A1.2 Learning Activity

Objective

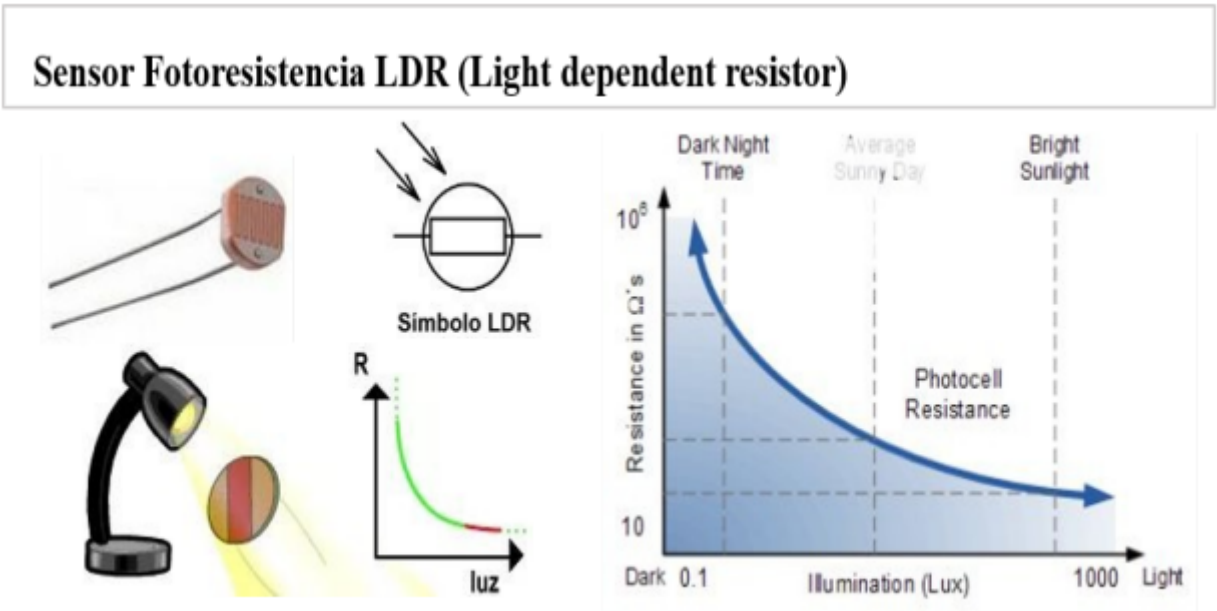
Make a light meter sensor (lux) through an electronic circuit, using a simulator and an LDR (Light dependent Resistor).

Development

1. Use the following list of materials for the elaboration of the activity and add in the source column your bibliographic link.

Quatity	Description	Source
1	LDR Photoresistance Sensor	Data sheet
1	Resistor 1K	Color code
1	Power supply of 5v	Data sheet

2. Considering that the LDR element is a photoresistive sensor that is varies its resistance based on the amount of light that impacts on it, What do you see in the graph below?



The LDR reacts to the light and it reduces its resistences depending in the intensity of the light, meaning that the brighter the light that impacts on it, the less resistences it has.

3. Assemble the circuit shown using the simulator you are considering, placing the photoresistance in the LDR position and resistance according to the schematic image:

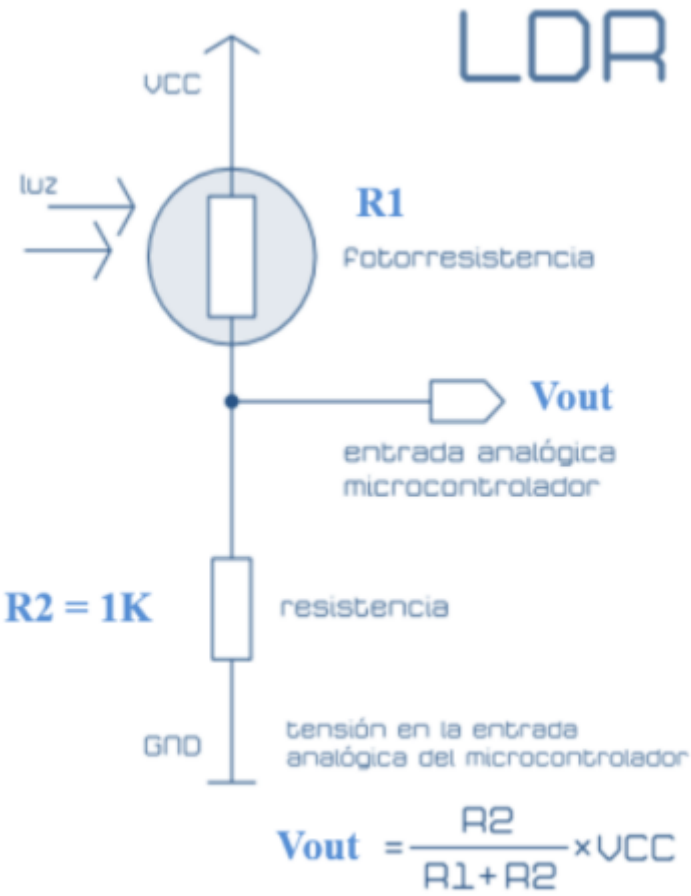
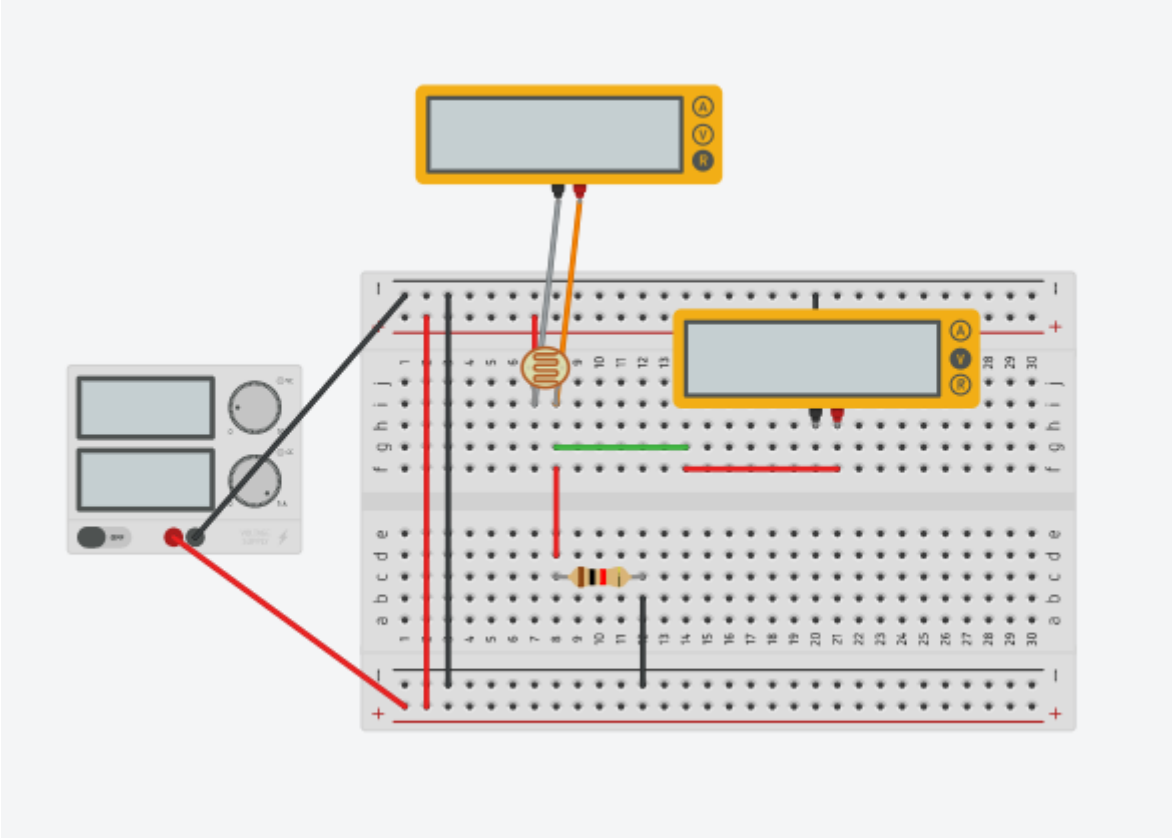


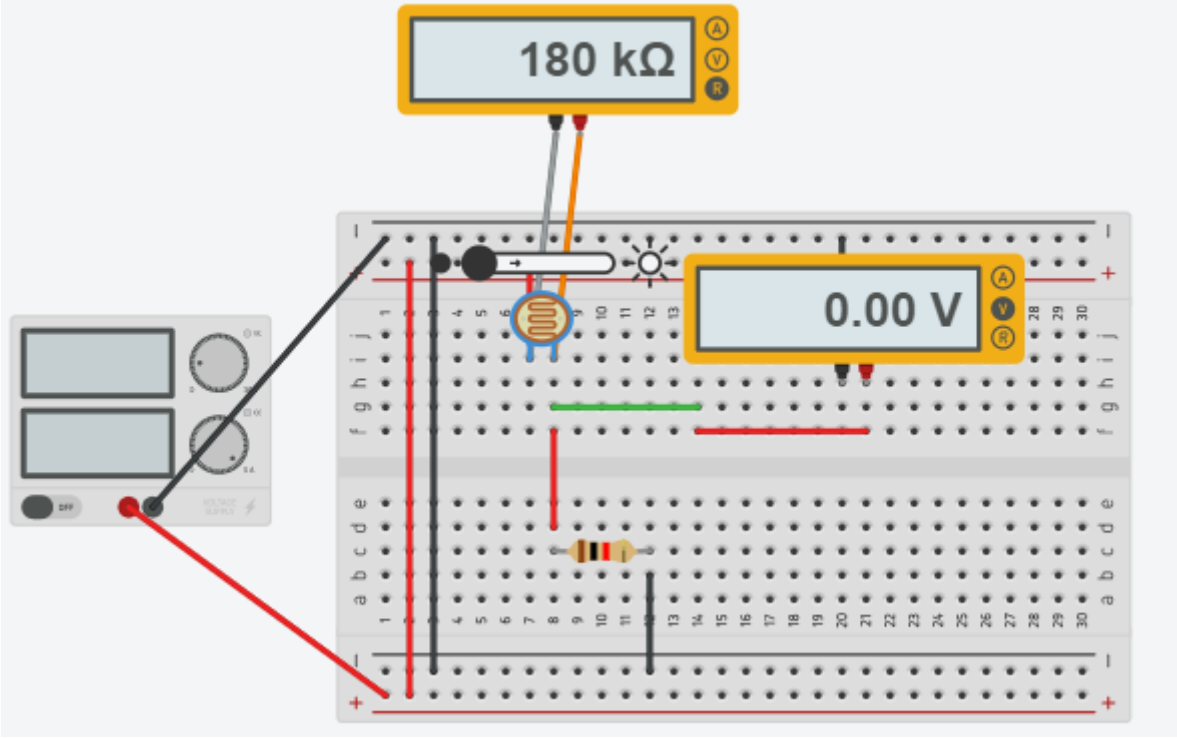
Imagen Esquemático del circuito

4. Place the image finally obtained from the assembled circuit inside your simulator.

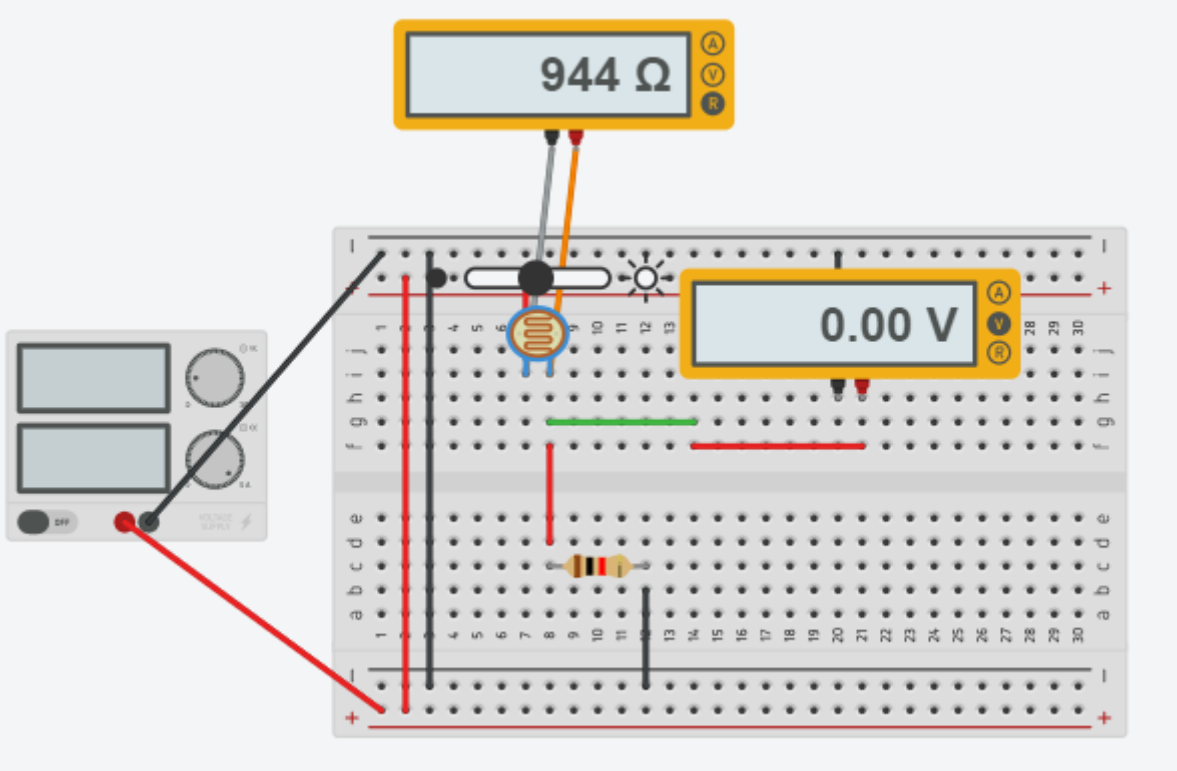


5. Measure the resistance of photoresistance with the ohm under the following conditions: absence of light or darkness, ambient light, intensive light.

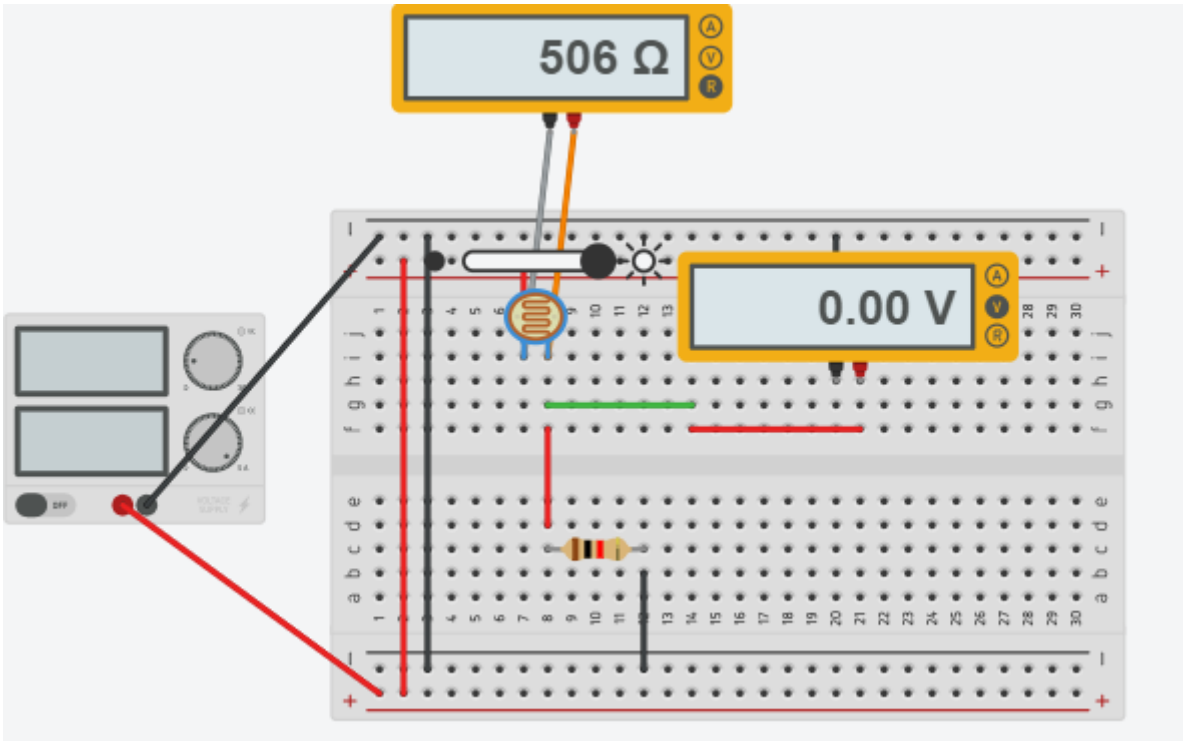
- Absence of light: 180k ohms



- Ambient light: 944 ohms



- Intensive light: 506 ohms



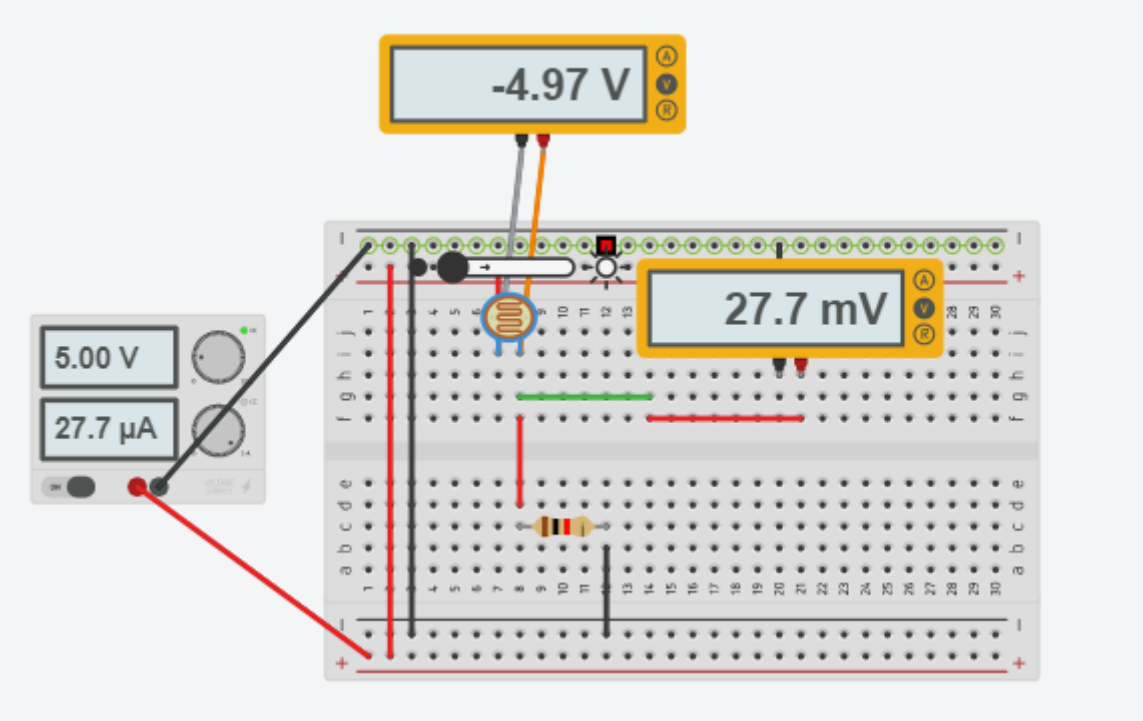
6. Calculate the theoretical voltage value Vout for each of the above conditions.

Conditions	**Calculations**
---	Vout = (R2 * VCC) / (R1 + R2)
Absence of light	Vout = (1000 * 5) / 181k = 5000/181k = 0.027V
Ambient light	Vout = (1000 * 5) / (1944) = 5000/1944 = 2.572V
Intensive light	Vout = (1000 * 5) / (1506) = 5000/1506 = 3.32V

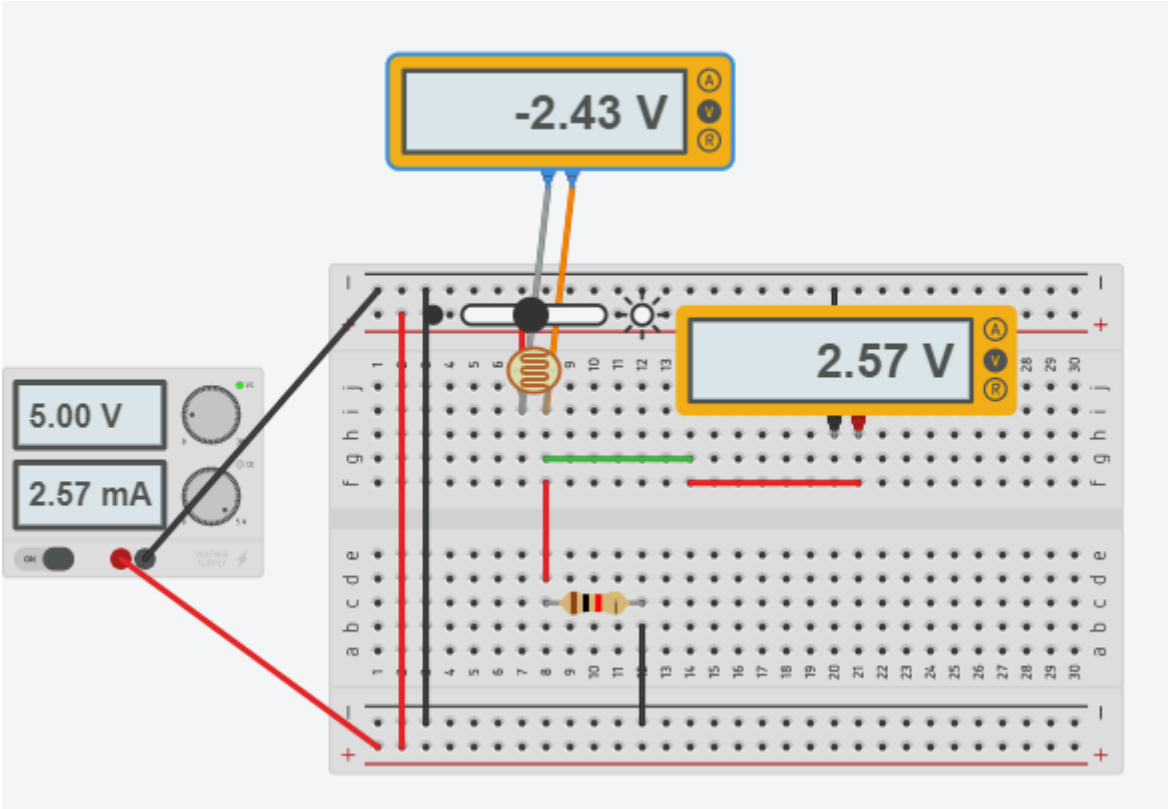
7. measure the voltage value Vout for each of the above conditions.

Simulation Values

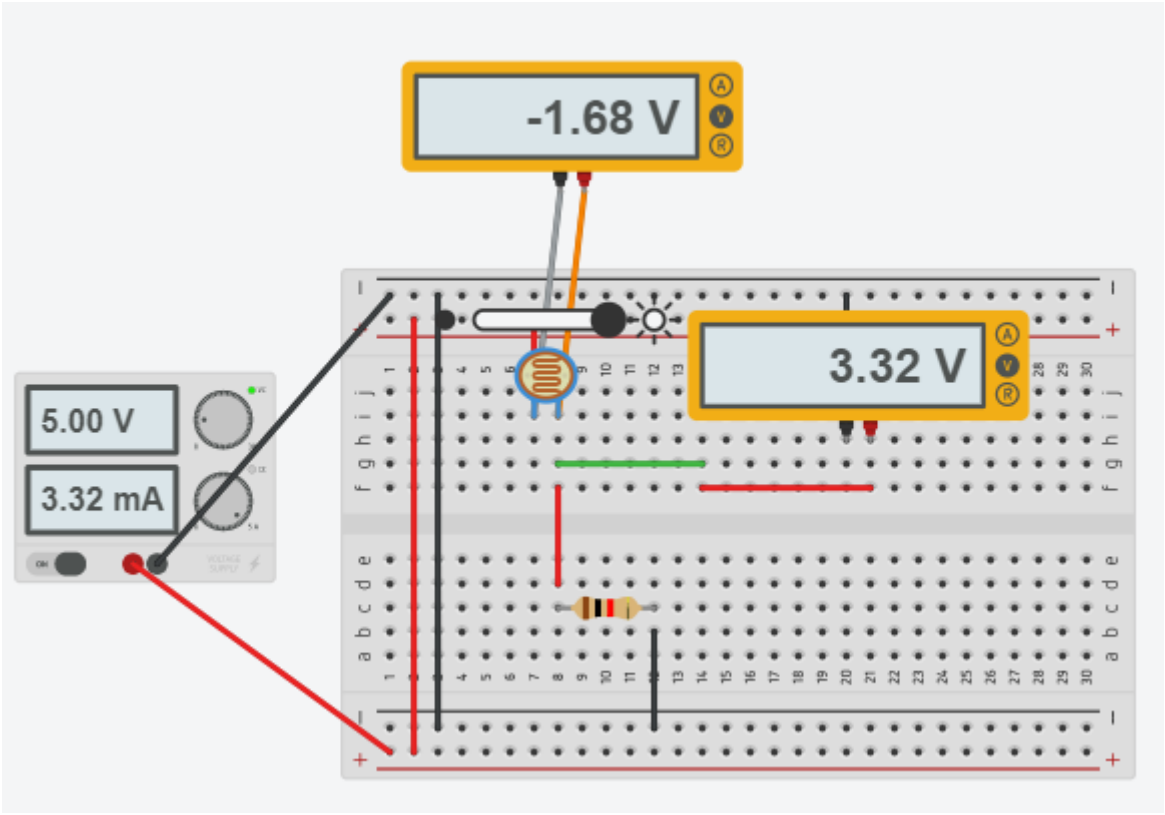
- Absence of light:



- Ambient light:



- Intensive light:



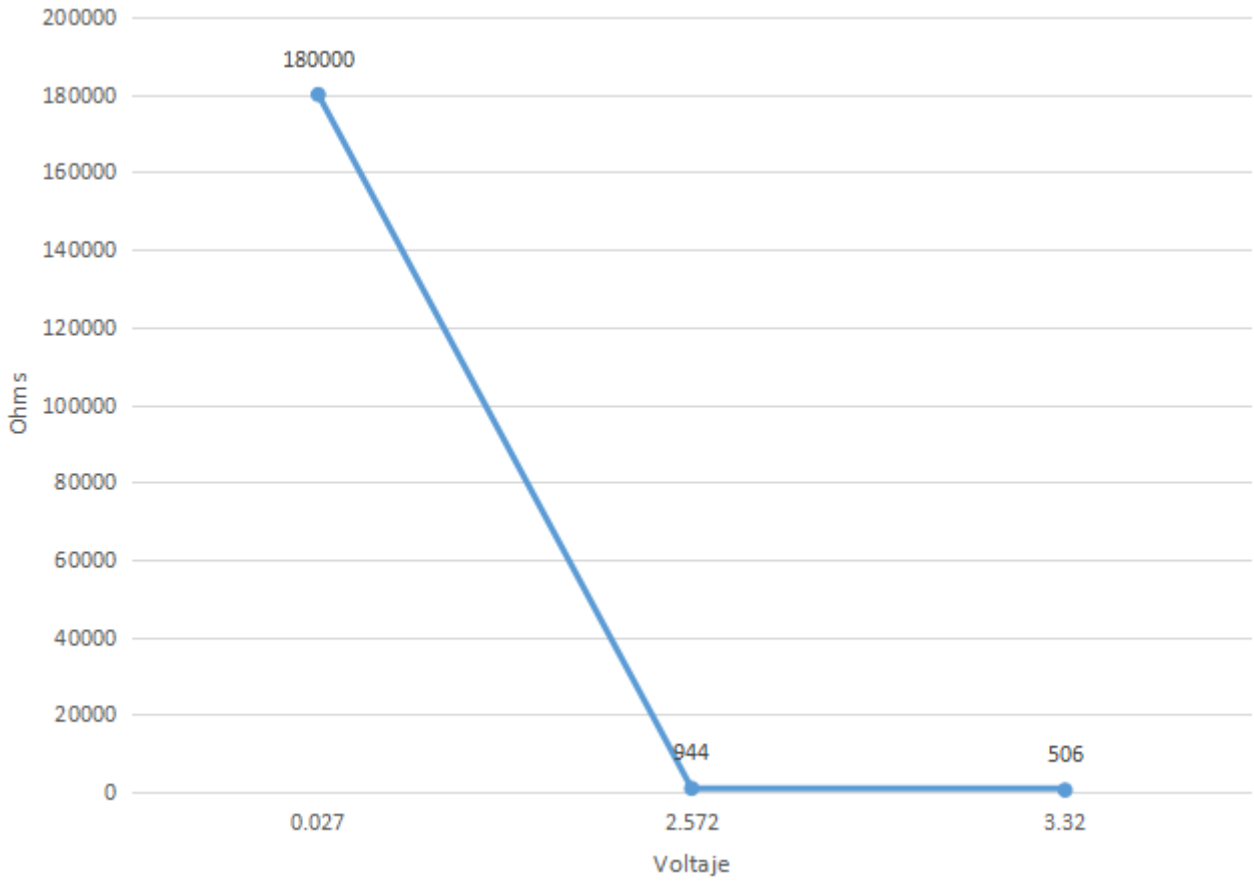
8. Calculate the voltage accuracy value between the theoretical and the measured for each condition, consider inlcuding in this section the theorical calculations

- Absence of light: (0.027/0.0277)*100 = 97%
- Ambient light: (2.57/2.572)*100 = 99%
- Intensive light: (3.32/3.32)*100 = 100%

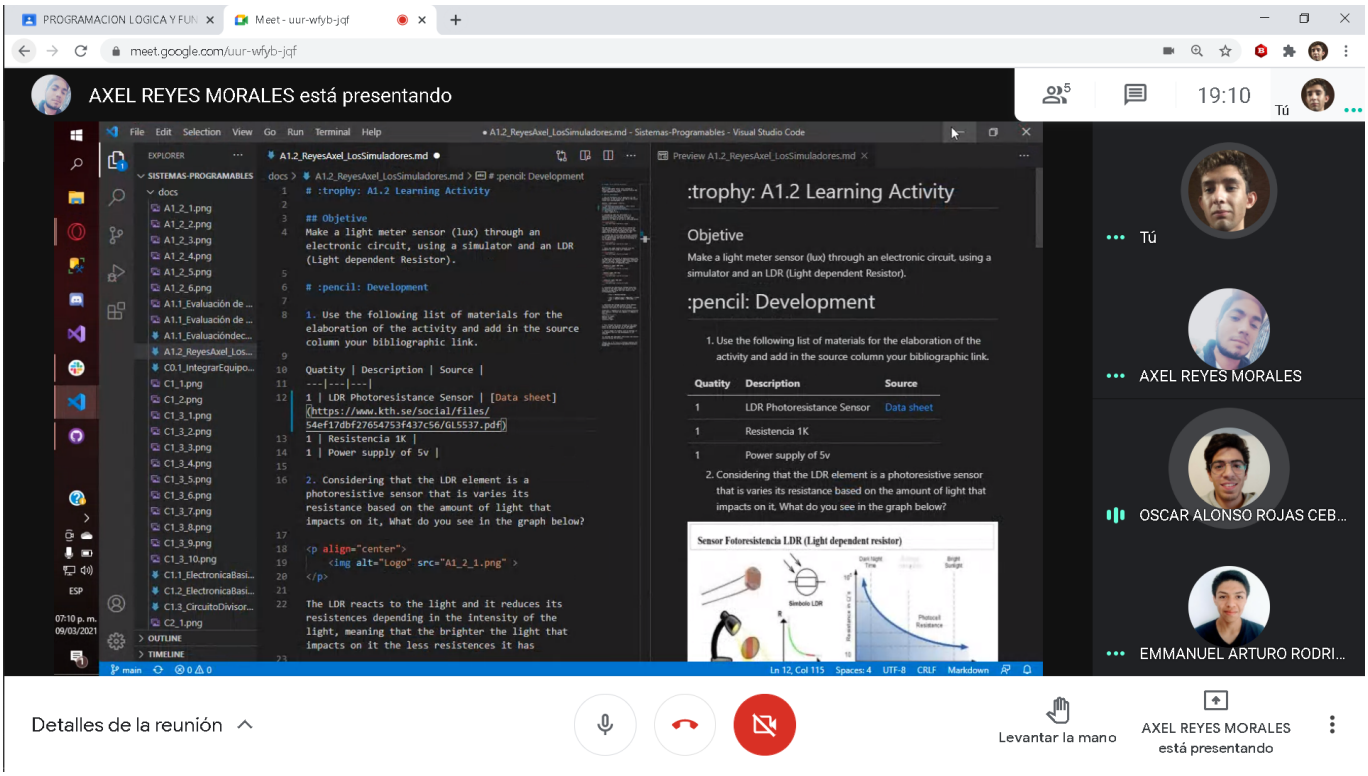
9. Calculate the **voltage accuracy value** between the theoretical and the measured for each condition and record in the corresponding table.

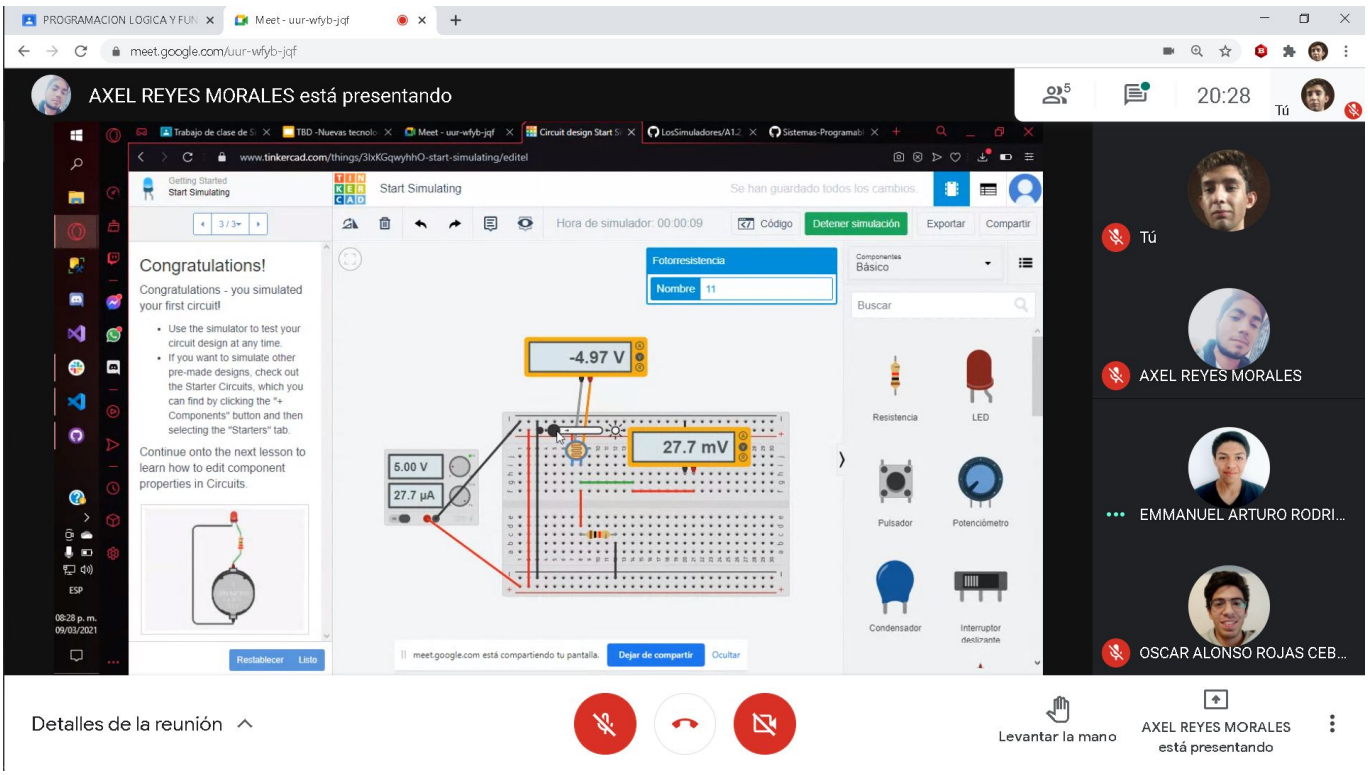
Conditions	**Impedance in photoresistance**	**Theoretical Vout voltage**	**Measured Vout Voltage**	**% V.Measured/ V.Theoric**
Absence of light	180k ohms	0.027 V	0.0277 V	97%
Ambient light	944 ohms	2.572 V	2.57 V	99%
Intensive light	506 ohms	3.32V	3.32 V	100%

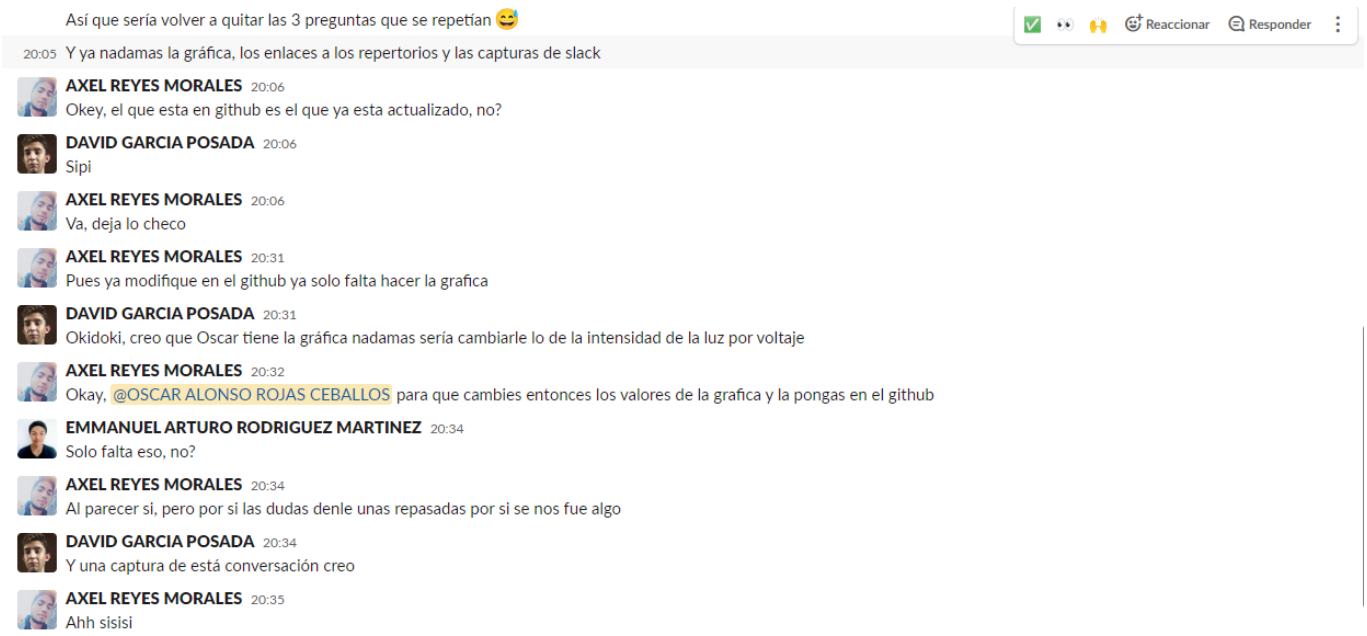
10. Plot through the values recorded in the table above, where the "X" axis is the measured voltage value Vout and the "Y" axis represent the LDR impedance, and insert the graph



11. Insert images of evidence such as meetings of team members held for the development of the activity


AXEL REYES MORALES está presentando
19:10
Tú
:trophy: A1.2 Learning Activity
Objetive
Make a light meter sensor (lux) through an electronic circuit, using a simulator and an LDR (Light dependent Resistor).
:pencil: Development
1. Use the following list of materials for the elaboration of the activity and add in the source column your bibliographic link.
Quatity | Description | Source
1 | LDR Photoresistance Sensor | Data sheet
1 | Resistencia 1K
1 | Power supply of 5v
2. Considering that the LDR element is a photoresistive sensor that is varies its resistance based on the amount of light that impacts on it. What do you see in the graph below?
Sensor Fotoresistencia LDR (Light dependent resistor)
Tú
AXEL REYES MORALES
OSCAR ALONSO ROJAS CEB...
EMMANUEL ARTURO RODRI...
Detalles de la reunión
Levantar la mano
AXEL REYES MORALES está presentando


AXEL REYES MORALES está presentando
20:28
Tú
Congratulations!
Congratulations - you simulated your first circuit!
Use the simulator to test your circuit design at any time.
If you want to simulate other pre-made designs, check out the Starter Circuits, which you can find by clicking the "+ Components" button and then selecting the "Starters" tab.
Continue onto the next lesson to learn how to edit component properties in Circuits.
Start Simulating
Fotorresistencia
-4.97 V
27.7 mV
5.00 V
27.7 µA
Resistencia
LED
Pulsador
Potenciómetro
Condensador
Interruptor deslizante
Tú
AXEL REYES MORALES
EMMANUEL ARTURO RODRI...
OSCAR ALONSO ROJAS CEB...
Detalles de la reunión
Levantar la mano
AXEL REYES MORALES está presentando



12. Include the individual conclusions and results observed during the activity.

David Garcia Posada: The LDR changes its resistance when its subjected to light lowering its impedance depending on the intensity of the light as we can se in the tree previous simulations where the measured resistance lowers with the light

Axel Reyes Morales: In conclusion it can be said that an LDR sensor serves us to be able to measure the intensity of light that there is in a certain place or to give us a resistance value according to the variation of the intensity of the light, since the more light intensity there is the resistive value of the LDR sensor decreases, and the lower the light intensity there will be a higher resistive value, taking this second use as a variable resistance.

Emmanuel Arturo Rodriguez Martinez: In conclusion the LDR is a component which allows to measure the intensity of the light which can be found in different circumstances, also if the impedance increases the value of the voltage decreases.

Oscar Rojas: The LDR component works by increasing or decreasing the amount of resistance based on the intensity of light, in low light environments the resistance is high and on the opposite side the resistance is lower, this let us take advantage of changing the resistance without the interaction of a human.

Repositories

Axel Go to my repository

David Go to my repository

Emmanuel Go to my repository

Oscar Rojas Got to my repository