

IMCA 222
Electronics for Artists
Fall 2025

dr lee wilkins

**Class is on Zoom even in the classroom
for sharing, find the details on Moodle**

Download the slides!

1.

Resources doc

HYBRID LAB SCHEDULE

FALL SEMESTER

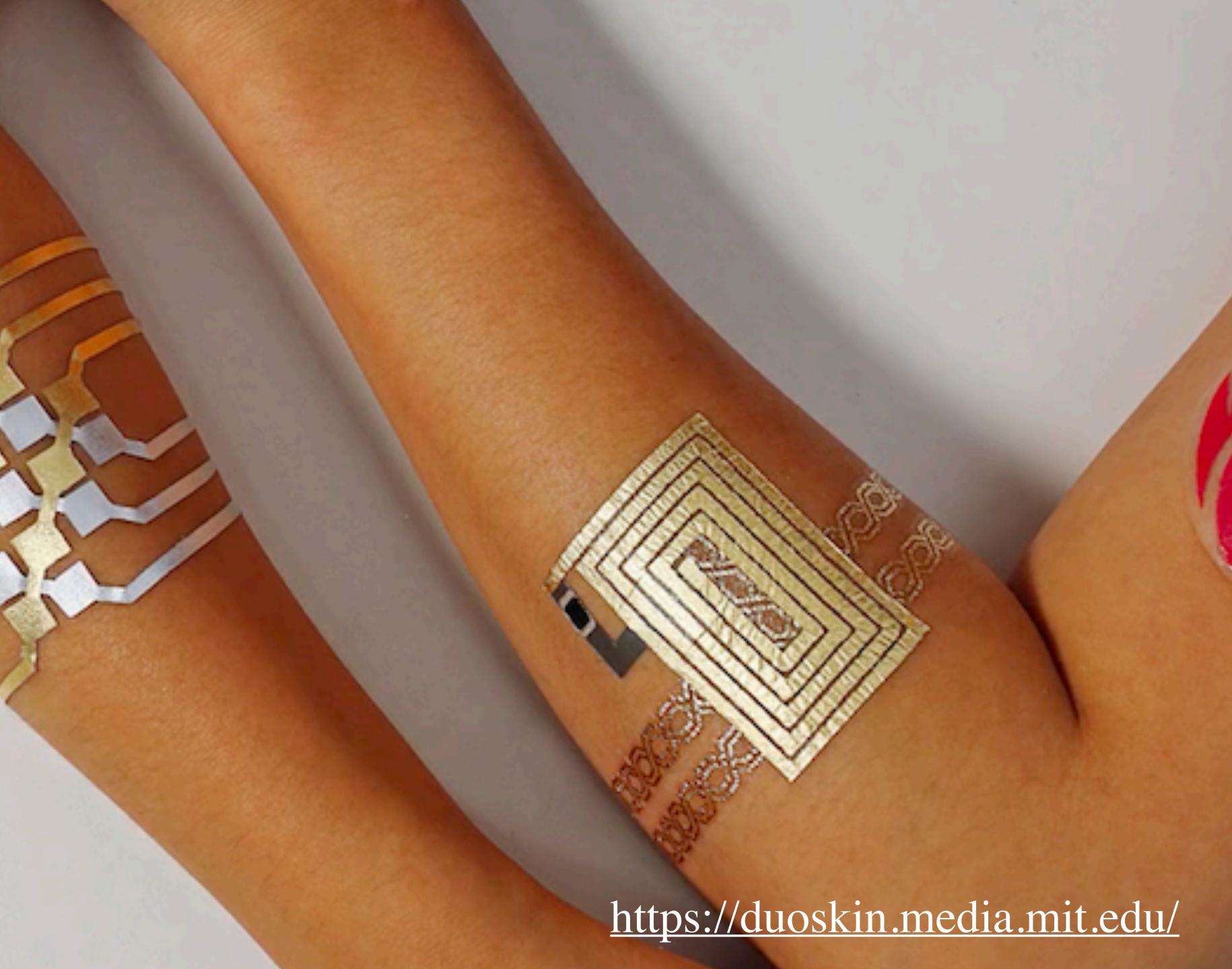
TIME	MON	TUE	WED	THU	FRI
8:00					
9:00					
9:30					
10:00					
10:30	OPEN				
11:00	LAB*				
11:30					
12:00					
12:30					
13:00		OPEN			
13:30	IMCA 220	LAB*			
14:00		13:00-16:30			
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16:30					
17:00					
17:30					



Lisa Hartje



Ewa Nowak
<https://cvdazzle.com/>



Duo Skin

<https://duoskin.media.mit.edu/>



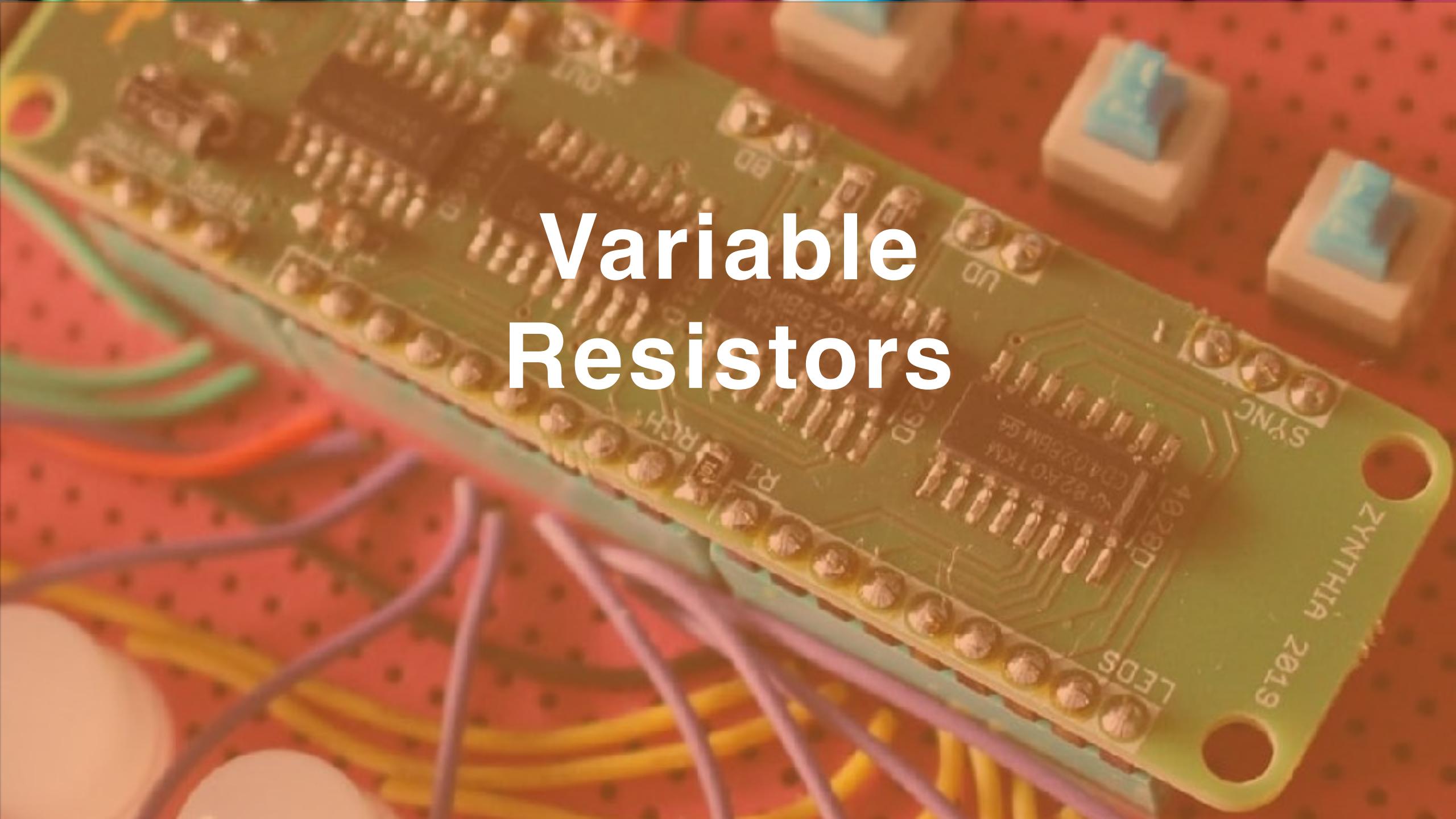
Cyberknitcs

<http://teresafourlamb.com/cyberknitcs.html>

Beautiful Circuit Critique:

What worked? What did you try? What were your the challenging parts? What inspired you? What was unexpected? What did you learn? What would you do differently next time? How can you take it further? What would you like to try next? Would you use this material again? How can you put this in your existing practice? What opportunities does this present? What questions do you have after doing this work?

Variable Resistors



Resistors restrict
the flow of
electricity in a
circuit

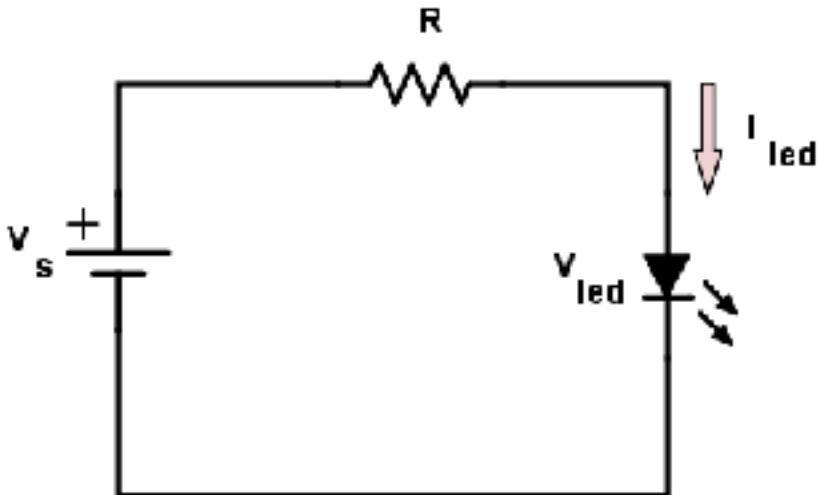




Set your multimeter to
Ohms, and the
maximum reading you
are expecting (range)



Place the probes
on each side of the
resistor to read
resistance.



Make this circuit, try
with many different
resistors and see the
difference in brightness.

What are variable resistors?

Variable resistors are materials or constructions that change resistance based on an environmental factor or change. A change in resistance can be used to change an LED, sound, motor, or measured by a micro controller



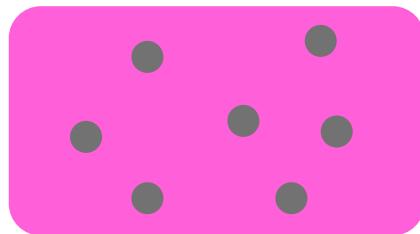
Method 1: conductive particles

Many materials contain conductive parts that can be brought together or separated with movement, helping or hindering the flow of electricity. This change in resistance is being physically made.

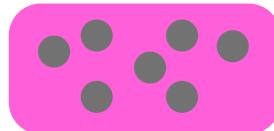
Velostat

Rubber with conductive particles in it

Natural



Squished



Sticky Sensor

[https://
www.instructabl
es.com/id/
Stickytape-
Sensors/](https://www.instructables.com/id/Stickytape-Sensors/)



DIY Conductive Rubber

instructables.com/id/Make-Conductive-Rubber-Transparent-stylus-iPodiP/



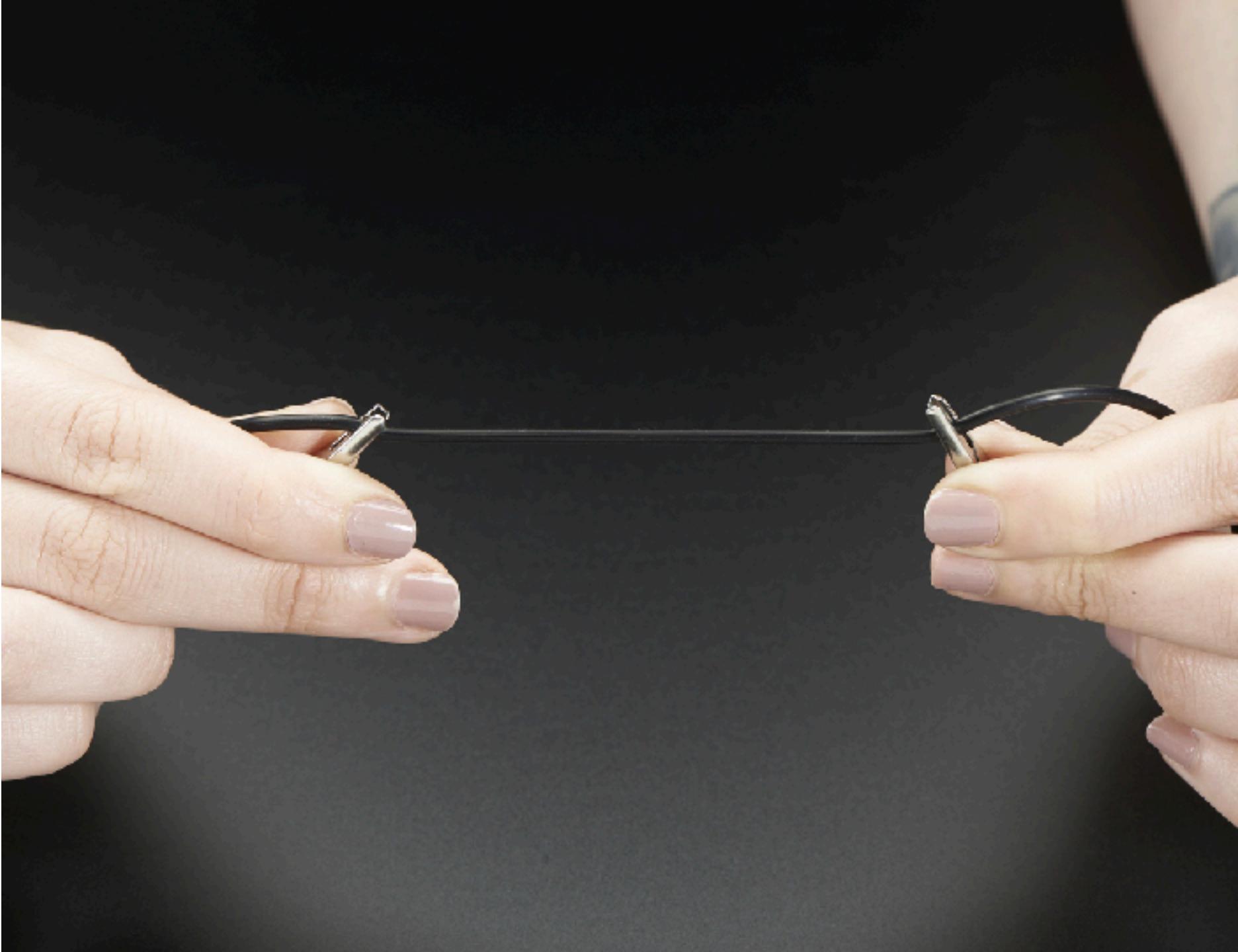
Bend Sensor

[https://
www.instructabl
es.com/id/
Neoprene-Bend-
Sensor-
IMPROVED/](https://www.instructables.com/id/Neoprene-Bend-Sensor-IMPROVED/)



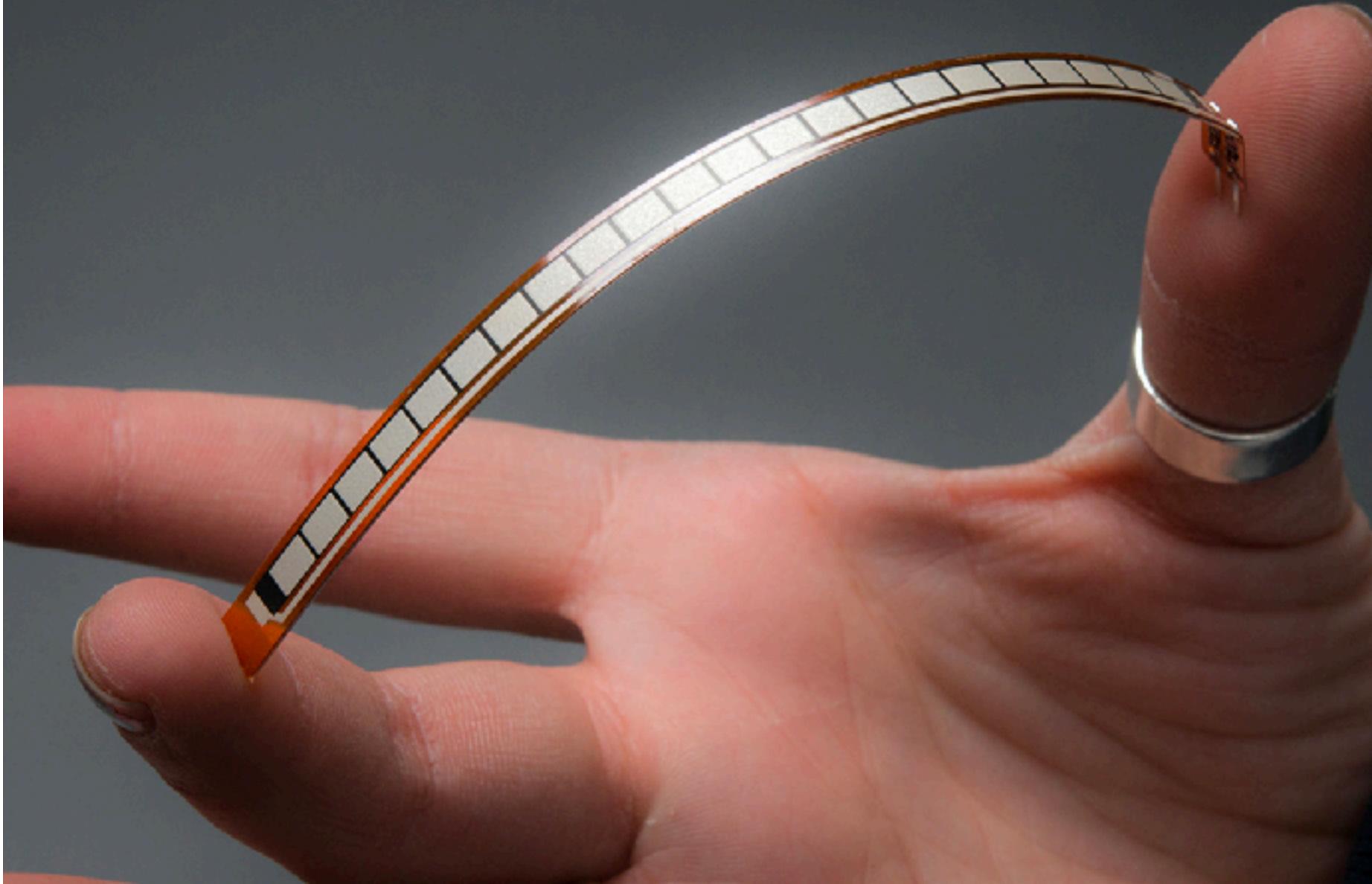
[https://
www.robotshop.
com/ca/en/
stretch-bend-
sensors.html](https://www.robotshop.com/ca/en/stretch-bend-sensors.html)

Stretch



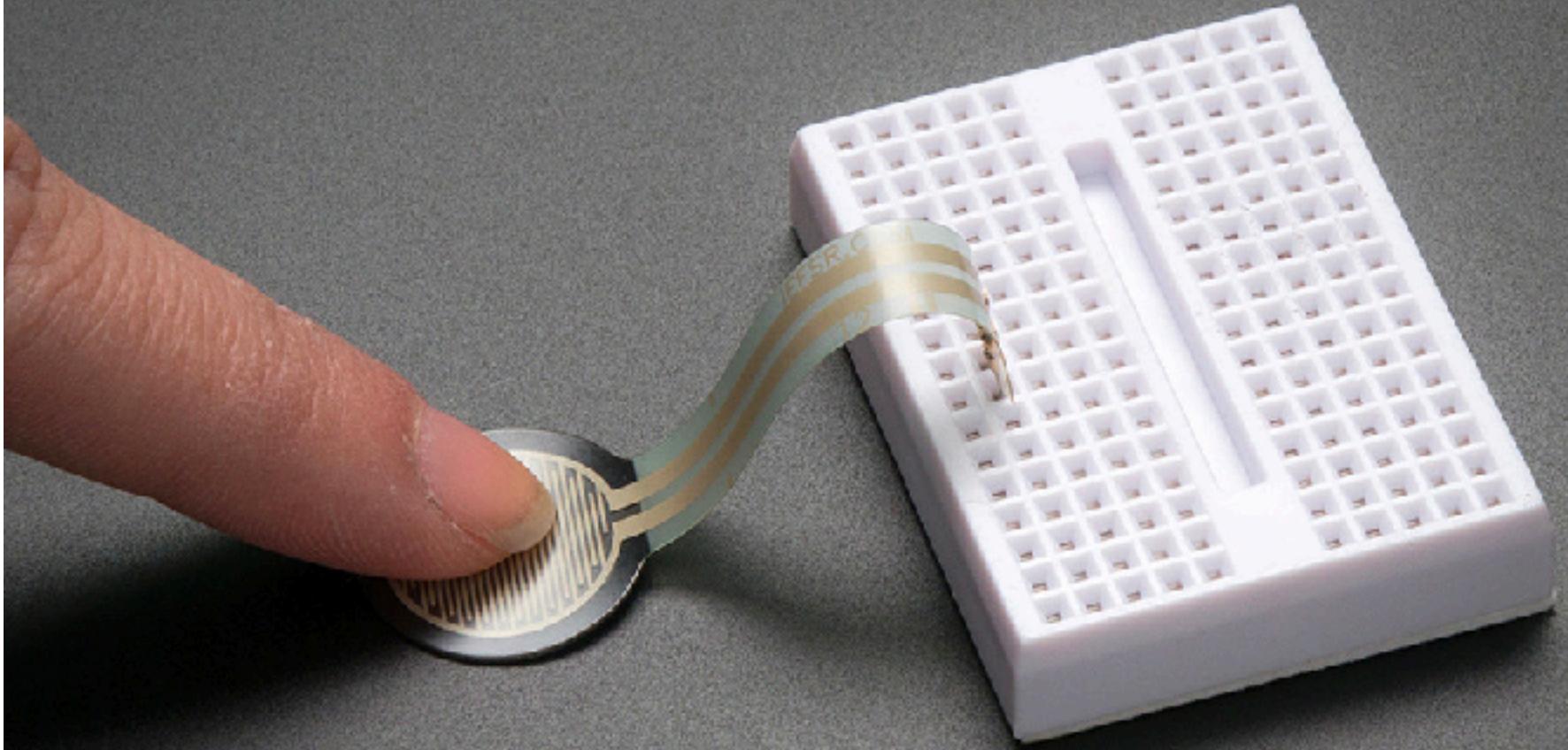
Flex Sensor

[https://
www.robotshop.
com/ca/en/
stretch-bend-
sensors.html](https://www.robotshop.com/ca/en/stretch-bend-sensors.html)



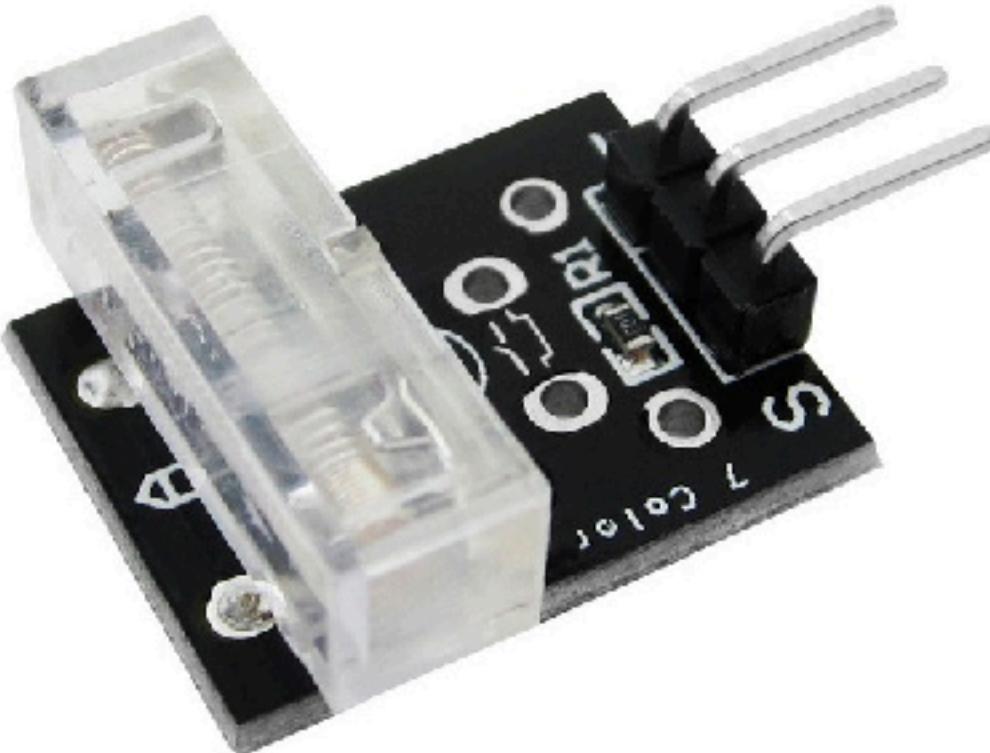
Force Sensing Resistor (FSR)

[https://
www.adafruit.co
m/product/166](https://www.adafruit.com/product/166)



[https://
www.adafruit.co
m/product/166](https://www.adafruit.com/product/166)

Knock Sensor (spring)



BEND IT!



Flex Sensors are made up of a combination of velostat and conductive traces that are more conductive as they bend together.

PULL IT!



Stretch sensors are made of a similar rubber, when they are stretched the particles move closer together and create a less resistive material!

SQUISH IT!



Method 2: Resistance

Resistive materials can be made into variable resistors by allowing the electricity to go through more, or less, of the material. Forcing the electricity through more of the resistive material will make more resistance. Shortening the path will make less resistance.

To Output To Battery



To Output Small amount of resistance

Resistive Material

To Output More resistance

To Batte



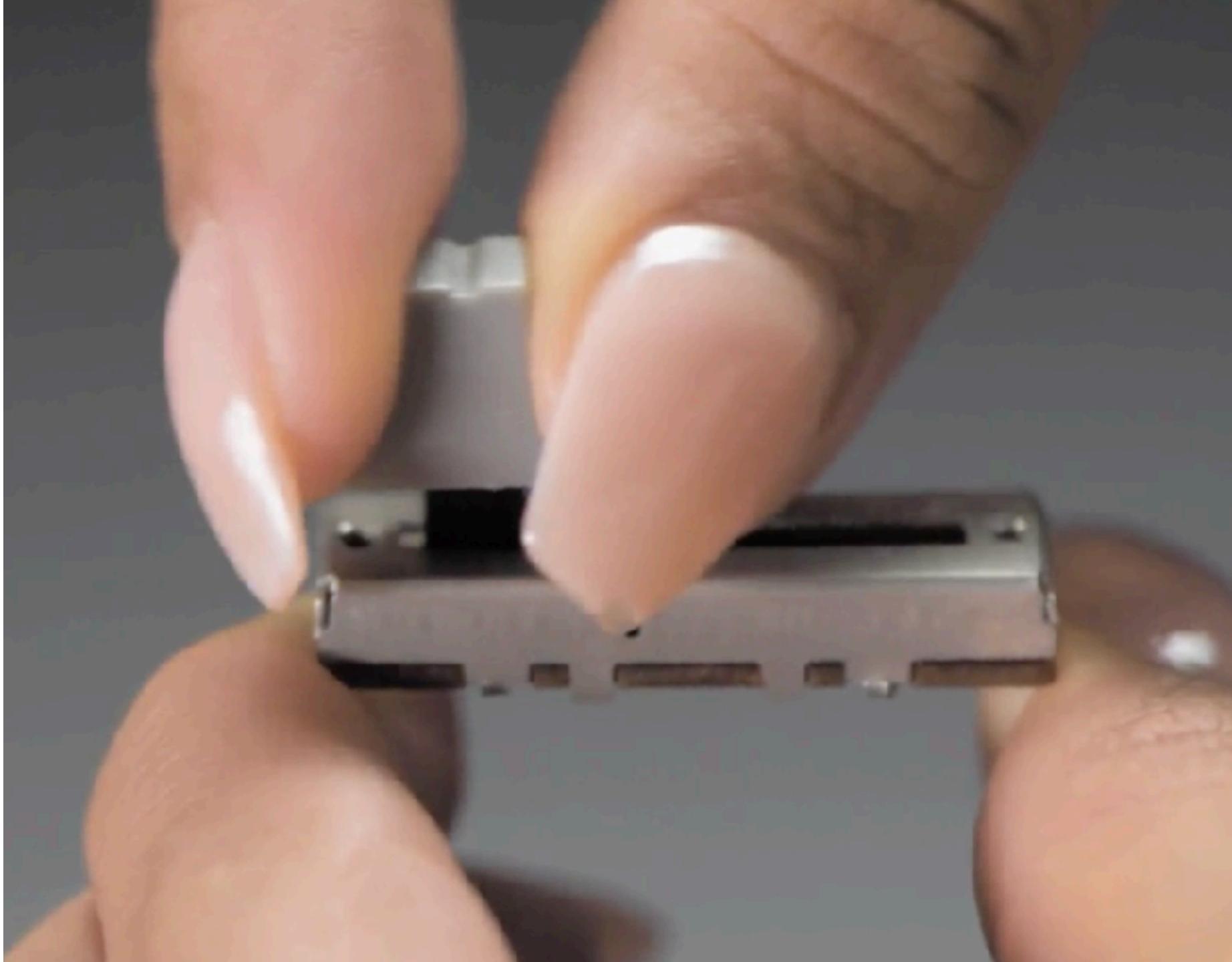
Large amount of resistance

Potentiometer



Linear Potentio meter

[https://
www.adafruit.co
m/product/4271](https://www.adafruit.com/product/4271)



Soft Potentio meter



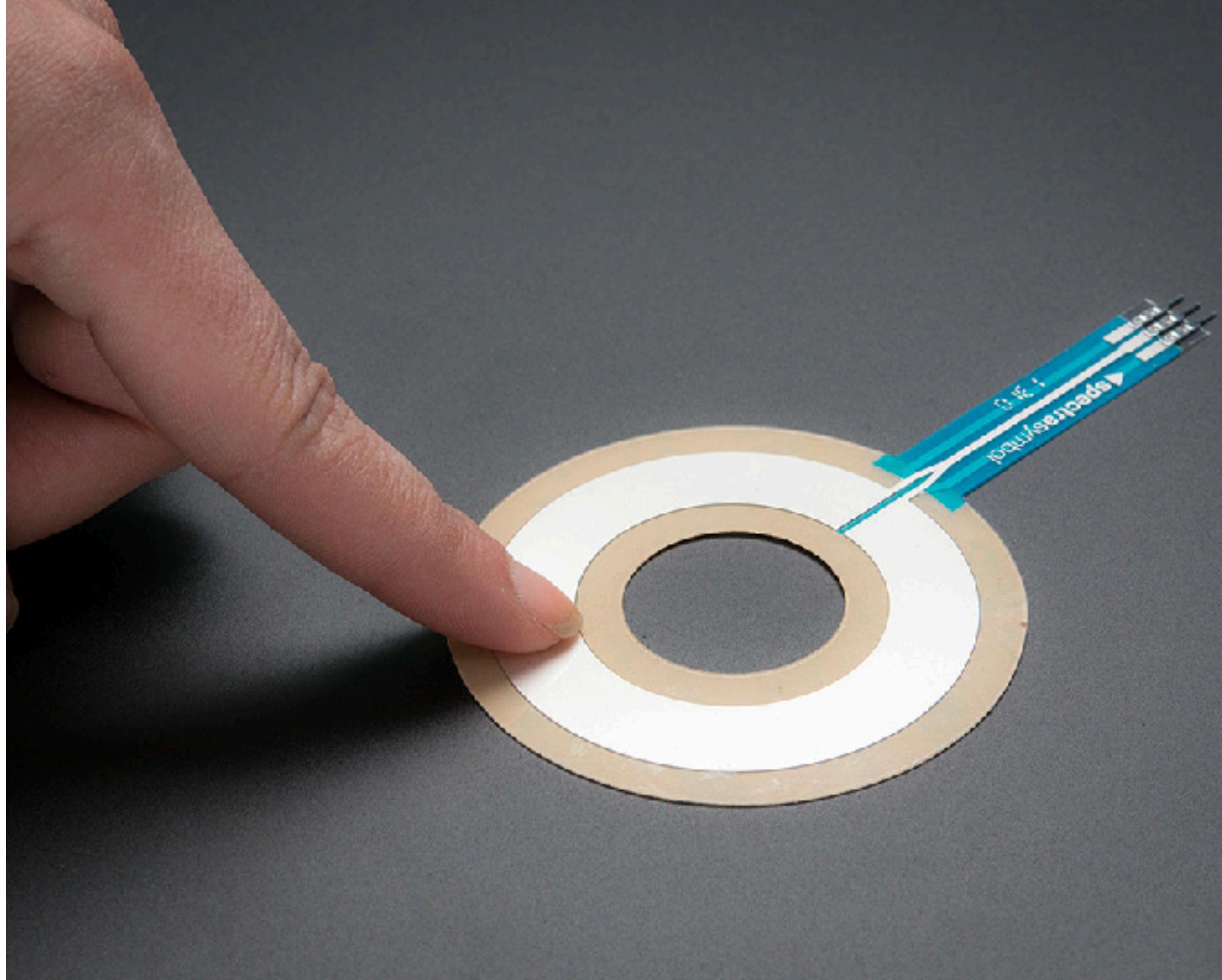
Soft Potentio meter

[https://
www.adafruit.co
m/product/178](https://www.adafruit.com/product/178)



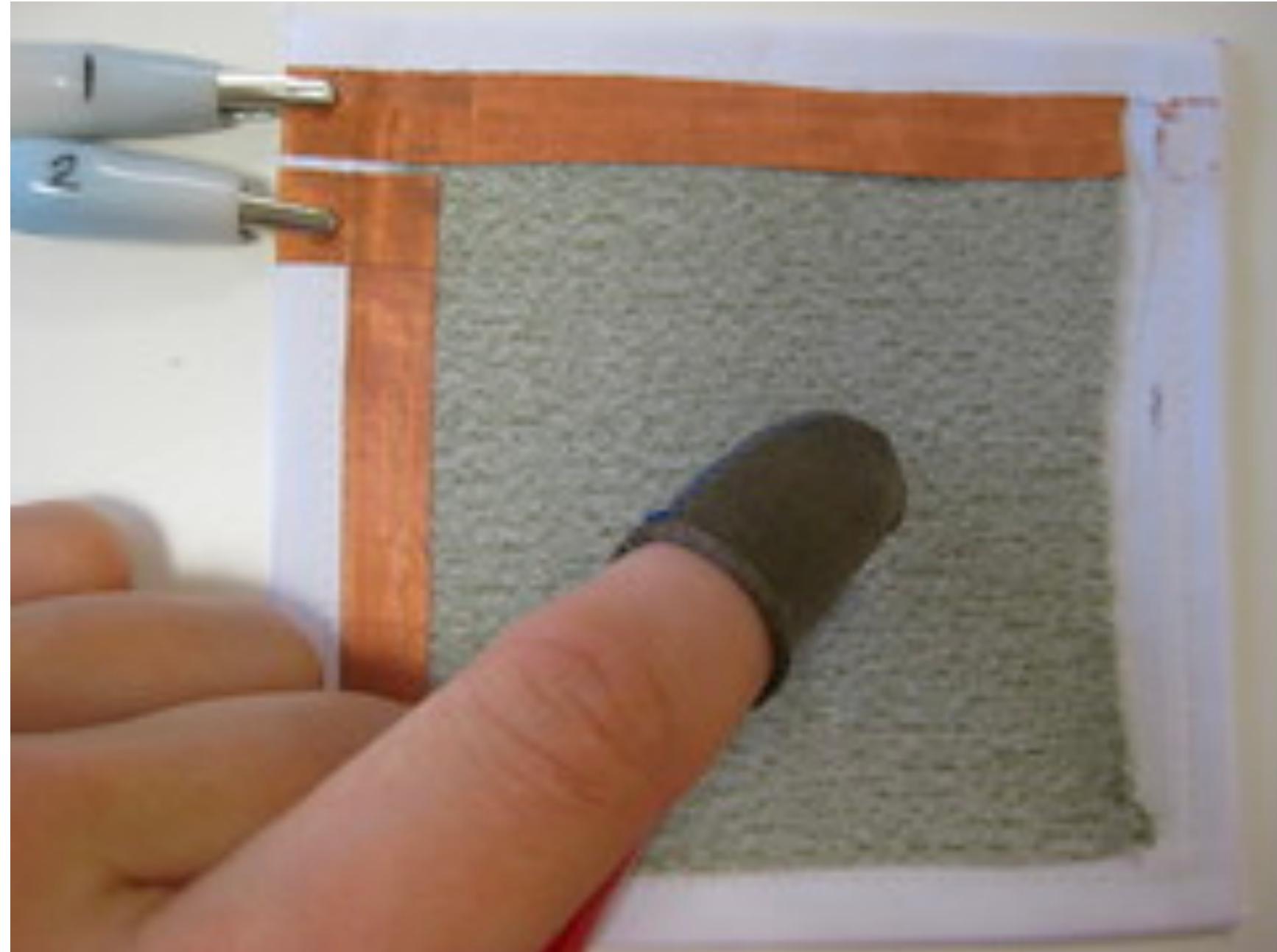
Linear Potentio meter

[https://
www.adafruit.co
m/product/1069](https://www.adafruit.com/product/1069)



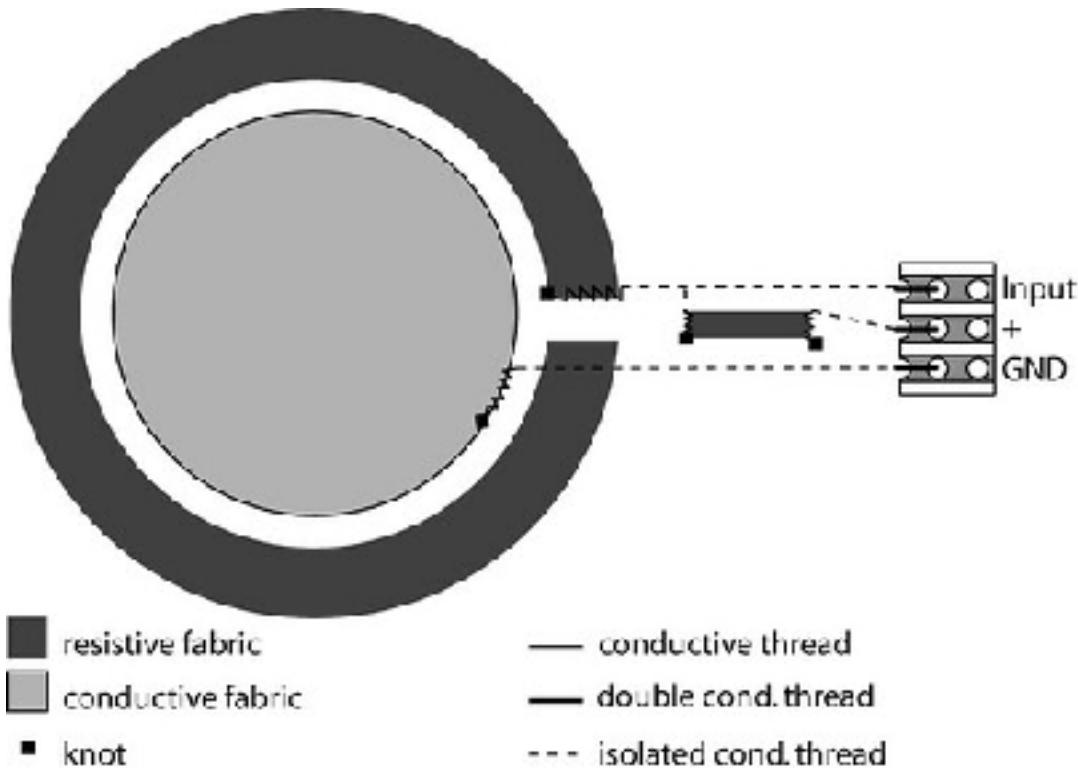
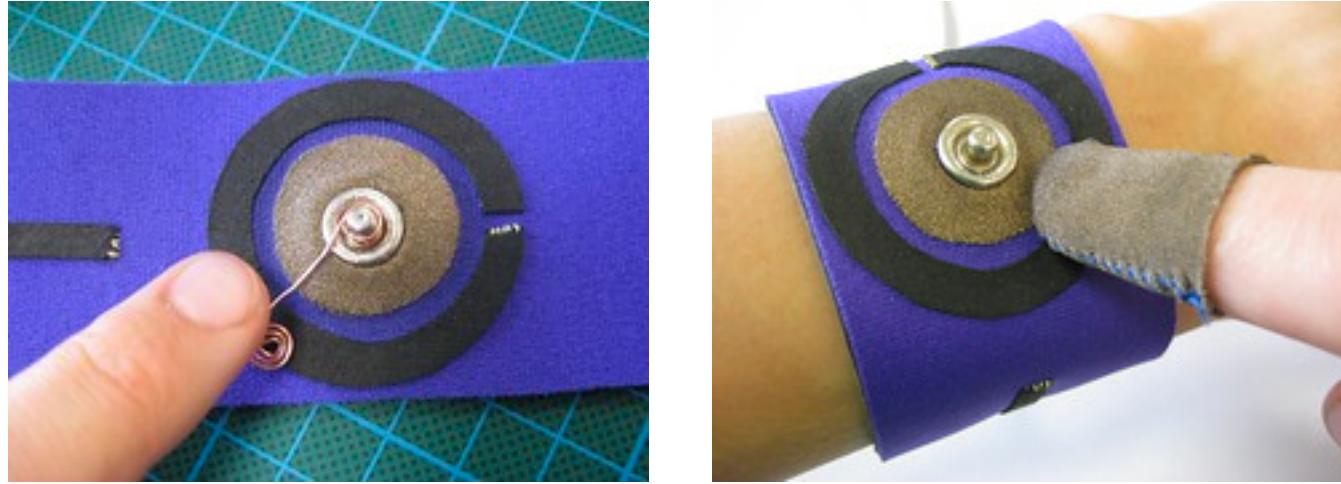
Linear Potentio meter

[https://
www.kobakant.a
t/DIY/?p=218](https://www.kobakant.at/DIY/?p=218)



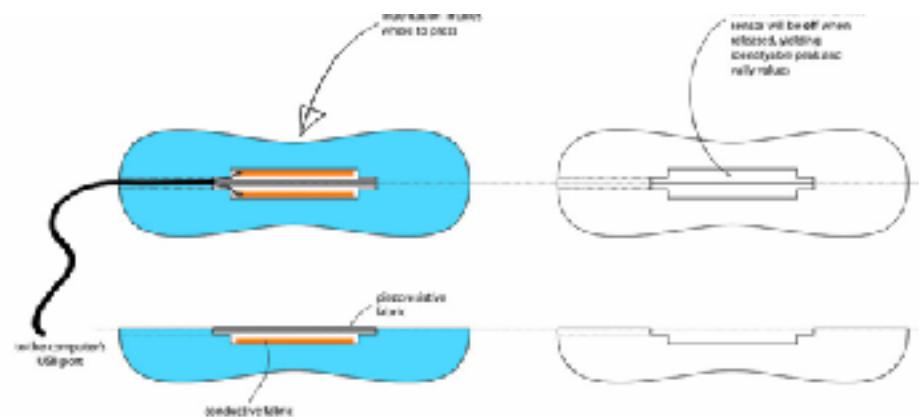
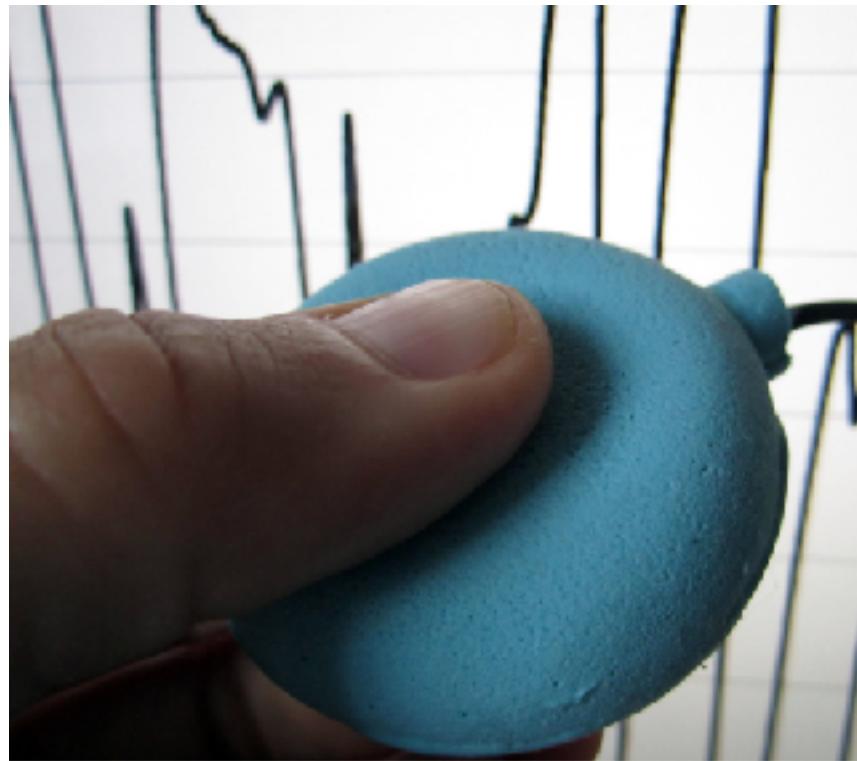
Soft Potentio meter

[https://
www.kobakant.a
t/DIY/?p=543](https://www.kobakant.at/DIY/?p=543)



Squishy potentio meter

[https://
www.kobakant.a
t/DIY/?p=7519](https://www.kobakant.at/DIY/?p=7519)



SLIDE IT!



TWIST IT!



SPIN IT!

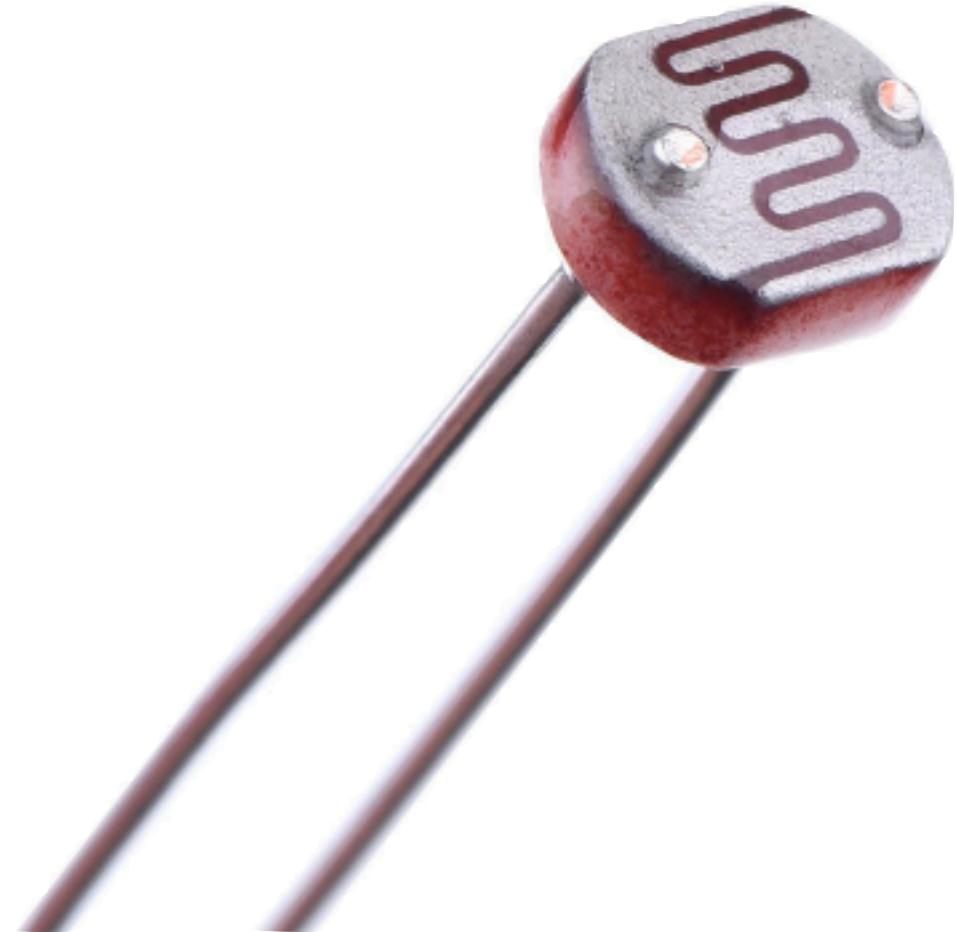


Method 3: Chemical properties

Some chemical properties vary in resistance

[https://
www.adafruit.co
m/product/1069](https://www.adafruit.com/product/1069)

Photocell, light dependant resistor LDR



<https://www.amazon.com/TOTOT-Thermal-Normally-Thermostat-Temperature/dp/B07KWKP9NY>

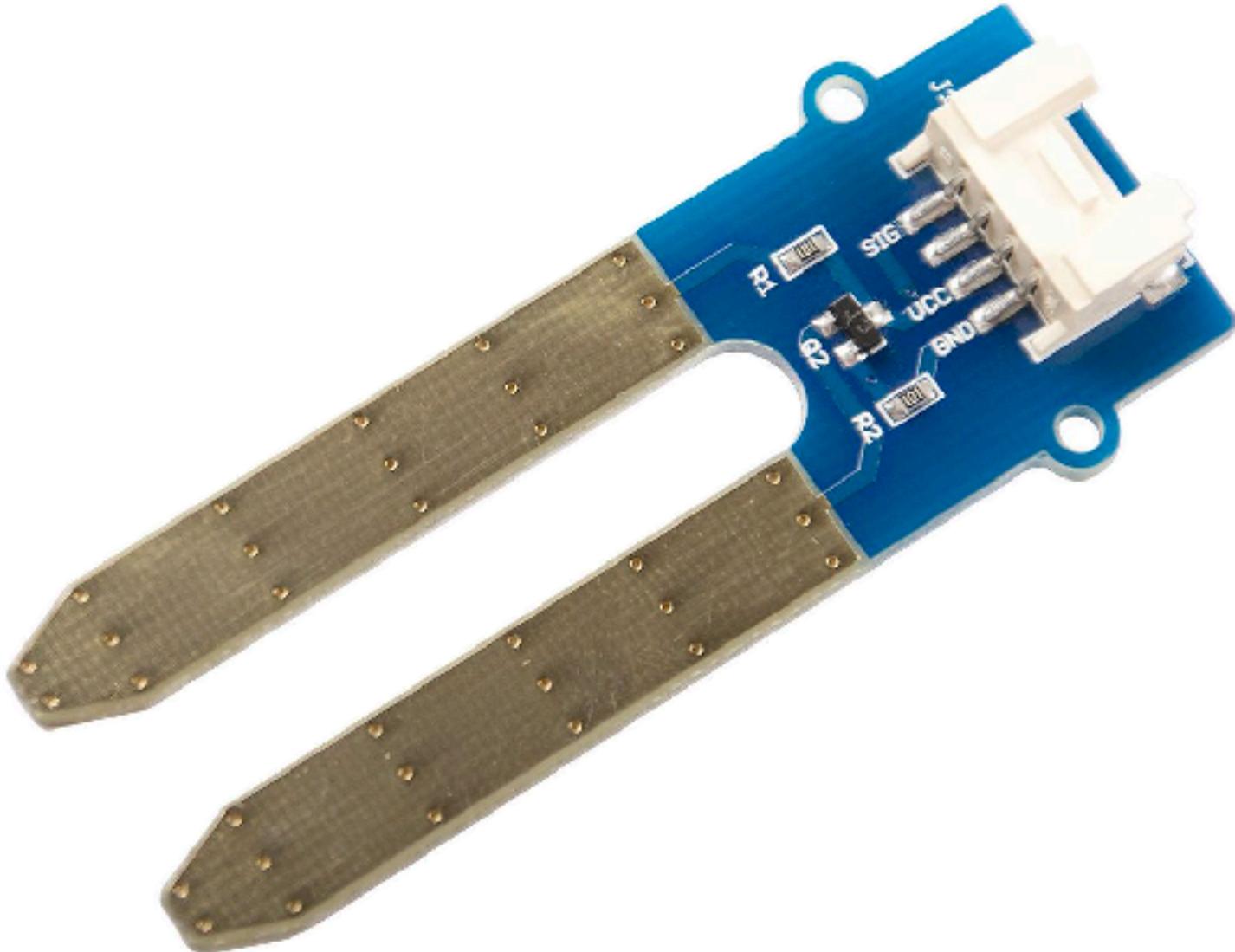
<https://www.amazon.com/Electronics-Salon-Normally-Thermostat-Assortment-Temperature/dp/>

Temperature switch



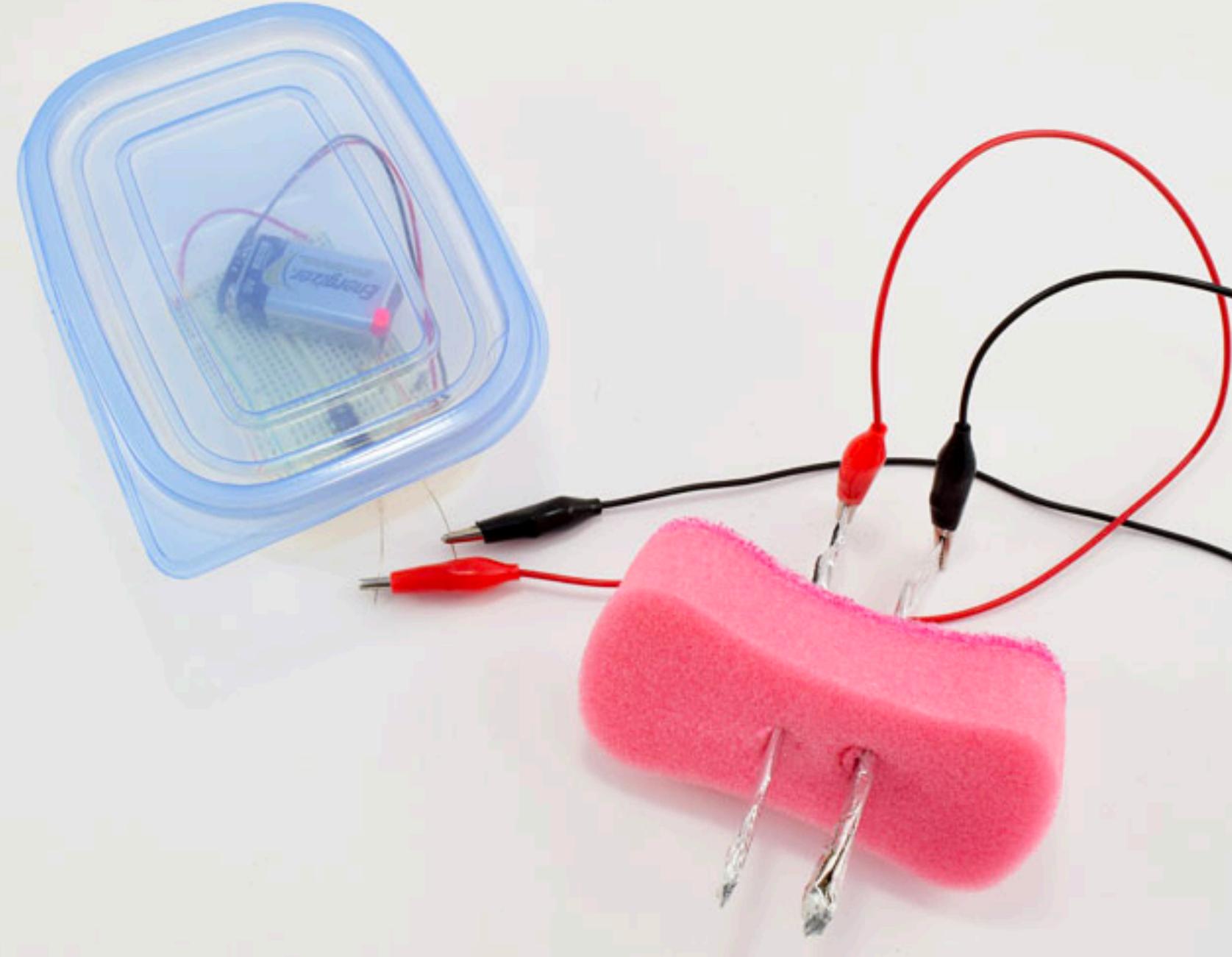
Moisture Sensor

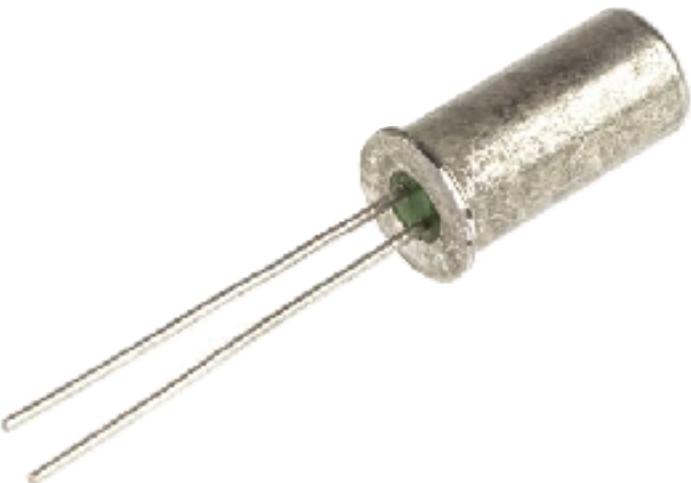
[https://
www.instructabl
es.com/id/DIY-
SOIL-
MOISTURE-
SENSOR-
CHEAP-YET-
ACCURATE-/](https://www.instructables.com/id/DIY-SOIL-MOISTURE-SENSOR-CHEAP-YET-ACCURATE/)



Moisture Sensor

<https://www.instructables.com/id/DIY-SOIL-MOISTURE-SENSOR-CHEAP-YET-ACCURATE/>





Magnetic
Switch /
Reed Switch

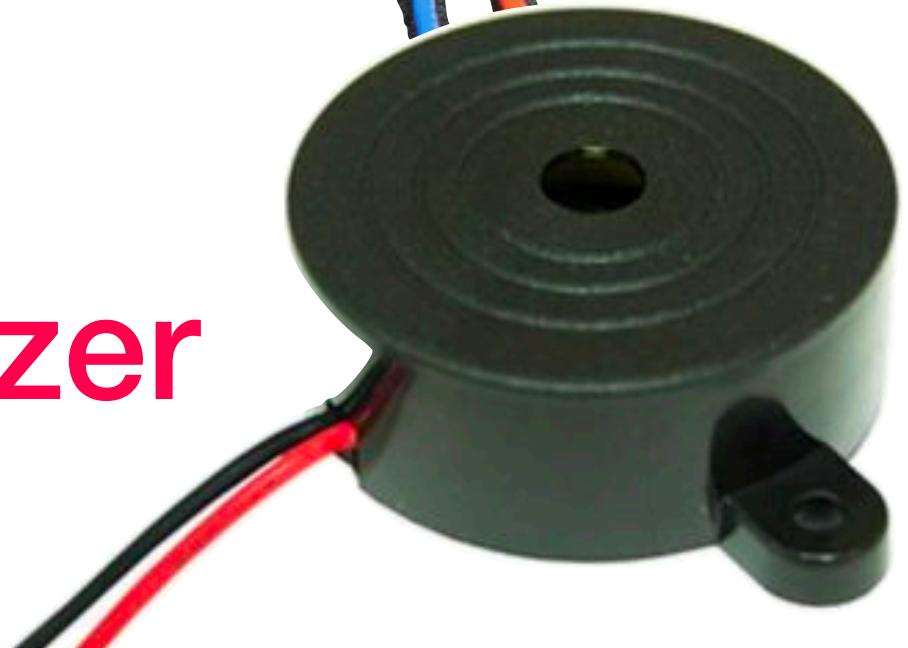


Tilt
Switch /
sensor

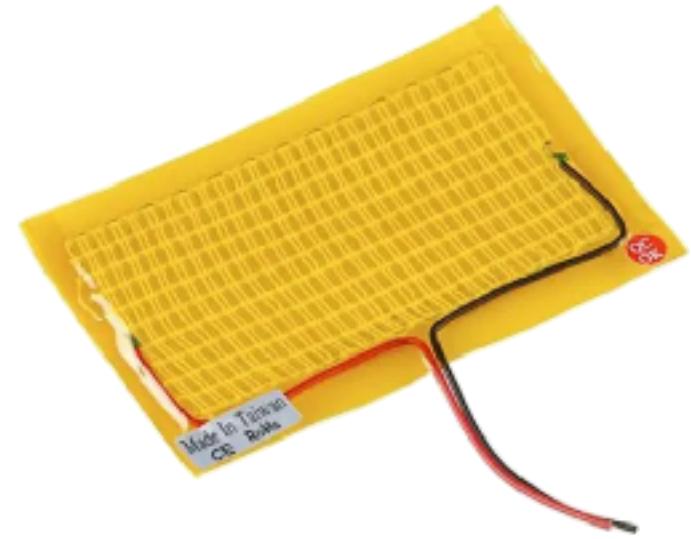
Vibration
Motor



Buzzer



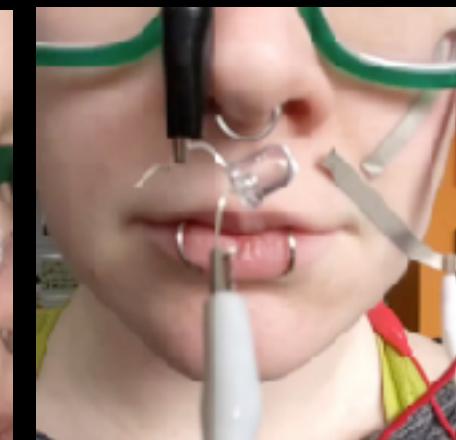
Fan



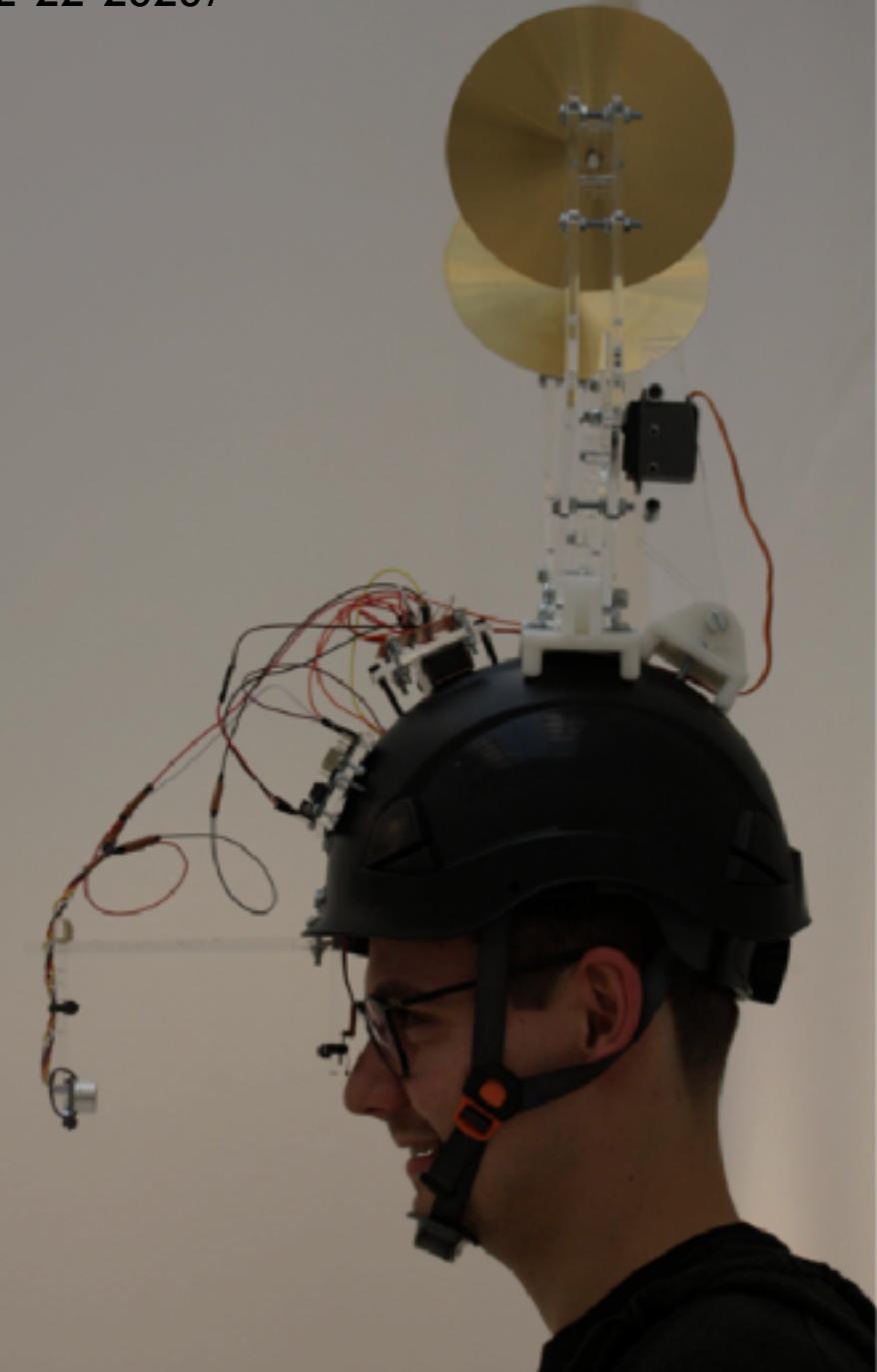
Heating
pad

Peltier





zhang
as gossner



Sway Sensor

[https://
www.instructabl
es.com/id/12-
Ways-to-Store-
Your-Coin-cells/](https://www.instructables.com/id/12-Ways-to-Store-Your-Coin-cells/)



EARTHQUAKE
DETECTION
KIT



Wimper switch (ant sensor)

[https://
www.kobakant.a
t/DIY/?p=5495](https://www.kobakant.at/DIY/?p=5495)



Ways to hold coin cells

<https://www.instructables.com/id/12-Ways-to-Store-Your-Coin-cells/>



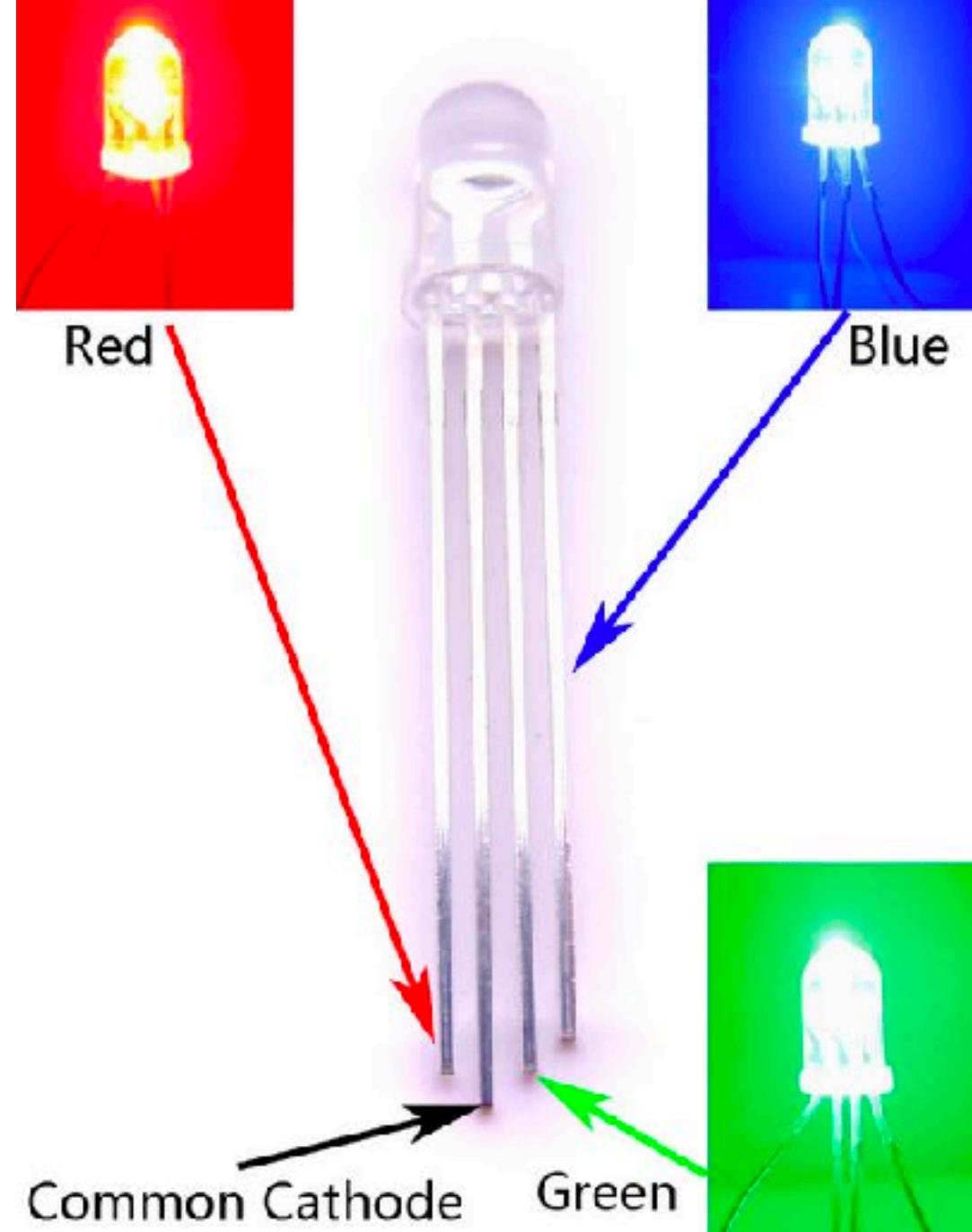
In Class exercise

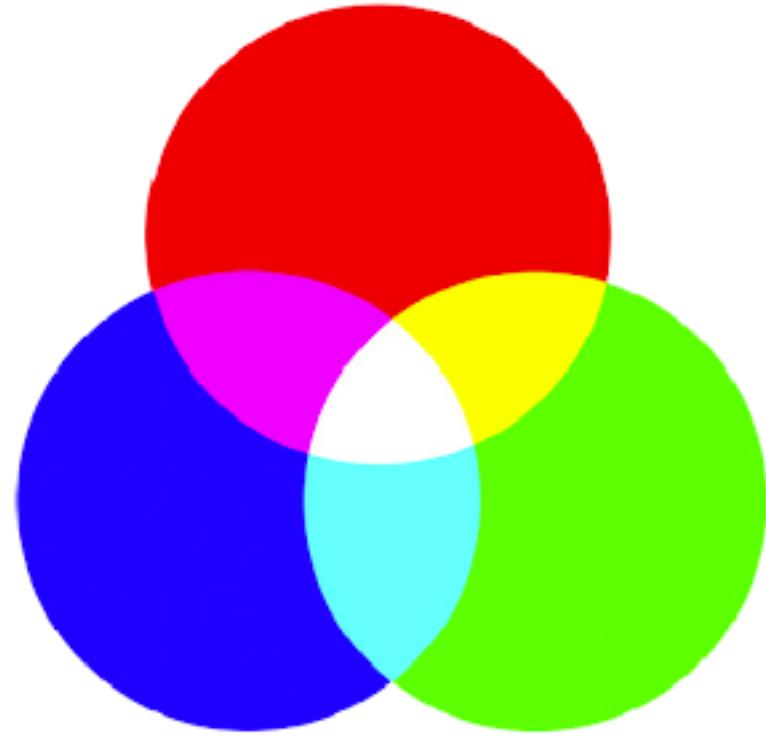
[https://
www.instructables.
com/id/Color-
Mixing-LED-
Bracelet/](https://www.instructables.com/id/Color-Mixing-LED-Bracelet/)

RGB color mixer Bracelet



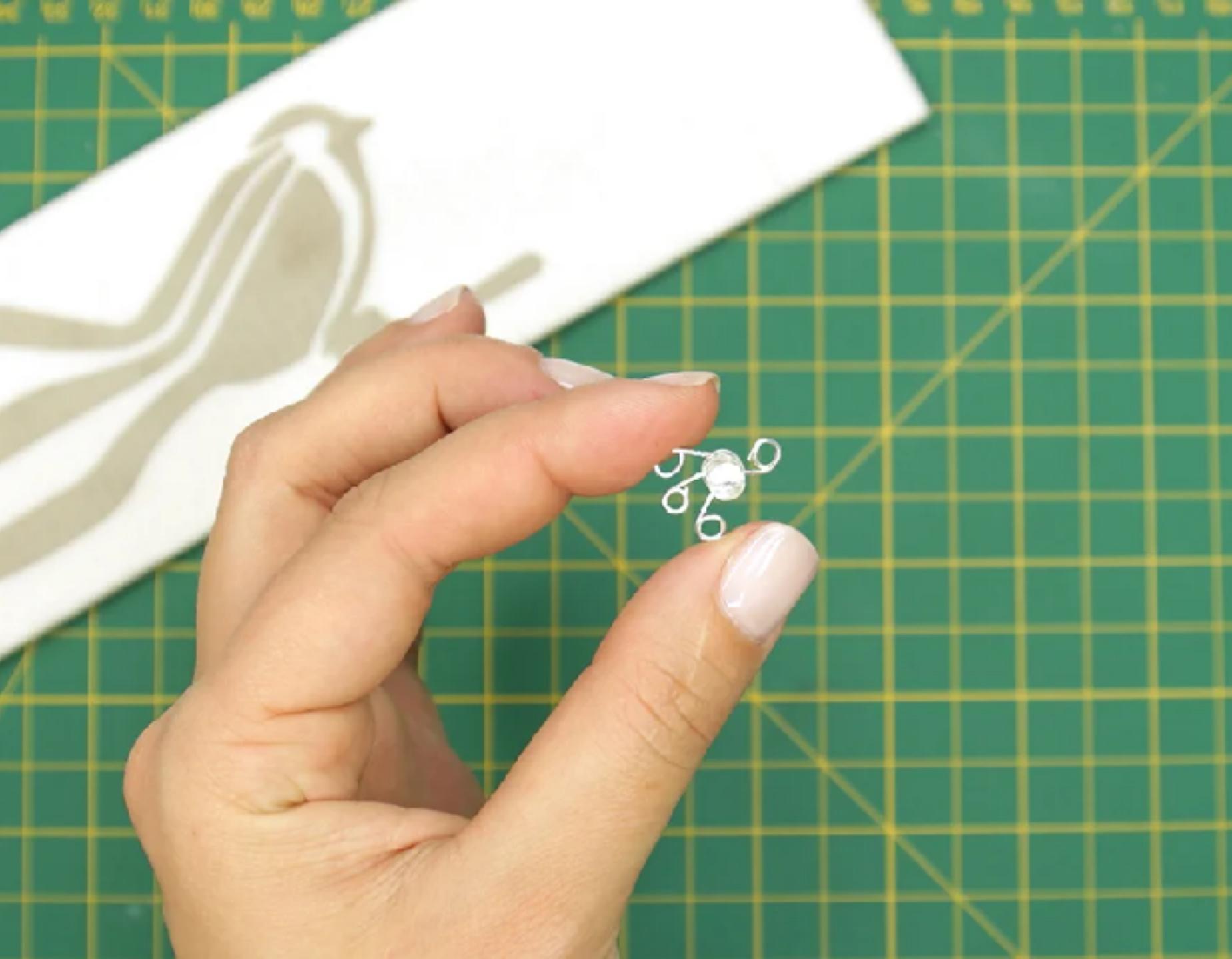
RGB LED

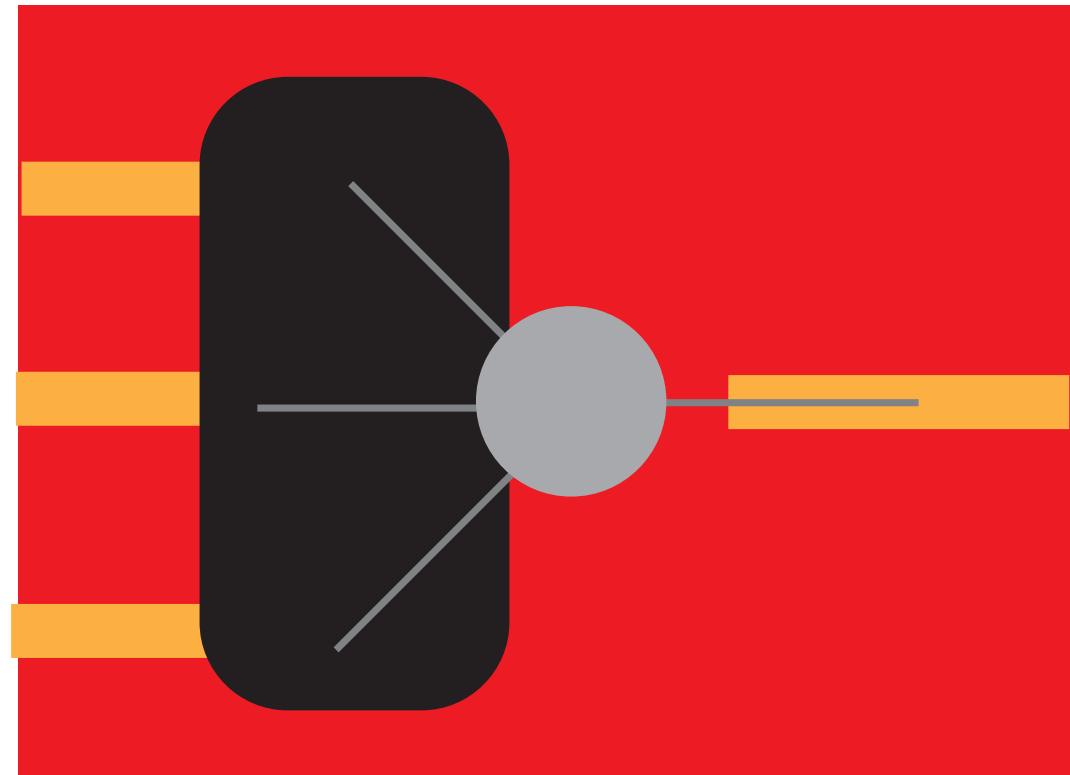
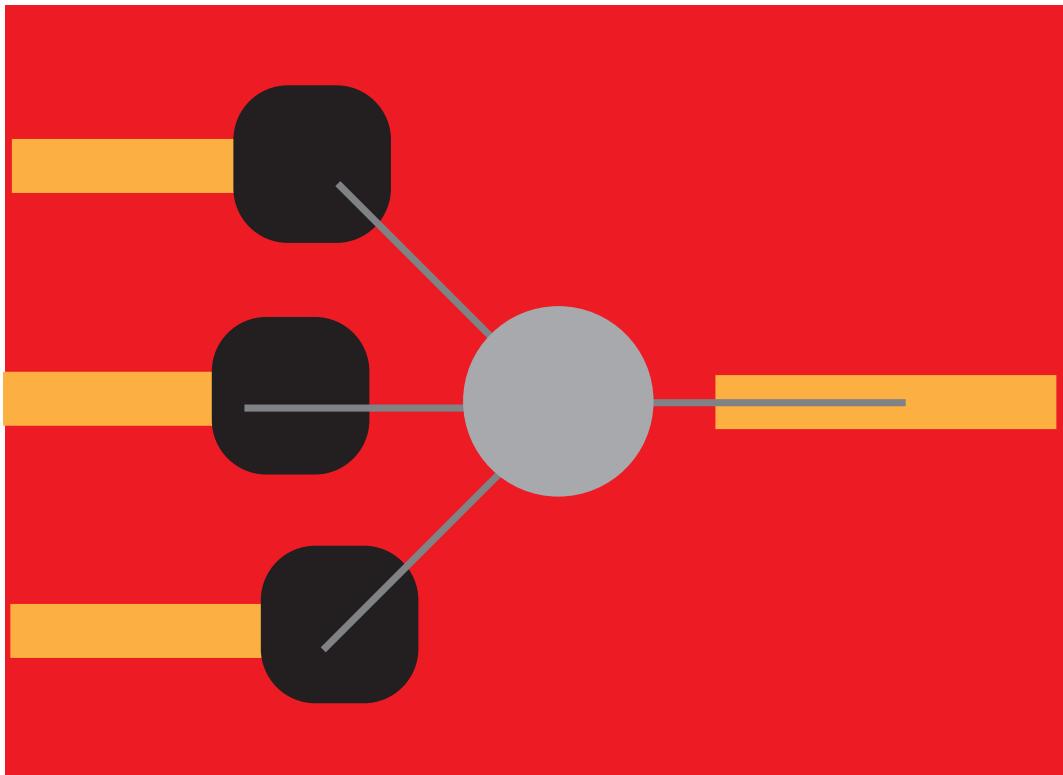




[https://
www.instructables.
com/id/DIY-SOIL-
MOISTURE-
SENSOR-
CHEAP-YET-
ACCURATE-/-](https://www.instructables.com/id/DIY-SOIL-MOISTURE-SENSOR-CHEAP-YET-ACCURATE-/)

RGB LED





Silly Sensor Assignment

Due October 2, 15%

Create a circuit that senses something: an interaction, a change, a situation, an event. The circuit can live on a body, a wall, a table, inside an object, hidden or visible. The circuit should in some way (light, movement, vibration, buzzer, heat) let the user know that something has happened. Use the techniques we discussed in class to create a refined object that can clearly sense something.

Be creative, consider a complex or specific interaction in a particular scenario. No high five or hug sensors. Consider clever placement of your sensor inside/around objects/people/places to create an interaction.

- A light sensor
- A bend or pressure sensor
- Any DIY sensor
- A button or switch (DIY, traditional, magnetic, tilt, etc)

Your piece should feel complete: ex no alligator clips or loose wiring.

Documentation should include a PDF with:

- A description of the project.
- A material & parts list.
- Images of iteration and process
- A clear, strong image or images of the completed project.