

A1.2 Learning Activity

Objective

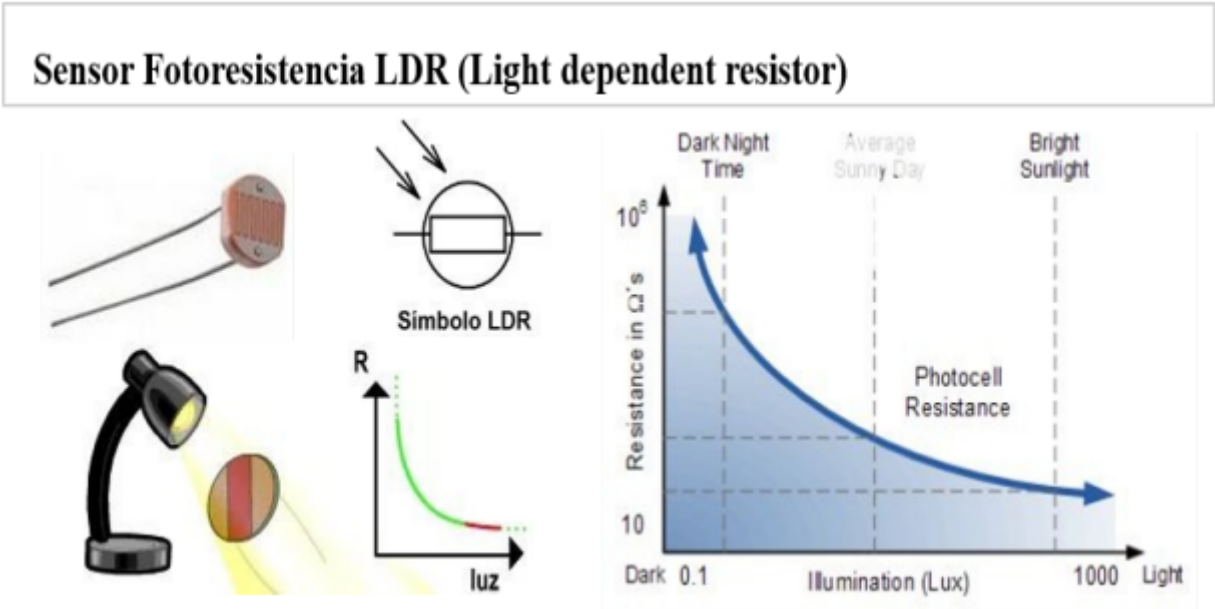
Make a light meter sensor (lux) through an electronic circuit, using a simulator and an LDR (Light dependent Resistor).

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.

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

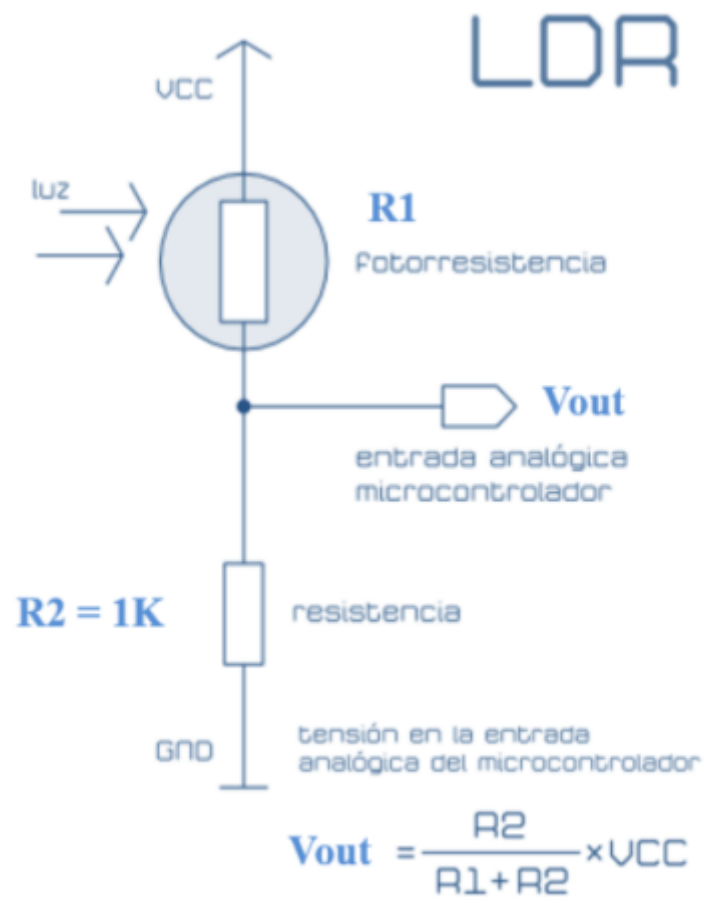
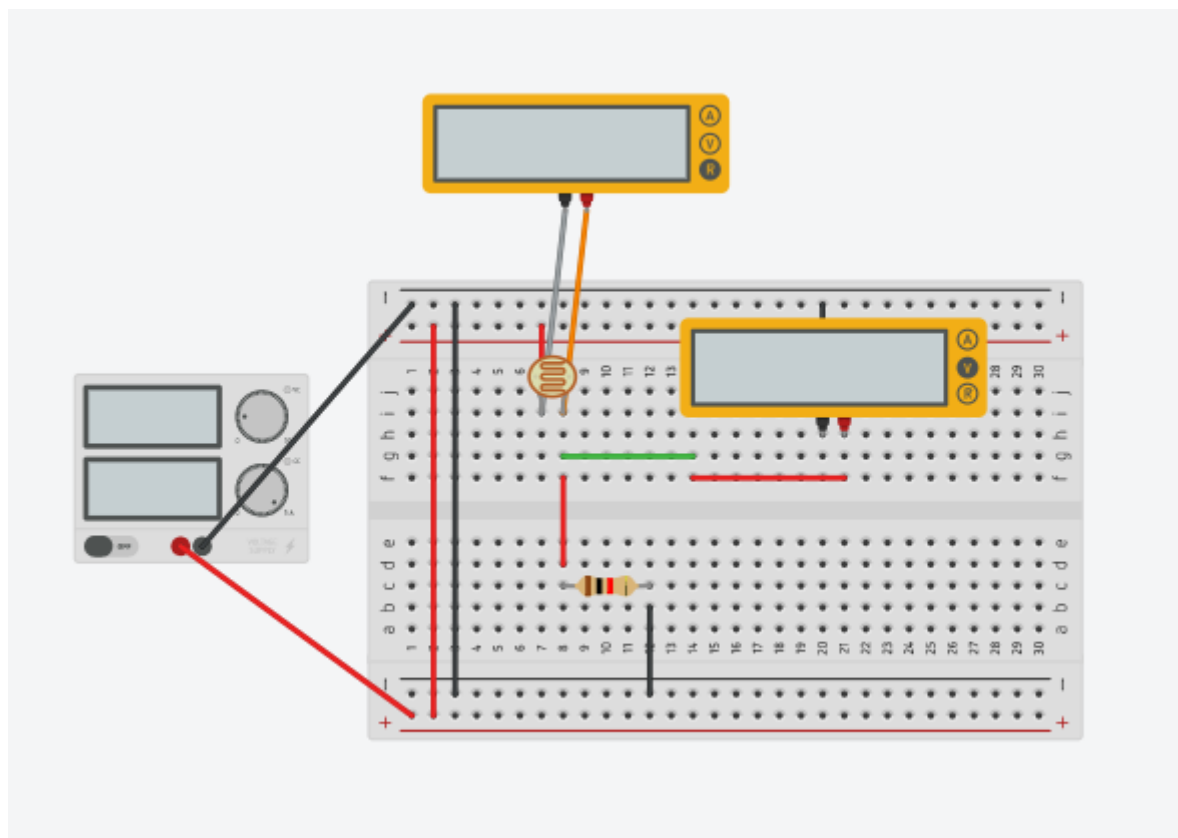


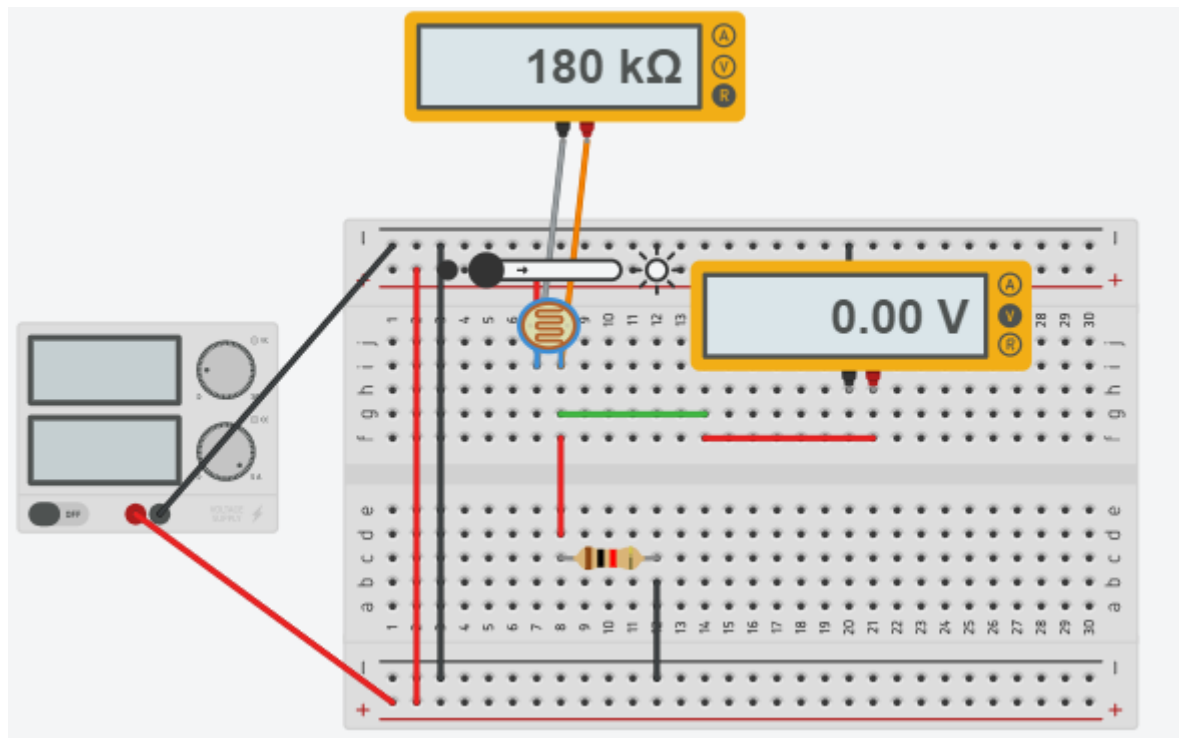
Imagen Esquemático del circuito

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

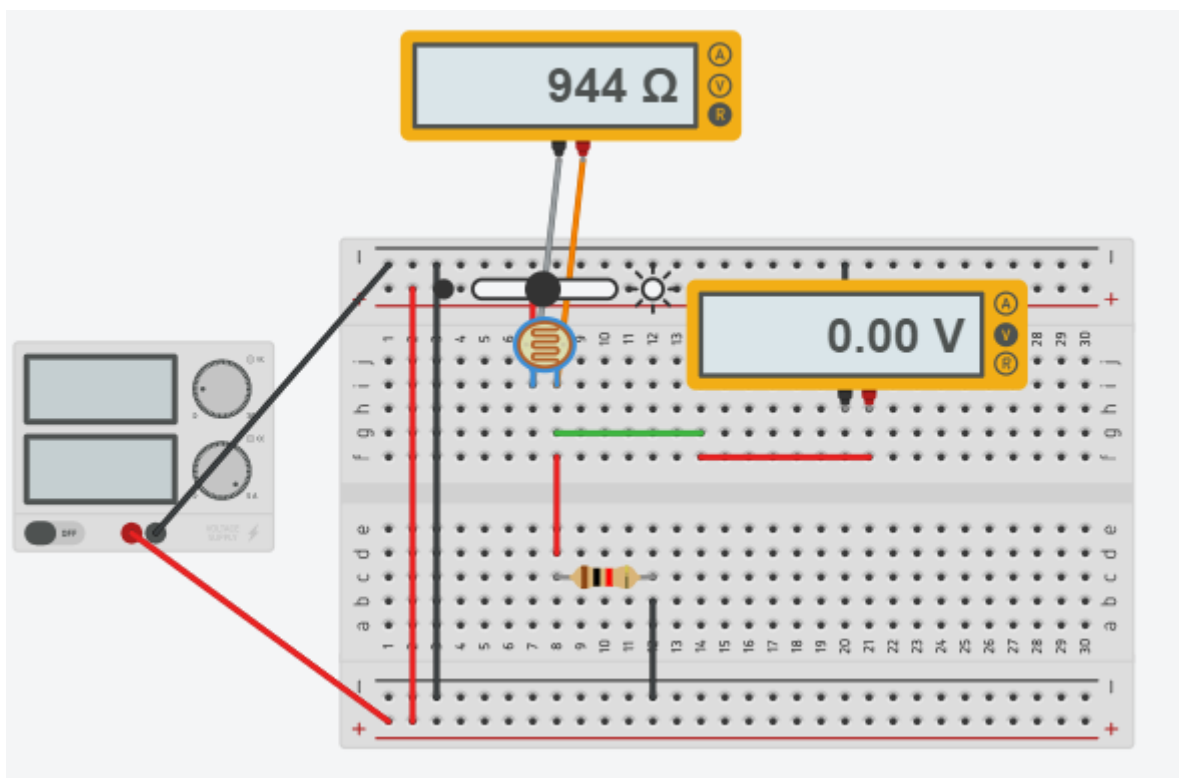


5. Measure the resistance of photoresistance with the ohm under the following conditions: absence of light or darkness, ambient light, intensive light.

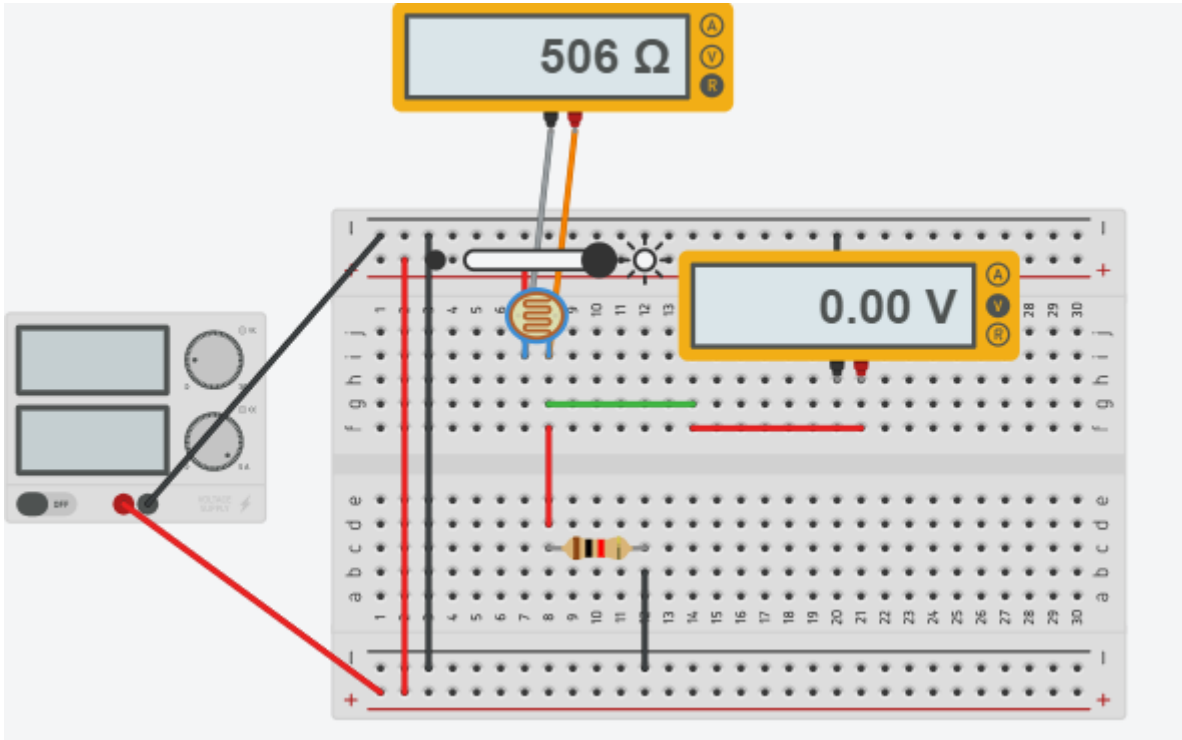
- Absence of light: 180k ohms



- Ambient light: 944 ohms



- Intensive light: 506 ohms



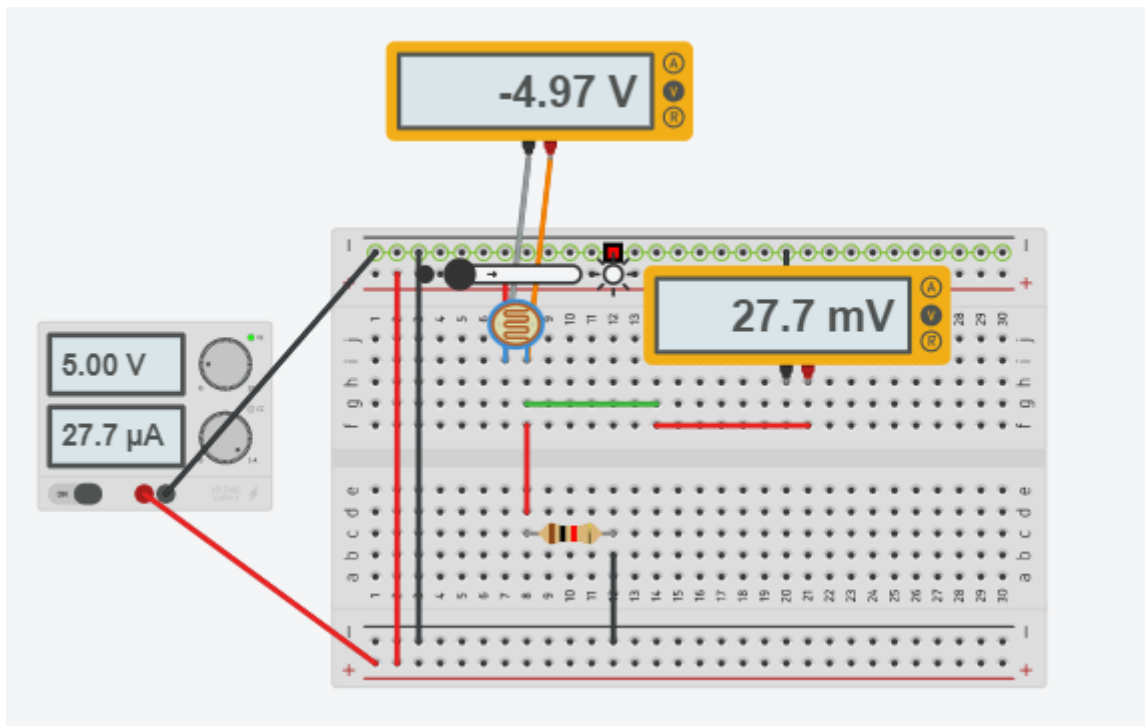
6. Calculate the theoretical voltage value V_{out} for each of the above conditions.

Conditions	Calculations
---	$V_{out} = (R_2 * VCC) / (R_1 + R_2)$
Absence of light	$V_{out} = (1000 * 5) / 181k = 5000/181k = 0.027V$
Ambient light	$V_{out} = (1000 * 5) / (1944) = 5000/1944 = 2.572V$
Intensive light	$V_{out} = (1000 * 5) / (1506) = 5000/1506 = 3.32V$

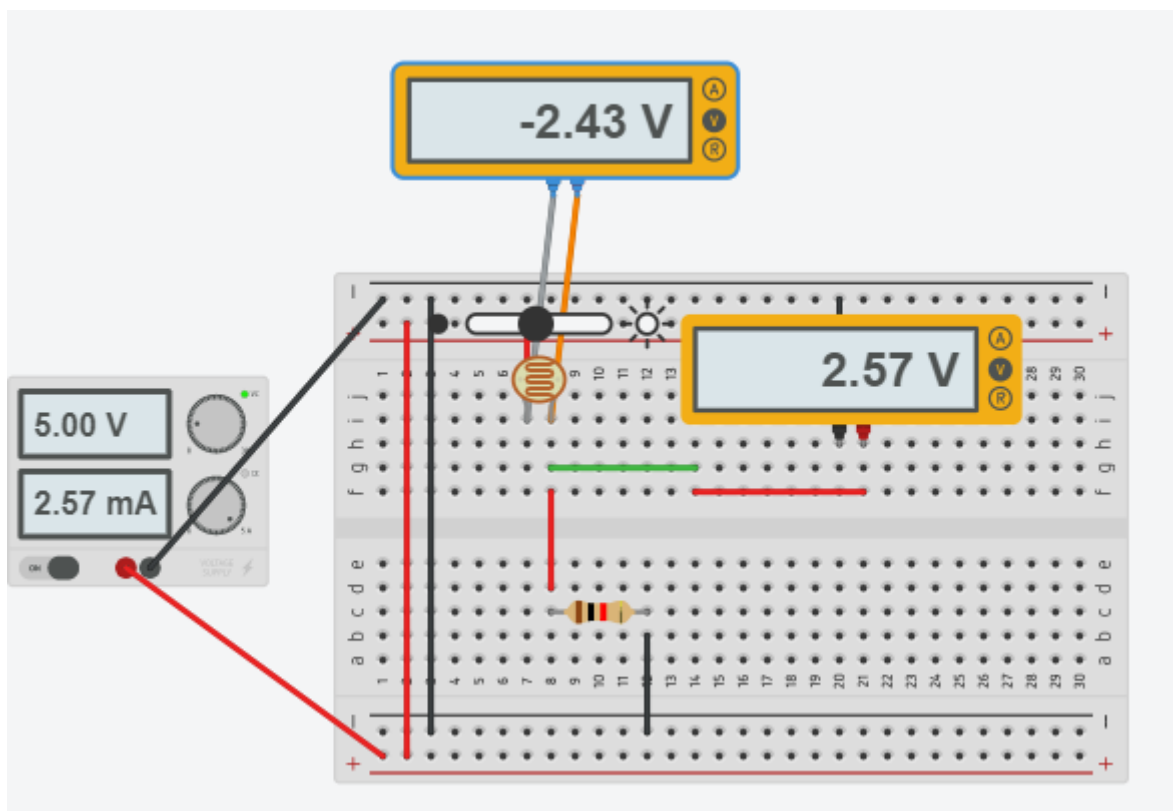
7. measure the voltage value V_{out} for each of the above conditions.

Simulation Values

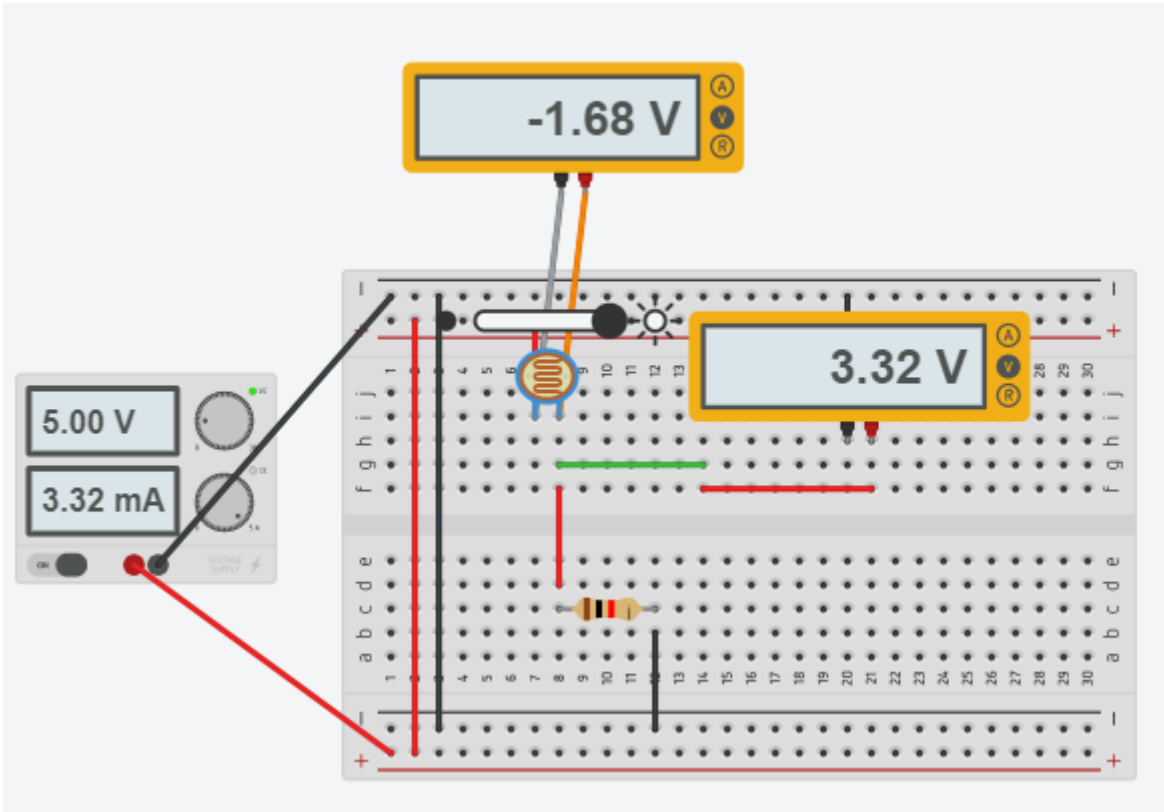
- Absence of light:



- Ambient light:



- Intensive light:



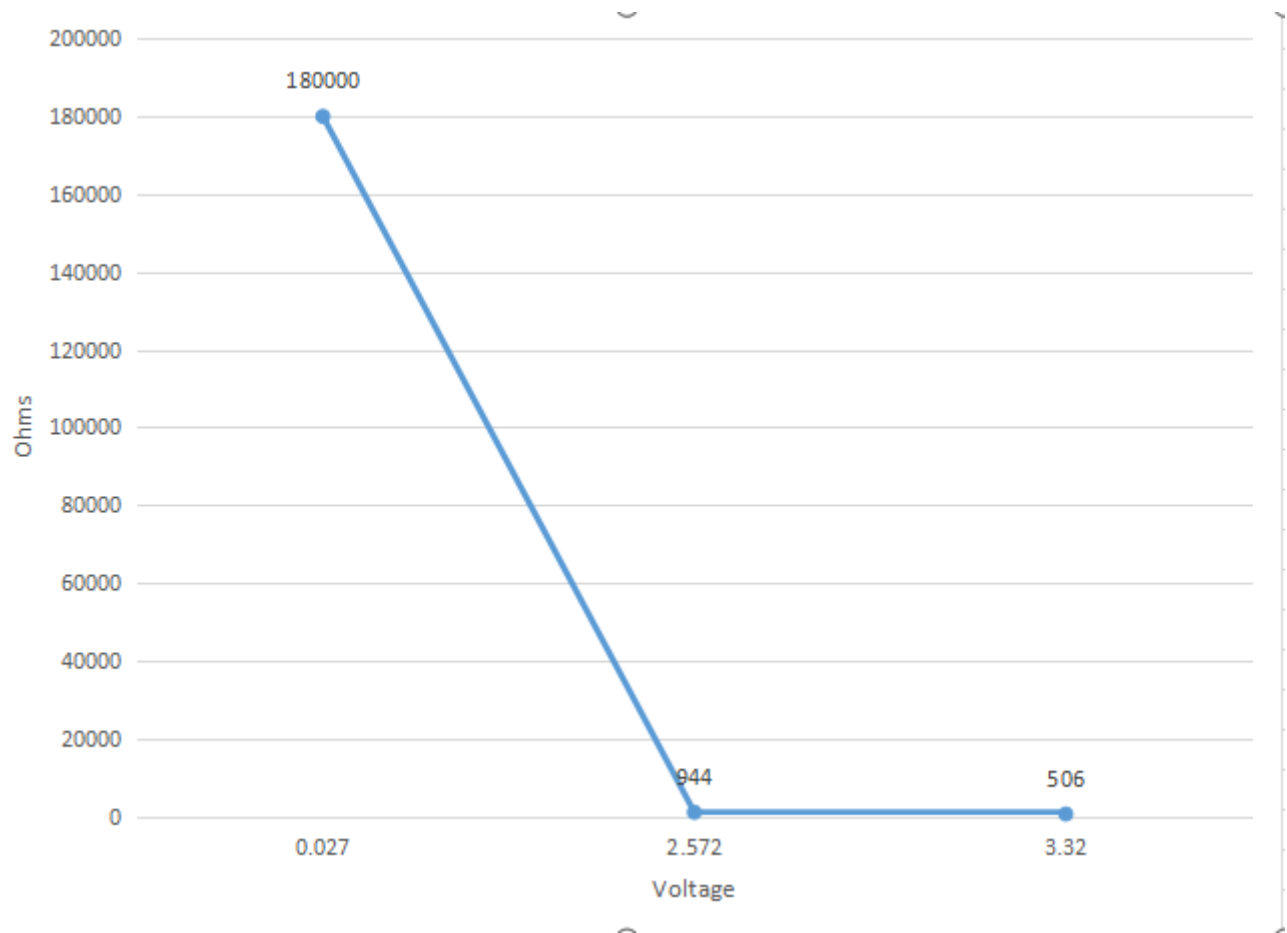
8. Calculate the voltage accuracy value between the theoretical and the measured for each condition, consider including in this section the theoretical calculations

- 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

PROGRAMACION LOGICA Y FUNCIONAMIENTO DE UN MICROCONTROLADOR

Meet - uur-wyfb-jqf

+

← → ↺

meet.google.com/uur-wyfb-jqf

84 96 104 114 124 134 144 154 164 174 184 194 204 214 224 234 244 254 264 274 284 294 304 314 324 334 344 354 364 374 384 394 404 414 424 434 444 454 464 474 484 494 504 514 524 534 544 554 564 574 584 594 604 614 624 634 644 654 664 674 684 694 704 714 724 734 744 754 764 774 784 794 804 814 824 834 844 854 864 874 884 894 904 914 924 934 944 954 964 974 984 994

AXEL REYES MORALES está presentando

5 10 20:28 Tú

Trabajo de clase de ... TBCD - Nuevas tecnolo... Meet - uur-wyfb-jqf Circuit Design Start 5 Leosimuladores/A12 Sistemas-Programa...

www.tinkercad.com/things/3lxKGqwyhhO-start-simulating/editel

Getting Started Start Simulating

3 / 3

Start Simulating

Se han guardado todos los cambios.

Hora de simulador: 00:00:09 Código Detener simulación Exportar Compartir

Fotoresistencia

Nombre 11

5.00 V

27.7 μ A

-4.97 V

27.7 mV

Resistencia

LED

Pulsador

Potenciometro

Condensador

Interruptor de 3/5 pines

Continuar con la próxima lección para aprender cómo editar las propiedades de los componentes en los circuitos.

Restablecer Listo

meet.google.com está compartiendo tu pantalla. Dejar de compartir Ocultar

Tú

AXEL REYES MORALES

EMMANUEL ARTURO RODRI...

OSCAR ALONSO ROJAS CEB...

Detalles de la reunión

Levantar la mano

AXEL REYES MORALES está presentando

Así que sería volver a quitar las 3 preguntas que se repetían 😊

20:05 Y ya nadamas la gráfica, los enlaces a los repertorios y las capturas de slack

AXEL REYES MORALES 20:06
Okey, el que esta en github es el que ya esta actualizado, no?

DAVID GARCIA POSADA 20:06
Sipi

AXEL REYES MORALES 20:06
Va, deja lo checo

AXEL REYES MORALES 20:31
Pues ya modifique en el github ya solo falta hacer la grafica

DAVID GARCIA POSADA 20:31
Okidoki, creo que Oscar tiene la gráfica nadamas sería cambiarle lo de la intensidad de la luz por voltaje

AXEL REYES MORALES 20:32
Okay, @OSCAR ALONSO ROJAS CEBALLOS para que cambies entonces los valores de la grafica y la pongas en el github

EMMANUEL ARTURO RODRIGUEZ MARTINEZ 20:34
Solo falta eso, no?

AXEL REYES MORALES 20:34
Al parecer sí, pero por si las dudas denle unas repasadas por si se nos fue algo

DAVID GARCIA POSADA 20:34
Y una captura de está conversación creo

AXEL REYES MORALES 20:35
Ahh sisisi

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](#)