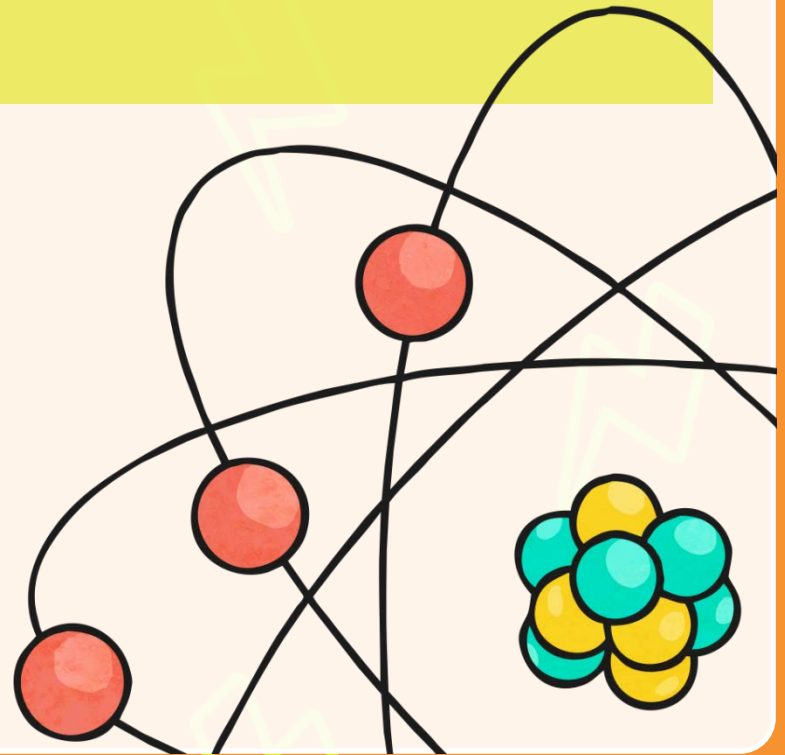
- I can identify how our understanding of electricity has changed over time.
- I can explain how major discoveries affected our understanding and use of electricity.

# Electricity Quiz



**Are you an electricity expert?**

**Let's check!**



# Electricity Quiz

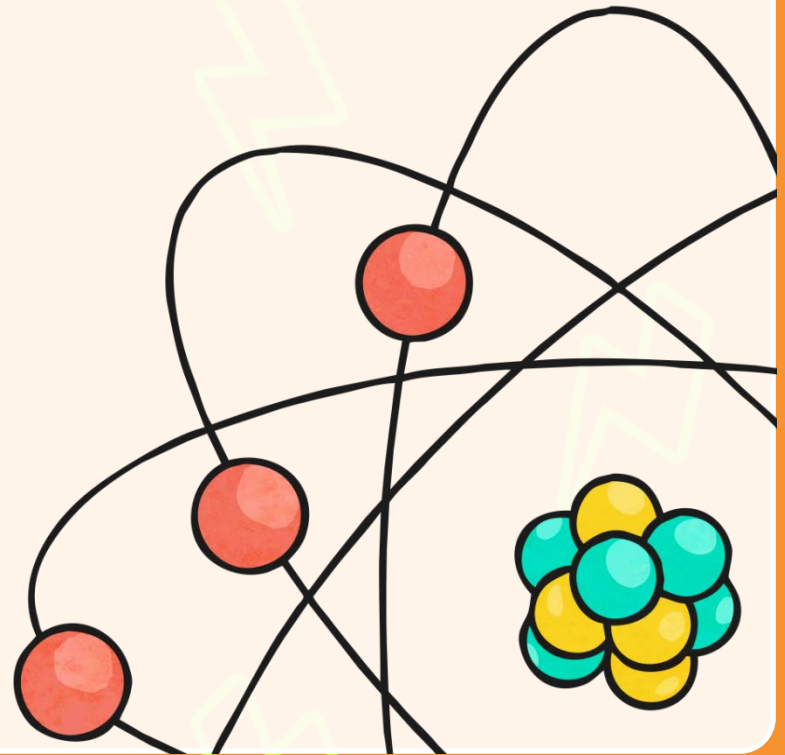


1. What two types of electricity are there?

a) natural and static electricity

b) natural and man-made electricity

c) man-made and animals producing electric shocks



# Electricity Quiz

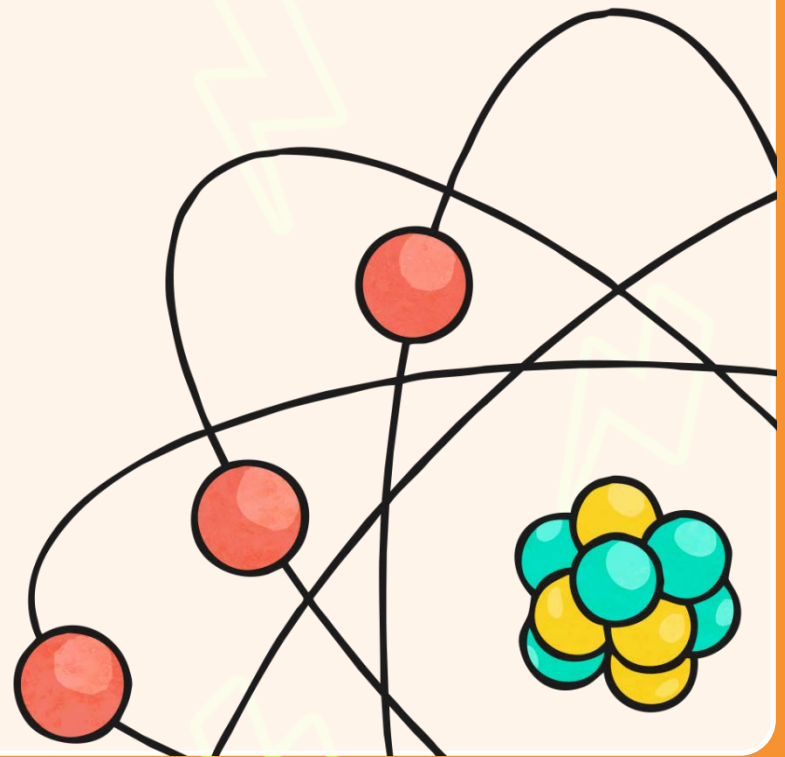


2. Which of the following is not naturally occurring electricity?

a) static electricity

b) electric shock from an electric eel

c) electricity produced by solar panels

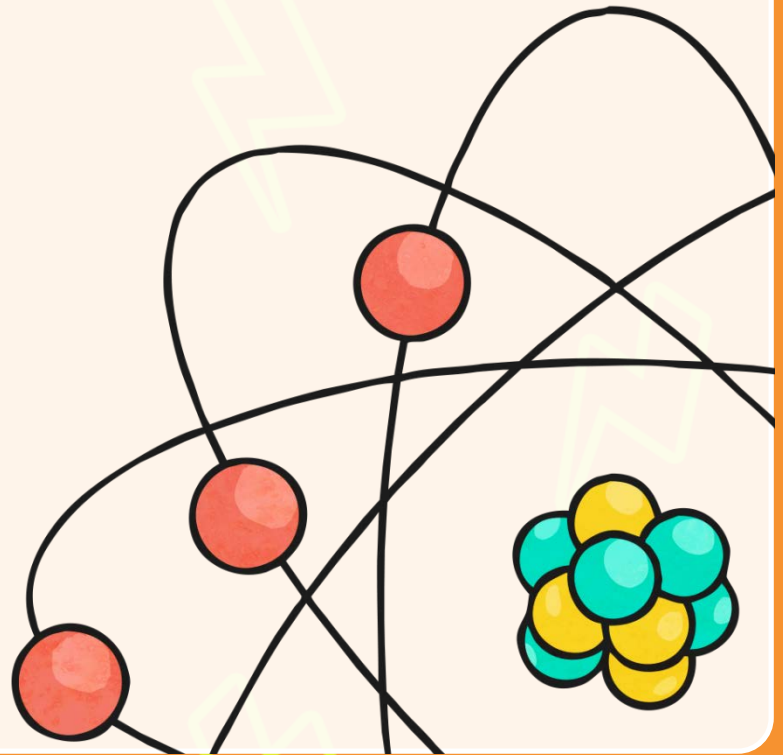


# Electricity Quiz



3. Name two man-made types of electricity?

- a) solar panels and lightning
- b) static electricity and wind turbines
- c) power stations and solar panels



# Electricity Quiz

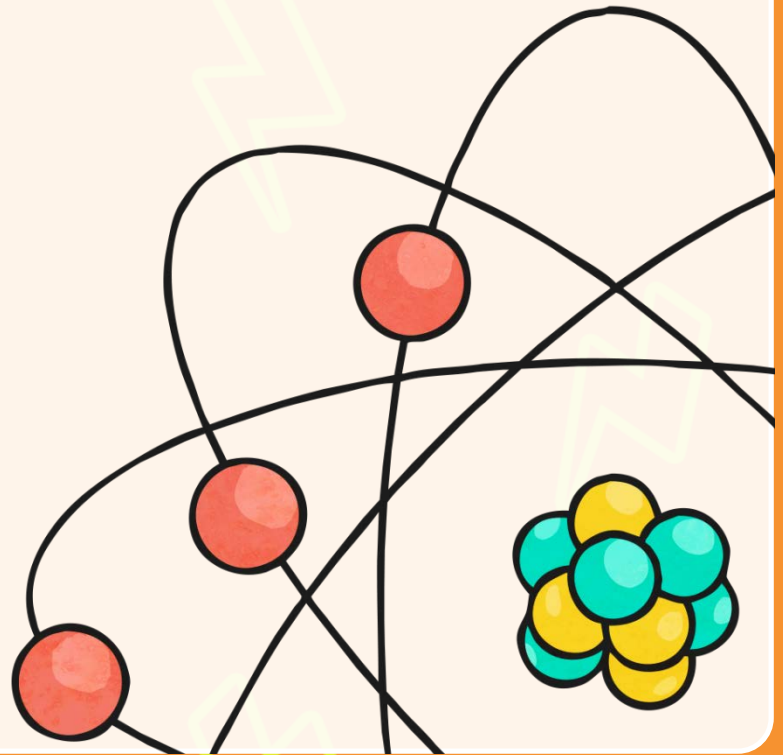


4. Materials that do not conduct electricity are called...

a) insulators

b) conductors

c) electrical appliances





# Electricity Quiz

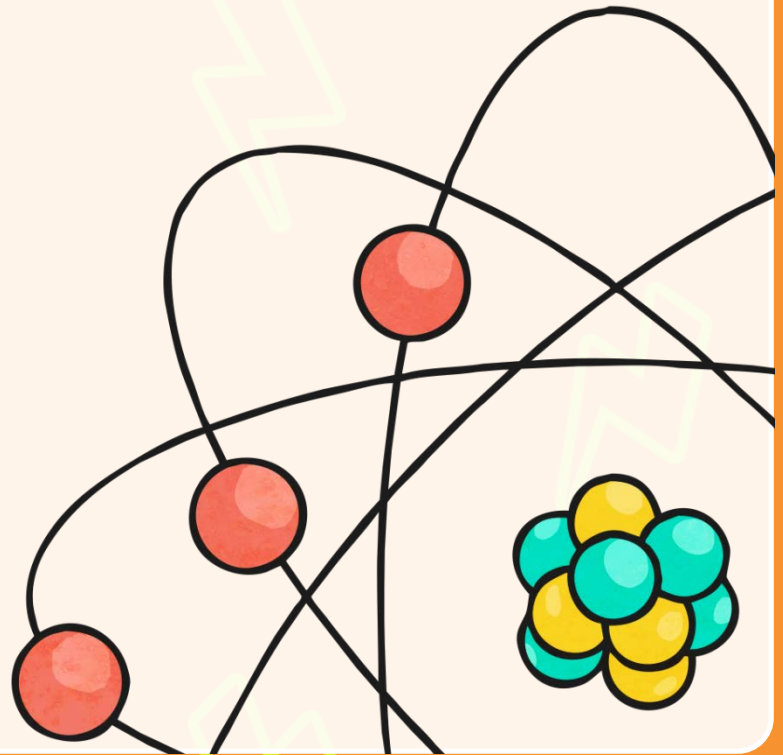


5. Which of the following does not conduct electricity?

a) wood

b) copper

c) water



# Electricity Quiz

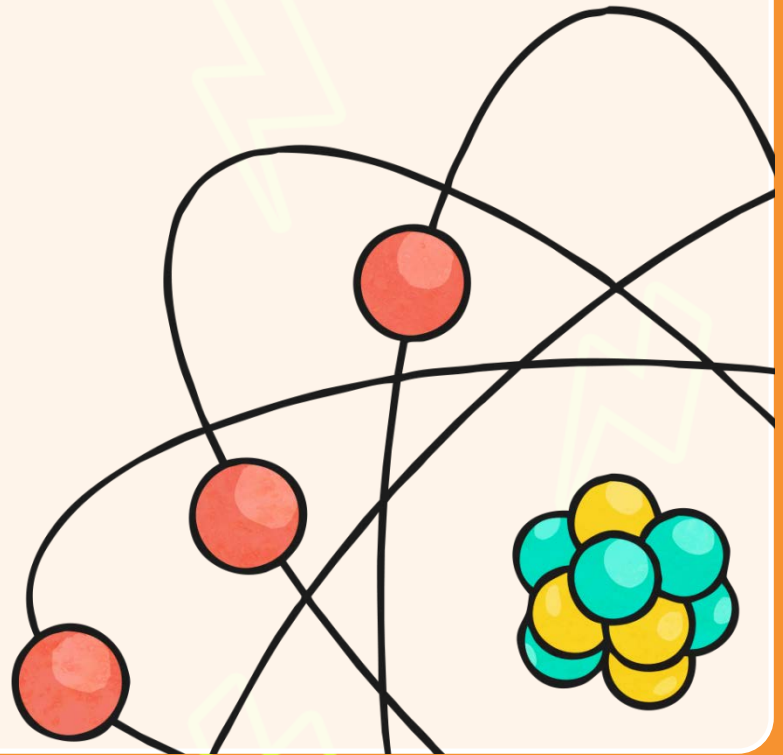


6. Which of the following does conduct electricity?

a) iron

b) wood

c) cotton



# Electricity Quiz

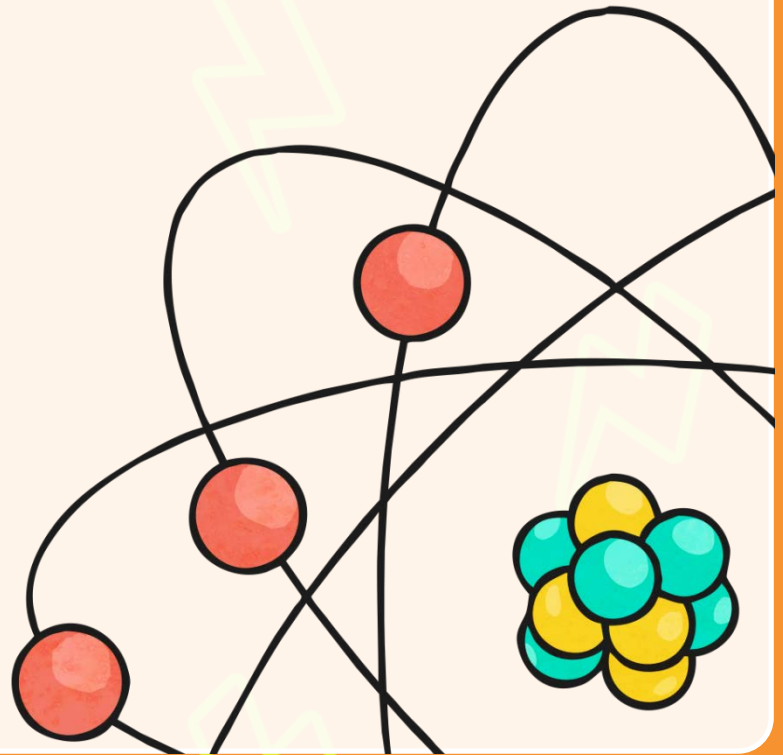


7. What do we call a circuit that does not work?

a) complete circuit

b) incomplete circuit

c) broken circuit

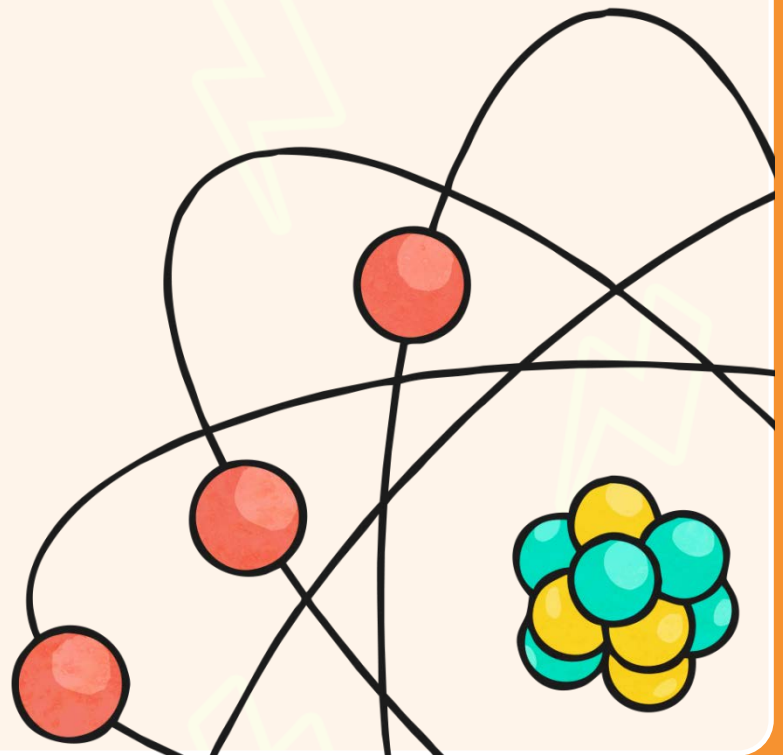


# Electricity Quiz



8. How can we create a break in the circuit without creating an incomplete circuit?

- a) disconnect the wires from the source of electricity
- b) remove the bulb/motor/buzzer from the circuit
- c) add a switch to the circuit



# Electricity Quiz

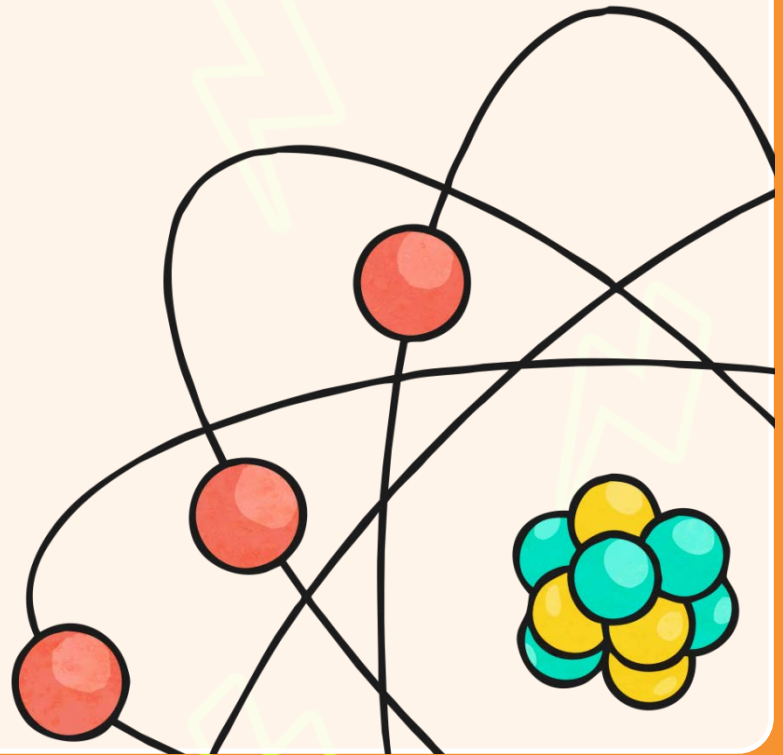


9. Which of the following is not a type of switch?

a) pinch switch

b) toggle switch

c) paddle switch



# Electricity Quiz

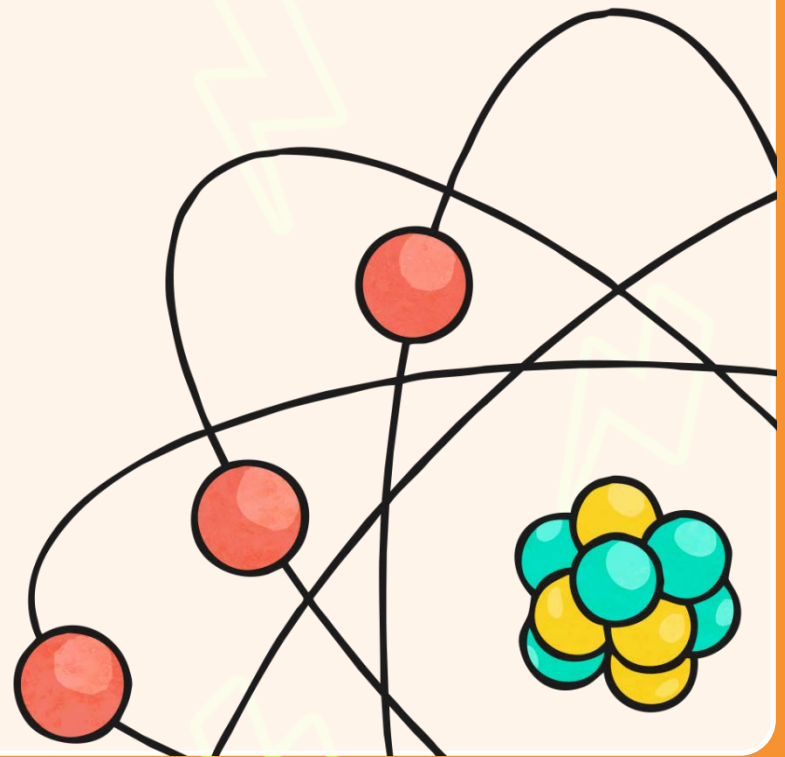


10. What are the two types of electrical sources we use?

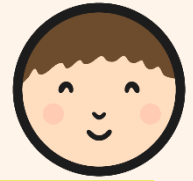
a) power station and batteries

b) mains and gas power station

c) mains and batteries



# History of Electricity



How have we come to learn about electricity and how to use it?

Read and answer questions about the fascinating scientists and their amazing discoveries.

## History of Electricity Comprehension

In modern life, we use electricity on a daily basis and do not think anything of it. We take it for granted. However, for most of human history electricity was not known about so how and why did this change? Read on!

We Ancient Greeks knew that rubbing amber would make light objects attract to it. We thought it became magnetic.

Ancient Egyptians thought that electric fish were 'protectors' of other fish. Electric fish were written about by the Ancient Greeks, Romans and Arab Scholars.

Benjamin Franklin was the first person to study electricity in depth. One of his most important findings was proving that lightning was electrical. He had been thought of as different up until then. He flew a kite during a storm, to which he had attached a key. When the kite was struck by lightning, he felt electric sparks from the key.

Alessandro Volta invented the first battery - which was known as the 'voltaic pile' as it was made of layers of zinc and copper which was soaked in a solution of sulphuric acid or saltwater brine to create an electric current.

Volta's name was also the basis for the following words:

Voltage - This is the electric force that causes free electrons to move from one atom to another.

Volt is the unit of measurement for Voltage (written as V).

## History of Electricity Comprehension

In modern life, we use electricity on a daily basis and do not think anything of it. We take it for granted. However, for most of human history electricity was not known about so how and why did this change? Read on!

We Ancient Greeks knew that rubbing amber would make light objects attract to it. We thought it became magnetic.

Ancient Egyptians thought that electric fish were 'protectors' of other fish. Electric fish were written about by the Ancient Greeks, Romans and Arab Scholars.

Benjamin Franklin was the first person to study electricity in depth. One of his most important findings was proving that lightning was electrical. He had been thought of as different up until then. He flew a kite during a storm, to which he had attached a key. When the kite was struck by lightning, he felt electric sparks from the key.

Alessandro Volta invented the first battery - which was known as the 'voltaic pile' as it was made of layers of zinc and copper which was soaked in a solution of sulphuric acid or saltwater brine to create an electric current.

Volta's name was also the basis for the following words:

Voltage - This is the electric force that causes free electrons to move from one atom to another.

Volt is the unit of measurement for Voltage (written as V).

## History of Electricity Reading Comprehension Sheets

The voltaic pile was hugely important as it allowed an electric current to be released steadily and efficiently. Therefore it was now possible to use an electric current as a form of power for other objects.

Michael Faraday used Volta's discoveries and was able to make an electric current move by using a magnet inside a wire coil. He was able to build an electric motor and generator.

Thomas Edison invented the modern lightbulb. While lightbulbs were not a new idea, he did improve on the previous designs which were not useful as they did not stay lit for very long.

Lewis Latimer worked for Edison and invented a filament (the metal part that you can see in lightbulbs, through which the electric current passes) which enabled Edison's lightbulbs to stay lit for a long time.

### War of the Currents

#### AC vs DC

There are two types of electric currents that can be generated - direct current and alternating current.

**Direct Current (DC)**  
The electric charge flows in one direction.

**Alternating Current (AC)**  
The electric charge changes direction periodically.

While there wasn't a real war about it, there was a time when it wasn't clear whether AC or DC would be used to power homes and other buildings.

The voltage of AC can be increased and decreased using a transformer. This means high voltage electricity can be transferred along power lines at a high voltage but it can be reduced to safe levels of voltage by the time it reaches buildings. DC cannot be increased or decreased in this way so is a less efficient way of transferring an electric current and also needs to be closer to the buildings it served.

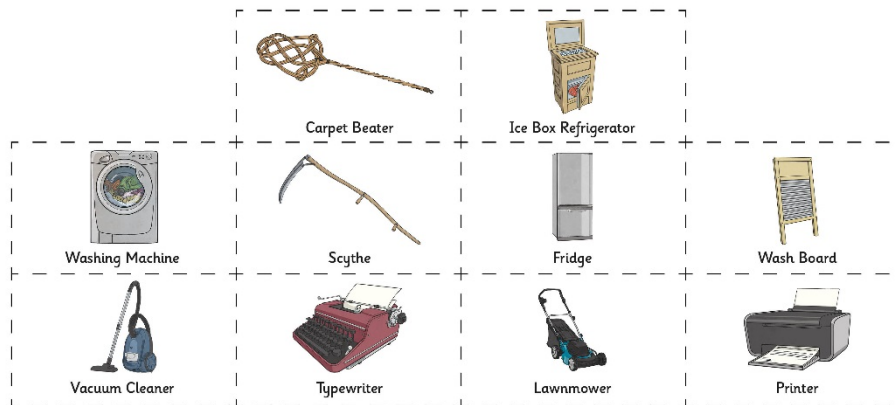
There were many concerns about the use of AC due to the high voltages of electric current and whether it was safe. Edison insisted that it was too dangerous and wanted DC to be used. His own company was involved in setting up DC systems in many American cities. Tesla created a more complex AC system which was called the polyphase system. It was Tesla's invention of transformers that eventually led to the victory of the AC current, as it allowed electricity to be transferred more efficiently, cheaply and safely. Even today, mains electricity in the UK comes from an AC current generated by power stations.

# How Has Electricity Impacted on Our Lives?



## How Has Electricity Impacted on Our Lives?

Cut and sort the pictures into the appropriate category in the table. One has been done for you.



## ected on Our Lives?

overies in electricity.

### Electrical Appliance



Bulb




# Aim



- I can explain the importance of the major discoveries in electricity.

# Success Criteria

- I can identify how our understanding of electricity has changed over time.
- I can explain how major discoveries affected our understanding and use of electricity.