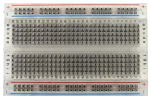
Lab02: Circuits

1 Materials for Each Group:


Battery pack

AA batteries (x2)


Breadboard

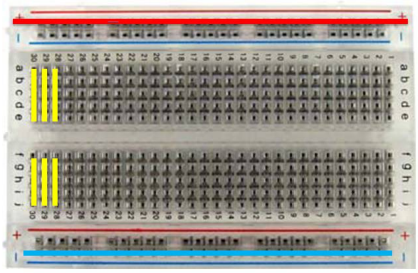

Resistors


Red LED

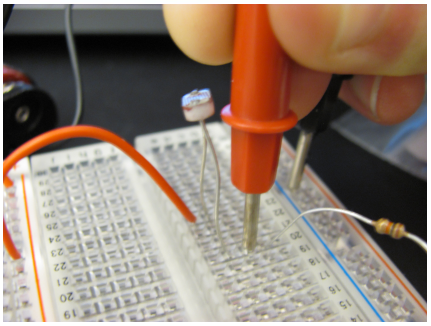

Light Sensor


Multimeter

2 Solderless Breadboards

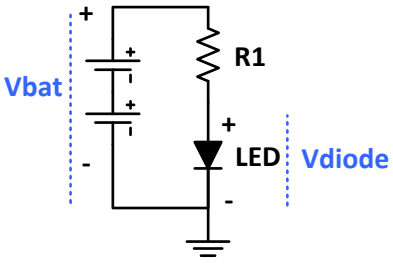


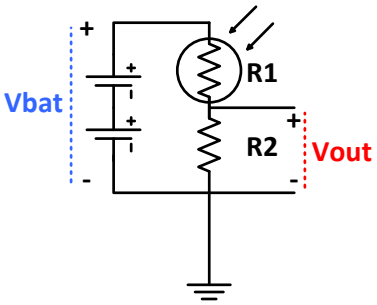
Solderless breadboards let you build circuits quickly. All the connections on the blue and red rows are connected across the breadboard with horizontal strips. All points on the yellow vertical lines are connected with vertical strips. Note there is a gap in the middle, the vertical strips don't go all the way across. You build a circuit connecting strips with wire.



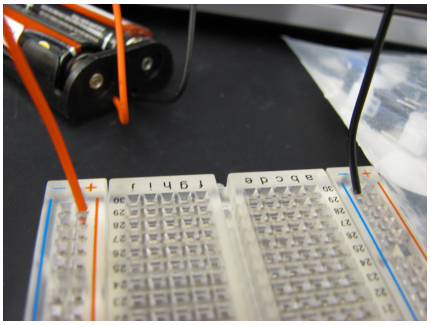
Multimeters measure the voltage, current, or resistance between two points. For this test we will use the 20v DC setting to measure voltage across batteries, resistors, and sensors.

3 Today's Circuits

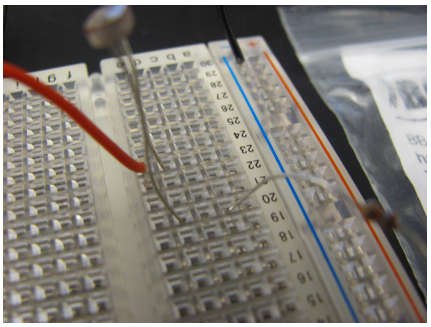




We will be building two circuits today. The first is a LED current limiter. The second is a voltage divider circuit, using a light-sensitive photoresistor.



We need to connect the battery for both circuits. Plug the red lead into the top red row of the breadboard. This row is v_{bat}. Connect the black lead to the bottom black row.



To build either circuit, connect one lead of the resistor $R1$ (either normal or photo sensitive) to v_{bat}, and connect the other lead to any unused vertical strip. The direction of $R1$ doesn't matter.

For the LED circuit, connect one lead of the LED to this same vertical strip, and the other lead to ground. Direction is important, the shorter LED lead goes to ground. For the photoresistor circuit, connect $R2$ between this strip and ground. This completes the circuit. Measure v_{out} across $R2$ and ground.

4 Resistor Color Code