VIDEO SUMMARIES: ELECTRICTY

V, I AND R – PART 1

What you need to know:

1. $V = IR$ $\boldsymbol{V}$ = Voltage (Volts), $\boldsymbol{I}$ = Current (A), $\boldsymbol{R}$ = Resistance (Ω)
2. Voltage is how much energy is given/taken from each coulomb of charge. $V = \frac{E}{q}$
3. Current is how fast each charge is moving. $I = \frac{q}{t}$
4. Resistance is how much a component opposes the flow of charge.
5. Parallel circuits are where there is more than one pathway.
6. Series circuits are when there is only one pathway.

V, I AND R – PART 2

What you need to know:

1. $V = IR$ can be used for individual components AND the whole circuit.
2.

	Series	Parallel
Current, I Unit: Amp (A)	*CONSTANT*	*SHARED*
Voltage, V Unit: Volts (V)	*SHARED*	*CONSTANT*
Resistance, R Unit: Ohm (Ω)	*MORE* resistors = *BIGGER* resistance $R_T = R_1 + R_2 + \ldots$	*MORE* resistors = *SMALLER* resistance $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$

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POWER

What you need to know:

$$P = VI \qquad P = \frac{E}{t}$$

1. Voltage determines how bright a lamp will be (because ↑V means ↑P)
2. Lamps in parallel are brighter than lamps in series
3. Lamps in parallel draw more power
4. Lamps in parallel can be kept going if a bulb blows
5. A diode only lets current travel in one direction 

ELECTRIC FIELDS – PART 1

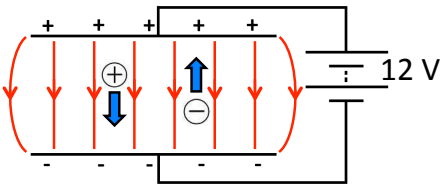
What you need to know:

1. Charges create an electric field
2. This electric field is shown as arrows which go from positive to negative.
3. $E = \frac{V}{d}$

   $\boldsymbol{E}$ = Electric Field Strength – (V m^{-1})
   $\boldsymbol{V}$ = Voltage – Volts (V)
   $\boldsymbol{d}$ = Distance – Meters (m)

4. $F = Eq$

   $\boldsymbol{F}$ = Force – Newton (N)
   $\boldsymbol{E}$ = Electric Field Strength – (NC^{-1})
   $\boldsymbol{d}$ = Charge – Coulombs (C)



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ELECTRIC FIELDS – PART 2

What you need to know:

1. An electric field causes charges to accelerate $F = Eq$
2. Charges in an electric filed have potential energy

$$V = \frac{\Delta E}{q} \qquad \Delta E_p = Eqd$$

V = Voltage – Volts (V)
ΔE, ΔE_p = Energy – Jules (J)
q = Charge – Coulombs (C)
E = Electric Field Strength – (V m^{-1})
d = Distance – Meters (m)

3. Electric potential energy can be turned into kinetic energy

$$\Delta E_p = Eqd = E_k = \frac{1}{2}mv^2$$ ⟸ Must Know

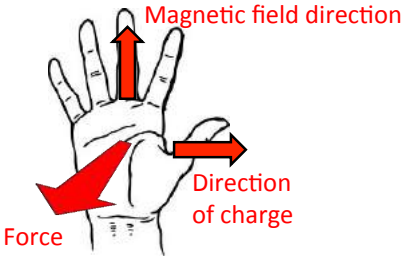
RIGHT HAND SLAP RULE – PART 1

What you need to know:

1. Magnetic fields go from north to south
2. X X X — Into Page

● ● ● — Out of Page

3. **R**ight **H**and **S**lap Rule



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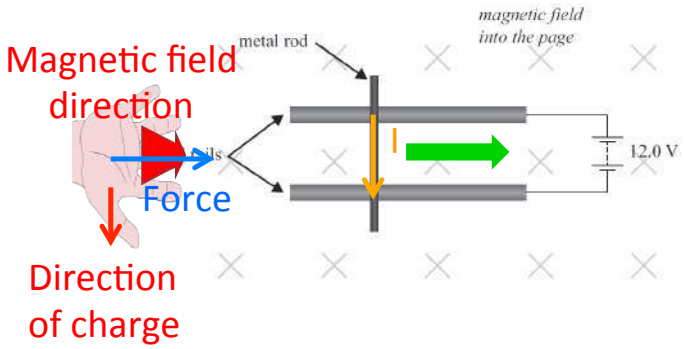
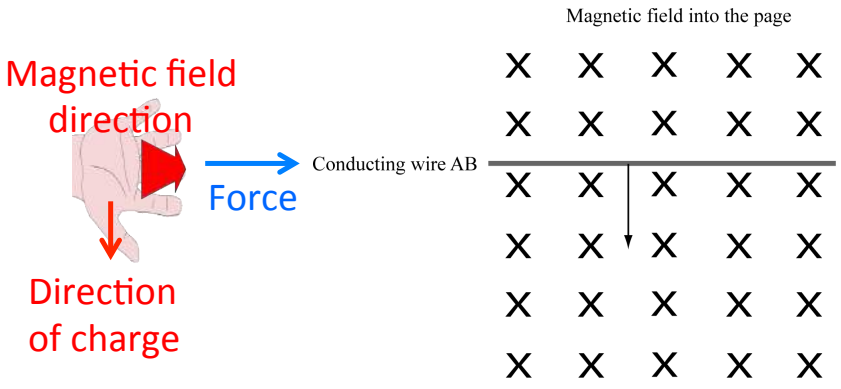
RIGHT HAND SLAP RULE – E.G. 1



RIGHT HAND SLAP RULE – E.G. 2



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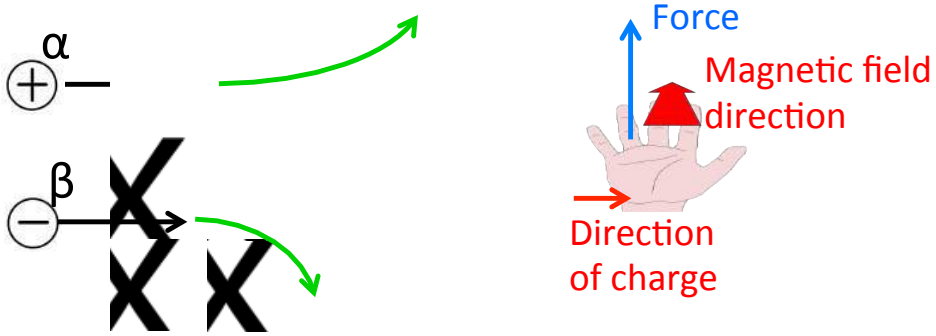
RIGHT HAND SLAP RULE – E.G. 3



RIGHT HAND SLAP RULE – CALCULATIONS

What you need to know:

$$F = BIL \qquad F = Bvq \qquad V = Bvl$$

F = Force – Newtons (N)
B = Magnetic Field Strength – Tesla (T)
I = Current – Amps (A)
v = Velocity – Meters per second (ms^{-1})
q = Charge – Coulombs (C)
L = Length of Rod – meters (m)
l = Total length – meters (m)

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