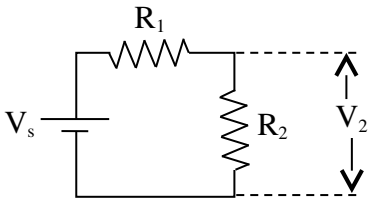
**PHY2250, Electronics & Circuit Theory**
**Activity: Series Circuits**

Work in groups of three (or two). You may refer to your notes and your textbook.

1. Using Ohm's Law and the fact that current in a series circuit is the same everywhere, *show* (i.e. *prove*) that the *total* resistance of three resistors in series is the same as the sum of the individual resistances.

2. Referring to the schematic below, find a formula for $V_2$, the voltage across $R_2$, as a function of (only) the source voltage $V_S$ and the values $R_1$ and $R_2$. (This is known as the "Voltage Divider" formula, and will be *crucial* to analyzing many circuits in this course.)




3. How would your answer to #2 (above) change if there were a third resistor in series with the other two, i.e. what would the formula for $V_2$ be?

4. Referring to the schematic in #2, if $V_s = 10V$, $R_1 = 100\Omega$ and $R_2 = 250\Omega$…
   a. What is the total power in the circuit?

   b. What is the power dissipated by $R_1$?