
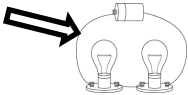


Electricity and Magnetism Study Guide

Static Electricity

- Static electricity is the **buildup of electric charges** in one place.
- An electric charge is a **basic property of the tiny particles that make up matter**. Electric charges can be **positive or negative**.
- Electric energy is produced **by the movement of electrons**.
- An example of static electricity is when you brush your hair on a cold, dry day. Your hair springs away from your head and **sticks out in all directions**.
- **Lightning** is another form of static electricity.
- An electric field is the **area around electric charges**, where electric forces can act.

Electric Currents

- An electric current is **a flow of electric charges**.
- An electric circuit is a **continuous pathway that can carry electric current**.
- For a simple electric circuit to work, you would need **a wire, battery, light bulb, and a closed path**.
- **Series circuit** is an electric circuit with only one path for current.
- If one light burns out in a series circuit, **the others will go out**.
- **Parallel circuit** is an electric circuit with two or more paths for current.
- Holiday lights should be made on a **parallel** circuit so if one bulb goes out, the entire string still works.
- For an electrical device to operate properly, the circuit must be **unbroken**.
- The circuit to the right will not work because it has no **energy source** 
- This is an example of a **closed series** circuit: 

Insulators and Conductors

- Insulators are any **materials that electrons do NOT flow easily through**.

- Examples of insulators include: cardboard, foam, plastic, rubber, cotton cloth
- Conductors are materials through which heat and electricity flow easily.
- Examples of conductors include: silver, copper, iron, nickel, cobalt and other metals.

Electromagnets

- Electromagnets are magnets that have coils of current-carrying wire around an iron core.
- A simple electromagnet is made from an iron nail, coiled wire, and a battery
- One way electromagnets are different from bar magnets is that you can turn on and off electromagnets.
- The strength of an electromagnet can be increased. One way this is done is by increasing the coil around the nail.
- Electromagnets and permanent magnets are alike because they both produce a magnetic field.
- Electricity always creates a magnetic field.
- Magnetism is greatest on a magnet at the north and south poles.