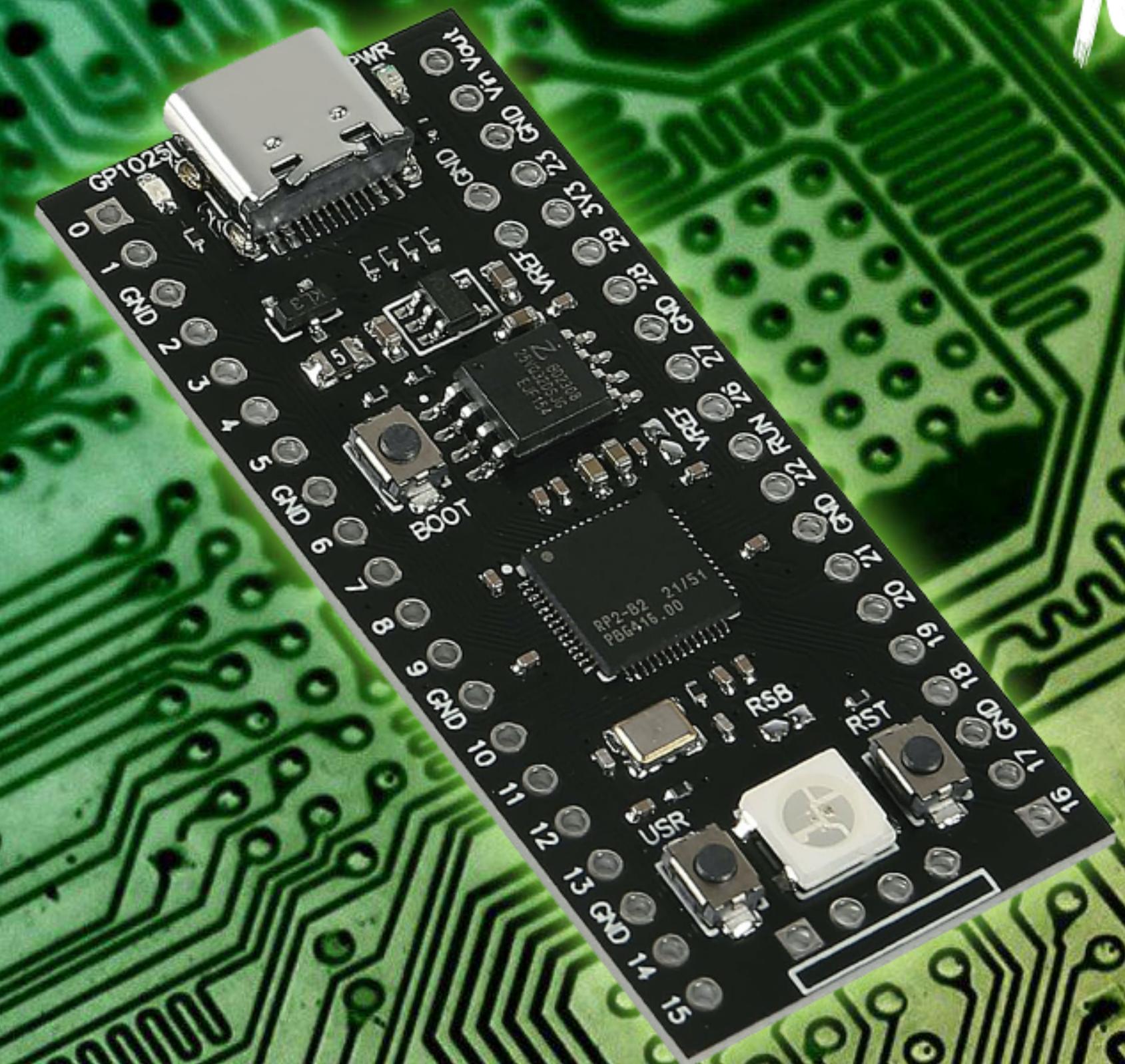


MICROCONTROLLER MASTERY



04 INPUT

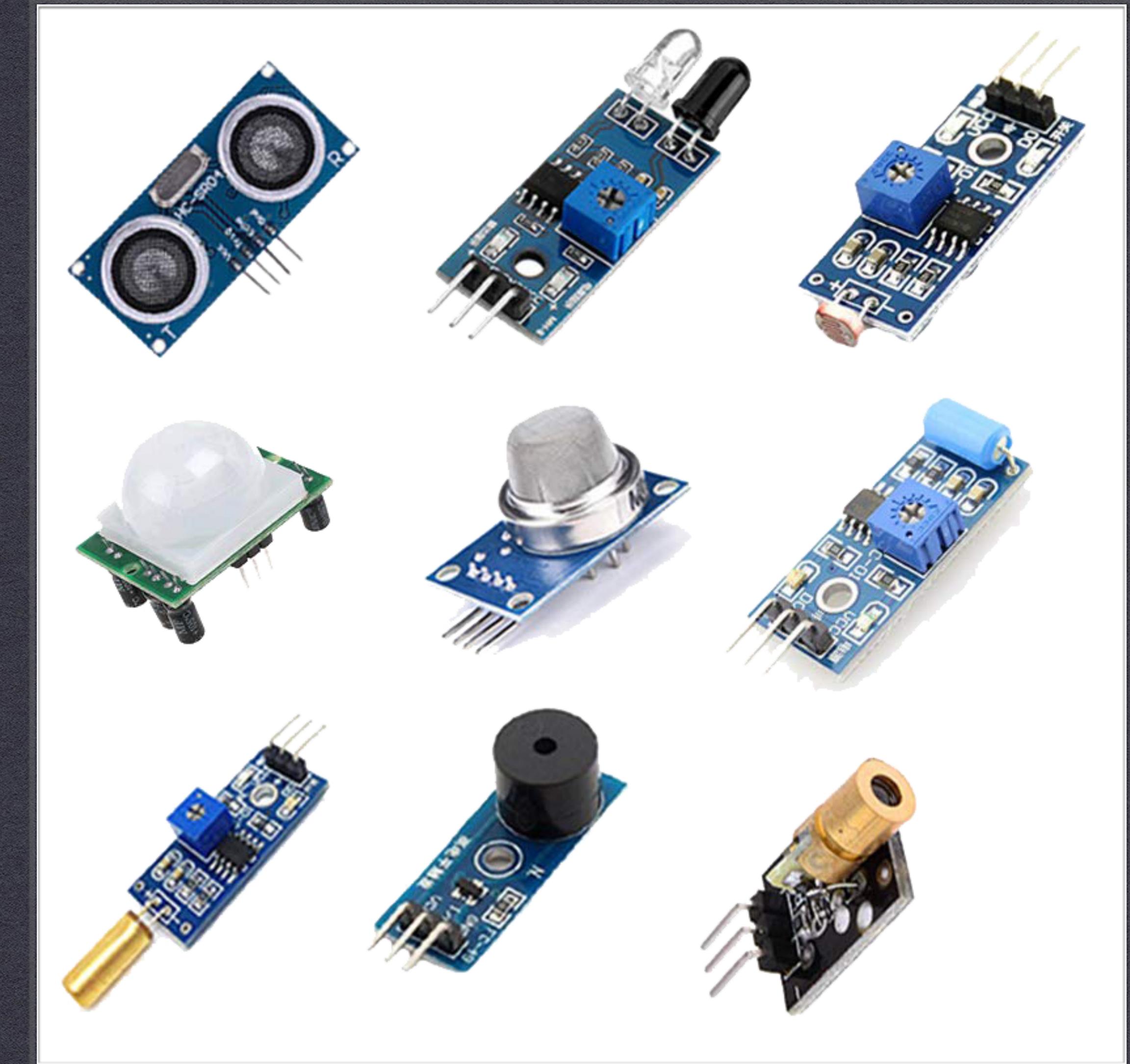
WHAT IS A SENSOR?

Short Circuit 2 (1987)
TriStar Pictures, Inc.

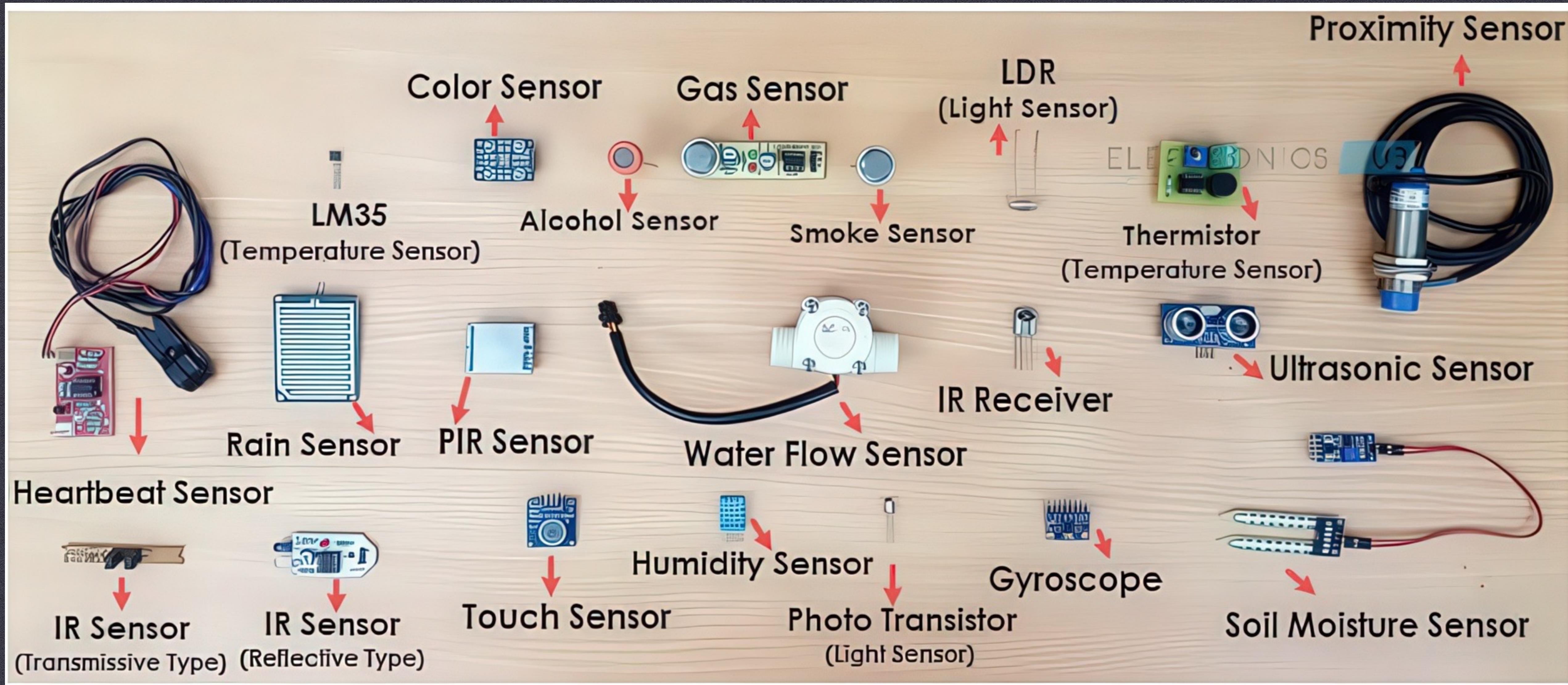


WHAT IS A SENSOR?

A SENSOR IS A DEVICE THAT DETECTS PHYSICAL, CHEMICAL, OR ENVIRONMENTAL CHANGES AND CONVERTS THEM INTO ELECTRICAL SIGNALS.



SENSOR EXAMPLES



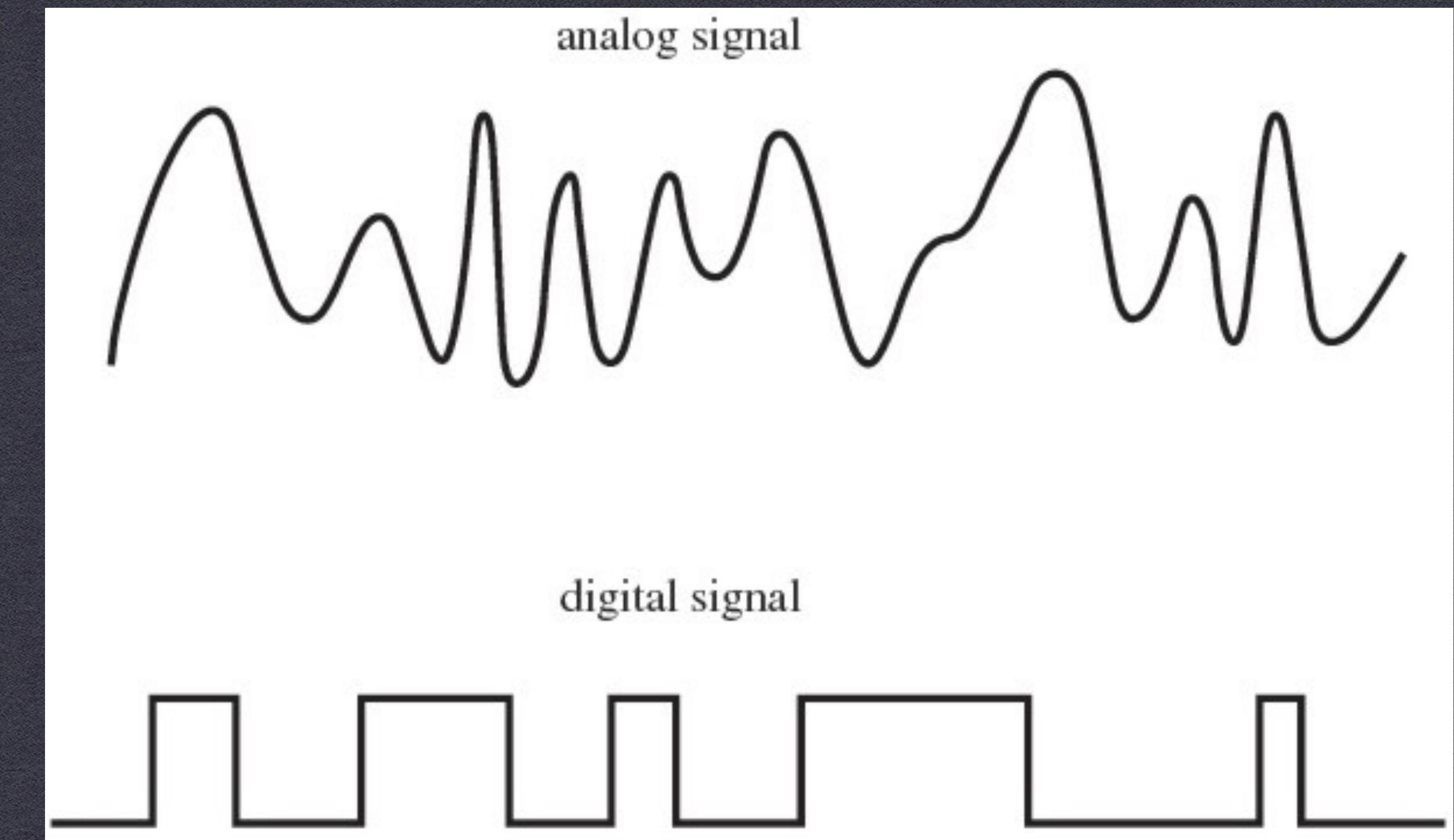
HOW DO SENSORS COMMUNICATE?



IWM

HOW DO SENSORS COMMUNICATE?

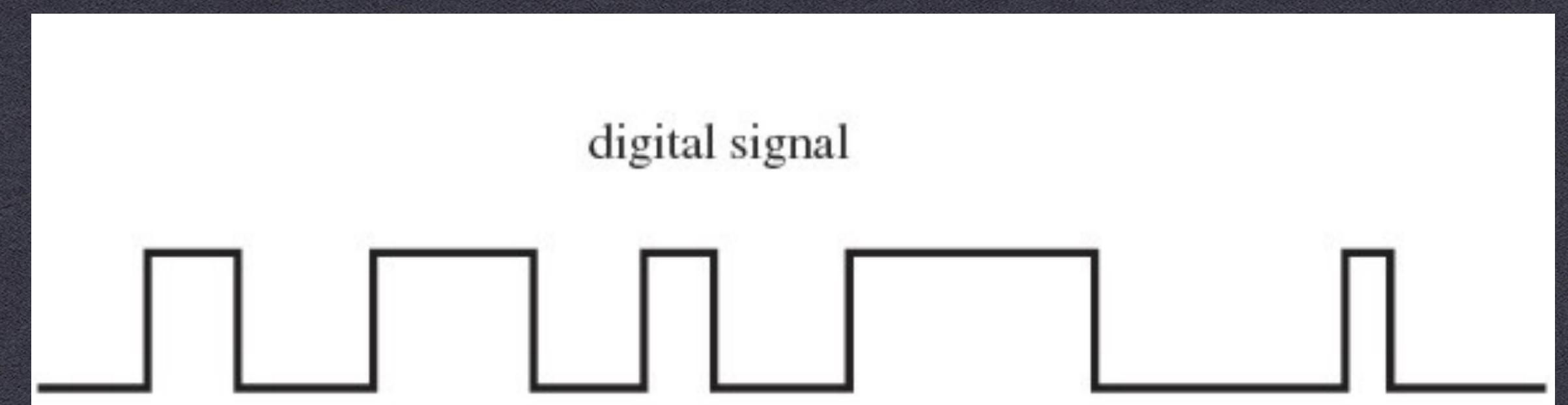
SENSORS COMMUNICATE USING
EITHER DIGITAL OR ANALOG
SIGNALS.



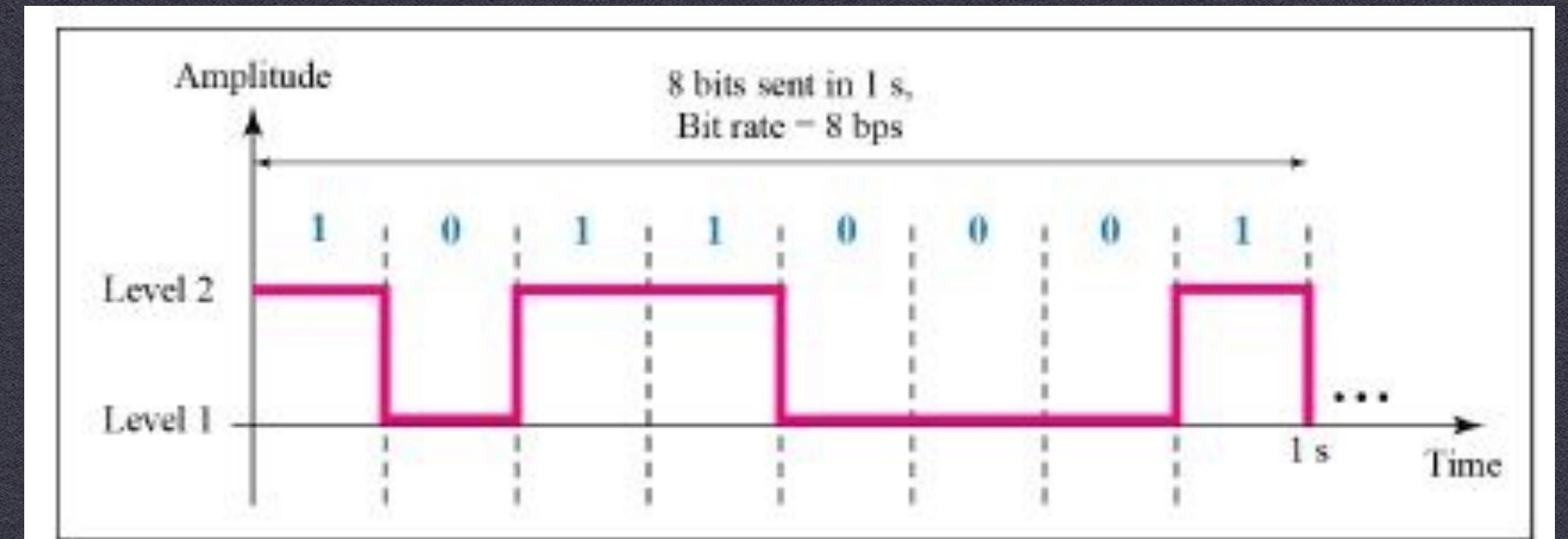
<https://www.quora.com/Whats-the-main-difference-between-digital-and-analog-in-lay-man%E2%80%99s-terms>

WHAT IS A DIGITAL SIGNAL?

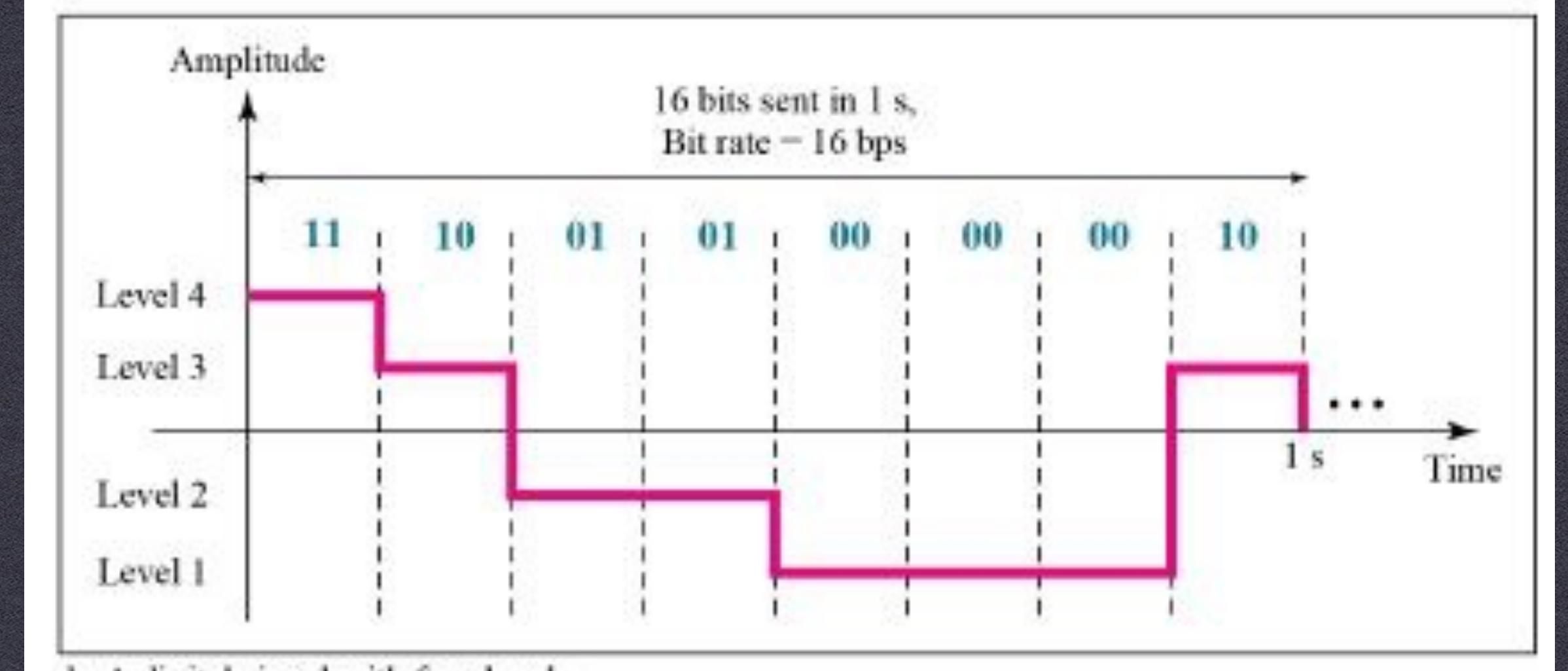
A DIGITAL SIGNAL REPRESENTS
DATA AS A SEQUENCE OF SPECIFIC
VALUES, TYPICALLY REPRESENTED
AS 0S AND 1S (BINARY CODE)



<https://www.quora.com/Whats-the-main-difference-between-digital-and-analog-in-lay-man%E2%80%99s-terms>



a. A digital signal with two levels

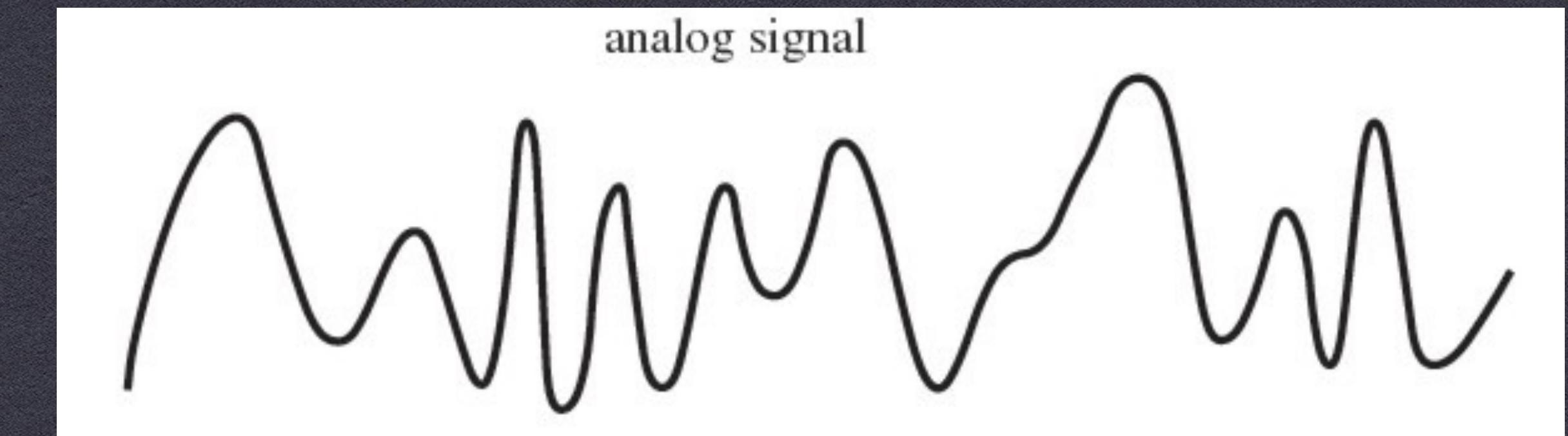


b. A digital signal with four levels

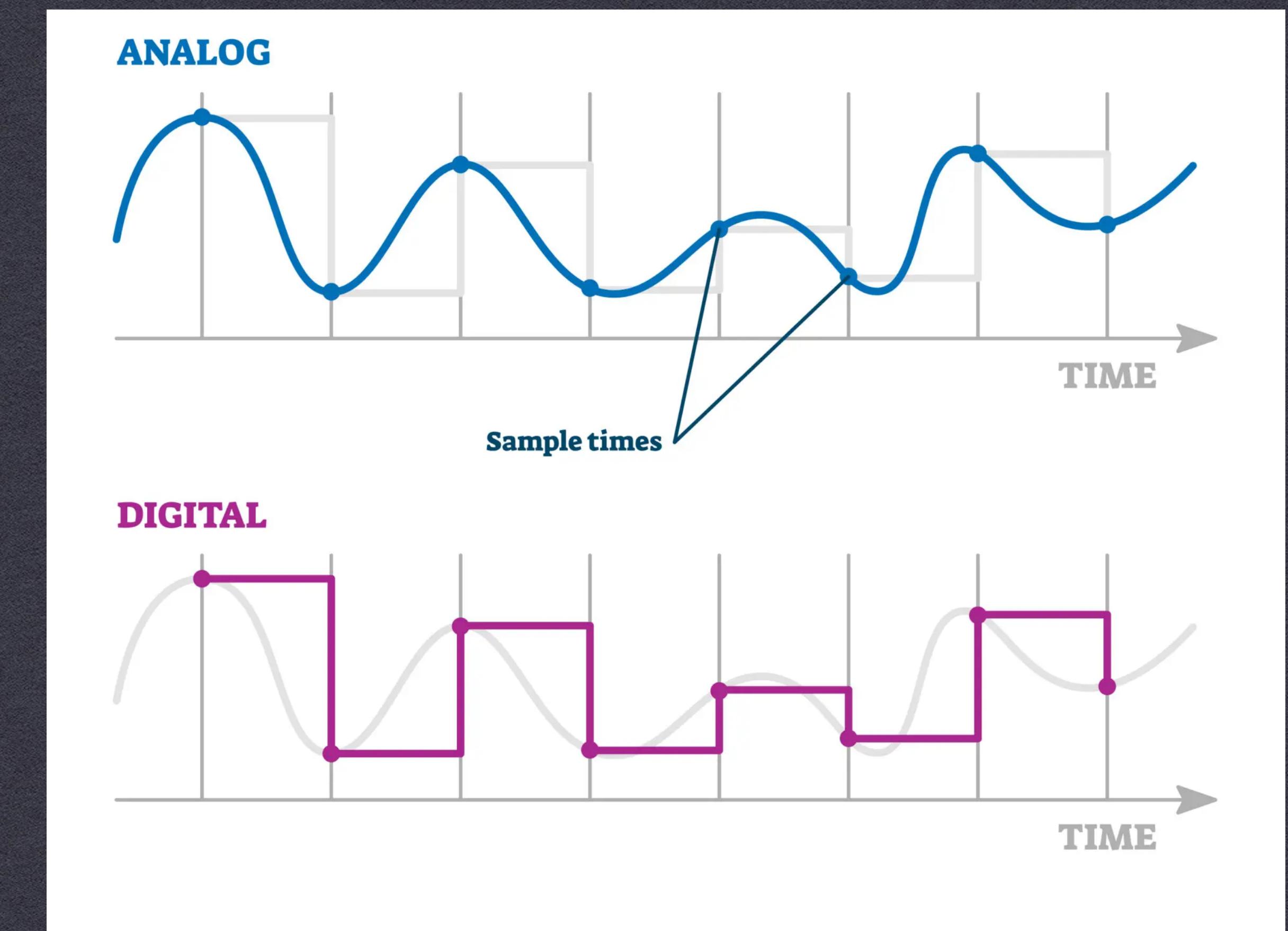
<https://www.youtube.com/watch?v=Os-JvsgtECI>

WHAT IS AN ANALOG SIGNAL?

AN ANALOG SIGNAL IS A CONTINUOUS-TIME SIGNAL, MEANING ITS VALUE CAN CHANGE SMOOTHLY AND CONTINUOUSLY OVER TIME, AS OPPOSED TO A DIGITAL SIGNAL WHICH REPRESENTS INFORMATION AS SPECIFIC VALUES (LIKE 0S AND 1S).



<https://www.quora.com/Whats-the-main-difference-between-digital-and-analog-in-lay-man%E2%80%99s-terms>



<https://engineerrefe.com/what-is-the-difference-between-analog-and-digital-circuit/>



PROJECT

<https://wallpaperboat.com/rainbow-wallpapers>

SENSORAMA!

LAB

4

MATERIALS

LAB KIT



TASK

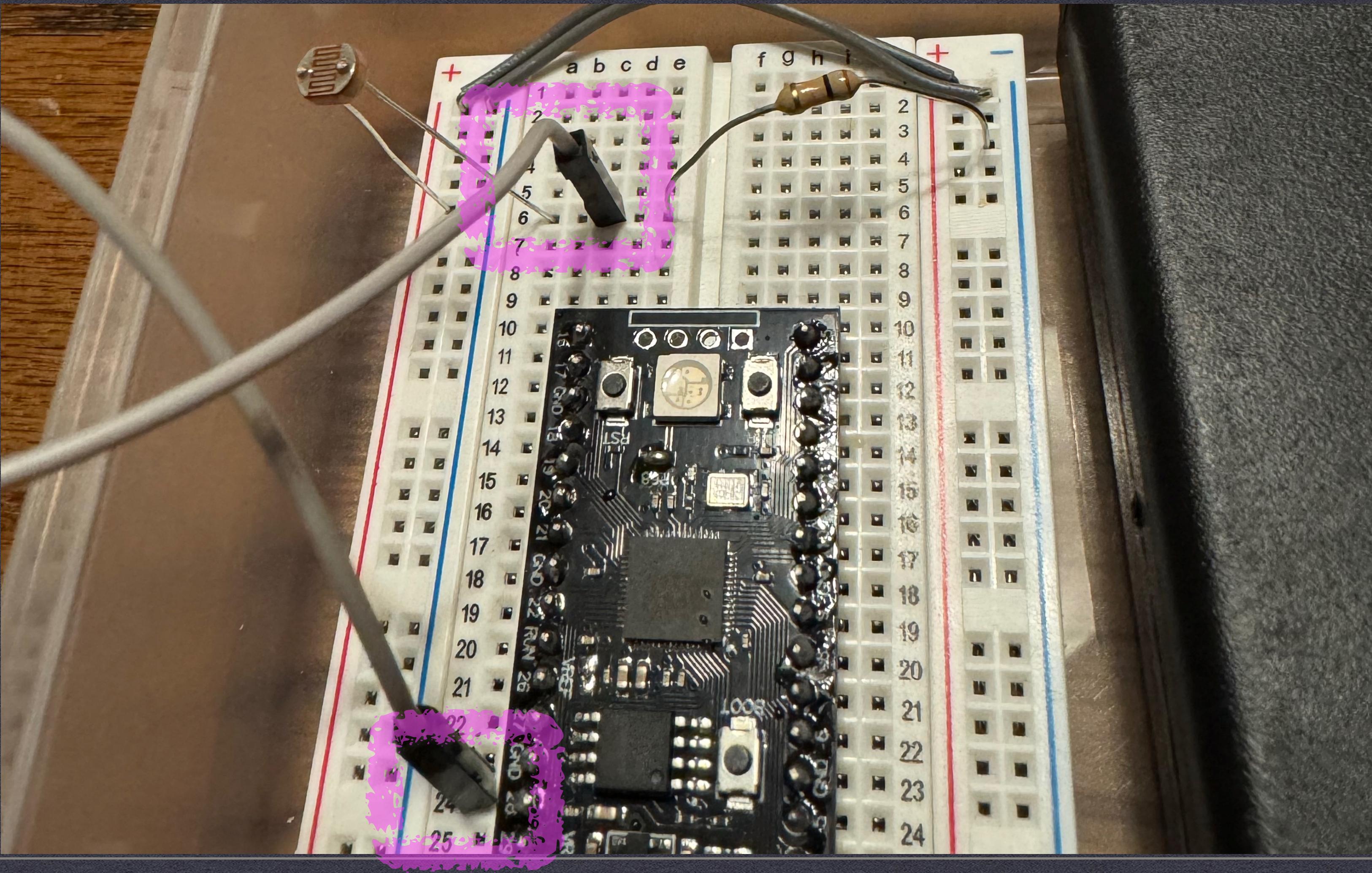
TURN OFF BATTERY PACK UNTIL ALL STEPS ARE COMPLETED

STEP

1

MATERIALS

BATTERY PACK



TASK

CONNECT WIRE FOR LIGHT SENSOR (LDR)

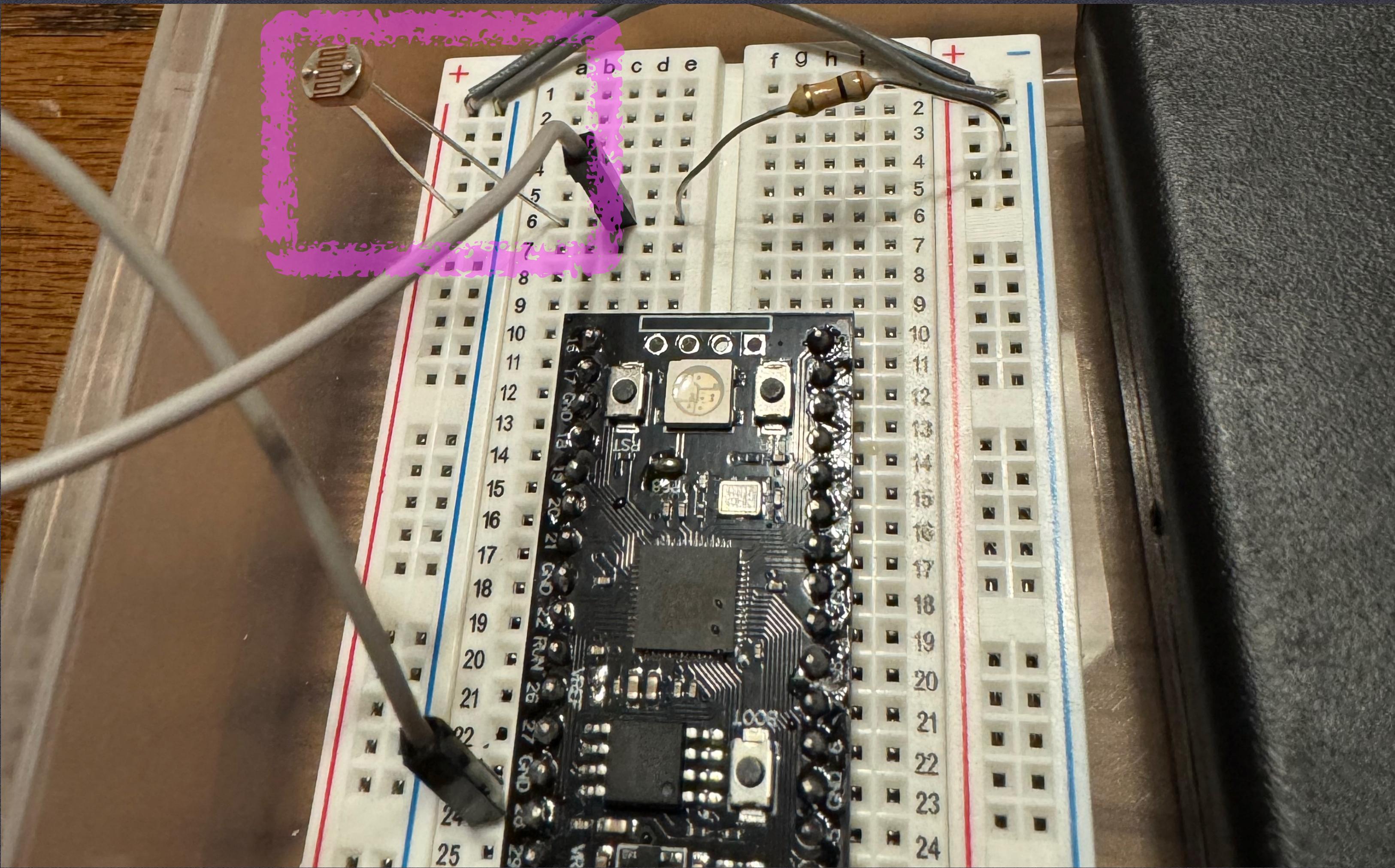
JUMPER WIRE FROM 24A TO 6C

STEP

2

MATERIALS

JUMPER WIRE



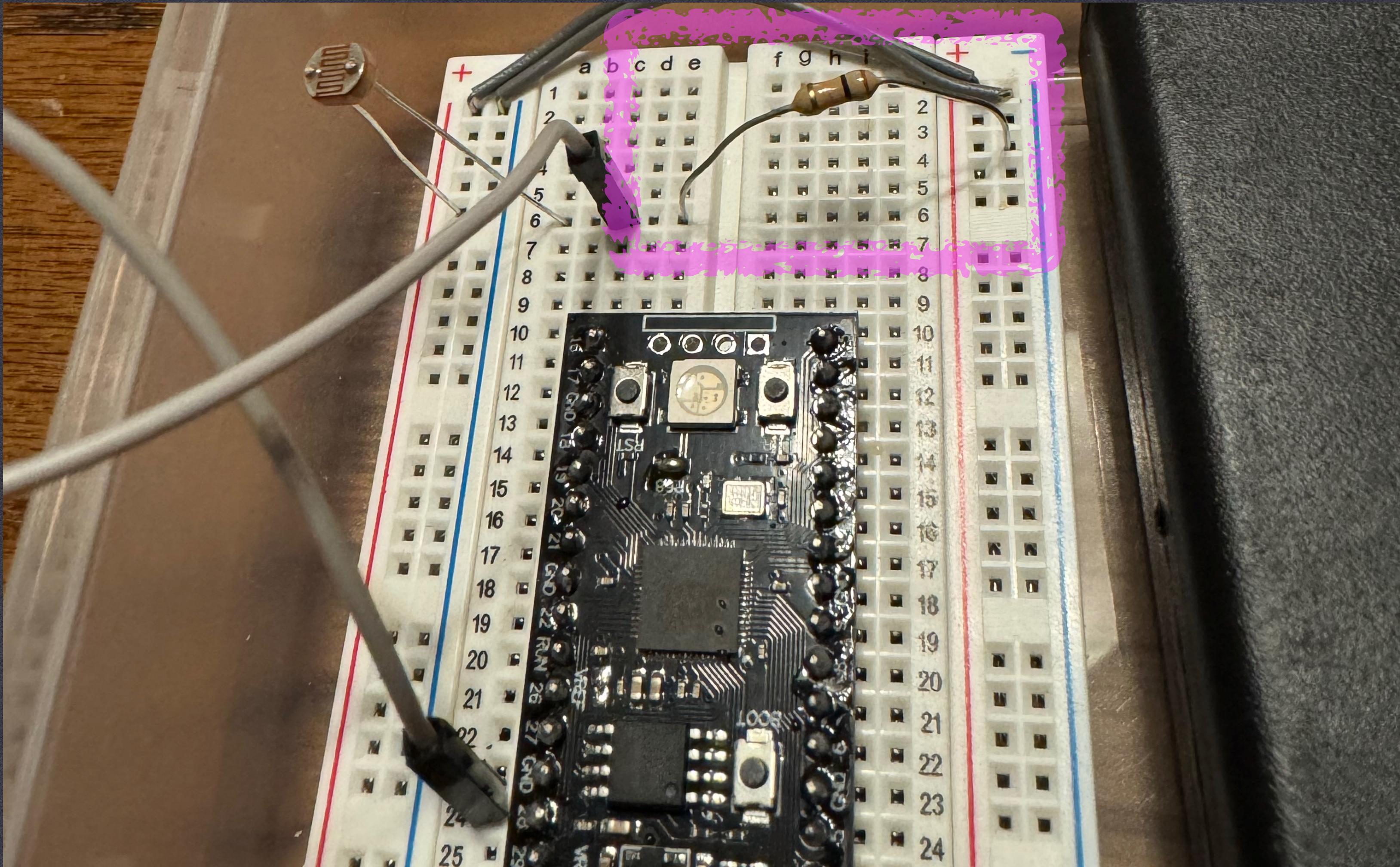
TASK

CONNECT LIGHT SENSOR (LDR) LIGHT SENSOR FROM POSITIVE RAIL (+) TO 6A

STEP
3

MATERIALS

LIGHT SENSOR



TASK

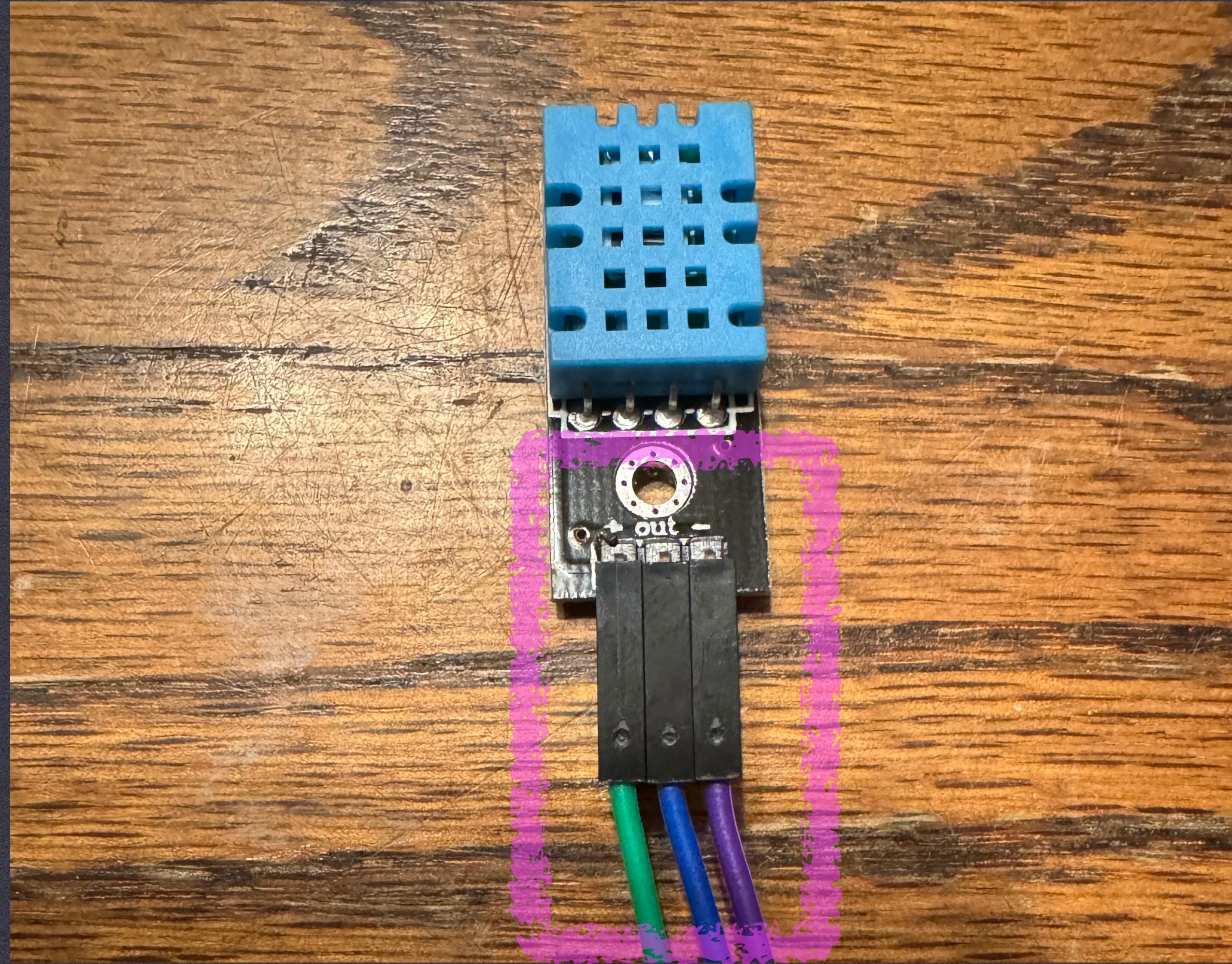
CONNECT RESISTOR RESISTOR FROM 6E TO NEGATIVE RAIL (-)

STEP

4

MATERIALS

RESISTOR



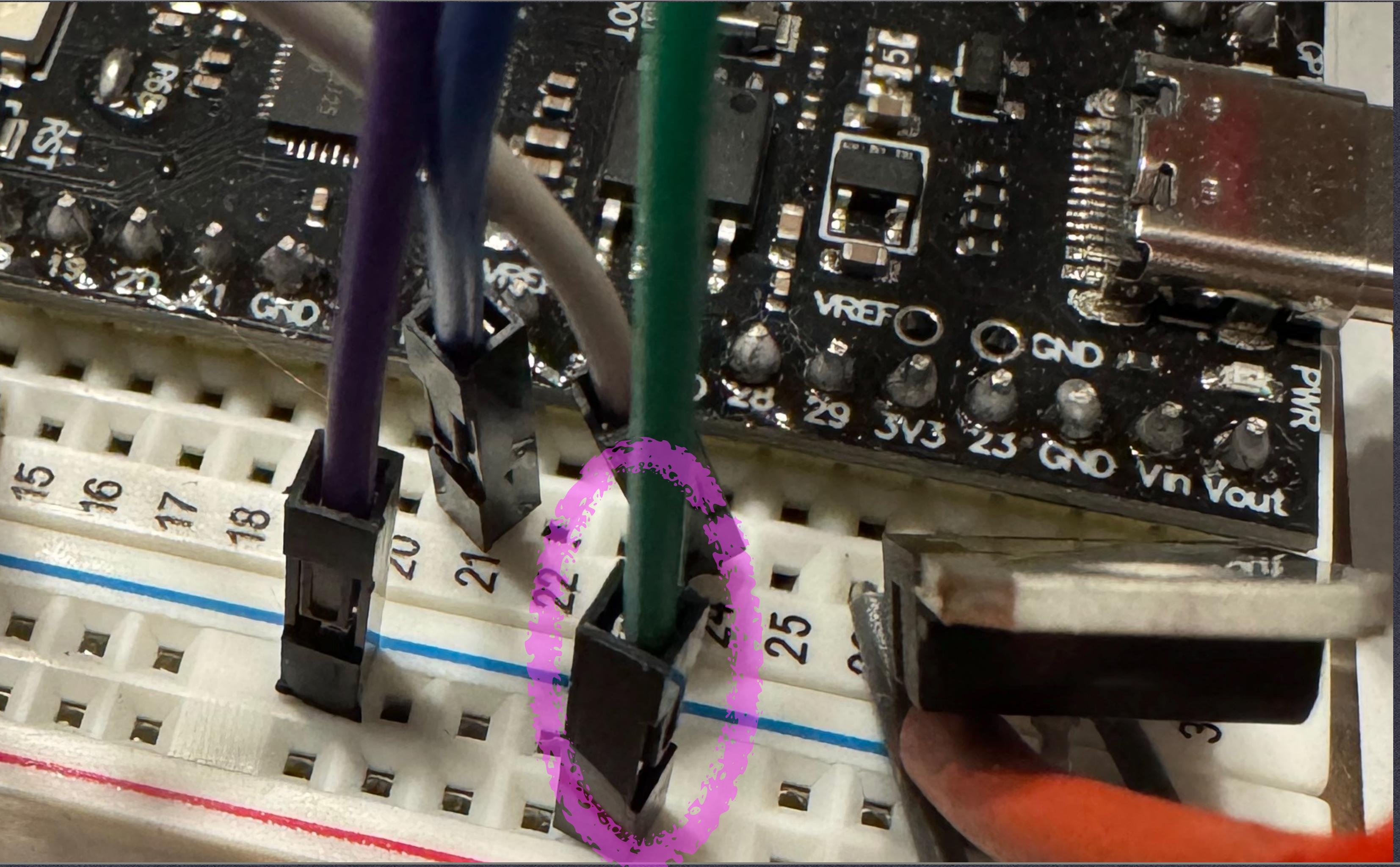
TASK

**REVIEW HUMIDITY SENSOR WIRE COLORS
TAKE NOTE OF WHICH COLORED WIRES PLUG INTO +, OUT, AND -.**

STEP
5

MATERIALS

HUMIDITY SENSOR (DHT11)



TASK

HOOK-UP HUMIDITY SENSOR WIRES

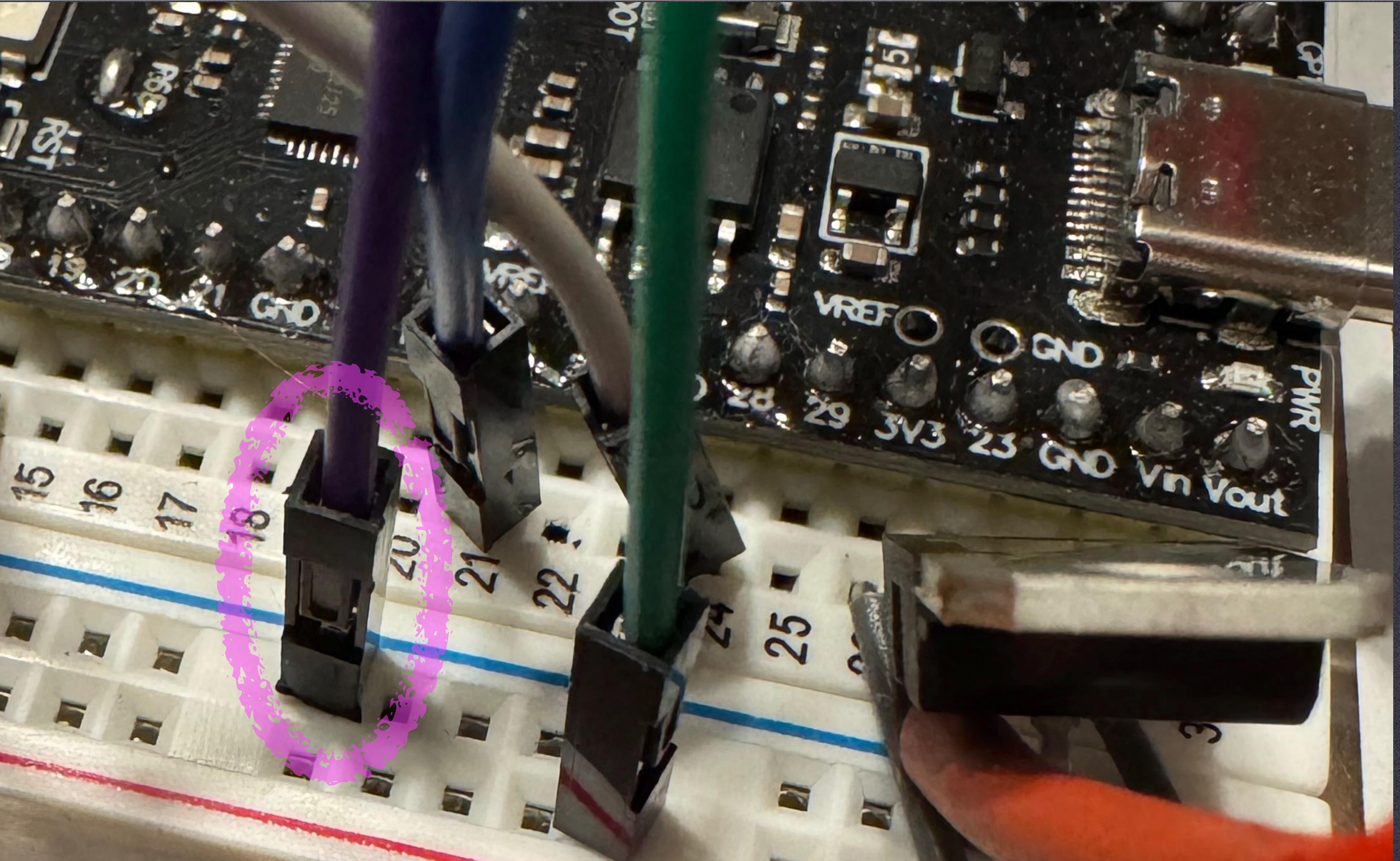
PLUG + WIRE TO POSITIVE RAIL (+)

STEP

6

MATERIALS

HUMIDITY SENSOR + WIRE



TASK

HOOK-UP HUMIDITY SENSOR WIRES

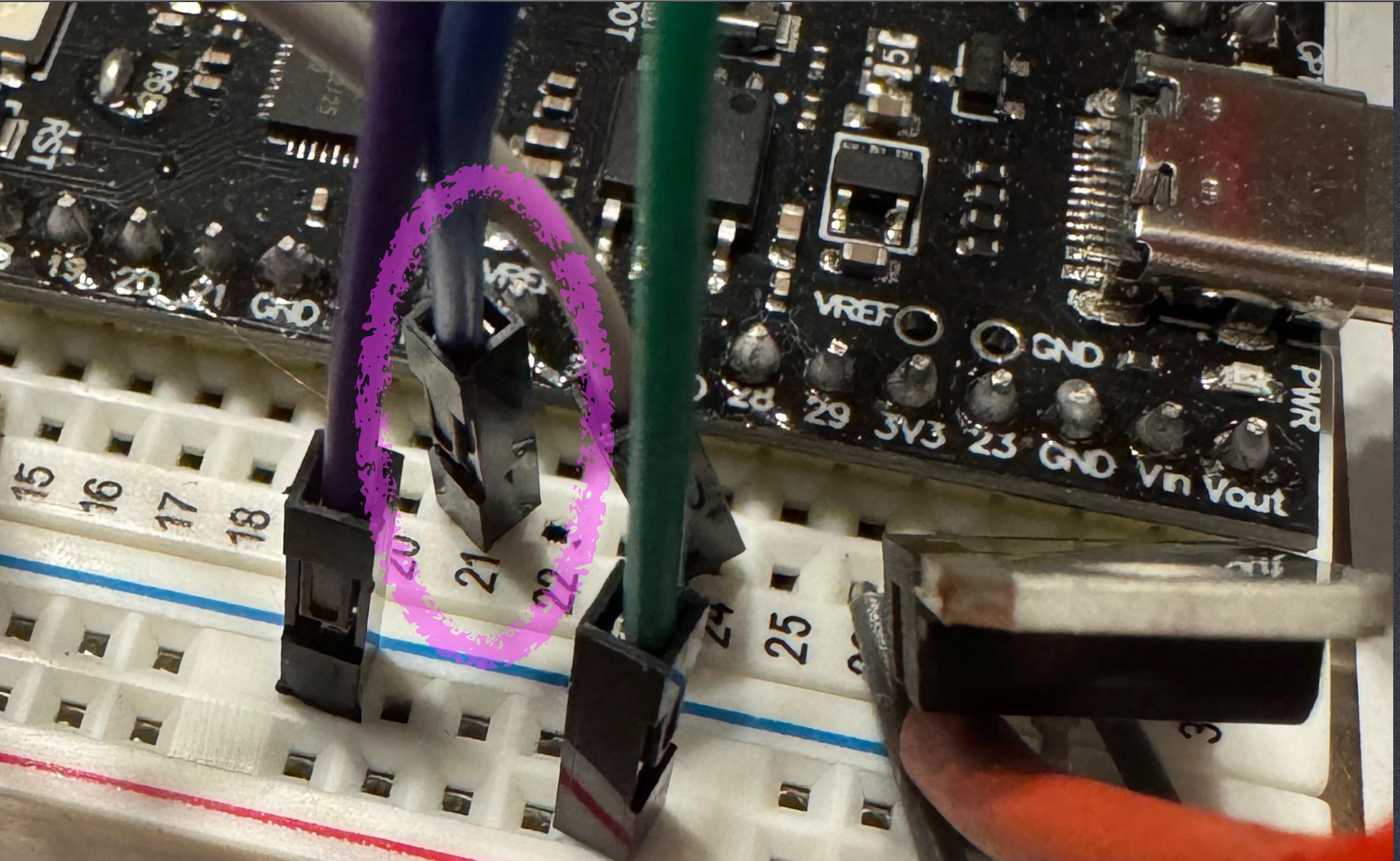
PLUG - WIRE TO NEGATIVE RAIL (-)

STEP

7

MATERIALS

HUMIDITY SENSOR - WIRE



TASK

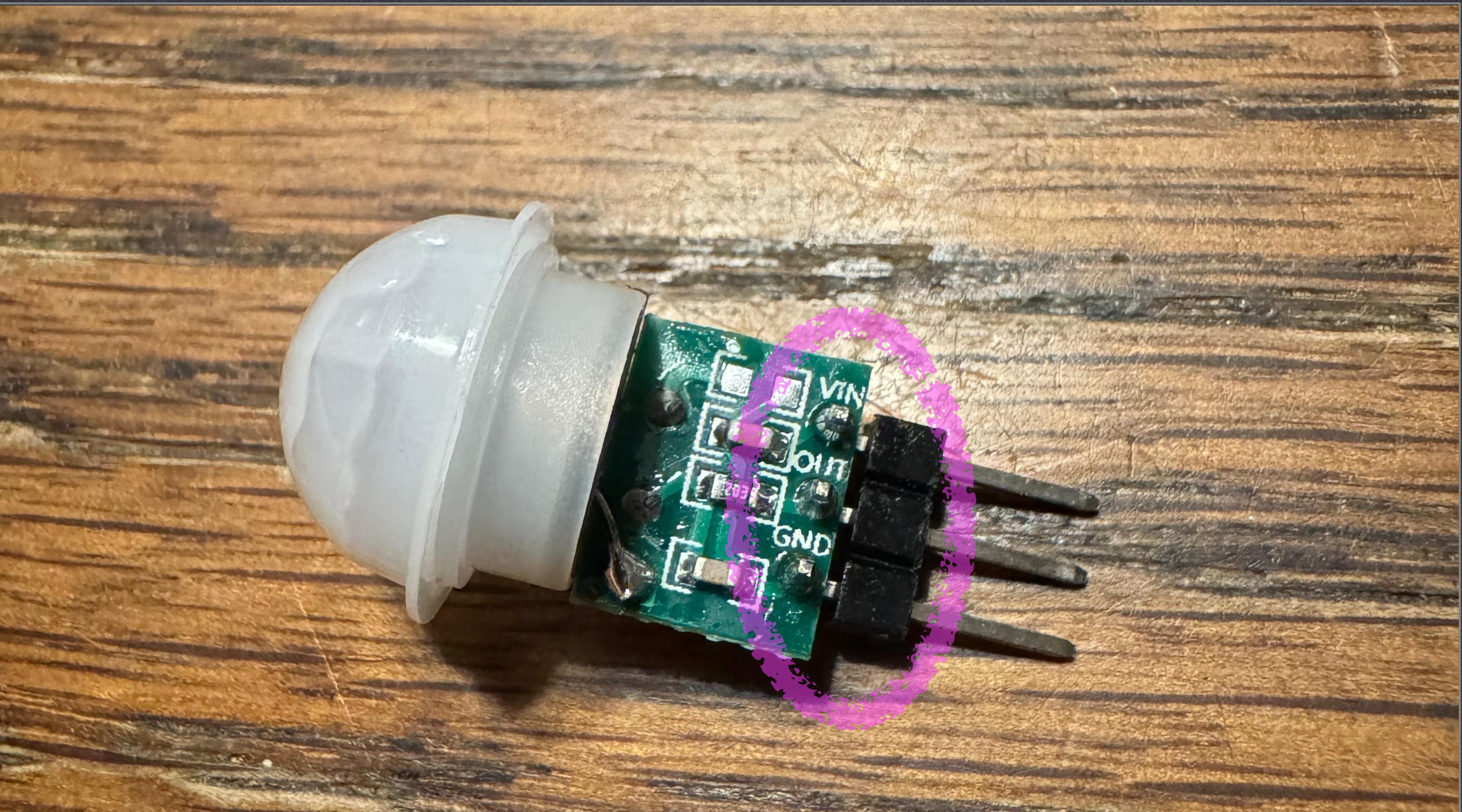
HOOK-UP HUMIDITY SENSOR WIRES

PLUG OUT WIRE TO 21A

STEP
8

MATERIALS

HUMIDITY SENSOR OUT WIRE



TASK

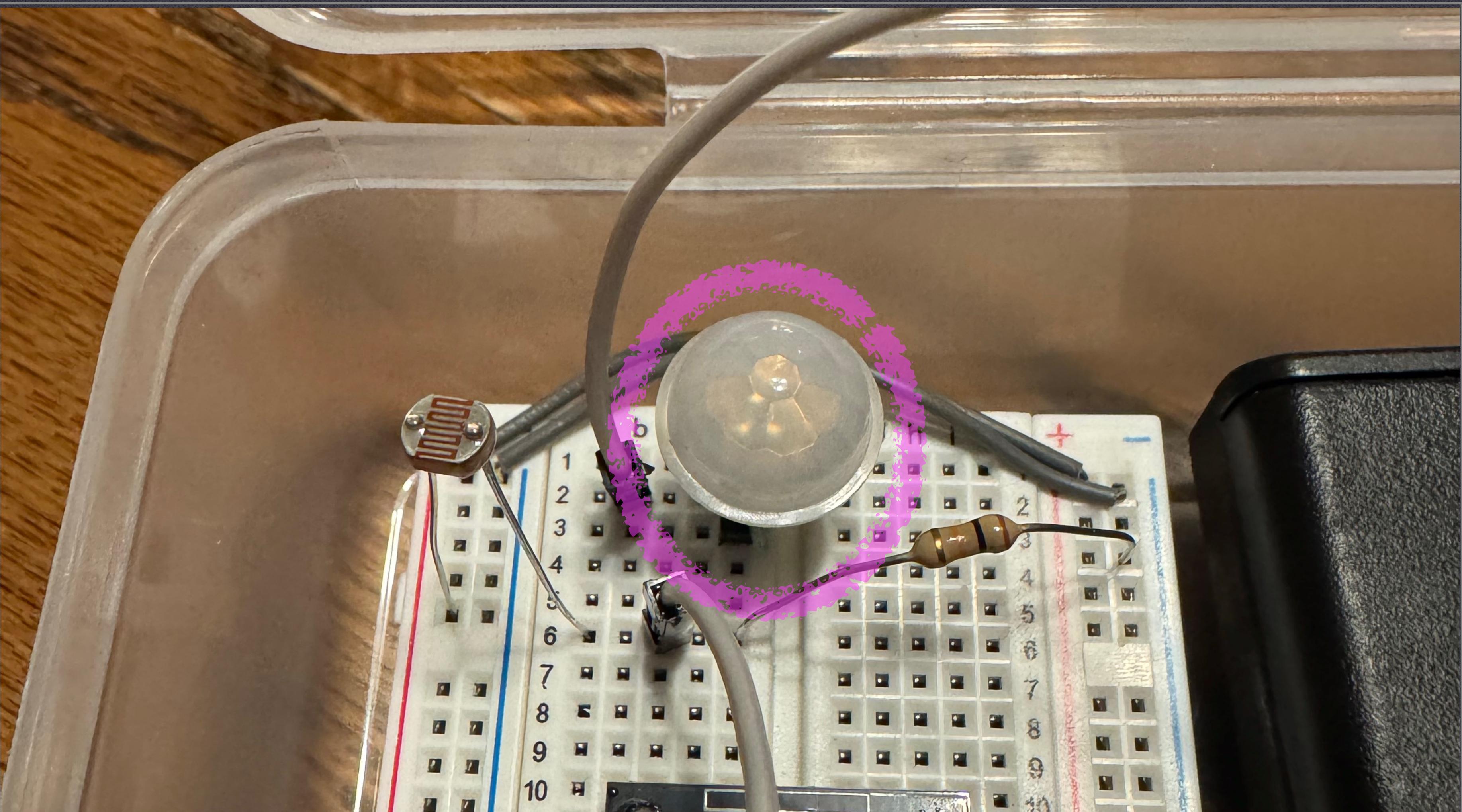
**REVIEW MOTION SENSOR PINOUT
TAKE NOTE OF WHICH PINS ARE **VIN (+)**, **OUT**, AND **GND (-)****

STEP

9

MATERIALS

MOTION SENSOR



TASK

ATTACH MOTION SENSOR

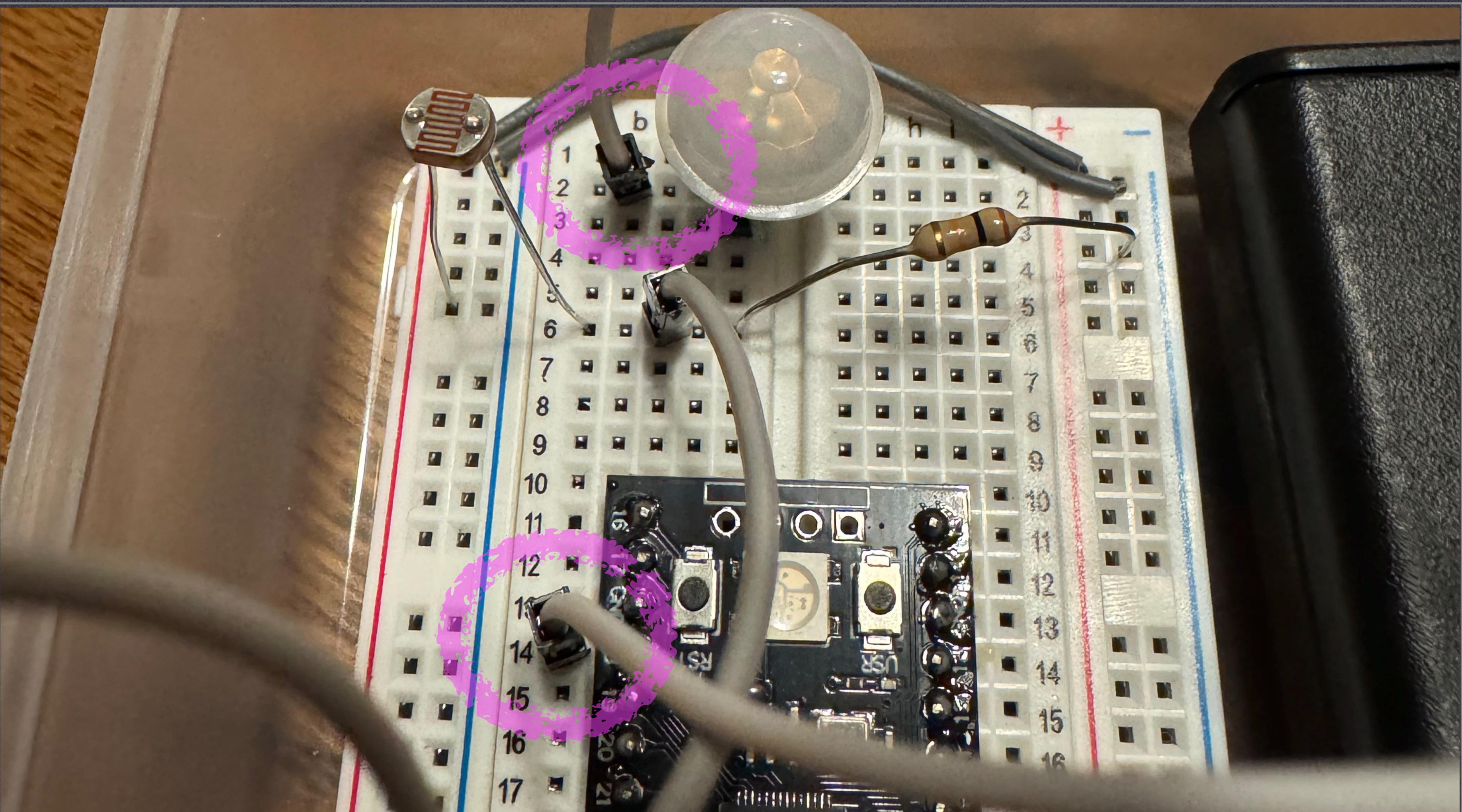
VIN (+) TO 1E, OUT TO 2E, AND GND (-) TO 3E

STEP

10

MATERIALS

MOTION SENSOR



TASK

HOOKUP MOTION SENSOR (OUT)

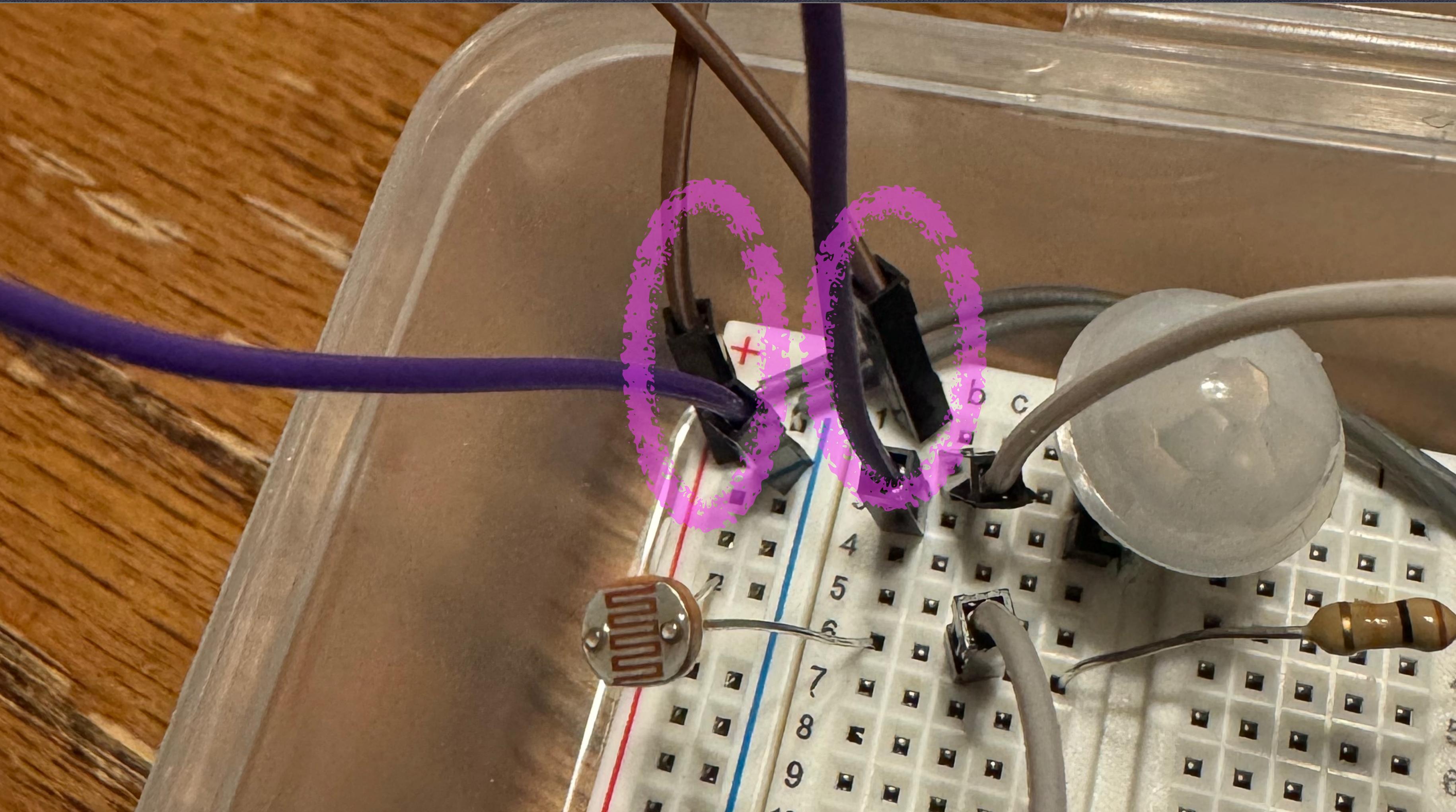
ATTACH WIRE BETWEEN 2B AND 14A

STEP

11

MATERIALS

WIRE



TASK

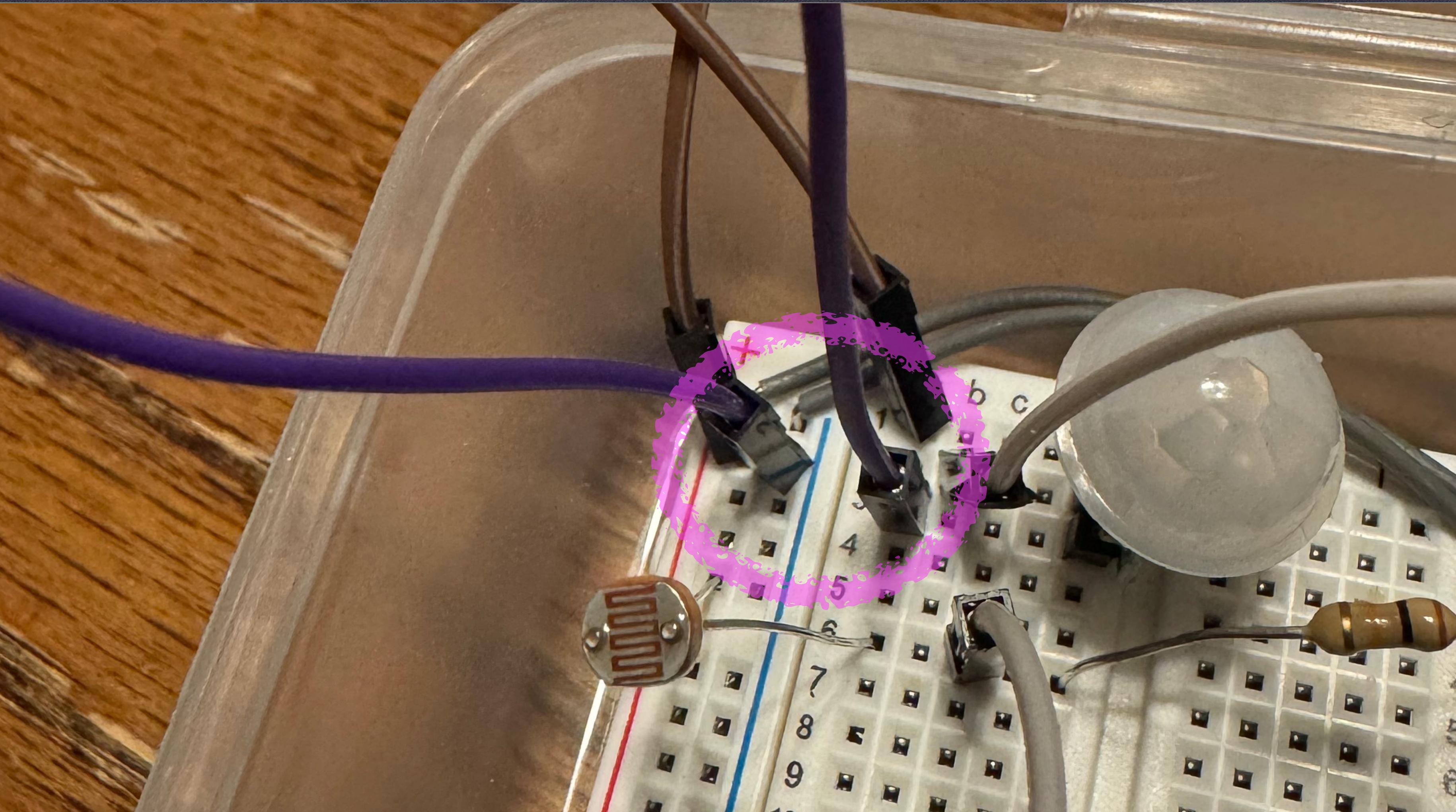
HOOKUP MOTION SENSOR (VIN) ATTACH WIRE BETWEEN 1A AND **POSITIVE RAIL (+)**

STEP

12

MATERIALS

WIRE



TASK

HOOKUP MOTION SENSOR (GND)

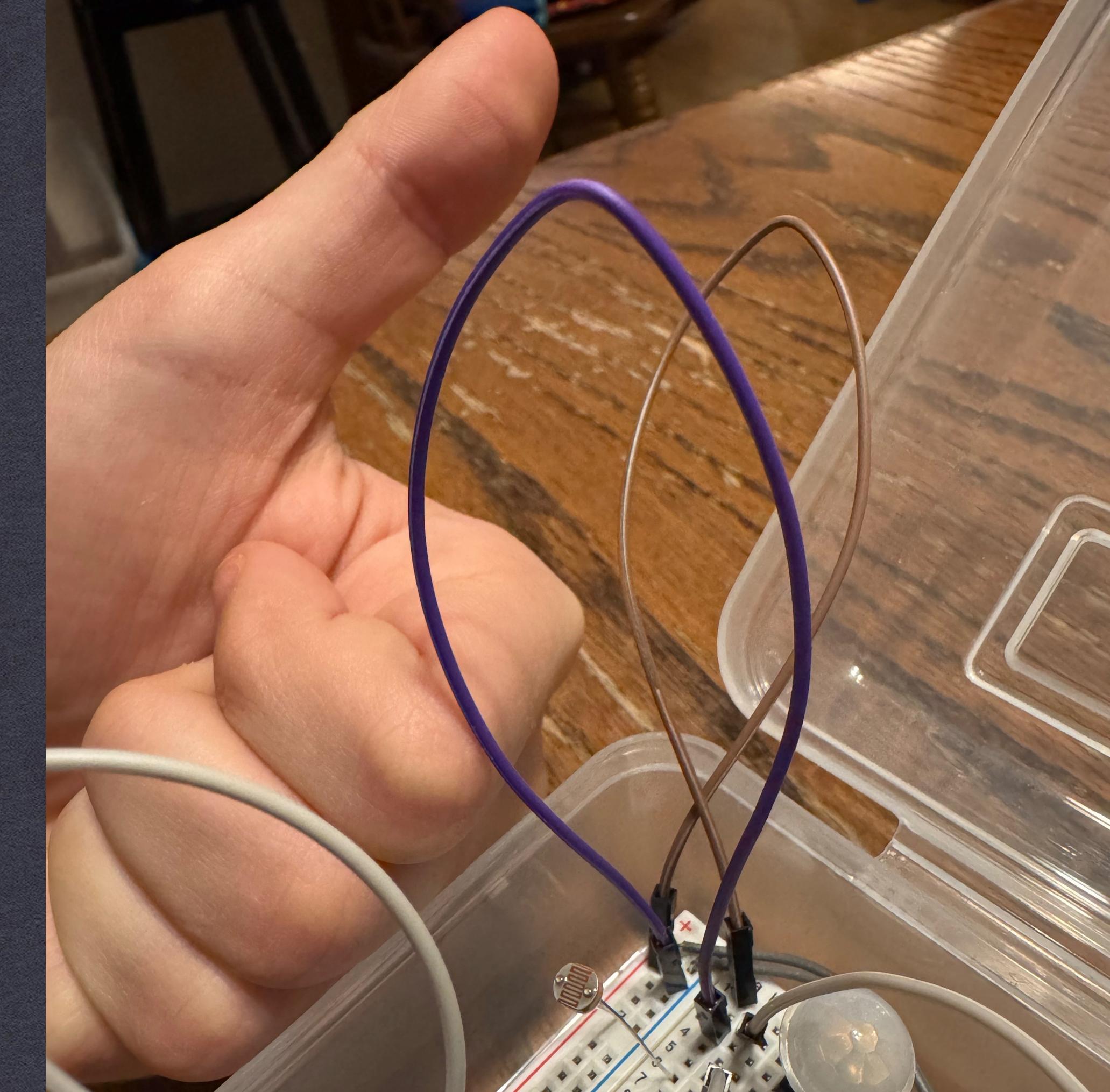
ATTACH WIRE BETWEEN 3A AND NEGATIVE RAIL (-)

STEP

12

MATERIALS

WIRE



TASK

DOUBLE-CHECK YOUR CONNECTIONS ENSURE EXPOSED CONNECTIONS AREN'T TOUCHING UNEXPECTEDLY

STEP

13

MATERIALS

PATIENT HUMAN WITH EYES



TASK

TURN ON POWER (IF THERE IS NOT A RESPONSE, ASK FOR HELP)

STEP

14

MATERIALS

KIT