ELECTROSTATICS:

ELECTROSTATICS: Interactions between charges

ATOMS: contain

1. Protons: Positive Charge (located in the nucleus)

2. Neutrons: Neutral Charge (located in the nucleus)

3. Electrons: Negative charge (located in the electron cloud outside the nucleus)

\*Electric charge is the fundamental property of all matter.

\*All matter is positive, negative or neutral. The charge or lack of charge depends on the number (amount) of protons and electrons within the atom.

\*Basic rule of charge:

-Refers to the electric force between charges.

-This force exists as a force field like gravity

1 -opposites charges attract

2. like charges repel

\*A proton is 2000 more times massive than an electron but they both have the same magnitude of charge. The only difference is protons are positive and electrons are negative.

\*The amount of charge is measured in Coulombs (C).

-it takes 6.25 x10^18 electrons to provide -1C

-it takes 6.25x 10^18 protons to provide +1C

3 ways to charge an object

1. Friction:

-Involves direct contact by rubbing objects together over a distance (work is done)

-Electrons are scraped from 1 object to another

-1 object loses electrons (becomes positive) while the other object gains electrons (becomes negative)

-Can not tell which is gaining or losing electrons

2. Conduction:

-Charging due to direct contact between dissimilar or neutral objects.

-Involves contact between charged and uncharged or charged and neutral objects

-when the 2 objects touch, electron flow is toward positive charged object

a. conductor: materials that allow for easy transfer of charge…allow charges to flow

example: copper, aluminum, gold, silver

b. insulator: opposes electric current…slows or prevents charges from flowing

example: glass, plastic, rubber, wood

3. Induction:

-No direct contact required

-charging by placing a charged object near a neutral object

-leads to polarization

a. Polarization:

-a negatively charged object near a neutral object causes charges to separate within the neutral object. Positive charges move to one pole and negative charges move to opposite pole (polarization)

-Polarization is temporary unless object is a good conductor….which allows negative charges so it becomes charged and no longer neutral (polarized)