Electrostatics

The Basics

Charge

symbol → q

Unit → C (coulomb)

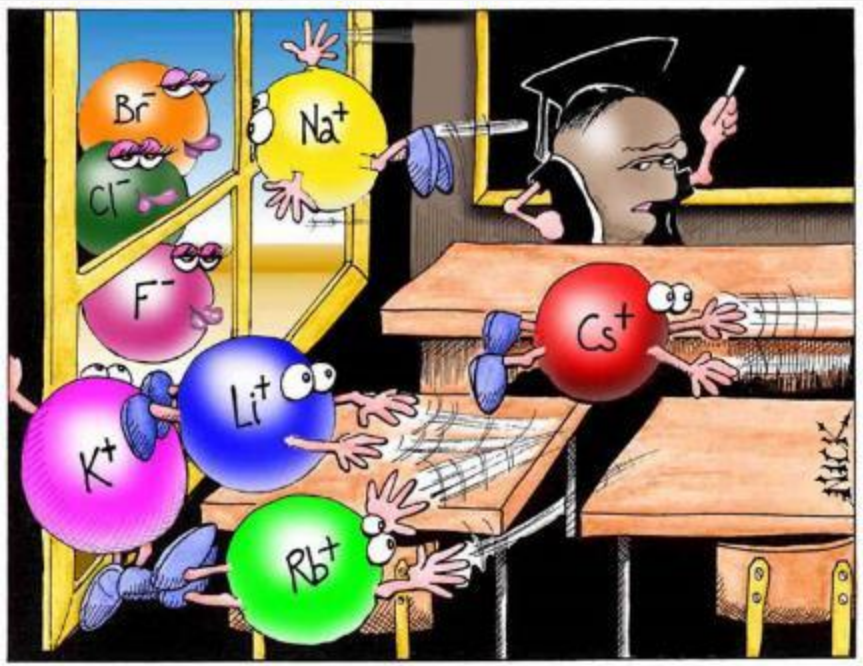
- Fundamental property of matter
  - Single isolated charge, $e = 1.6 \times 10^{-19}$ C
- Positive charged objects have a lack of electrons required for neutrality
- Negative charged objects have an excess of electrons required for neutrality
- Total charge, q =ne, where n is the number of single charges in the object

Charge is Conserved

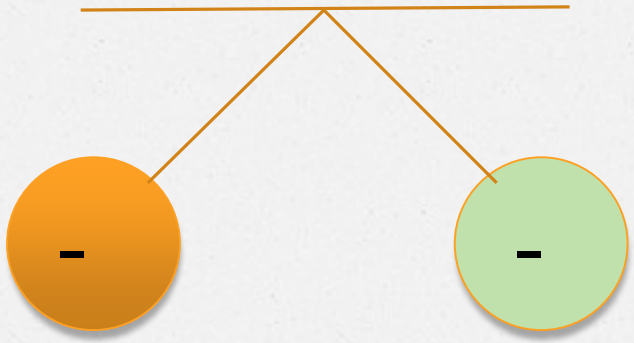
Net charge is unchanged

Laws of Attraction

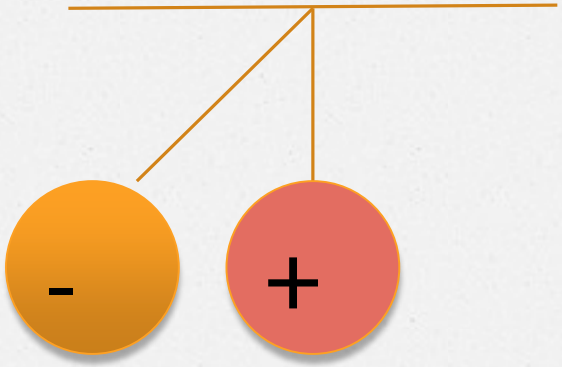
- Opposite charges attract
- Like charges repel



"Perhaps one of you gentlemen would mind telling me just what it is outside the window that you find so attractive..?"



Two like charges repelling



Two opposite charges attracting

Coulomb's Law

Mutual force of attraction or repulsion proportional to the product of the charges and inversely proportional to the square of the distance between the charges.

$F_e = (kq_1q_2)/ r^2$ $k= 9 \times 10^9 Nm^2/C^2$