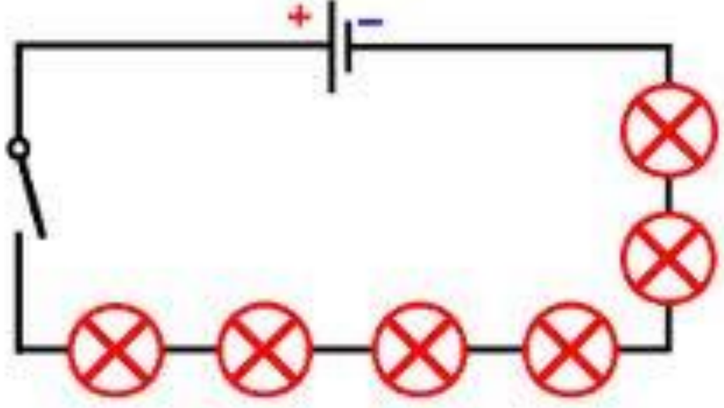
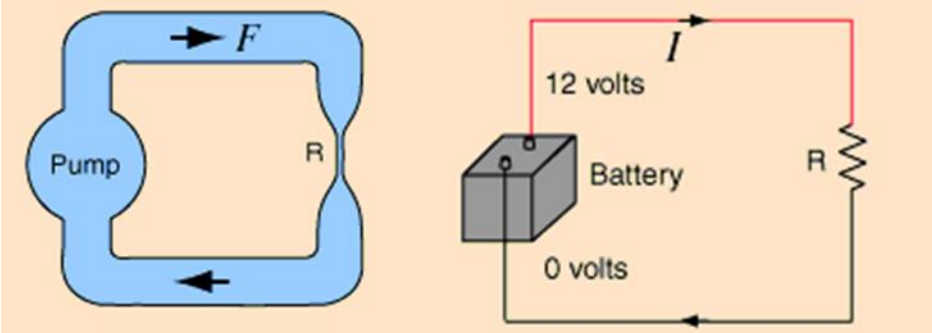
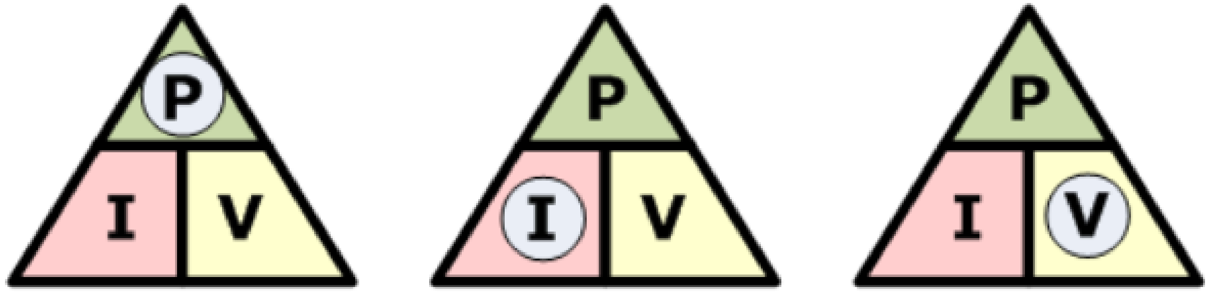


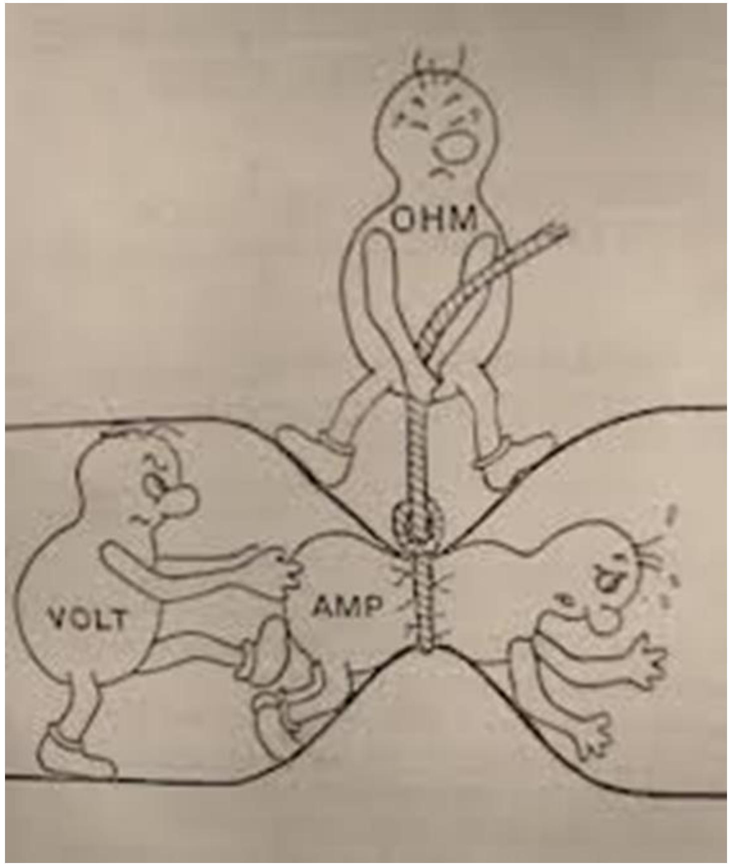
Series Circuits 21.1

Review



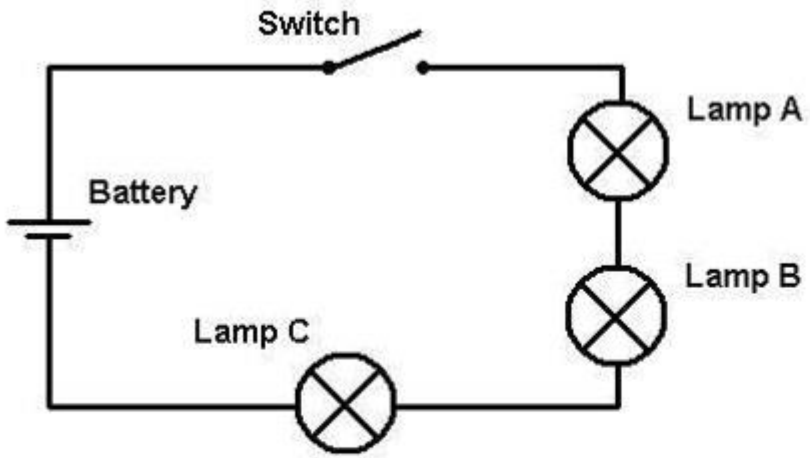


$P = I \times V$ $\quad$ $I = \frac{P}{V}$ $\quad$ $V = \frac{P}{I}$

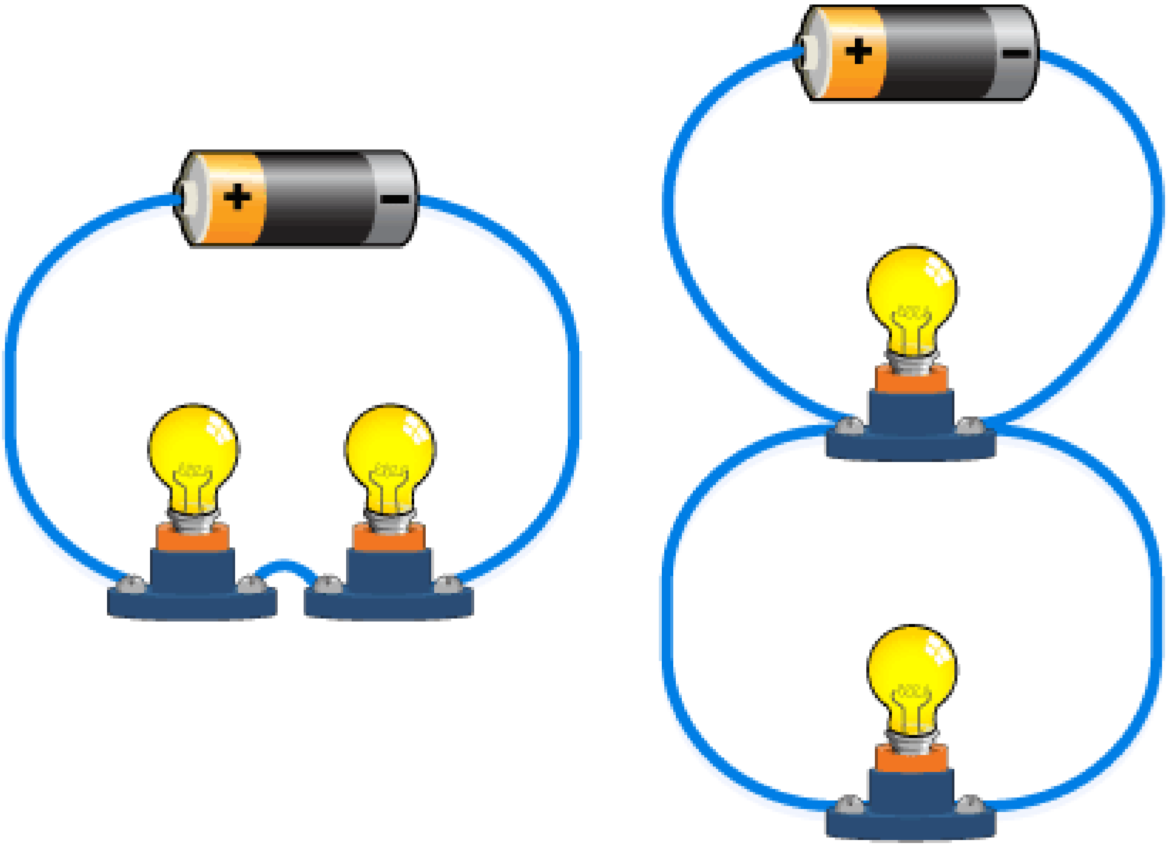


Series Circuits (SC)

- <u>Series Circuit: </u>a circuit that only has one path for the current

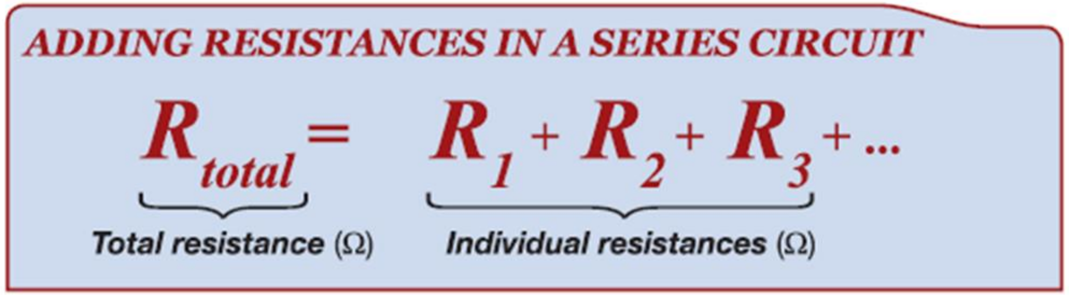


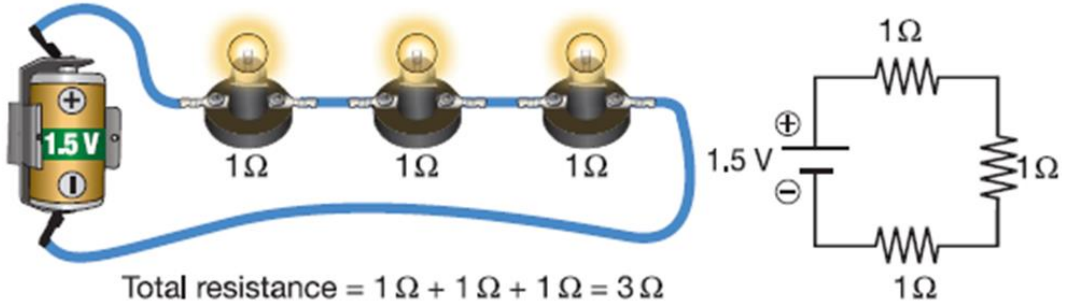
Which one is a SC?

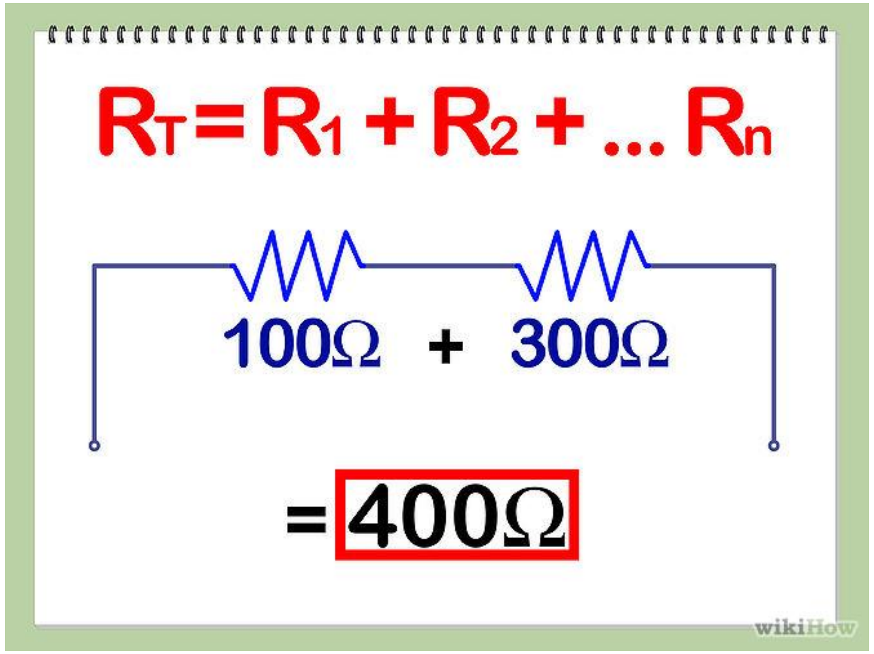


Current & Resistance in a SC

- Resistance slows down current like pinches in a hose
- Even though we can make resistors for slowing current on purpose, everything in a circuit is a resistor (wires, light bulbs, etc.)







“Math is cool” ~$_{\text{Jay-Z}}$

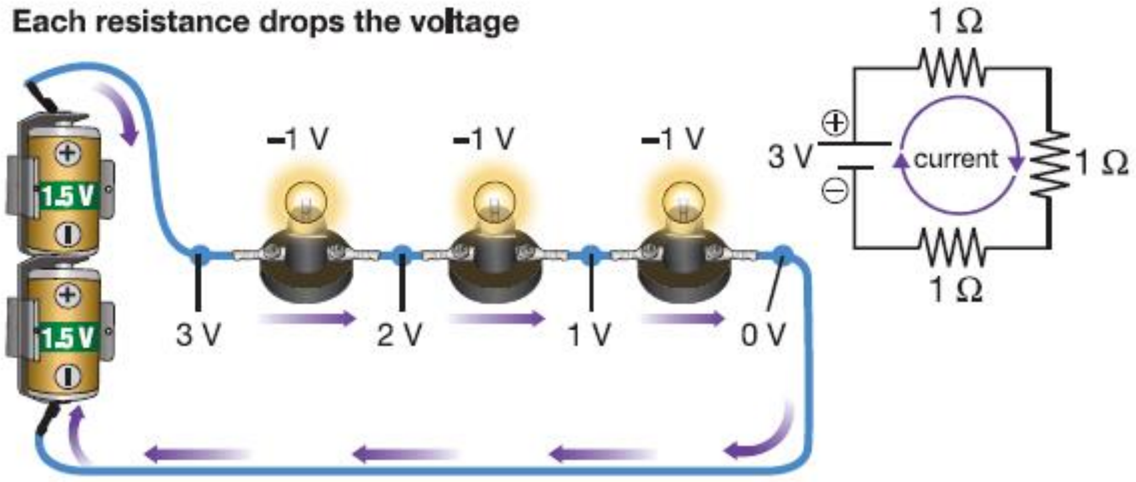
- A series circuit contains a 12V battery and 3 bulbs with resistances of 1Ω, 2Ω, and 3Ω. What is the current flowing in the circuit?

  - $R_{tot} = R_1 + R_2 + R_3$
  - 1+2+3 = 6Ω

  - Ohm’s Law: I = V/R
  - I=(12V)/(6Ω)
  - 2A

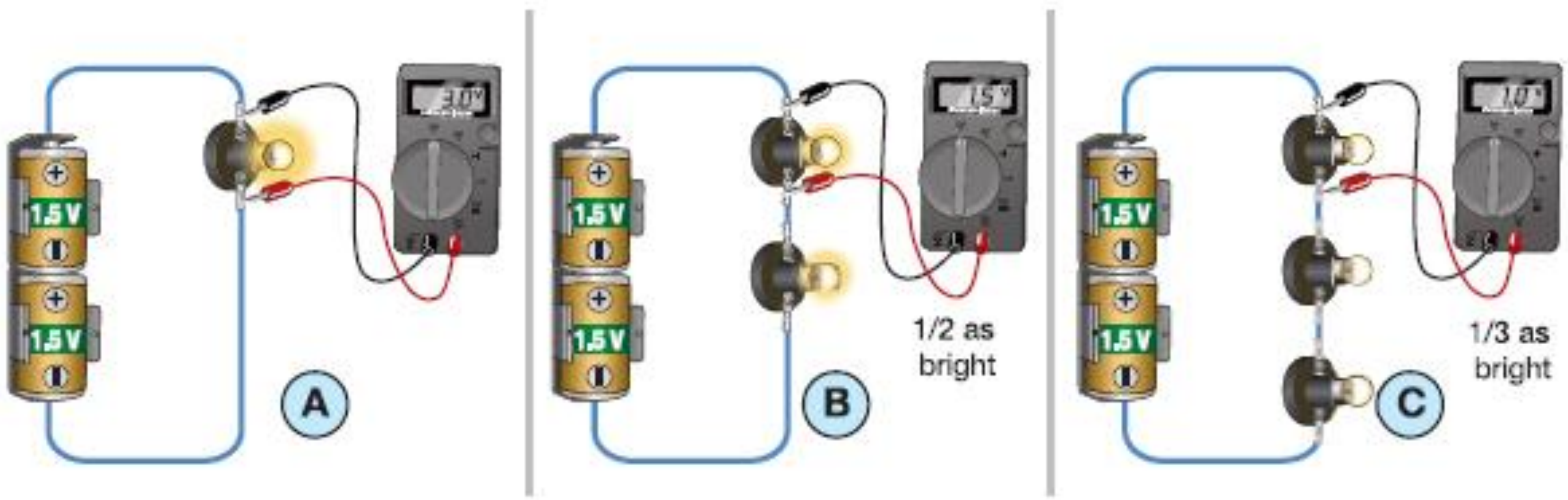
Energy & Voltage in a SC

- <u>Voltage Drop:</u> The difference in voltage across an electrical device that has current flowing through it
- REMEMBER: **S**eries/**S**hare
- Voltage is lower after each device that uses power
- If bulbs are identical, each bulb gives off same light/heat and uses the same amount of power



Voltage Drop

Voltage Drop



Properties of Series Circuits

- If there is a break anywhere in the circuit, all lights will go out
- Kirchhoff's voltage law: the total of all voltage drops in a series must equal the voltage supplied by battery