Physics 3204

Core Lab -Current Electricity

Student Name: _____

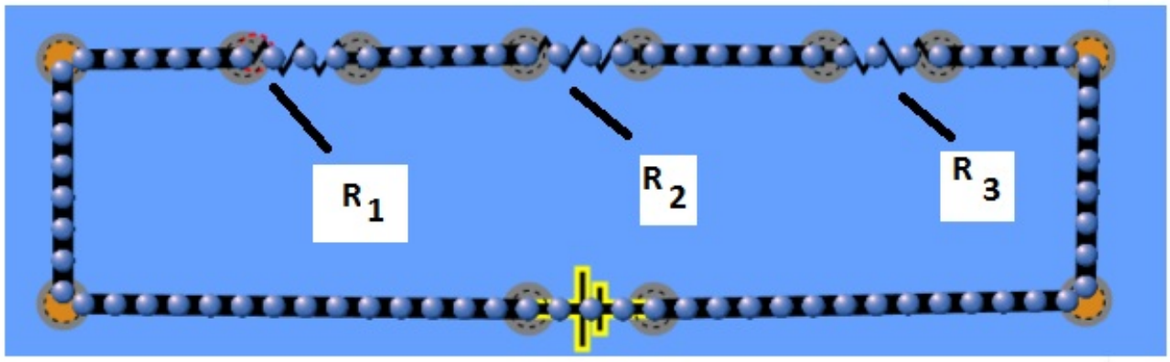
Date: :_____

Purpose: For this lab activity you will use an online circuit simulator to practice building series and parallel circuits and investigate the similarities and differences between them.

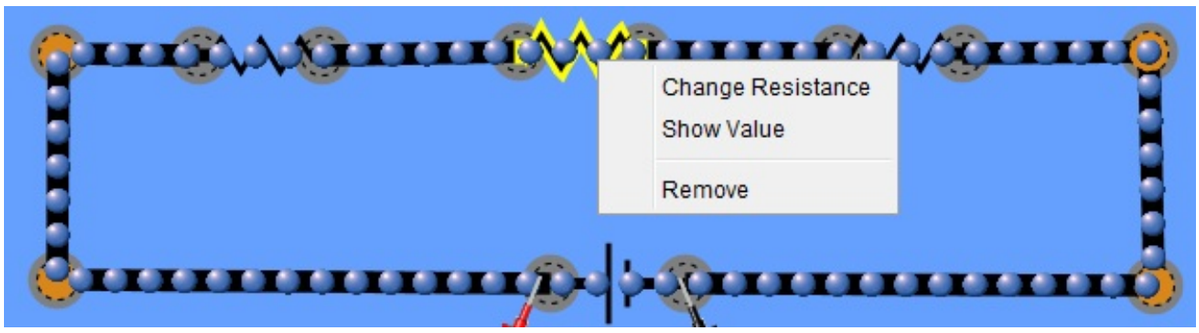
PART 1: STUDY OSERIES CIRCUIT

Step #1 : Change the display to schematic by clicking it the "**Visual Tab**"

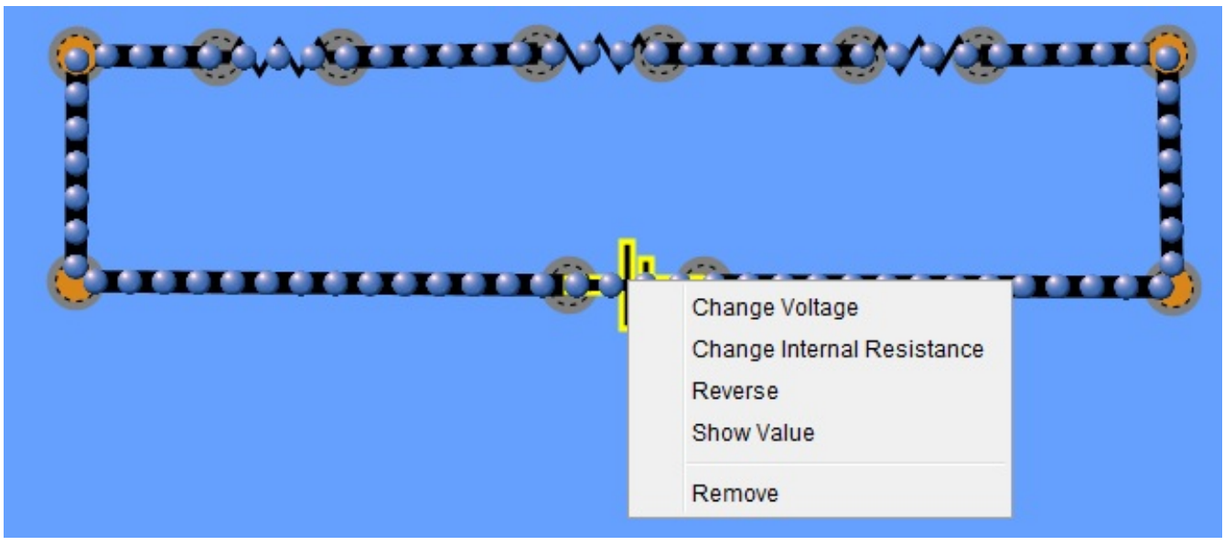
Step #2: Build the following series circuit



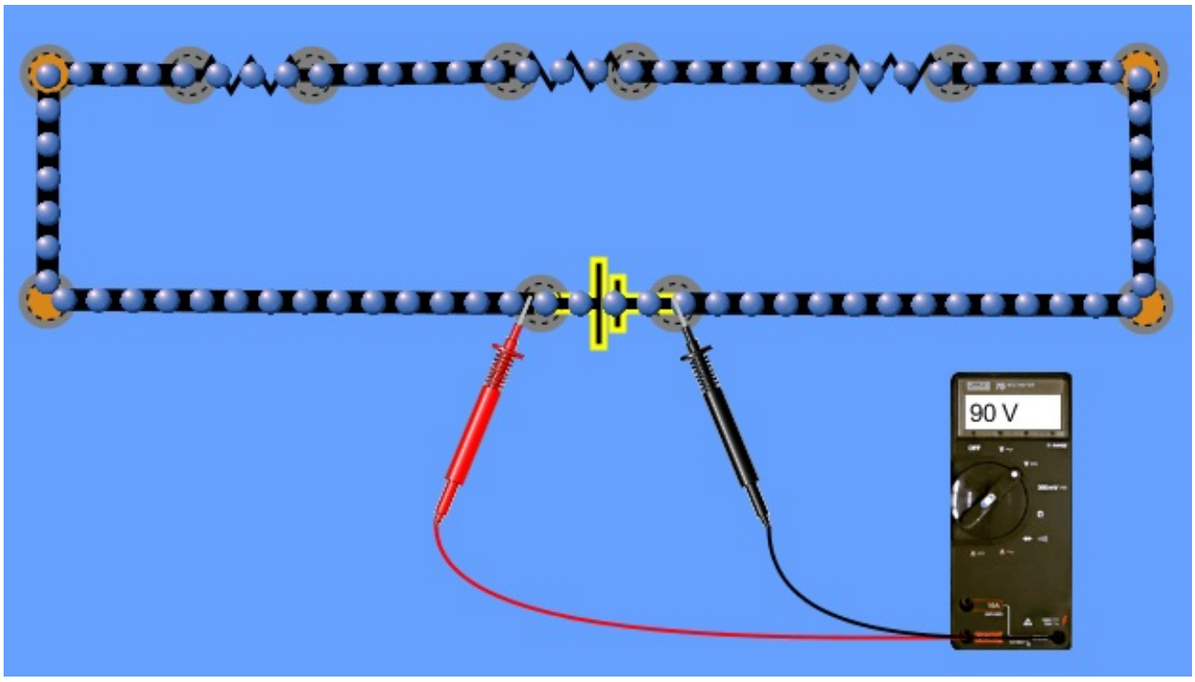
Step #3: Right click each resistor and "change resistance" to 100 Ω



Step #4: Right click the battery and "Change Voltage " to 90 V

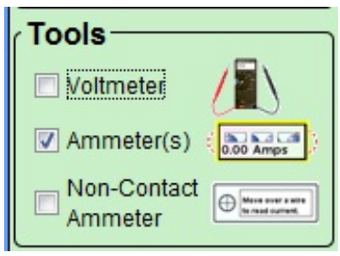


Step # 5: Under tools click "Voltmeter". Use the voltmeter as shown below to find the voltage of the battery, R_1, R_2 and R_3. Record your information in the table below

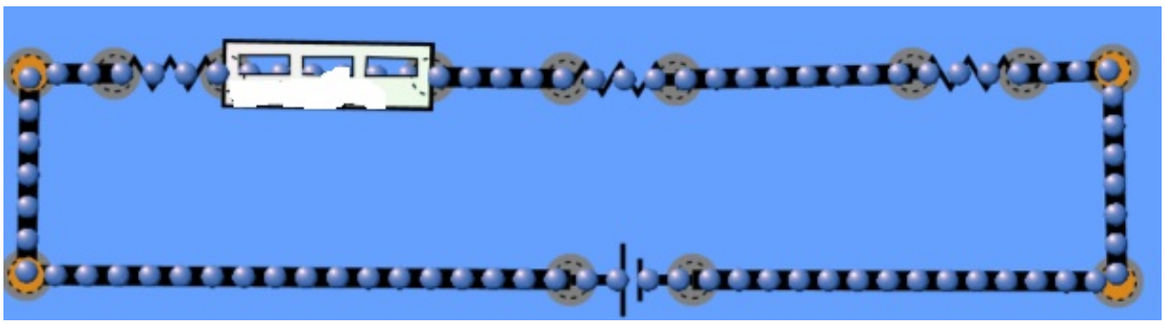


V_T	V_1	V_2	V_3

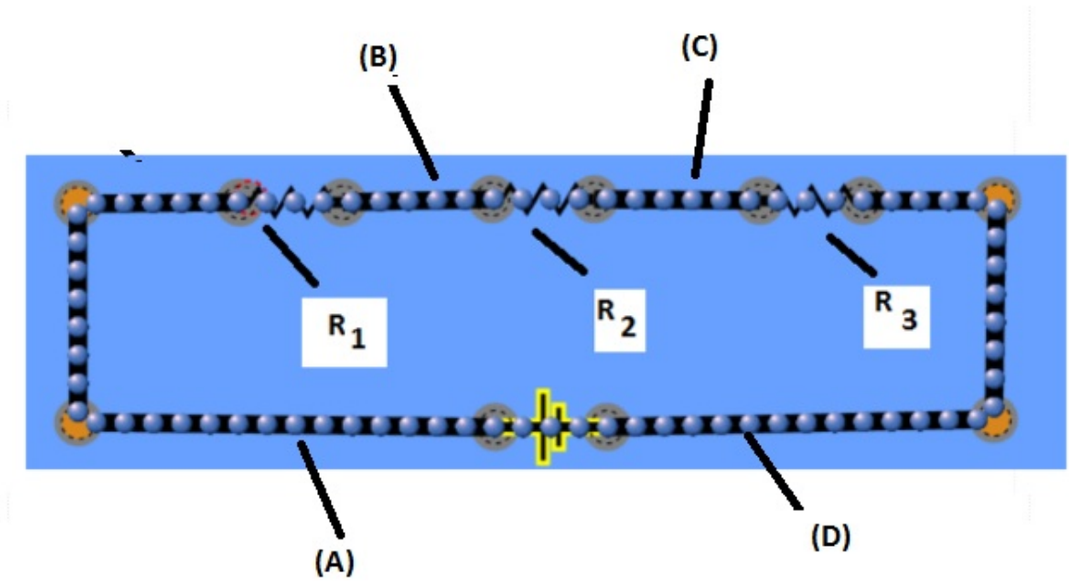
Step #6 Click the ammeter to measure the current.



Step #7: The ammeter must be put in series to measure current as shown below



Step #8: Use the ammeter to measure the current in 4 different places around the circuit as show in the picture below.



(A) After the battery
(B) Between R_1 and R_2
(C) Between R_2 and R_3
(D) Between R_3 and battery

Record your data in the table below:

Location of Measurement	Current (A)
After the battery	
Between R_1 and R_2	
Between R_2 and R_3	
Between R_3 and battery	

Question on series circuit:

1. What is the total resistance in the circuit?

2. How would you describe voltage in the series?

3. How would you describe the current in a series circuit?

4. How much power is used in this circuit.

5. This circuit is used for 3 hour daily. How much would it cost to run this circuit for a year if the rate is \$0.12/kw • hr

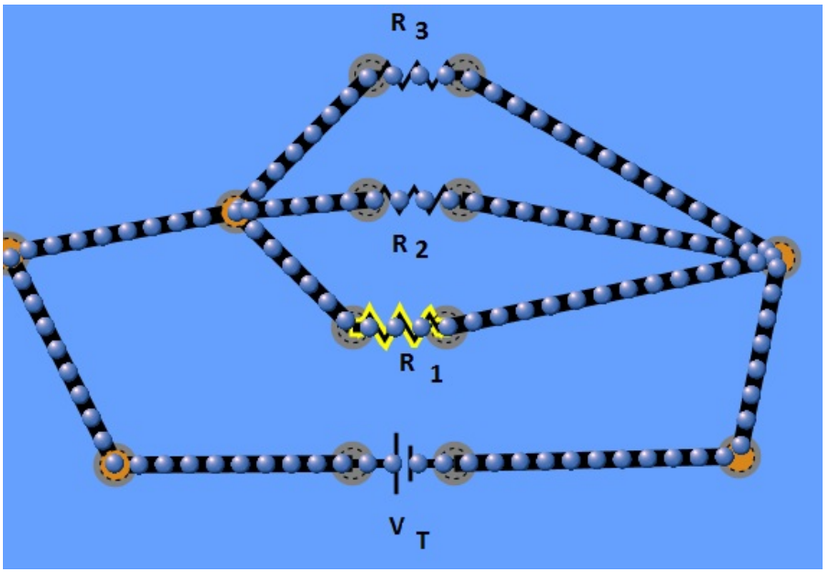
6. What is one advantage of a series circuit

7. What is one disadvantage of a series circuit?

PART 1: STUDY OF A PARALLEL CIRCUIT

Step #1 : Change the display to schematic by clicking it the "**Visual Tab**"

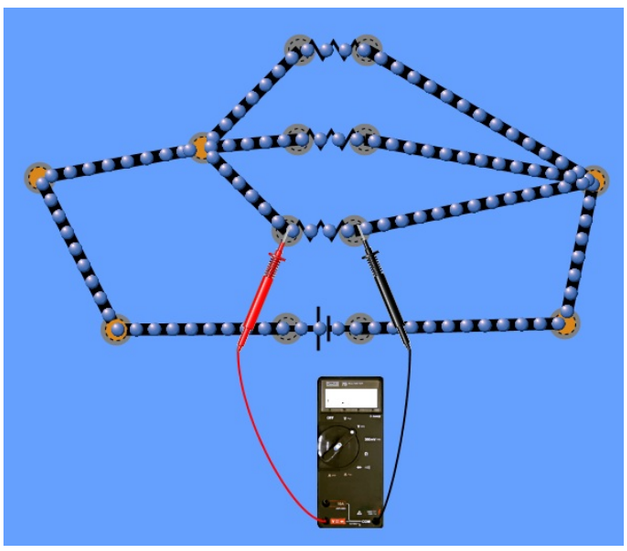
Step #2: Build the following parallel circuit



Step #3: Right click each resistor and "change resistance" to 100 Ω

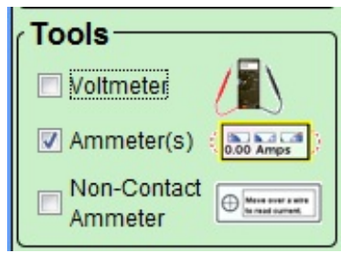
Step #4: Right click the battery and "Change Voltage " to 90 V

Step # 5: Under tools click "Voltmeter". Use the voltmeter as shown below to find the voltage of the battery, R_1, R_2 and R_3. Record your information in the table below

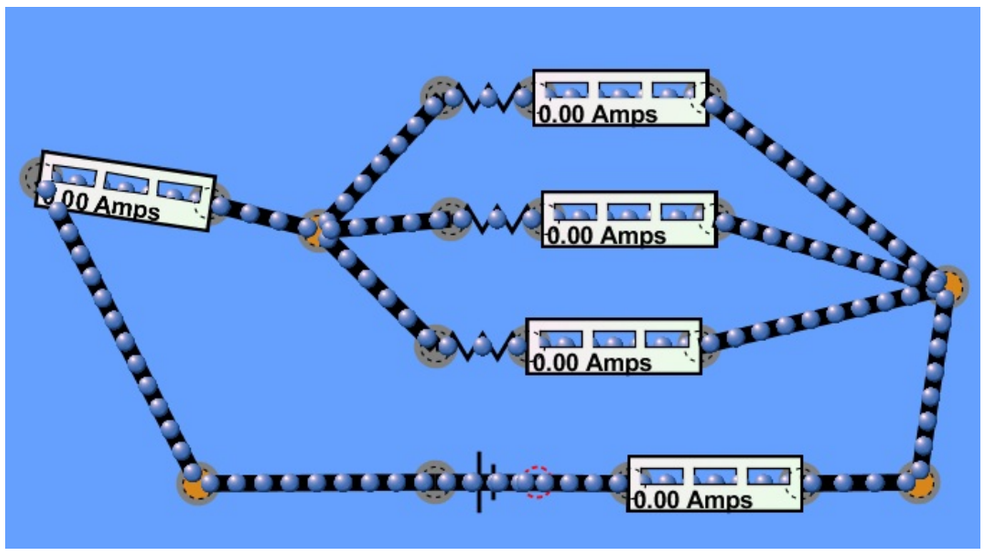


V_T	V_1	V_2	V_3

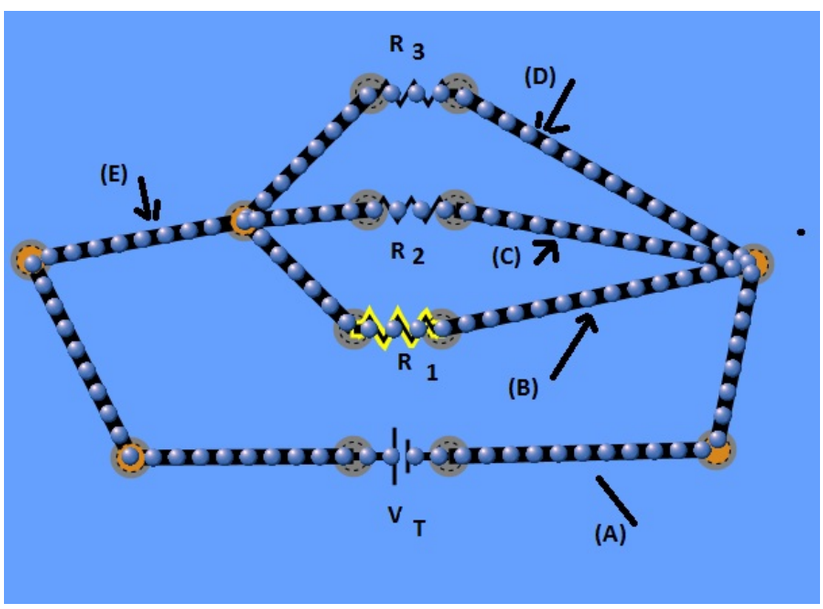
Step #6 Click the ammeter to measure the current.



Step #7: The ammeter must be put in series to measure current as shown below



Step #8: Use the ammeter to measure the current in 5 different places around the circuit as show in the picture below.



Use the ammeter to measure the following:

(A) After the battery
(B) Branch with R_1
(C) Branch with R_2
(D) Branch with R_3
(E) After the junction point left of the resistors in parallel

Record your data in the table below:

Location of Measurement	Current (A)
After the battery	
Branch with R_1	
Branch with R_2	
Branch with R_3	
After the junction point left of the resistors in parallel	

Questions on parallel circuit:

1. What is the total resistance in the circuit?

2. How would you describe voltage in the parallel circuit ?

3. How would you describe the current in a paralell circuit?

4. How much power is used in this circuit.

5. This circuit is used for 3 hour daily. How much would it cost to run this circuit for a year if the rate is \$0.12/kw • hr

6. What is one advantage of a parallel circuit

7. What is one disadvantage of a paralell circuit?