



Table 1. Resistor data table.

Resistor	Color Code	Measured Resistance ( $\Omega$ )	Color Coded Resistance ( $\Omega$ )
$R_1$			
$R_2$			
$R_3$			

### Part A: An LED in a Series Circuit

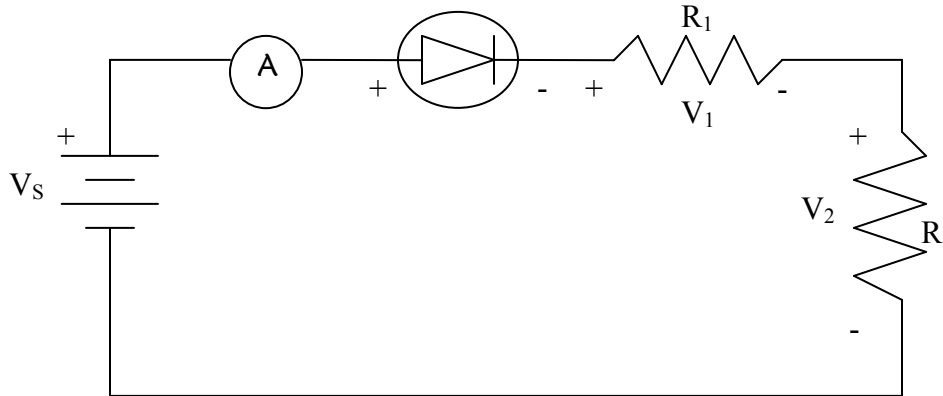


Figure 2. Series schematic circuit.

3. Create a series circuit with resistor one ( $R_1$ ) in the breadboard provided.
4. Add an ammeter between the battery and LED to record the current.
5. Attach the breadboard circuit to a 3V potential difference.
6. Does the LED light up? If it does not, change the polarity of the LED.
7. Measure the voltage across the resistor with the voltmeter or multimeter. Record the values in Table 2.
8. Measure and record the voltage across the LED.
9. Record the ammeter current (total current).
10. Disconnect the power supply.
11. Add another resistor ( $R_2$ ) in series and repeat steps 4 through 10, but place the values in Table 3.
12. Add another resistor ( $R_3$ ) in series and repeat steps 4 through 10, but place the values in Table 4.

Table 2. Data for the first series circuit.

Resistor	Resistor Value ( $\Omega$ )	Resistor Voltage (V)	Current (A)
R <sub>1</sub>			
LED			

Table 3. Data for the second series circuit.

Resistor	Resistor Value ( $\Omega$ )	Resistor Voltage (V)	Current (A)
R <sub>1</sub>			
R <sub>2</sub>			
LED			

Table 4. Data for the third series circuit.

Resistor	Resistor Value ( $\Omega$ )	Resistor Voltage (V)	Current (A)
R <sub>1</sub>			
R <sub>2</sub>			
R <sub>3</sub>			
LED			

### Part B: An LED in a Parallel Circuit

13. Create a parallel circuit with R<sub>1</sub> and R<sub>2</sub> on the breadboard.
14. Add an ammeter and LED in series with the battery. Look at Figure 3 for help.
15. Connect the breadboard circuit to a 3V power supply or battery.
16. Does the LED light up? If it does not, change the polarity of the LED.
17. Measure the voltage across the resistors with the voltmeter or multimeter. Record the values in Table 5.
18. Measure and record the voltage across the LED.
19. Record the ammeter current (total current).
20. Disconnect the power supply.
21. Add another resistor (R<sub>3</sub>) in parallel and repeat steps 17 through 20, but place the values in Table 6.

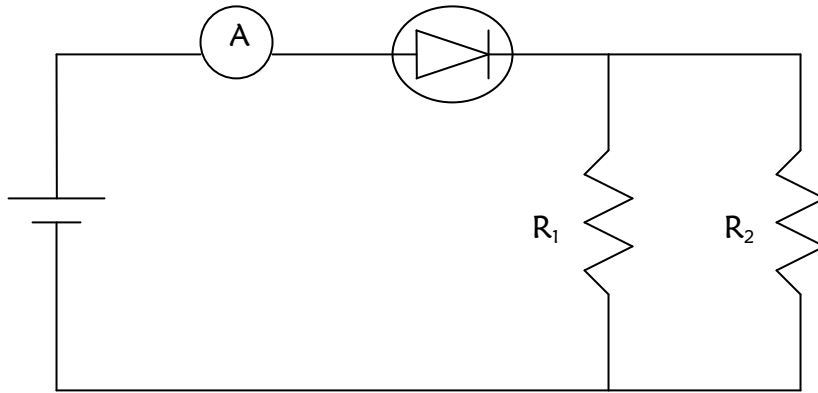


Figure 3. Setup for the first parallel circuit.

Table 5. Data for the first parallel circuit.

Resistor	Resistor Value ( $\Omega$ )	Resistor Voltage (V)	Current (A)
R <sub>1</sub>			
R <sub>2</sub>			
LED			

Table 6. Data for the second parallel circuit.

Resistor	Resistor Value ( $\Omega$ )	Resistor Voltage (V)	Current (A)
R <sub>1</sub>			
R <sub>2</sub>			
R <sub>3</sub>			
LED			

### Part C: An LED in a Combination Circuit

22. Create a combination circuit with R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> on the breadboard.
23. Add an ammeter, LED, and R<sub>1</sub> in series with the battery. Look at Figure 4 for help.
24. Connect the breadboard circuit to a 3V power supply or battery.
25. Does the LED light up? If it does not, change the polarity of the LED.
26. Measure the voltage across the resistors with the voltmeter or multimeter. Record the values in Table 7.
27. Measure and record the voltage across the LED.
28. Record the ammeter current (total current).
29. Disconnect the power supply.

