

Name: _____

Date: _____

7.2 Electrical Force

A force is a **push or pull** acting on an object – electric force can do both, without actually touching the object

Electric Force is an **action-at-a-distance** force – A force can be applied without touching

Laws of Static Charge

What happens when you put **two like** charges together? ie/ two positives

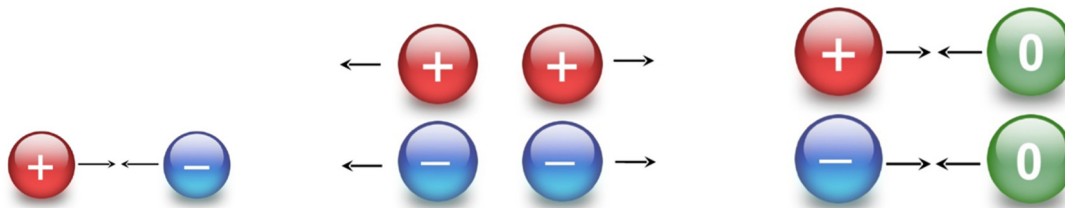
- **They repel**

How about **two opposite** charges?

- **They attract**

What about a **neutral** object (positive and negative charges are balanced)

- Attracted to **charged** objects (**positive or negative**)



Charles Coulomb observed that electric force is **proportional** to charge

- **Increasing** the amount of charge **increases** electric force
- **Decreasing** the amount of charge, likewise, **decreases** electric force

Coulomb also observed that if you **increase** the distance between charged objects, you **decrease** the electric force

- **Decreasing** distance will **increase** the electric force

Conductivity – ability of materials to allow electrons (-) to move freely

Conductor – a material that allows electrons to change positions

- In a conductor – electrons (-) are NOT as tightly bound to nuclei (+), therefore can move away **easily**

Insulator: a material that holds on to its electrons, electrons are not able to move easily

- Electrons (-) are bound tightly to the nuclei (+) so they resist movement



Charging by **Conduction** (see page 259)

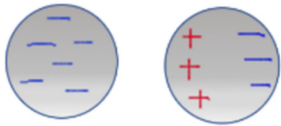
- Charging through **direct contact**
- Electrons move to a location where there is less of them

Charging by **Induction** (see page 260)

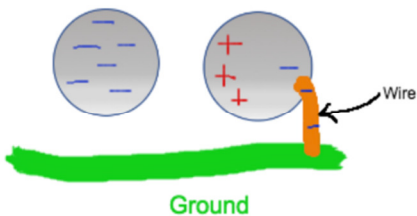
- Let's say we have a (-) charged object that is brought close to a neutral object (objects do NOT touch)



- Within the neutral object, the like charge (-) will be **repelled** away from the charged object (also (-))
- This results in the opposite charge (+) remaining on the side **closest** to the charged object (-)



- Overall the neutral object is still neutral, it just has a positive pole (end) and a negative pole
- The neutral object is then connected to the ground, electrons (-) flow further from the charged into the **ground**



- When ground connection is **removed** the object will then have the **opposite** charge (+) to that of the charged object

