

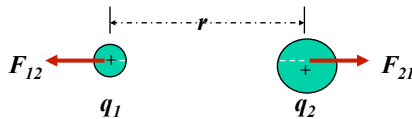
ELECTRIC CHARGE

(+) **POSITIVE**– contains fewer electrons compared to its protons

(-) **NEGATIVE**– contains ____ electrons compared to its protons

NEUTRAL– contains an ____ number of electrons and protons
- zero net charge

Electrostatic Force



• $F \propto q_1$

• $F \propto q_2$

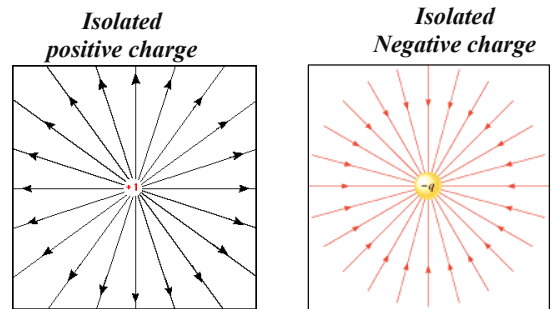
$F \propto \frac{1}{r^2}$

$$F \propto \frac{q_1 q_2}{r^2}$$

$$F = k \frac{q_1 q_2}{r^2}$$

Coulomb's Law

Electric Field Patterns



radial electric field lines

Electric Phenomena

• charge

• Force

$$F_e = \frac{k q_1 q_2}{r^2}$$

• Electric Field (E)
(different view)

charge

Field

charge

Magnetic Phenomena

• poles

• Force

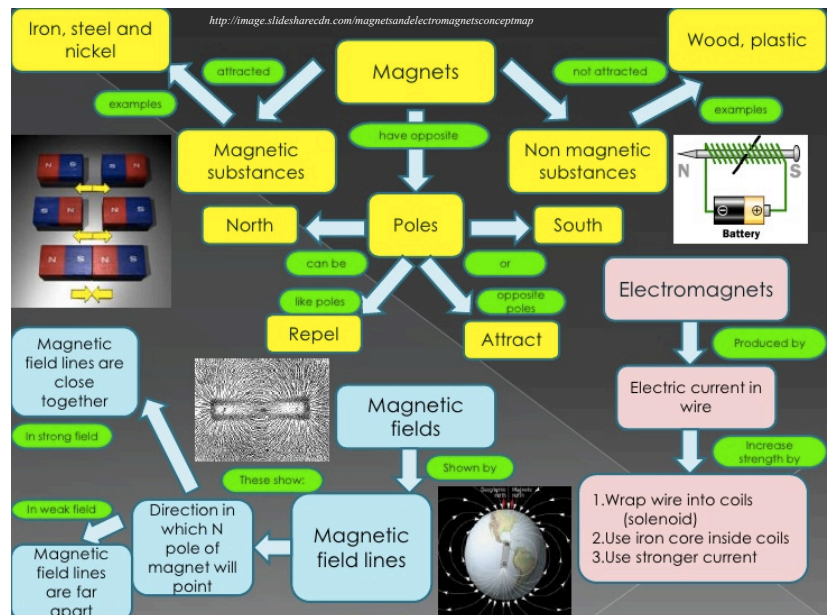
$$F_m = \frac{k' p_1 p_2}{r^2}$$

• Magnetic Field (B)
(different view)

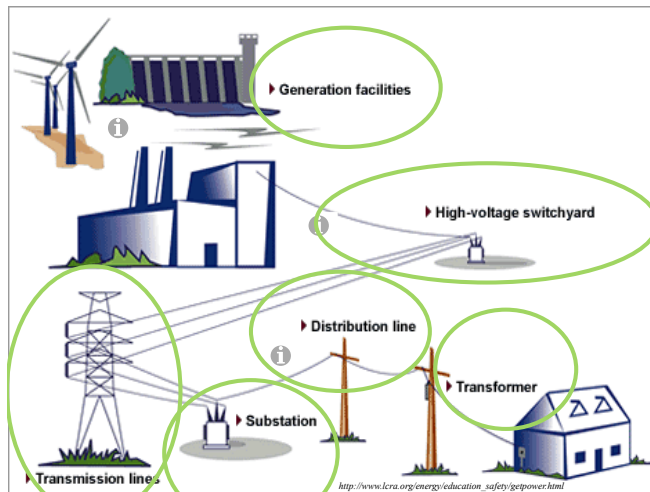
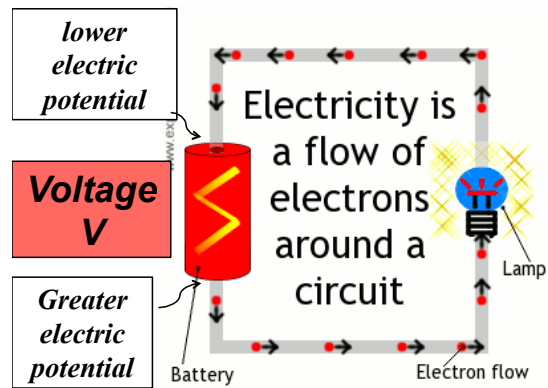
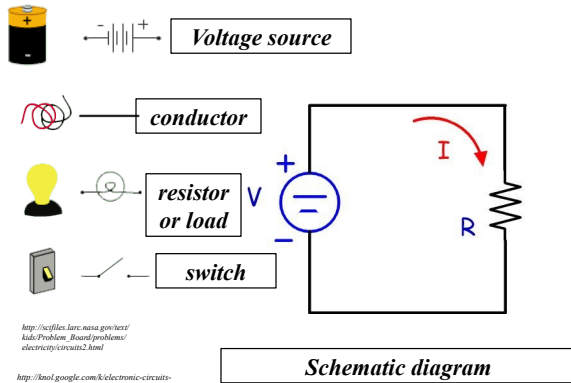
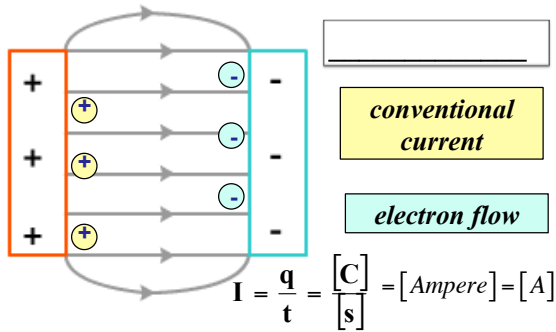
magnet pole

Field

magnet pole

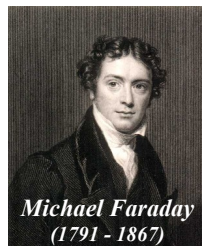


The motion of electric charges in an uniform electric field



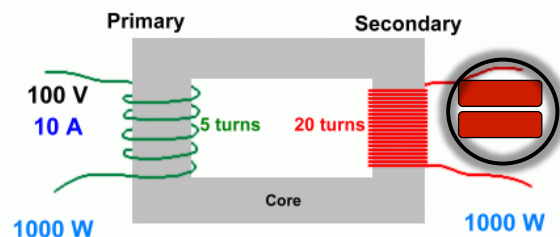
How can a magnet produce electricity?

- through relative motion between magnet & coil;
- through changing current in a coil.



A changing magnetic field produces electricity!

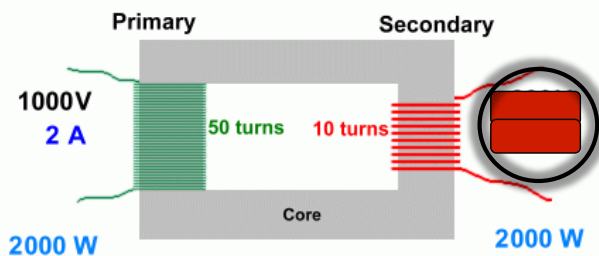
Step Up Transformer



$$\frac{V_s}{V_p} = \frac{N_s}{N_p} = \frac{I_p}{I_s}$$

<http://www.worsleyschool.net/science>

Step Down Transformer



$$\frac{V_s}{V_p} = \frac{N_s}{N_p} = \frac{I_p}{I_s}$$

<http://www.worsleyschool.net/science>