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)