

Name: _____ Date: _____ Partner: _____

Objective

Build and test several simple heater circuits. Collect data on the current, resistance and voltage of each circuit. Tabulate and graph the data to find all meaningful linear relationships.

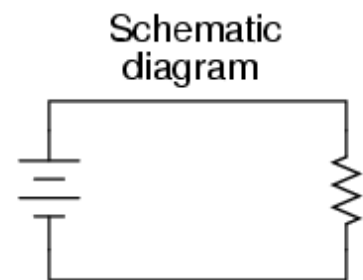
Methods

Materials

PASCO EM-8656 AC/DC Electronics Laboratory (circuit kits), various resistors, Multimeter, Computer with MS Excel

Procedures

Select at least 5 different resistors that have different values. Create simple resistor circuits that only connect a single resistor across the combined voltage of two D-cell batteries. (A switch can be optionally included to more easily control the application of power.) Measure the Resistance of each resistor, the voltage of the batteries in the circuit, and the current in the circuit when each different resistor is swapped in to the circuit. To be clear: you will build the circuit shown to the right, and swap out each of the resistors when making the measurements for current. Only one resistor at a time will be in the circuit. This all seems to go best when the data is collected while using the same 2 batteries.



Results

Data to Collect

Collect data on the voltage, current and resistance of each of the circuits. Keep in mind that a resistor in a circuit is a rudimentary heater, so low value resistors could get hot when in the circuit – be mindful.

Calculations to be Made

Graph the data to look for meaningful trends. In order to make connections, force your graphs into linear arrangements. These allow for simple assessment of the relationships between variables. In order to achieve this, you may need to alter the variable that you are graphing (such as squaring a dataset before graphing, taking the inverse, etc.) Consult the web or your teacher if you have any questions about how to do this. [<https://youtu.be/ENMITIzWwBQ>]

Lab Completion

Once all data is tabulated, graphs are made and connections are understood, a document will need prepared for submission. Compile the data table and necessary graphs on a single printable page, along with a written explanation of the connections between the variables observed. This document will then be submitted to the teacher either as a printed copy or electronically, per teacher directions.

Circuit	Resistance (Ω)	Current (amps)	Voltage (Volts)
1			
2			
3			
4			
5			