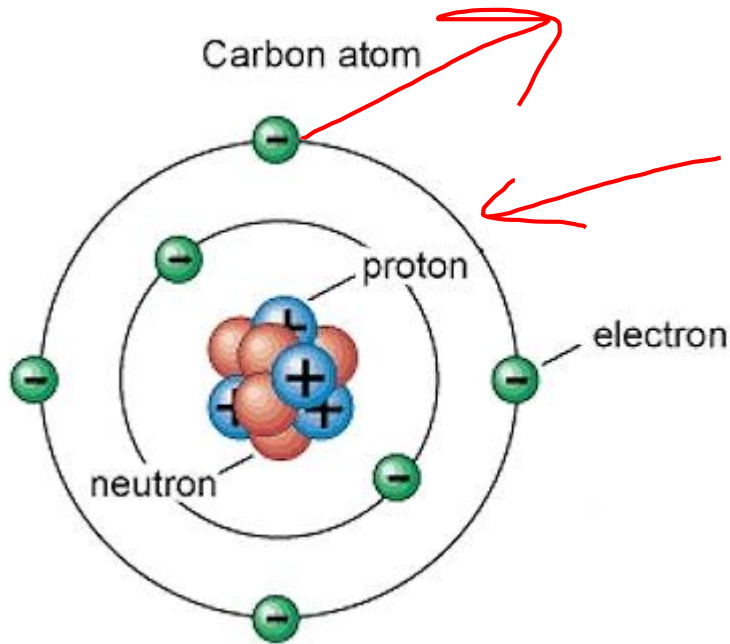




1.1 Static Electricity



Review – Parts of an Atom



Protons are positively charged particles (+)

Electrons are negatively charged particles (-)

Electrons can be gained or lost, but protons cannot

Neutrally charged

Materials are **neutrally charged** when they have an **equal** number of protons and electrons.



Electrical Charges

If an object has more protons (\oplus) than electrons (\ominus), its electrical charge is

positive.

Example: $\oplus \oplus \oplus \oplus \oplus \oplus \ominus \ominus \ominus$

6^+ 3^-

3^+ positively charged

Electrical Charges

If an object has more electrons (\ominus) than protons (\oplus), its electrical charge is

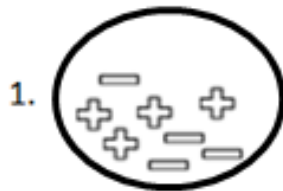
negative.

Example: $\oplus \oplus \oplus \ominus \ominus \ominus \ominus \ominus \ominus$

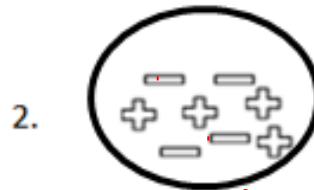
3⁻

✓ Check Your Understanding

Count the positive and negative charges in each picture. Write positive charge, negative charge, or neutral (no charge)



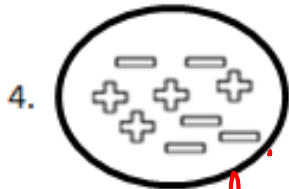
neutral



neutral



positive



negative



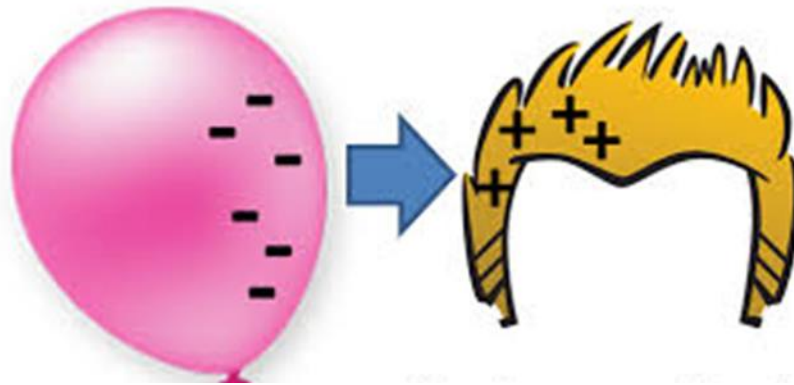
negative



positive

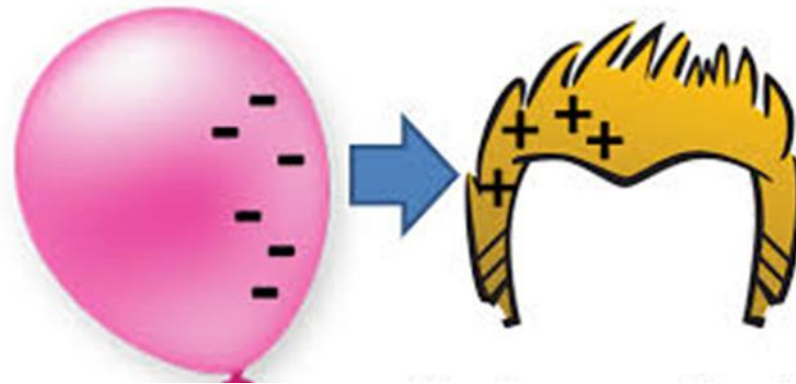
Static Electricity

- Static electricity is when an object has an electrical charge, but does not flow like an electrical current



Example

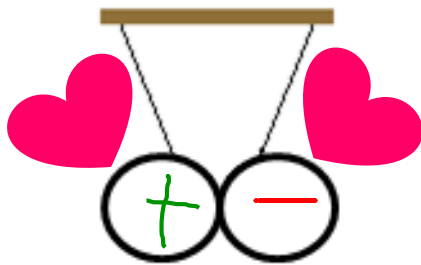
- Rubbing a balloon on your head transfers electrons from your hair to the balloon.



Laws of Electrical Charges

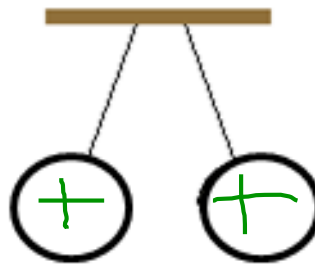
- Opposite charges attract each other
- Like charges repel each other

same

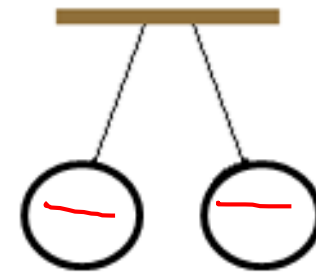


Attract

"opposites attract"



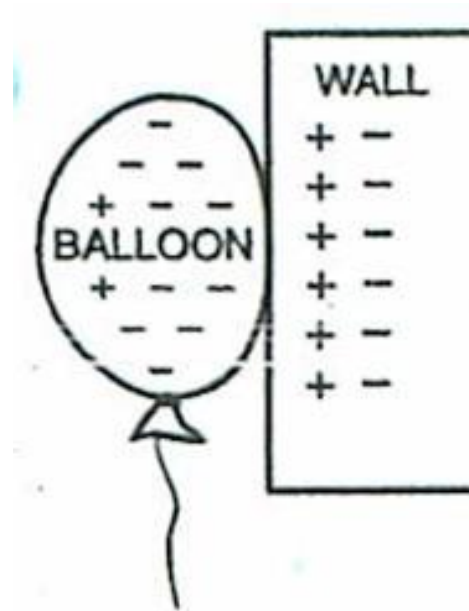
Repel



Repel

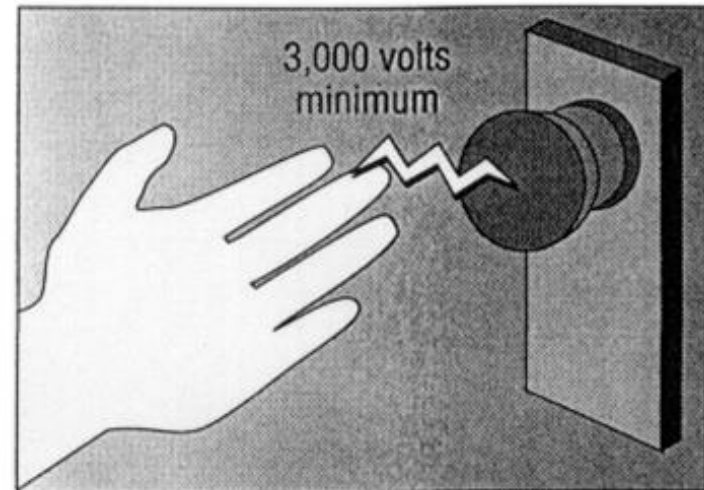
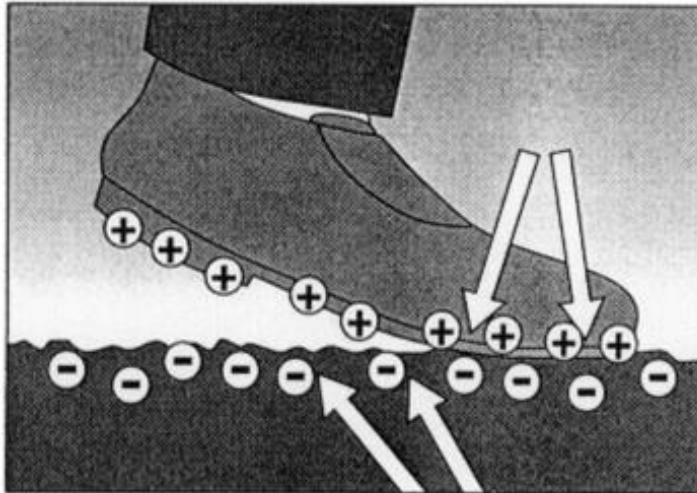
Static Electricity

- When the charged balloon is near the wall, its electrons repel the wall's electrons, and attract the wall's protons. The balloon “sticks” to the wall.



Electrical discharge

- Static electricity does not flow like a current, but it does sometimes **discharge**.
- This is why you sometimes get a shock or see sparks.



Static Electricity at the Pump

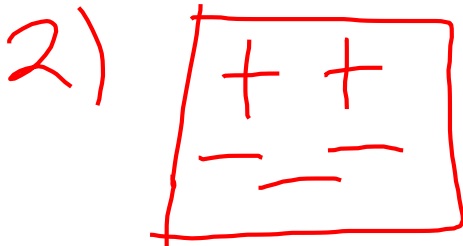
- <https://www.youtube.com/watch?v=tuZxFL9cGkl>



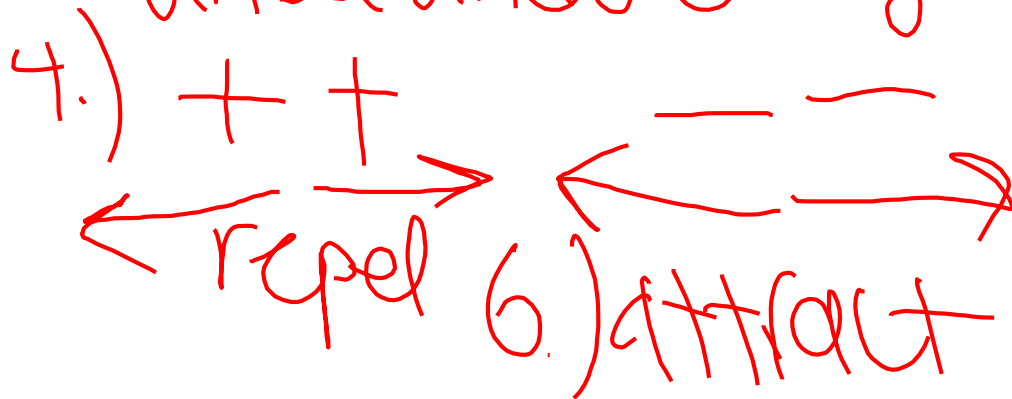
- <https://youtu.be/bqzupgP6upU>

✓ Check Your Understanding

1.) proton - positive (+)
electron - negative (-)



3.) electrons don't move, are 'static'
unbalanced charge





1.2 Current Electricity

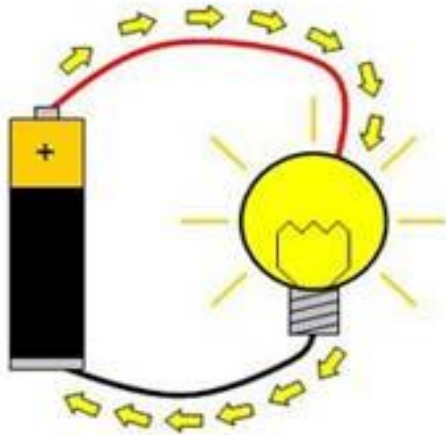


Electrical Current

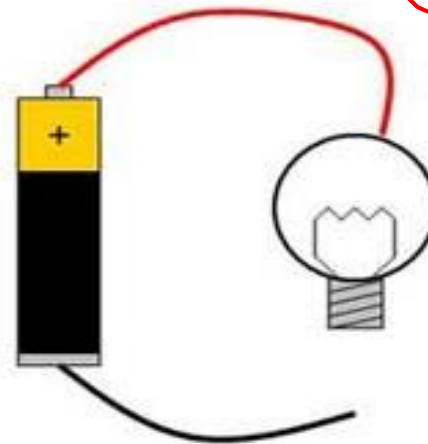
Electrical current will flow continuously as long as there is

- an **energy** source
- a complete path or **circuit**

Closed circuit



Open circuit



*E.C. flow
path
material - copper
conver-*

Circuits

- The water system in your house is like an electrical circuit; the pipes and taps control the flow of water.



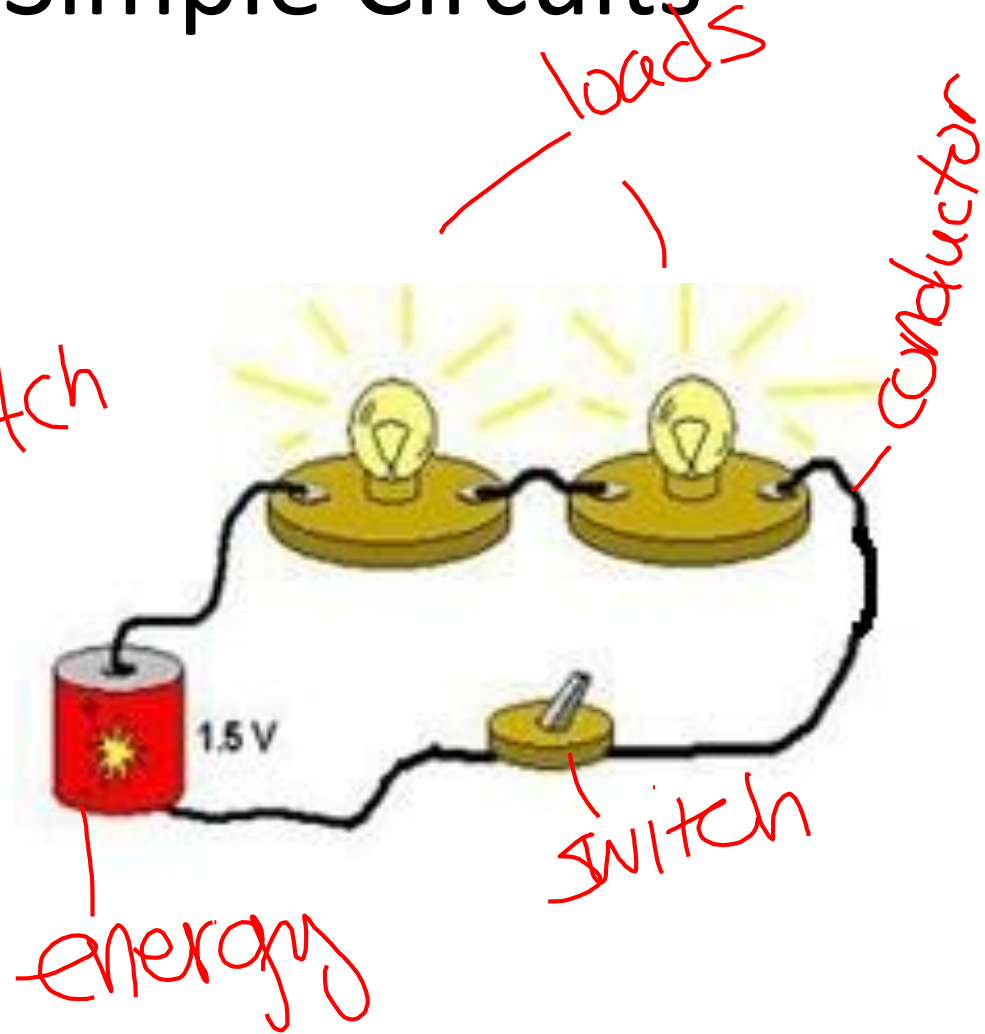
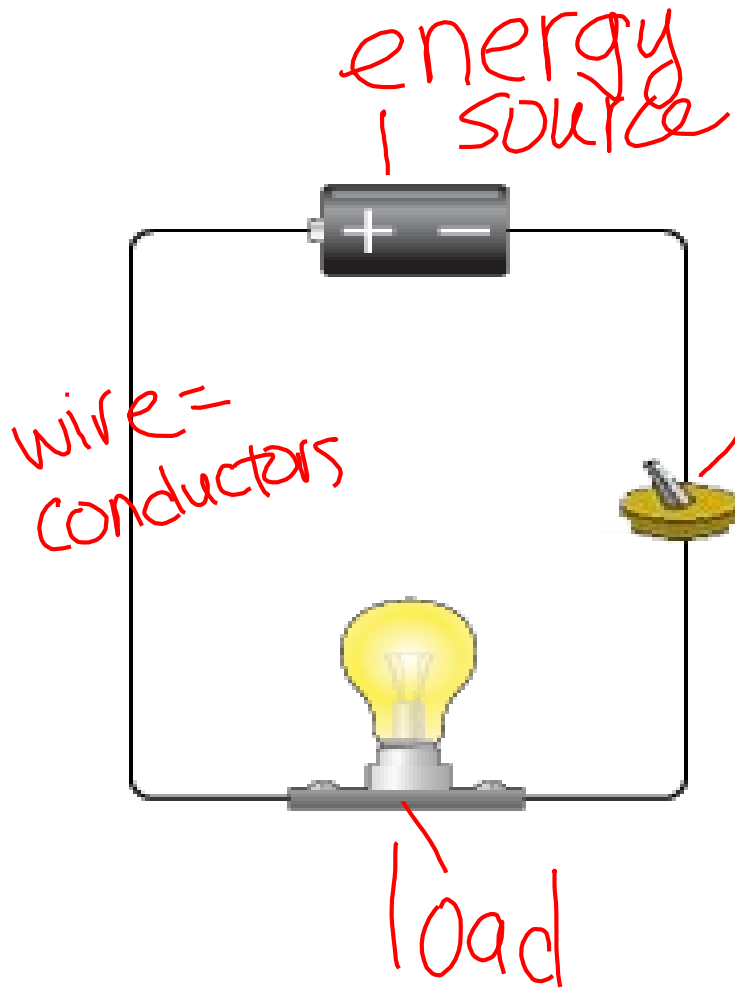
https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

Play with circuits!!

Parts of a Circuit

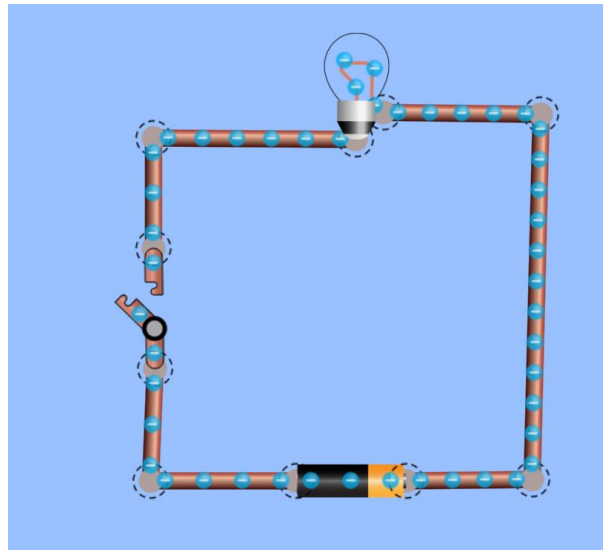
- **Energy source** - power supply
- **Conductor** - wire through which current flows
- **Load** - converts electricity into other forms of energy
- Many circuits also have a **switch** to turn the flow of electricity on and off.

Examples of Simple Circuits



✓ Check Your Understanding

- Once you are done, you can use the rest of the period to build virtual circuits
- https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html



- **Current** – _____ at which electrons flow
- Current is measured in _____, often called an “amp” for short.
- Current can be measured with an _____, or galvanometer for very small current.