Experiment 2

Question: How does resistance affect current in series circuits?

Hypothesis: I think resistance will reduce the amount of current in a series circuit. The more resistance there is, the less current there will be.

Experiment:

1. Get materials (Volt Meter, Wires, Battery, Resistors, power source)
2. Set Power Source to 3.3 Volts (And turn it on)*
3. Create a Series circuit with one Resistor
4. Measure the amount of current
5. Create a another Series Circuit with multiple resistors
6. Measure the amount of current
7. Repeat Experiment in the simulation
8. Compare the expected results to the actual results, and create

Analysis:

Measurements:
Power source: 3.3 V
Resistance: 18.5Ω

Actual Results:
Current with 1 Bulb: 0.18
Current With 2 Bulb: 0.12
Current with 3 Bulb: 0.09

Simulation:
Current with 1 bulb: 0.18 0%
Current with 2 bulb: 0.09 28%
Current with 3 bulb: 0.06 40%

Conclusion: ...

In conclusion, our hypothesis was correct. We found that the resistance reduced the amount of current in a series circuit causing more resistance to have less current. This was possible because the current of the 1st light bulb in our test was 0.18A with the resistance being 18.5Ω. To secure this theory we continued to test the amount of resistance in the other two resisters/light bulbs and the sum of each one was 0.09A then 0.06A. This displays that the most resistance you apply causes the current to decrease. This data was also inserted to a simulation and we did have some slight difference in the last two bulbs, first being 28% then 40%. This might have been a source of error from our power source. But, overall our hypothesis was correct and resistance effects the current in a series circuit by the current being decreased at the expense of more resistors.

Experiment 3
Question: How does resistance affect current in parallel circuits?
Hypothesis: I think the amount of current will increase ~~slightly~~ each time we put each resistance in parallel

Experiment:

1. Get materials (Volt Meter, Wires, Battery, 3 light bulbs, power source)
2. Set Power Source to 3.3 Volts (And turn it on)*
3. Create a parallel circuit with two light bulbs
4. Measure the Current next to the power source
5. Measure the current of the lightbulb
6. Add a lightbulb to the parallel circuit
7. Measure the Current next to the power source
8. Measure the current of the lightbulb
9. Measure the current between lightbulbs 1 and 2
10. Repeat Experiment in the simulation
11. Compared simulated results to actual results and calculate a percent difference

*and make sure it's plugged in
Analysis: Compare expected results (simulation) and actual results, calculate a percent difference...

Measurements:
Power source: 3.3 V
Resistance: 18.5Ω

Actual Results:]

Near Power Source w 2 Bulbs: 0.36
At Bulb w 2 Bulbs: 0.18

Near Power Source w 3 bulbs: 0.55
At Bulb w 3 Bulbs: 0.18

Current with 3 Bulb, 2 paths: 0.3

Simulation:

Near Power Source w 2 Bulbs: 0.36 0%
At Bulb w 2 Bulbs: 0.18 0%

Near Power Source w 3 bulbs: 0.54 2%
Between Bulbs 1 and 2: 0.36 0%
At Bulb w 3 Bulbs: 0.18 0%

Conclusion:

In conclusion, our hypothesis was correct. It was found that the amount of current increased each resistor placed in parallel. This was found because the first resister was placed on a parallel was 0.18A at the foundation of the bulb/resistor. We then tested this theory by placing the voltmeter near the power source, causing a larger sum of 0.36A. Then to test the hypothesis we applied and calculated the next resister, near the power source, and got the sum of 0.55A. This proves that the amount of current increase at the application of resistors on parallel circuits. To make sure our calculation were persist we did the same process in the simulation and received the the percent difference of 2%. Overall our hypothesis was correct and resistance effects the current in a parallel circuit by the increase of current at the application of more resistors.

*and make sure it’s plugged in