



# Chapter Six: Electricity

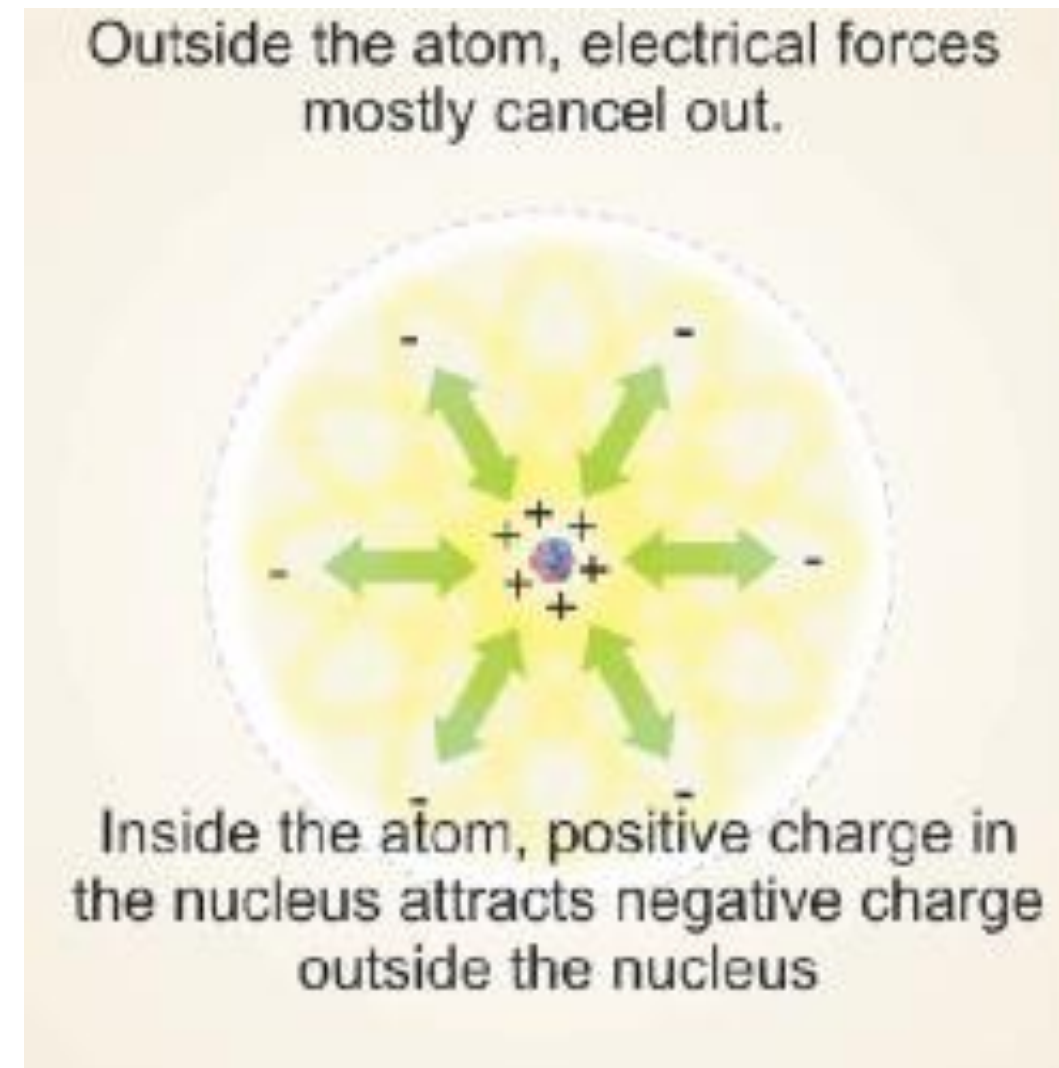
- **6.1 Charge and Electric Circuits**
- **6.2 Current and Voltage**
- **6.3 Resistance and Ohm's Law - Types of Circuits**

## Chapter 6.1 Learning Goals

- **Define static electricity and discuss its causes.**
- **Explain what it means when an object is electrically charged.**
- **Describe the components of an electric circuit and explain the difference between a closed circuit and an open circuit.**

## 6.1 Positive and negative charge

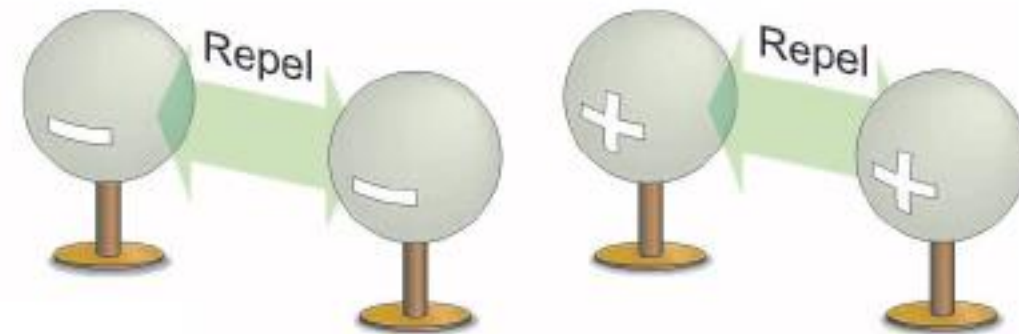
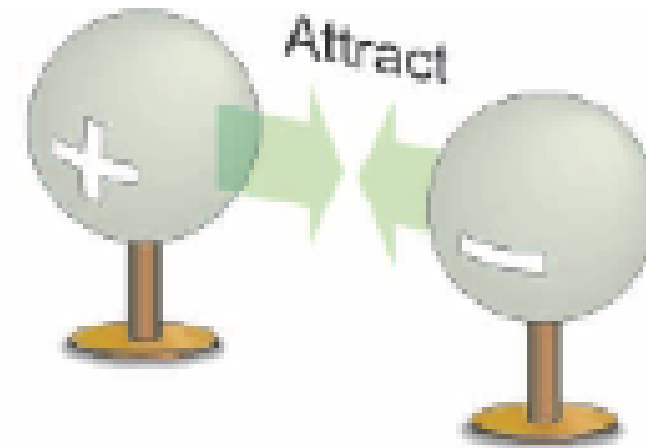
- **Electric charge, like mass, is also fundamental property of matter.**
- **Inside atoms found in matter, attraction between positive and negative charges holds the atoms together.**





## 6.1 Positive and negative charge

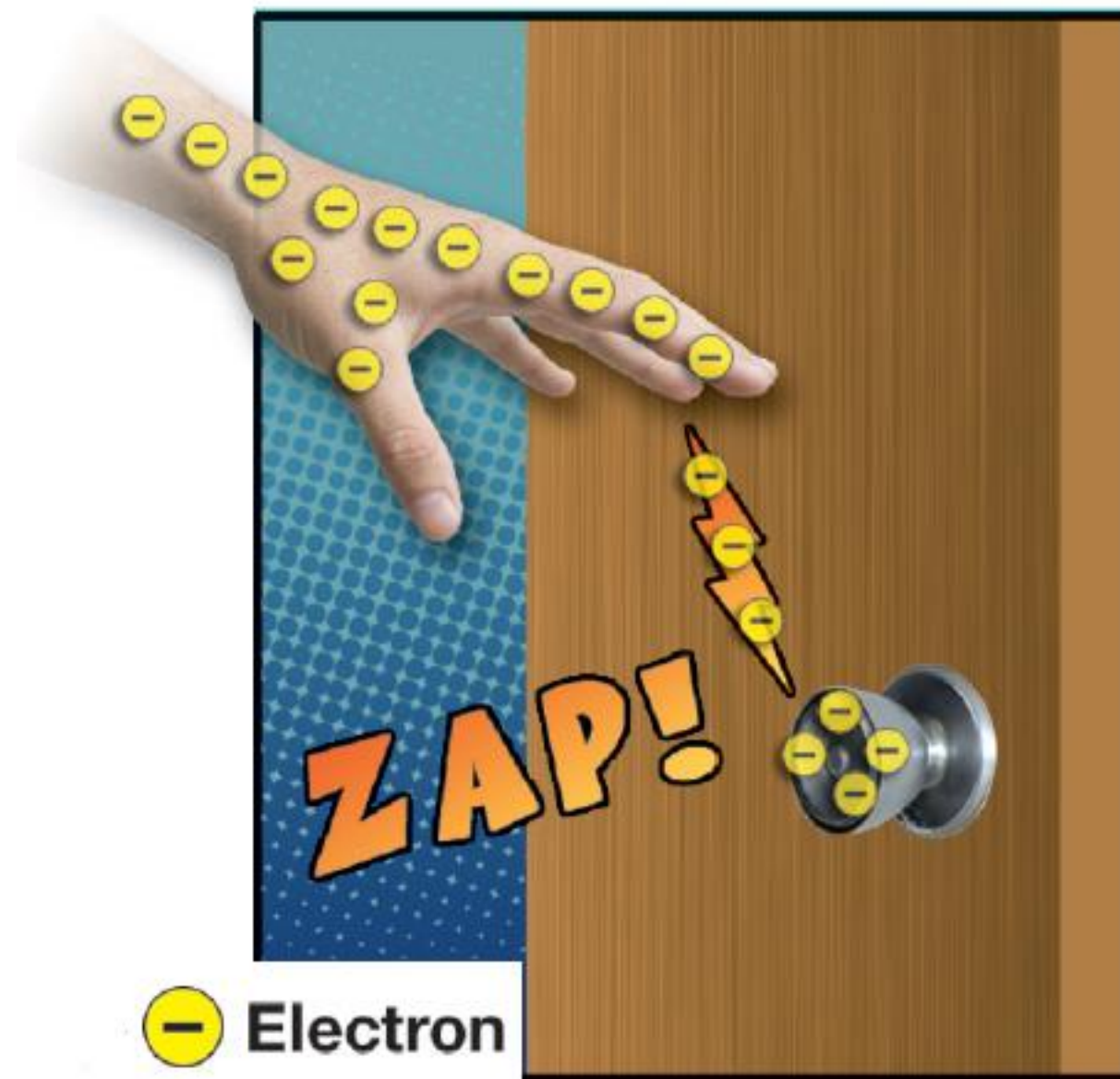
- Whether two charges attract or repel depends on whether they have the same or opposite sign.
- A positive charge attracts a negative charge and vice versa.
- Two similar charges repel each other



## 6.1 Electrical forces

- **The unit of charge is the coulomb (C). The name was chosen in honor of**
- **Charles Augustin de Coulomb (1736-1806), the French physicist who performed the first accurate measurements of the force between charges.**

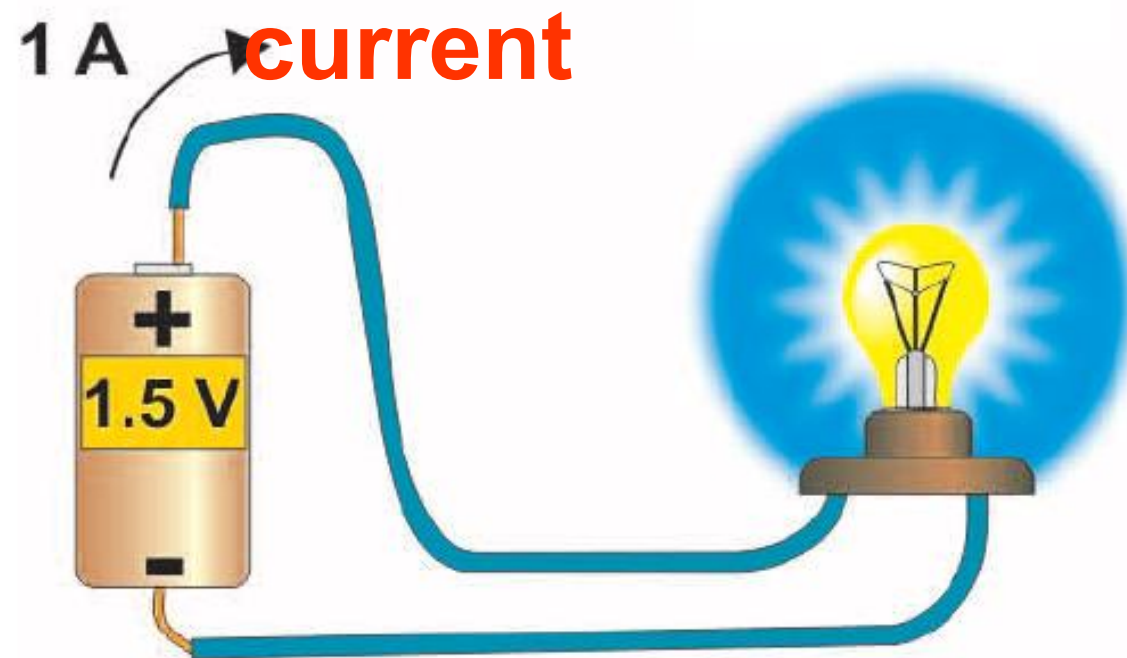
## 6.1 Static charge



- A tiny imbalance in either positive or negative charge on an object is the cause of static electricity.

## 6.1 Electric current

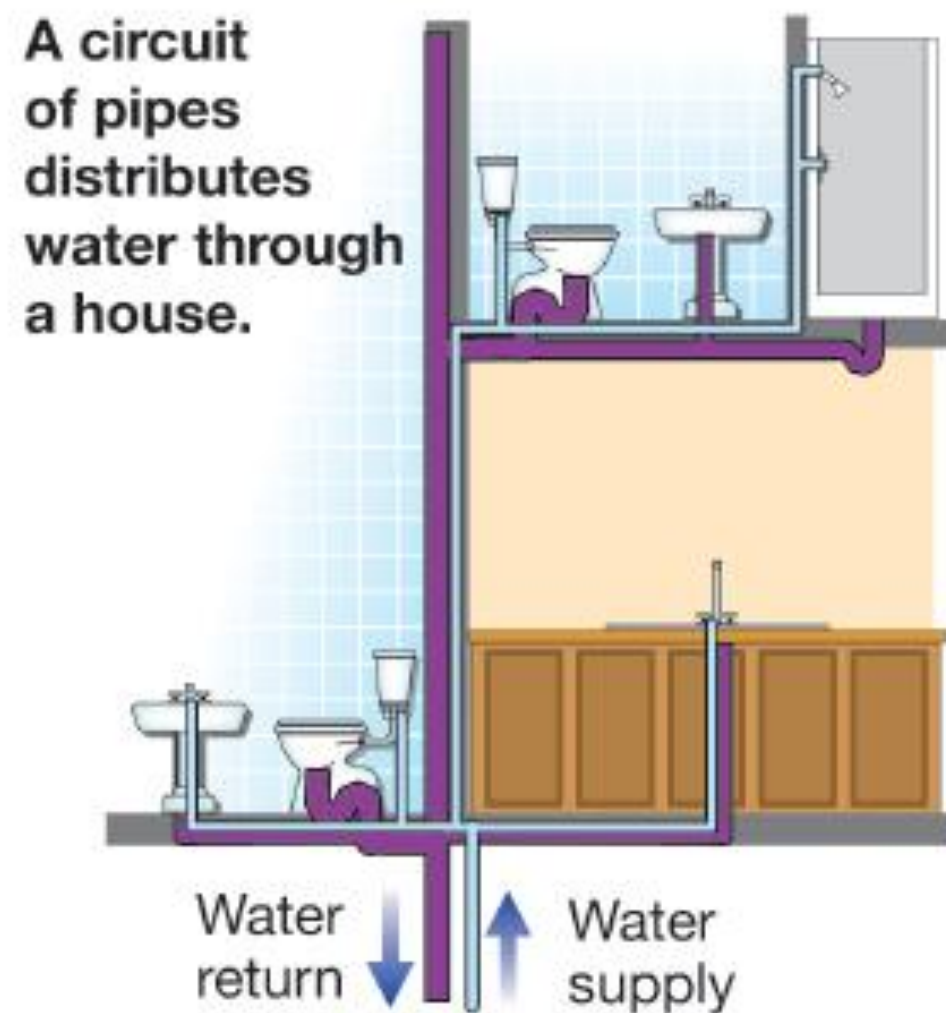
- **Electric current is caused by moving electric charge.**
- **Electric current comes from the motion of electrons.**



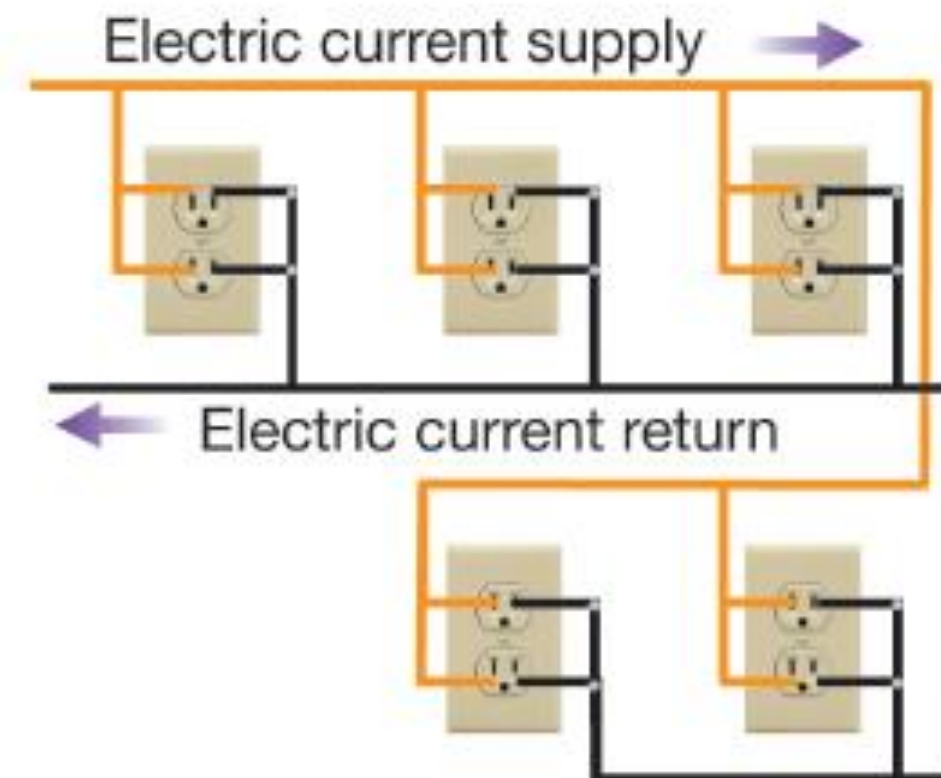


## 6.1 Electric Circuits

- Wires in electric circuits are similar in some ways to pipes and hoses that carry water.

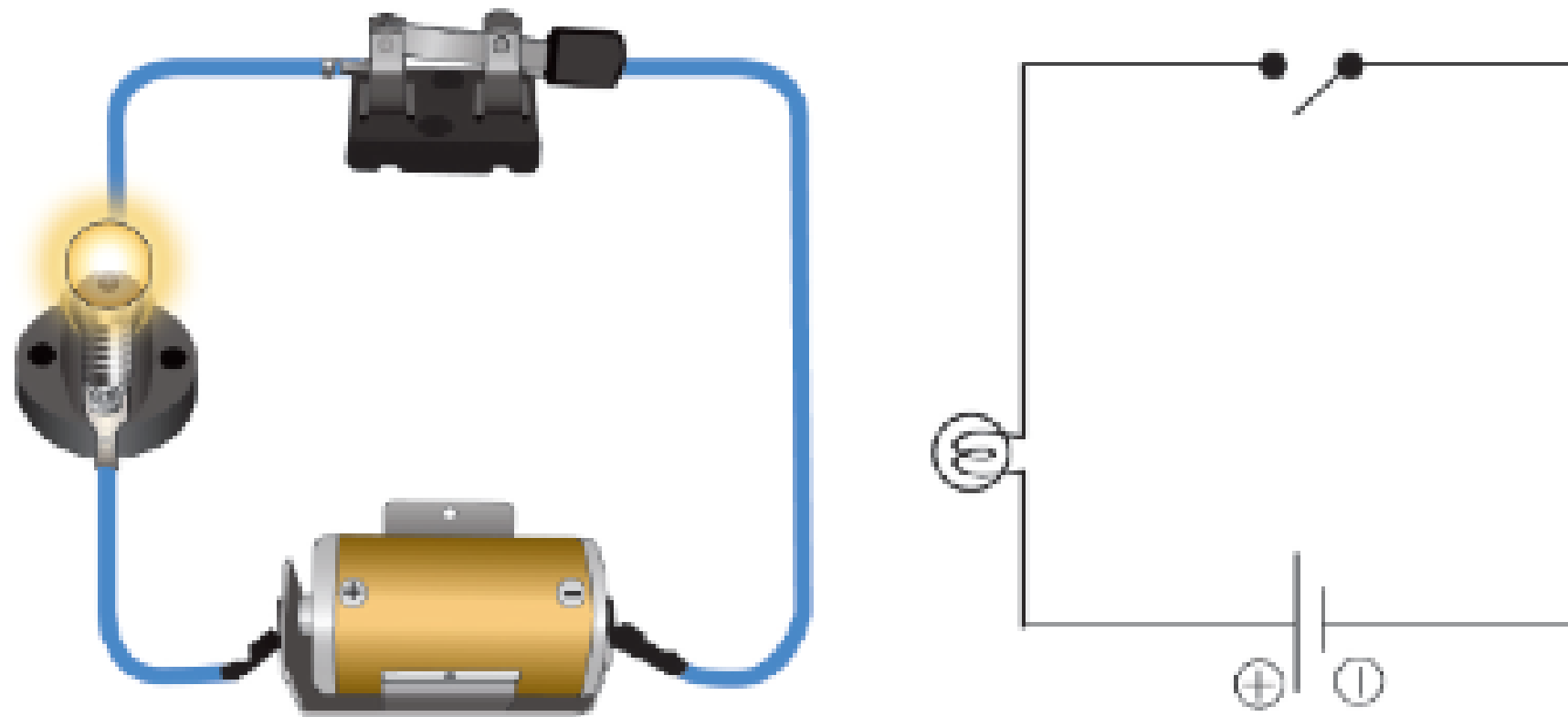


A circuit of wires distributes electric current through a house.





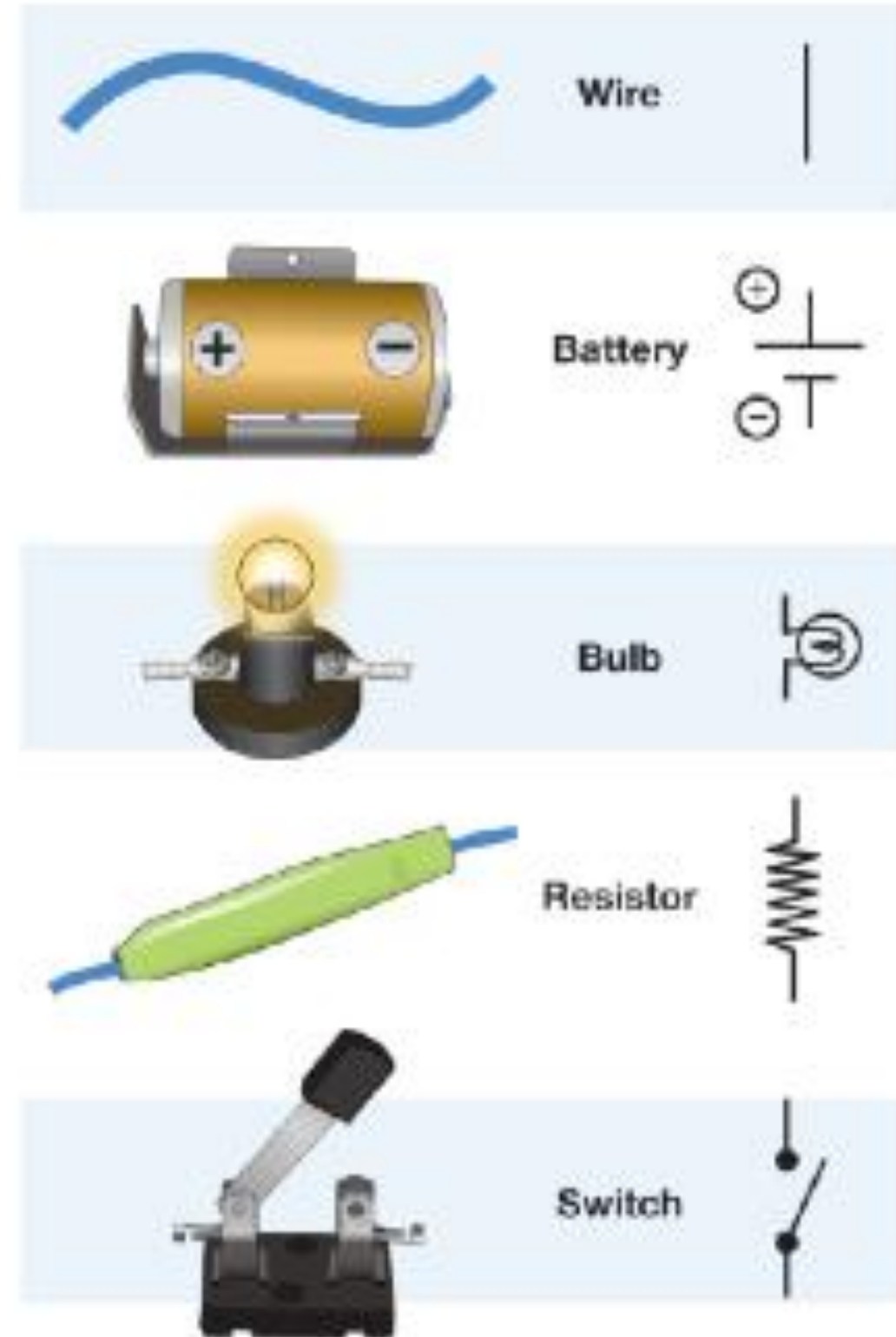
## 6.1 Circuit diagrams



- **When drawing a circuit diagram, symbols are used to represent each part of the circuit.**

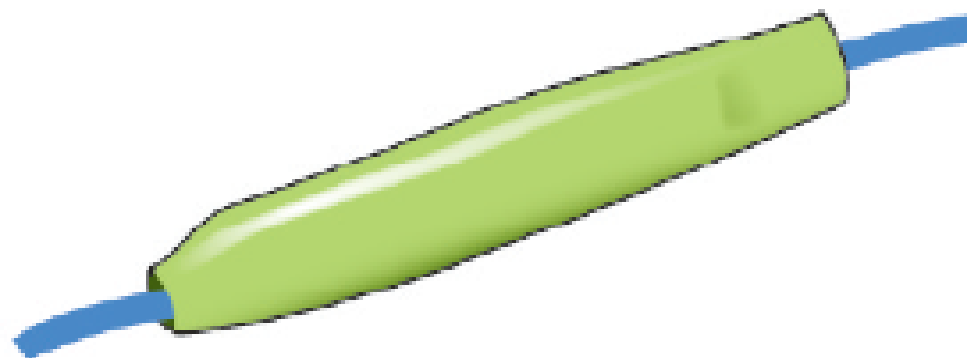
## 6.1 Circuit diagrams and electrical symbols

- **Electrical symbols are quicker and easier to draw than realistic pictures of the components.**



## 6.1 Resistors

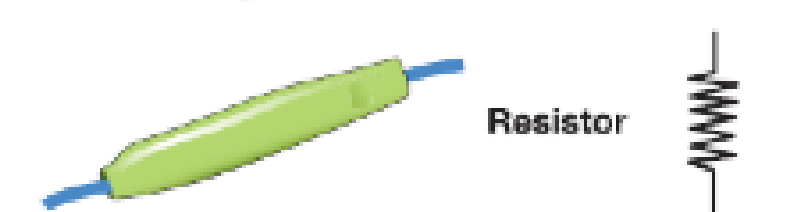
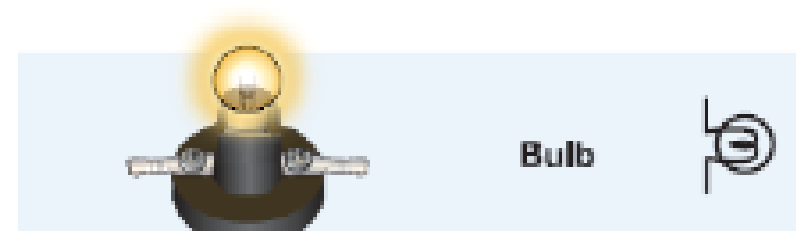
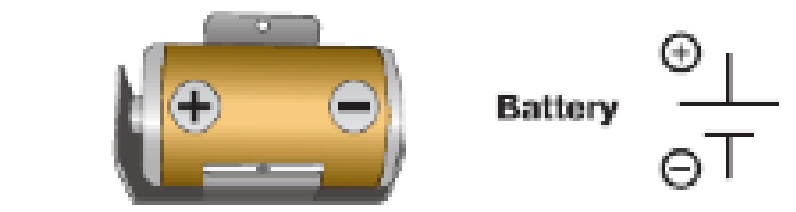
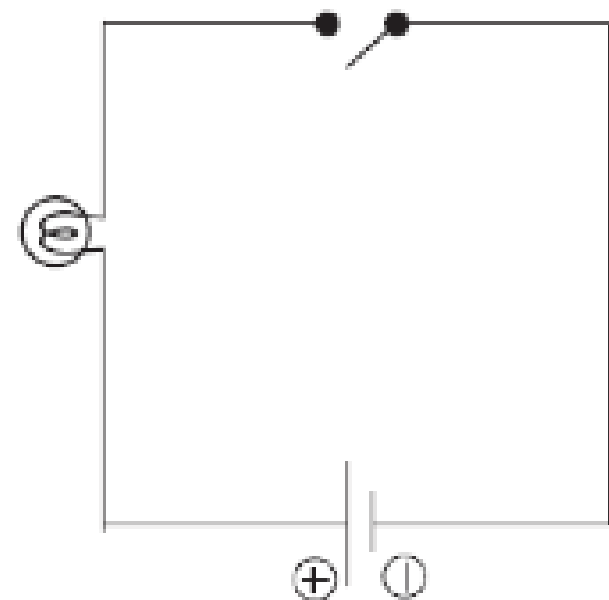
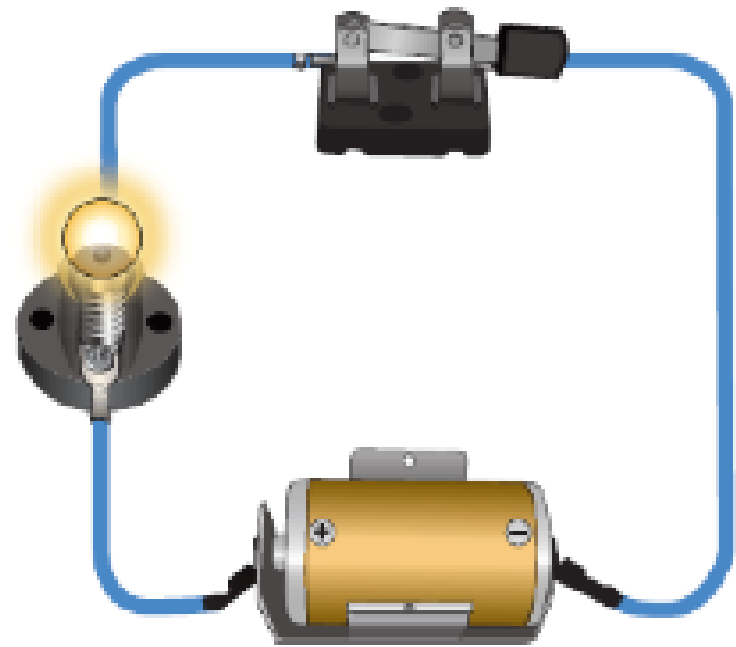
- A resistor is an electrical device that uses the energy carried by electric current in a specific way.
- Any electrical device that uses energy can be shown with a resistor symbol.



Resistor

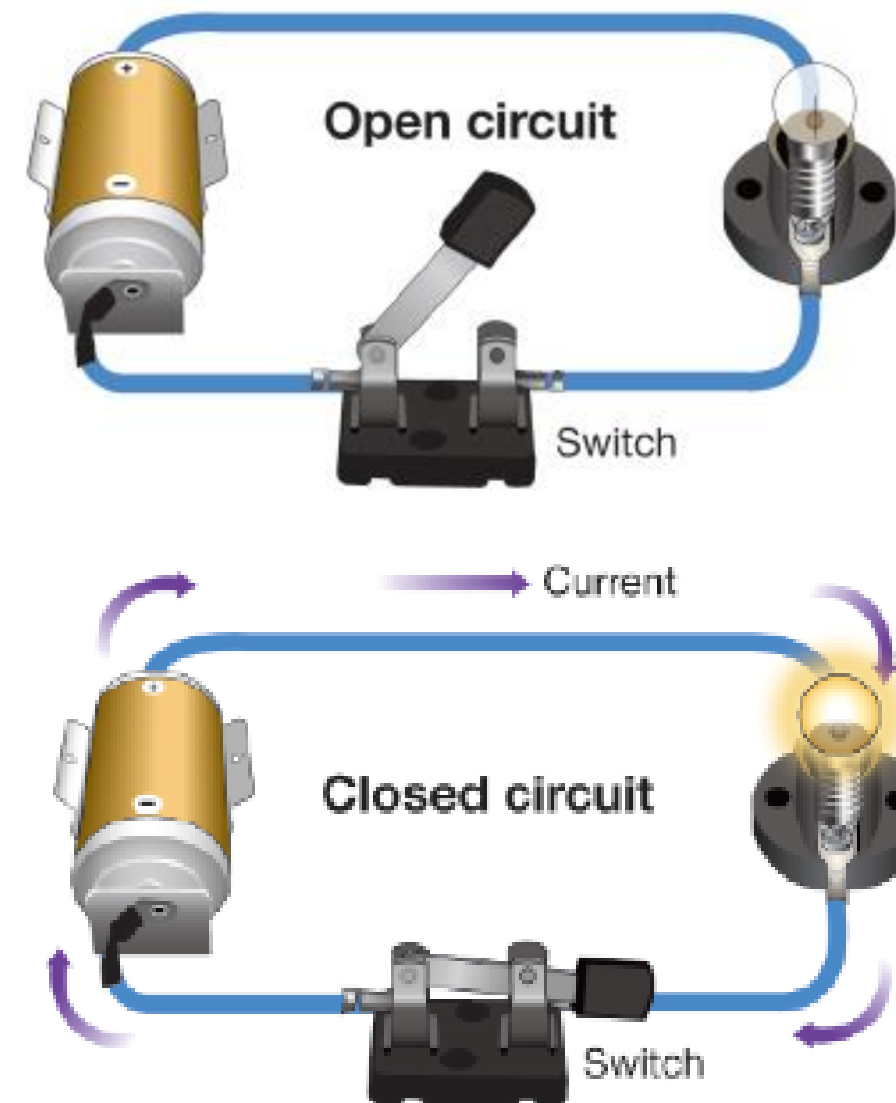


# Circuit Diagrams and Electrical Symbols



## 6.1 Open and closed circuits

- Current only flows when there is a complete and unbroken path, or a closed circuit.
- Flipping a switch to the “off” position creates an open circuit by making a break in the wire.



## 6.1 Open and closed circuits

- **Switches are used to turn electricity on and off.**
- **Flipping a switch to the off position creates an open circuit by making a break in the wire.**

