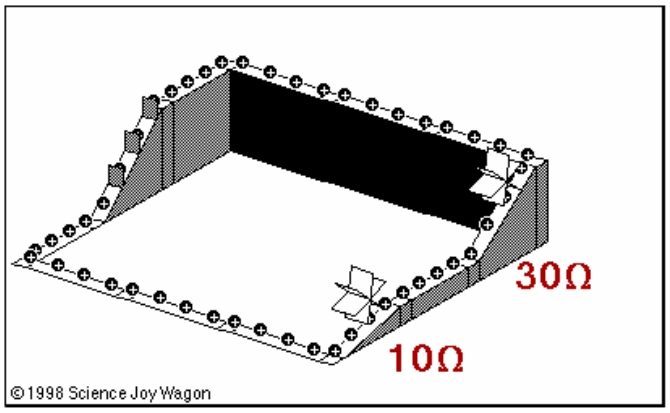
Name _____ Physics

Series Circuits

A **series circuit** has more than one resistor *(anything that uses electricity to do work)* and gets its name from **only having one path for the charges** to move along. Charges must move in "series" first going to one resistor then the next. If one of the items in the circuit is broken then no charge will move through the circuit because there is only one path. There is no alternative route. Old style electric holiday lights were often wired in series. If one bulb burned out, the whole string of lights went off.



Below is an animation of a series circuit where electrical energy is shown as gravitational potential energy (GPE). The greater the change in height, the more energy is used or the more work is done.

Summary:

1. _____

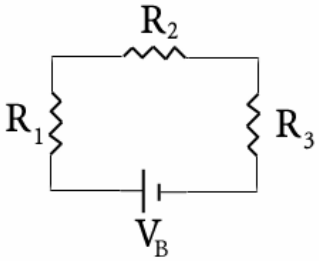
2. _____

3. _____

Summary of Voltage, Current and Resistance

Ohm's Law Summary:

Series Circuit – Example



R_1 = 2 ohms
R_2 = 3 ohms
R_3 = 1 ohm
V_B = 12 V
I = 2.0 A

Find Voltage drop at each resistor

Series Circuits Practice problems:

1. A series circuit contains
    - (1) 9 V cell and 5 Ω (1) resistor.
    - A voltmeter measures the voltage drop across the resistor.
    - An ammeter measures the current flowing in the circuit.

1) Draw the Circuit
2) Calculate the current in the circuit
3) What is the voltage drop across the resistor?

Practice Problem #2

- A series circuit contains a 12 V battery with 5Ω and 3Ω resistors in series.
    - Draw the circuit
    - What is the voltage drop across the resistors?
    - What is the current flowing in the circuit?