Read all directions carefully: **Do not calculate missing values for the data tales below, take your data from the simulation itself.**

You can find this simulation at <http://phet.colorado.edu/en/simulation/battery-resistor-circuit> . If the link does not work you can search for the “Battery-Resistor Circuit” simulation.

In this simulation you can change either the potential difference (voltage) of this circuit or the resistance. Play around for a minute with these variables to see what happens when you increase and decrease each one.

1. Set the voltage to 7.20 V and **do not change it.** You will use the resistance values in the chart below and the ammeter in the lower left-hand corner (circular and black), **estimate the amps running through the circuit by reading the dial on the ammeter** and complete the chart below:

|  |  |  |
| --- | --- | --- |
| Potential Difference | Resistance | Current |
|  | .2 Ω |  |
|  | .4 Ω |  |
|  | .6 Ω |  |
|  | .8 Ω |  |

2. Describe what is happening inside the resistor as resistance is increased.

3. How does increasing the resistance affect the current passing through the circuit?

4a) Set the resistance on this circuit to .6 Ω **and do not change it**. Start at 9 V and incrementally decrease the voltage for the 8 trials below (ending at 0 V). Fill in the chart below as you complete this exercise.

|  |  |  |
| --- | --- | --- |
| Potential Difference | Resistance | Current |
| 9 V |  |  |
|   |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|   |  |  |
|  |  |  |
| 0 V |  |  |

4b) Using the graph below, plot your voltage vs. current for this circuit. Create a line of best fit.

4c) Calculate the slope of the graph you created using two of your data points that fall on your line of best fit. Show your calculation.

What does this value represent?