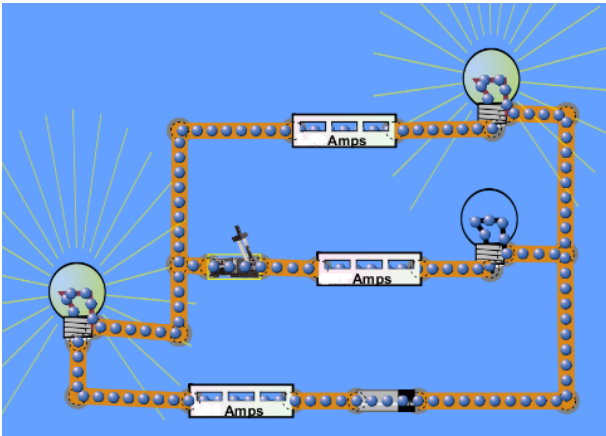


# Power in a Circuit



Build the Circuit shown to the left in the pHET Circuit Construction Kit.

- The resistance of the bulb is 10 ohms.
- The voltage of the **Battery** is set at **20 Volts**.
- Start with the switch in the off position.
- Follow the Instructions below.
- Start with switch open and don't close it until the next portion of this LAB.

Draw the Schematic Circuit Below  
Label the first bulb in the Circuit  $R_1$ , the top bulb  $R_2$ , and the bulb controlled by the switch  $R_3$ .

Draw the Simplified Equivalent Circuit below.  
This should have a single battery and resistor.

Complete the following table.

	R	V	I	Power
1	10			
2	10			
3	10	0		
Total				

Predict what will happen to the following **if** the switch is closed:

Power of  $R_1$  will (*increase, decrease or stay the same*)  
Current through  $R_1$  will (*increase, decrease or stay the same*)  
Brightness of  $R_1$  will (*increase, decrease or stay the same*)

Power of  $R_2$  will ( *increase, decrease or stay the same*)  
Current through  $R_2$  will (*increase, decrease or stay the same*)  
Brightness of  $R_1$  will ( *increase, decrease or stay the same*)

Total Power will (*increase, decrease or stay the same*)  
Total Current will (*increase, decrease or stay the same*)

What is happens to the Total Resistance of the Circuit when the switch is closed? (*increase, decrease or stay the same*)

Go to the back and make the calculations before you close the switch

<p><b>Draw the Schematic of the Circuit when the Switch is closed Below</b></p>	<p>Draw the Simplified Equivalent Circuit below. This should have a single battery and resistor.</p>
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**Calculate** the values for the following table.

	<b>R</b>	<b>V</b>	<b>I</b>	<b>Power</b>
1	10			
2	10			
3	10			
Total				

**Now close the switch** and check the Voltages with the voltmeter.

What happened to the power of  $R_1$ ? (increased, decreased, stayed the same)

What happened to the brightness of  $R_1$ ? (increased, decreased, stayed the same)

What happened to the power of  $R_2$ ? (increased, decreased, stayed the same)

What happened to the brightness of  $R_2$ ? (increased, decreased, stayed the same)

What happened to the total power of the Circuit? (increased, decreased, stayed the same)

In which circuit will the battery last longer? The First Circuit or the Second Circuit.