Name: _____ Block: _____

Laboratory Activity – Ohm's Law

Voltage across a resistor and Current through the same resistor

Choose 2 different resistors, no smaller than 100 Ω and no larger than 1000 Ω. Ideally, the resistor values of the 2 resistors should not differ by more than 400 Ω (e.g. 100 Ω and 330 Ω is ok; or 680 Ω and 1000 Ω)

Data Tables (modified slightly from the one in the textbook)

Resistor #1

Resistor colour code (state colours): _____

Resistor value (based on the colour code): _____ Ω

Column 1	Column 2	Column 3	Column 4	Column 5
Number of Cells	Voltage "V" (V)	Current "I" (mA)	Current "I" (A) *(divide the value in column 3 by 1000)*	Ratio: Voltage (V)/Current (A) *(divide column 2 by column 4)*
1				
2				
3				
4				
5				
				Average =

Resistor #2

Resistor colour code (state colours): _____

Resistor value (based on the colour code): _____ Ω

Column 1	Column 2	Column 3	Column 4	Column 5
Number of Cells	Voltage "V" (V)	Current "I" (mA)	Current "I" (A) *(divide the value in column 3 by 1000)*	Ratio: Voltage (V)/Current (A) *(divide column 2 by column 4)*
1				
2				
3				
4				
5				
				Average =

Name: _____ Block: _____

Procedures:

- Start collecting data from the BOTTOM of the data table (5 cells in series). Set the voltmeter to the 10 V scale before connecting the circuit.
- With Resistor #1, set up a simple series as shown on page 315 (ammeter in series with the resistor, and voltmeter in parallel with the resistor).
- Record the current (I) and Voltage (V) readings when the circuit is connected.
- Then, remove one of the cells and reconnect the circuit. Dial the Voltmeter scale down if appropriate (if the value is less than 5V).
- Record current and voltage for 4 cells, 3 cells, 2 cells, and 1 cell, changing the meter scales when appropriate
- ***Repeat the procedures for Resistor #2.***
- Complete and record calculations for columns 4 and 5 on both tables, and record the average of column 5 for each table.

Graph:

- On ONE piece of graph paper, plot the Voltage vs Current values for both resistors (it is helpful to use different colours of pen or pencil for each of the two different resistors).
- Voltage "V" (V) must be on the y axis (column 2 of the data table)
- Current "I" (A) must be on the x axis (column 4 of the data table)
- Choose scales for the axis that will work for both sets of data
- Start both scales at zero (0), and use an even scale. DO NOT break the scale/axis (i.e. create an even scale from zero to the maximum value – no interruptions)
- Draw a straight ***line of best fit*** for EACH resistor i.e. you will have 2 lines on your graph, with different slopes. One line represents Resistor #1, the other line represents Resistor #2. DO NOT "connect the dots". The "line of best fit" **must** be a straight line (use a ruler!) that matches the trend of the data points (i.e. falls basically in the middle of the data points for one resistor – like an average). Label each line so that the reader knows which resistor it represents.

Data Analysis:

- Calculate the SLOPE of each line of best fit. Provide the slope in Decimal form, rounded to the 1s (e.g. 125 V/A; not 124.8456 V/A). Show the units with the numerical value of the slope.
- Compare the average value in column 5 of the data with the slope of the graph for the resistor. Are the values similar? Explain.