

Applying Electronics - Lab 2 : Photocell

Lab 2: Create a new circuit in Tinkercad. We will still be using 5 volts so make sure you use the LM7805 chip in your circuit along with the 9 volt battery.



This is a pictorial of the LDR component (also called a photocell). It is a variable resistor.

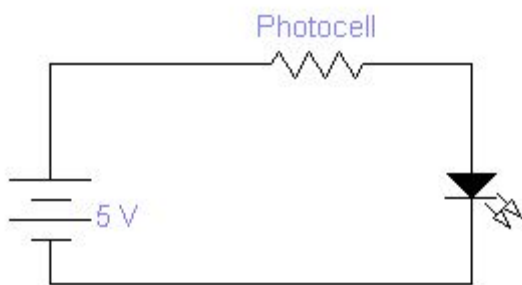
Photocells are sensors that allow you to detect light. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they often appear in toys, gadgets and appliances. They are often referred to as CdS cells (they are made of Cadmium-Sulfide), light-dependent resistors (LDR), and photoresistors.

Inventory

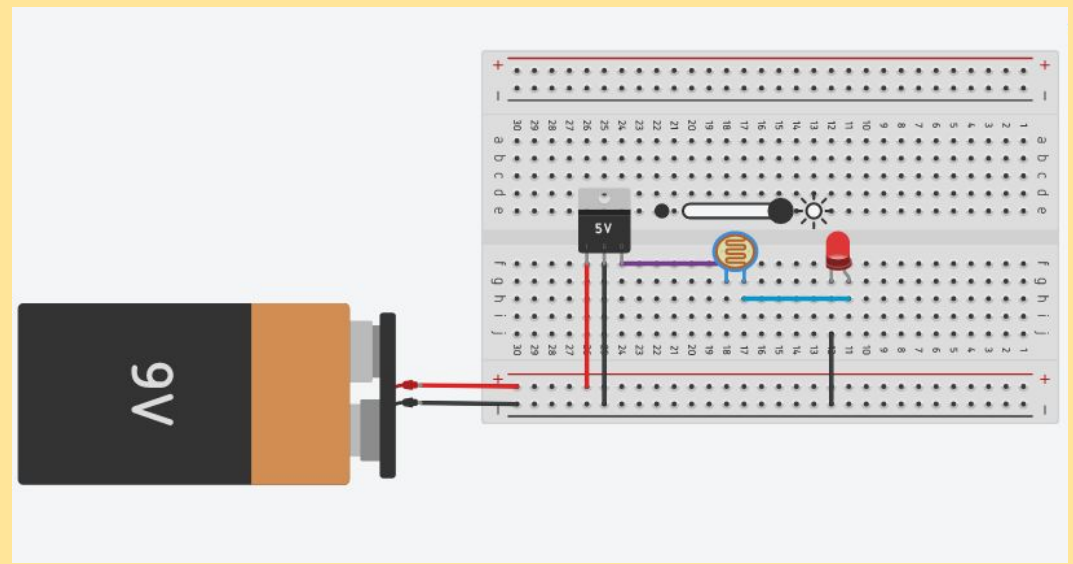
Using the inventory listed below, double check and isolate to make sure you have all the necessary parts before you go any further.

- Photoresistor (must type this in exactly to find it in Tinkercad)
- Red LED
- Battery (use a 9 volt battery with the voltage regulator to get 5 volts)
- Build Circuit (Lab1)

Wire the circuit below in Tinkercad:



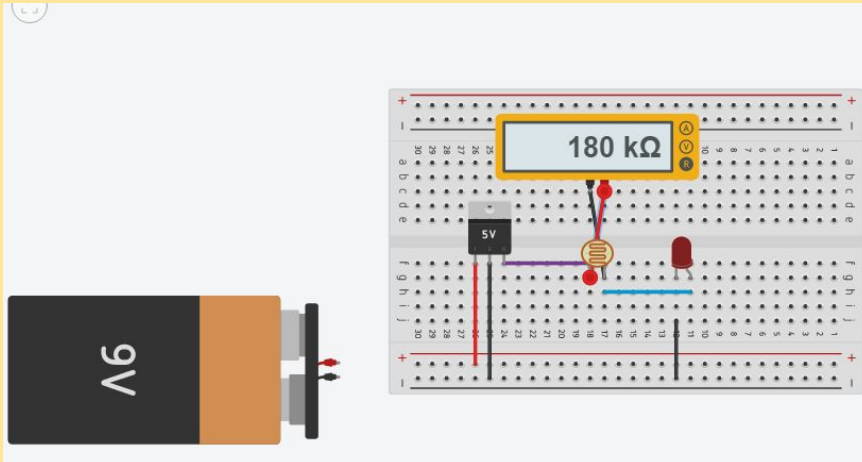
Insert your screenshot of the circuit working in this box. Remember to click on “Start Simulation”. Make sure the LED is ON.



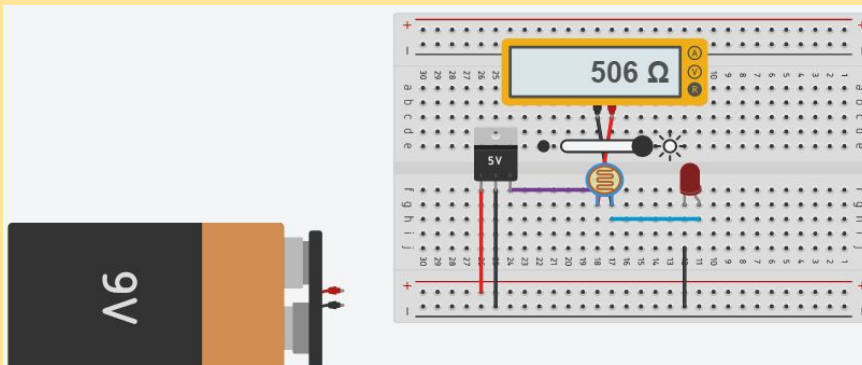
Questions: (Note: To alter the amount of light on the LDR, you must click on it during a live simulation and use the slider to adjust the amount of light on it). This will help you answer the questions below.

1. Using a virtual multimeter, measure the resistance of the LDR when it is DARK and when it is LIGHT. What is the range of values you get in Ohms?

Resistance of LDR when DARK



Resistance of LDR when LIGHT



The range values I get in Ohms are 180kΩ to 506Ω. Although I had to disconnect the battery because otherwise when I connected the LDR while the battery was connected it led to an explosion on the LED light.

2. What is the relationship between light and resistance of an LDR? Be specific.

The relationship between light and resistance of an LDR is as the light gets dimmer the resistance of the LDR increases and as the light gets brighter the resistance of the LDR increases.