ELECTRICITY AND MAGNETISM

Electricity

Electricity is the flow of electrical charge.

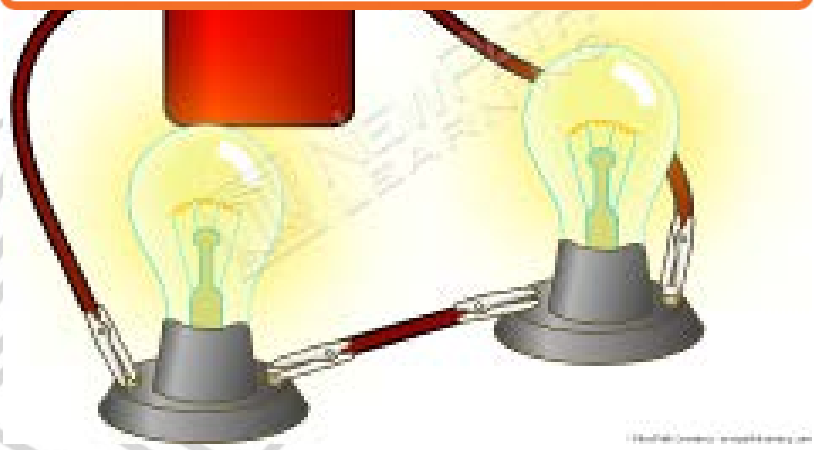
Atoms are made of **three different particles**, of which some have a positive charge, some have a negative charge, and some have no charge at all. Matter usually has the **same** number of positive and negative charges, making it neutral.

Static Electricity is the imbalance of positive or negative charges between objects. If two objects have opposite charges, they'll pull toward each other. Objects that have the **same charge** will repel each other.

Lesson Checkpoint: What is static electricity?

Electrica

A **simple** (only one path.



In a **simple circuit** that has two bulbs, if one of the bulbs burns out the other bulb will go out too.

A **parallel circuit** has two or more paths the electric charge can flow through.

In a **parallel circuit**, if one bulb goes out, the other bulb will stay lit.

Lesson Checkpoint: What is the difference between a simple and a parallel circuit?

Two Mai

AC = Alte verses its direction a ly **alternatir** flows through a

DC = Dire ne direction o ind of electricity made by a battery that has positive and negative terminals.

Lesson Checkpoint: What are two types of current?

Battery Cells

A **dry cell battery's** contents cannot be spilled. A **wet cell battery** is a battery whose contents **can** be spilled, like the batteries used in a car.

Lesson Checkpoint: What is a wet cell battery?

Electricity Safety

It is important to be **very careful** around any type of electricity. You should never touch wires, outlets, or any electrical device that you are not sure about. There are some tools and devices that have been created to make using electricity safer, like a **fuse**.

A **fuse** is a safety device that has a metal wire which melts and stops the electrical current from flowing through the circuit when the current becomes too strong.

A **transformer** allows electricity to be safely transmitted over long distances at a fast rate of speed. Electricity travels faster at high voltages. Electricity can be transmitted at high voltages because transformers change that voltage back into a lower voltage so that it is safe to use.

Lesson Checkpoint:

What is the purpose of a fuse?

Magnetism

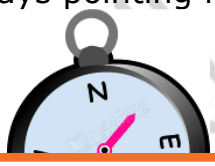
Magnetism is the property of attracting certain kinds of metals. The invisible field around a magnet is called a **magnetic field**.

Magnets have two poles, a North end and a South end. Like poles repel each other while opposite poles attract, meaning the North pole on one magnet will attract the South pole on another magnet.

The Earth is a Magnet?

Earth acts as a large magnet, with its magnetic fields being strongest at its poles, which are not exactly at the North and South Pole.

A **compass** is a tool that has a small needle that responds to the Earth's magnetic field by always pointing North.



Electrom

An **electro** current passes. An electromagnet has a coil wrapped around an iron core.

There are several ways you can make an electromagnet **stronger**. You can:

- increase the number of coils,
- increase the amount of current running through the wire, and
- increase the size of the core that the wire coils around to make the electromagnet stronger.

Lesson Checkpoint:
What is one way to strengthen an electromagnet?

Using Electricity and Magnets Together

A **generator** uses magnets and wires to turn mechanical energy into electrical energy by using the wind, falling water, and even steam.