

Mr. Schneider presents...

Electromagnetic Topics

Electrostatics

- **Charge carriers**
- **Charge interactions** (attraction vs. repulsion of +/-)
- Electrical affinity
- **Polarization**
- **3 charging methods**
- **Coulomb's law**
- Electric field strength vs. gravitational field strength
- **Electric force vectors**
- **Faraday field lines**
- Electric potential vs. electric PE
- Converting work to EPE to KE
- Conductors vs. insulators
- Gauss's law
- **Charge distribution in a conductor**
- Electric arcs (sparks)

Circuits

- **Batteries** (Pumping charge, converting chemical PE to electric PE)
- Resistance in conductors
- **Ohm's law**
- **Kirchhoff's 2 laws**
- **Series and parallel circuits**
- **Current direction vs. electron motion direction**
- AC vs. DC
- Fuses and Breakers

Magnets

- **Magnetic poles & B-field lines**
- **Magnetic interactions** (attraction vs. repulsion of N/S)
- Magnetic domains
- Attracting "plain" iron
- Creating and destroying permanent magnets
- Earth's magnetic field
- **3-D vector notation**
- Strength of a solenoid B-field
- **Source of all magnetic fields**
- **3 right-hand rules:**
 - **Straight wire produces a B-field**
 - **Solenoid produces a B-field**
 - **Current crossing B-field lines produces a force**
- Strength of force felt by charge crossing B-field lines
- **Motor effect on a current carrying wire/coil**
- **Generator effect (current induced in a wire/coil)**
- **Lenz's law**
- Faraday's law
- **One generator rule (right-hand or left-hand)**