We have learned enough to this point to introduce a **battery** to act as a source of voltage, also known as potential. That is, it gives us the ‘potential’ to do some (electrical) work!

If at any time one of your components gets hot, immediately disconnect your battery. Consider the probable cause and then undertake the corrective action.

Note. The battery should be disconnected while you are assembling a circuit.

1. Wire up up your breadboard in the following standard arrangement.



2. The purpose of this worksheet is to understand how the **voltage drops** throughout a working circuit. The image below is intended to present four different circuits labeled 1 through 4. Using a **DMM**, determine the amount of voltage between the **red** and **black** locations within each circuit.



3. a) The previous image appears to suggest that the entire voltage (potential) of the battery is to be consumed by a single 1000Ω (1k Ω) resistor. Wire up the circuit as shown below, **before** attaching your 9V battery.

 b) Set the dial of your DMM to **Voltage** as shown to the right, making sure the **FUNC** button is pressed so that **DC** appears in the LCD screen.

 c) Place the **red** probe of your DMM on the first leg of the resistor and the **black** (ground) probe on the second leg of the resistor. You have just determined how much voltage remains to be consumed by this **single** resistor. *What does your DMM read?* V?



4. So, it could be said that the **single** resistor in Circuit 1 is responsible for consuming the **entire** voltage of our battery (*as it’s the only resistor in the circuit*).

The remaining three circuits each have **two** resistors in **series**. We’re interested in how much **voltage remains** to be consumed by the **second** resistor. Saying this another way, we’re interested in how the two series resistors **divide** the 9V of our battery source. Prototype each of the three remaining circuits, obtain the DMM voltage measurements between the **red** and **black** test points and fill in **all** of the blank cells in the table below. *Be sure to unplug your battery and remove each circuit completely as you go so it does not interfere with your measurements.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Circuit** | **R1 (Ω)** | **R2 (Ω)** | **Voltage Remaining (V)** |
| **2** | **1K** |  |  |
| **3** | **470** |  |  |
| **4** |  |  |  |