Seven Concepts

Seven Concepts that make this course worthwhile.

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Ohm's Law
Joule's Law (*I Squared R Loss*)
Open Switch / Closed Switch
Multimeters
 Connect volt meter in parallel (across *potential*)
 Connect ammeter in series (in-line *flow*)
Product over the Sum (*Parallel Resistors*)
Voltage Divider

Ohm's Law

The current (I) is proportional to the voltage (V)

$I \propto V$ (The current is linearly proportional to the voltage)

$I = \frac{1}{R}V$

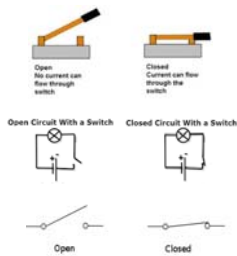I = V / R   Note: 1/R is the slope of the current voltage curve

V = I R

R = V / R

Joule's Law (Power)

P = I V

P = (V / R) V = V^2 / R   from   I = V / R
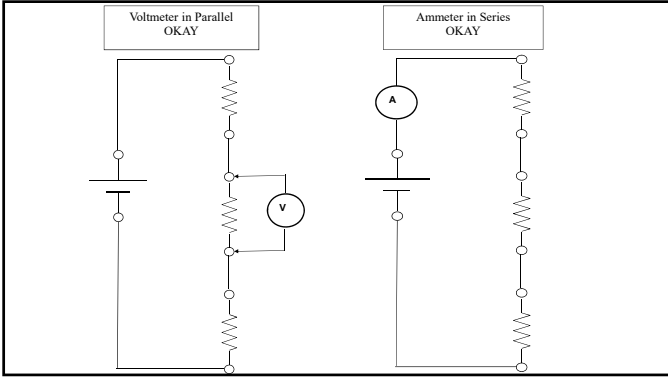
P = I (I R) = I^2 R   from   V = I R

Note: P = I^2 R   is the so called "I squared R loss" (heat loss)

Open Switch = No Current Flow   Closed Switch = Maximum Current Flow
   Voltage across Switch = Supply Voltage   Voltage across Switch = Zero
   Voltage across Load = Zero   Voltage across Load = Supply Voltage

Slide 1

Voltmeter in Parallel
OKAY

Ammeter in Series
OKAY

A

V

Slide 2

Voltmeter in Series
Prohibited

Ammeter in Parallel
Prohibited

Slide 3

Product over the Sum (Parallel Resistors)

R_1 R_2

$$R_{EQ} = \frac{R_1 R_2}{R_1 + R_2}$$
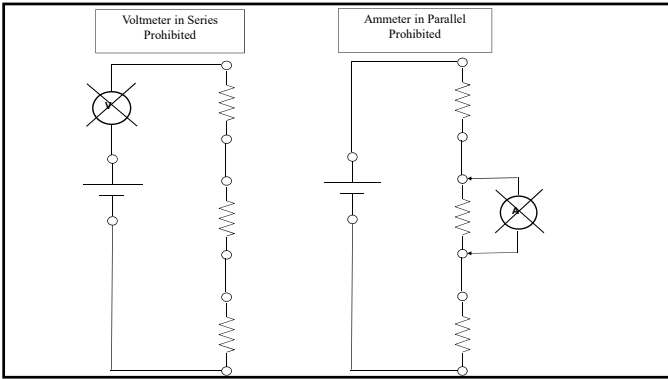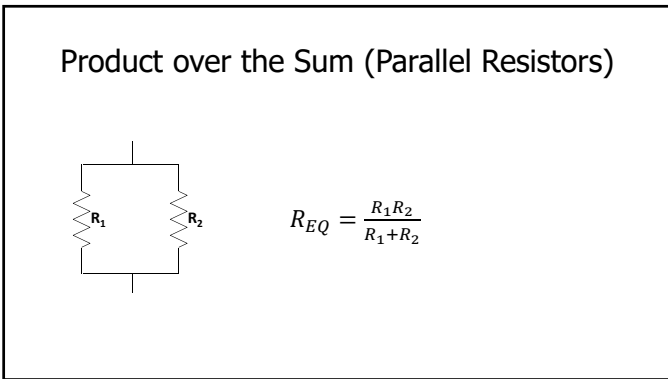
Voltage Divider

$$V_{R_2} = V \frac{R_2}{R_1 + R_2}$$