Grade 7 Science

Week of January 25 – January 29

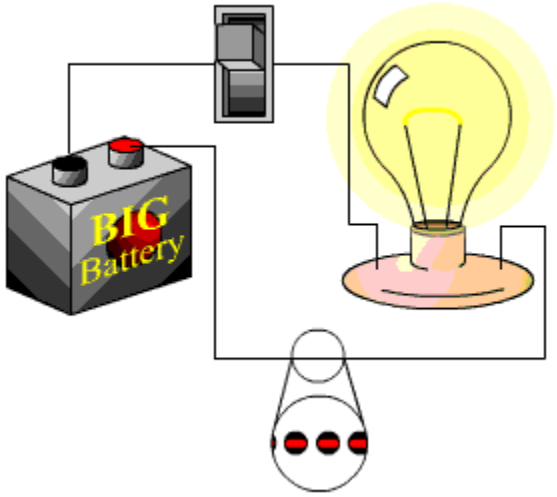
Circuits

Current

In the previous book, you learned about Static Electricity. And as you now know, a Static Charge is the transfer of an electron from a **negatively charged object** to a positively charged object in an electric field.

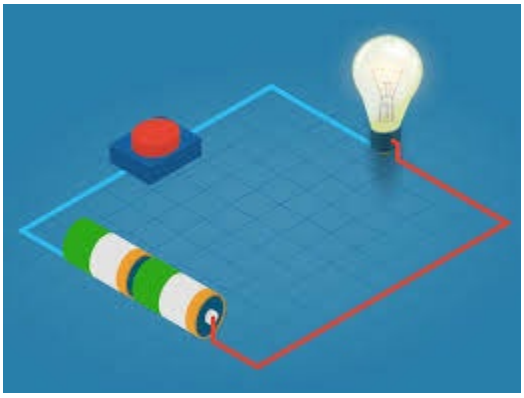
It is a charge (not a current) because there is **no flow** of electrons and there is **no path** for the electrons to flow along.

Current electricity is the flow of electrons on a path.



Electrical Circuits

An electrical current needs a path to travel on. Another name for this path is a **circuit**. Electricity flows from the power source, in a loop, (or a circuit), then back to the power source. This means that the electricity **must start and finish at the same power source**. If the circuit is not complete (i.e. if the loop is not closed) then electricity cannot flow through it properly.



There are **different kinds of circuits**, which you will learn about throughout this book.

Circuit Vocabulary

To help increase understanding, we are going to compare a water fountain to a circuit.

Think about a water fountain. Sometimes, the water comes out just fine, the pressure is high enough that the water shoots up so you can drink it. But have you ever experience a fountain that has little pressure? The water hardly comes out at all!

In Electrical circuits, there is pressure too, but it's called **voltage**, or volts. The **higher the voltage**, the more electrons want to jump. This creates **more power**.

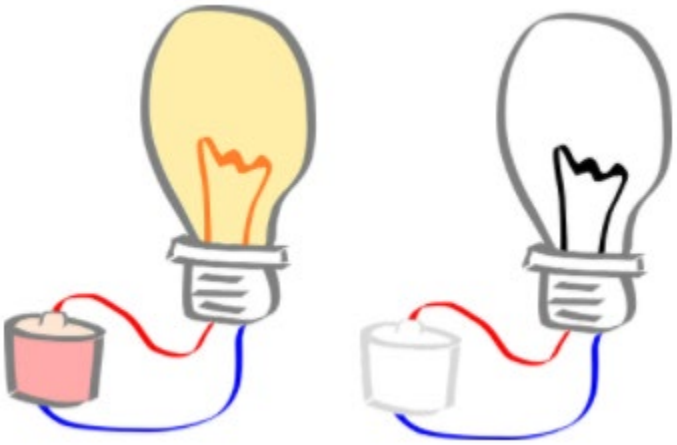
The number of electrons flowing through a wire is called **amperage**, or amps. Amps are like the amount of water coming out of a drinking fountain. In other words, the **strength** of the electric current.

Take a look at the following video for an introduction into circuits. Make sure you follow along in your **Learning Guide**!

Bill Bye – Electricity: https://youtu.be/SYacUaukaxg

Conductivity

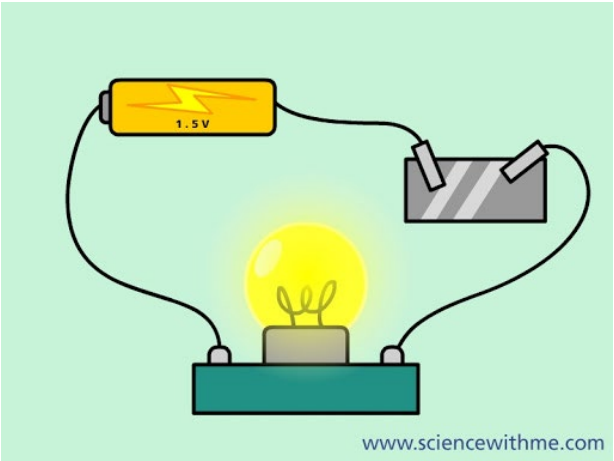
Electrical conductivity is the **ability** of a material to **conduct electricity**.



Conductors are things that allow electric charge to pass through easily.

A conductor is a material that allows electricity to easily pass through them. There are more free electrons in the atoms of conductors and are free to move from atom to atom. As a result, electric charges are free to move from place to place. There is less resistance to the movement of the electrons.

Aluminum, copper, gold, water, and people are examples of conductors. This is why electricity producers use copper and aluminum wires to carry power from generating plants to consumers. Conductors also allow heat energy to pass through them easily.



Insulators are things that do not allow electric charge to pass through easily.

An insulator is a material that does not allow electricity to easily pass through them. The electrons in the atoms of insulators do not freely move from atom to atom. As a result, electric charges do not freely move from place to place. There is more resistance to the movement of the electrons

Rubber, plastics, wood, and paper are all great examples of insulators. These materials are also poor conductors of heat energy.

Take a look at the following video. Make sure you follow along in your **Learning Guide**!

What Conducts Electricity?: https://youtu.be/Y66PW1nIea0

1. What is the main difference between Static and Current electricity?

_____

2. Fill in the blank: Electricity must start and finish at the same _____.

3. Watch the video to answer the following questions. Video 1: Bill Nye the Science Guy Electricity

I. Why to plugs have two prongs

_____

_____

4. Fill in the definitions:

Conductors:

_____

Insulators:

_____

5. Watch the video to answer the following questions. Video 1: What Conducts Electricity?

I. Is the glass marble a conductor or an insulator? _____.