

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

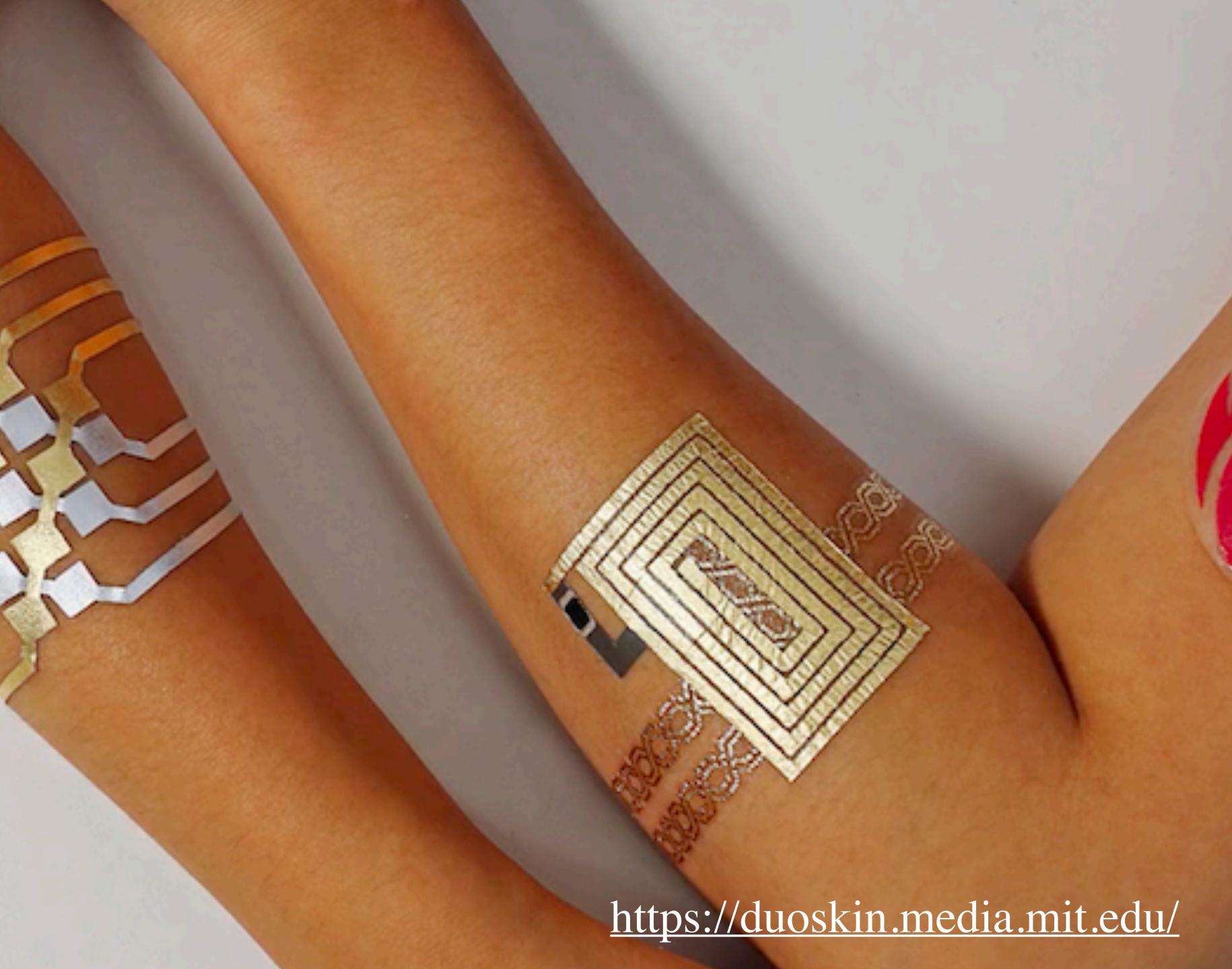
TIME	MON	TUE	WED	THU	FRI
8:00					
9:00					
9:30					
10:00					
10:30	OPEN				
11:00	LAB*				
11:30					
12:00					
12:30					
13:00		OPEN			
13:30	IMCA 220	LAB*			
14:00		13:00-16:30			
14:30					
15:00					
15:30					
16:00					
16:30					
17:00					
17:30					



Lisa Hartje



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



# Duo Skin

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



# Cyberknitcs

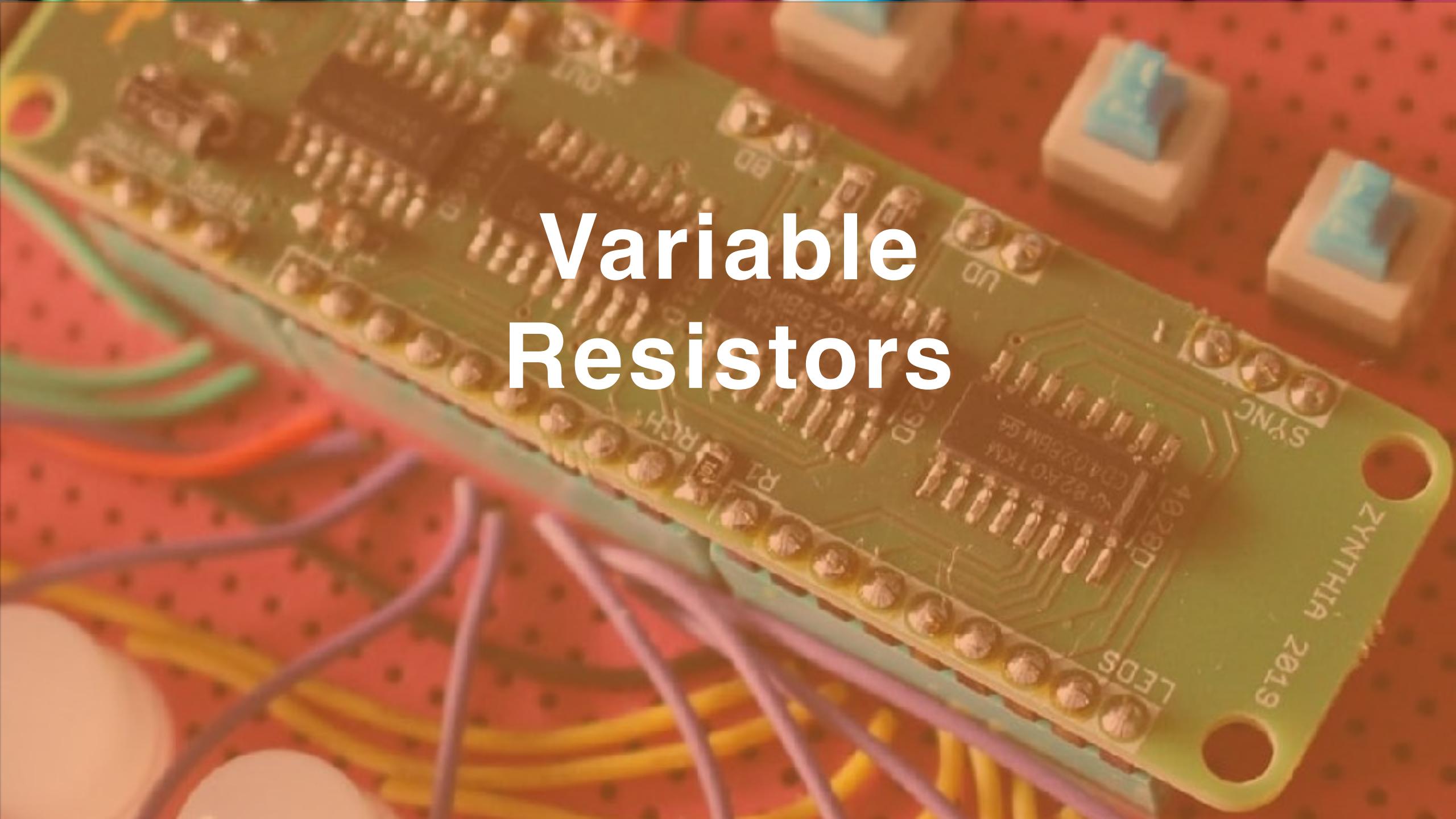
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<http://teresafourlamb.com/cyberknitcs.html>

## **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

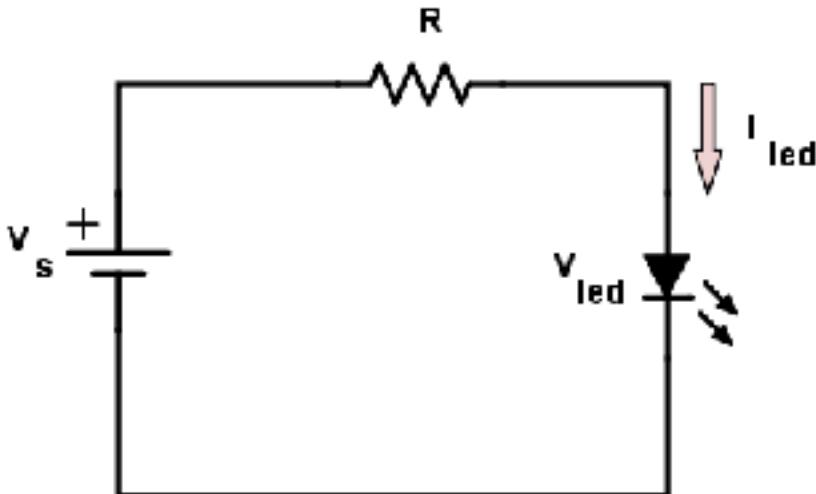




Set your multimeter to  
Ohms, and the  
maximum reading you  
are expecting (range)



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



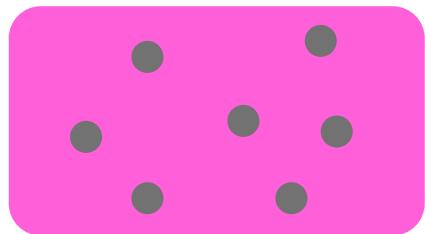
# Method 1: conductive particles

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.

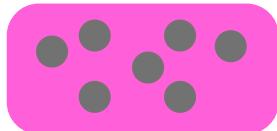
# Velostat

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/](http://instructables.com/id/Make-Conductive-Rubber-Transparent-stylus-iPodiP/)



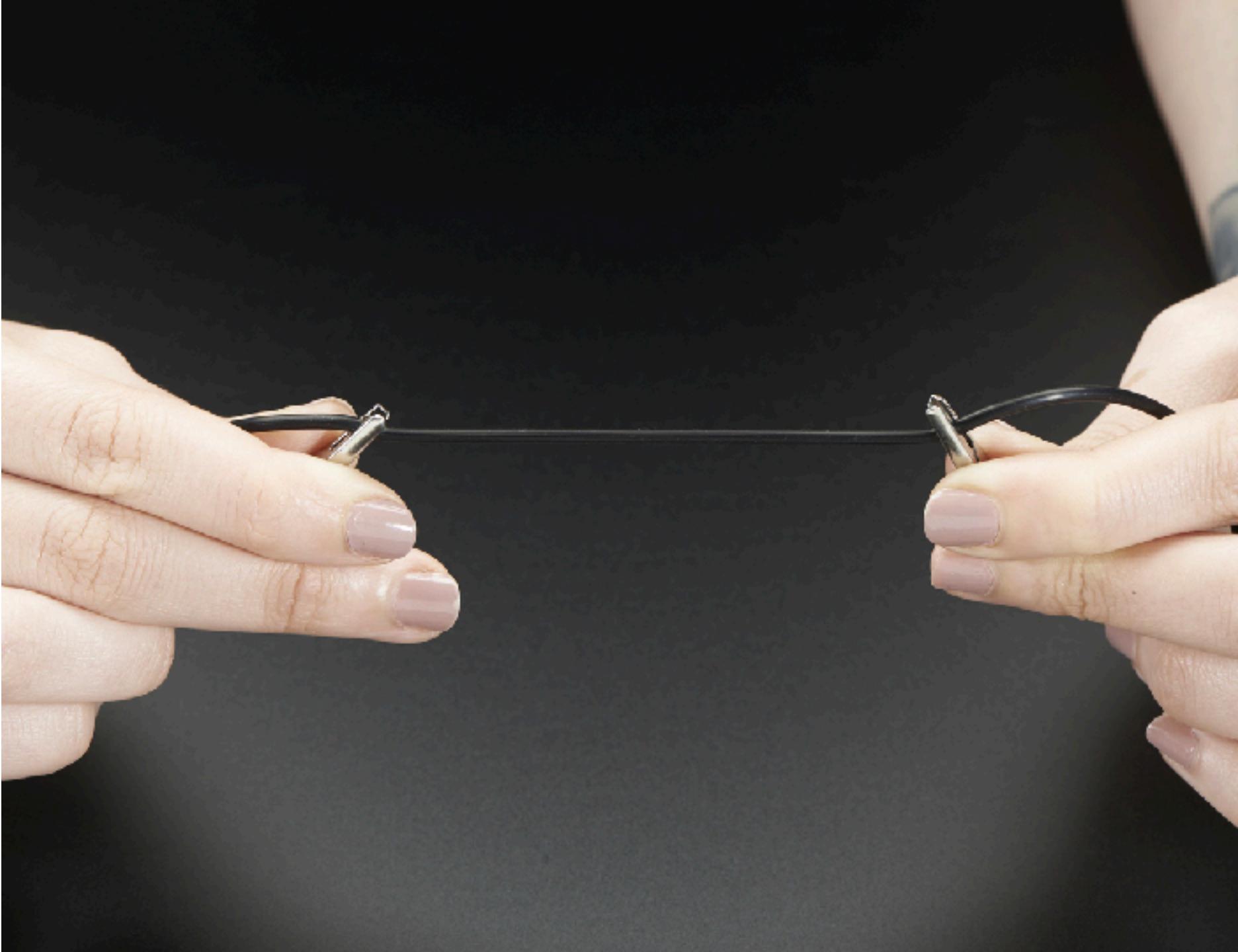
# Bend Sensor

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



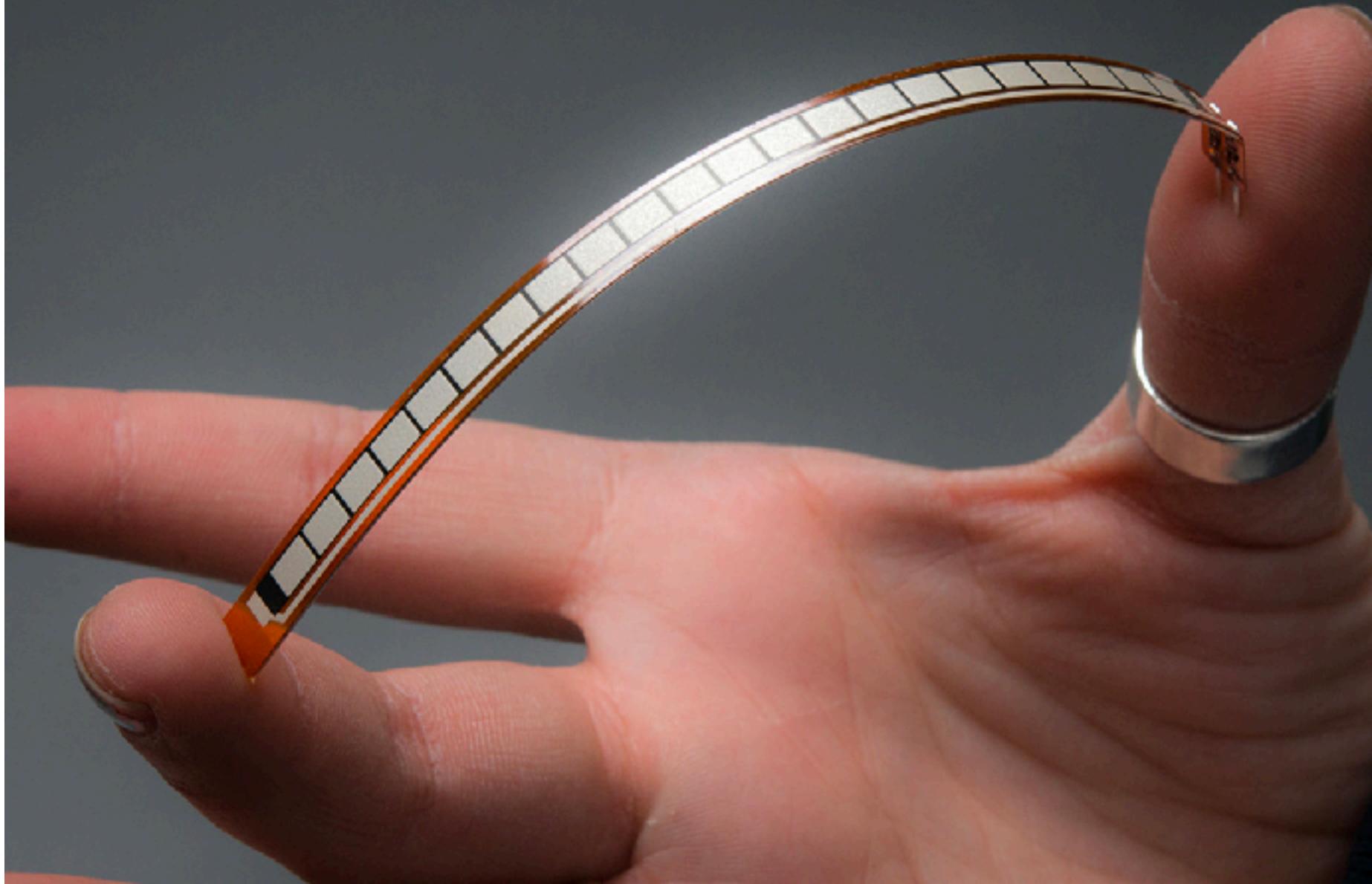
[https://  
www.robotshop.  
com/ca/en/  
stretch-bend-  
sensors.html](https://www.robotshop.com/ca/en/stretch-bend-sensors.html)

# Stretch



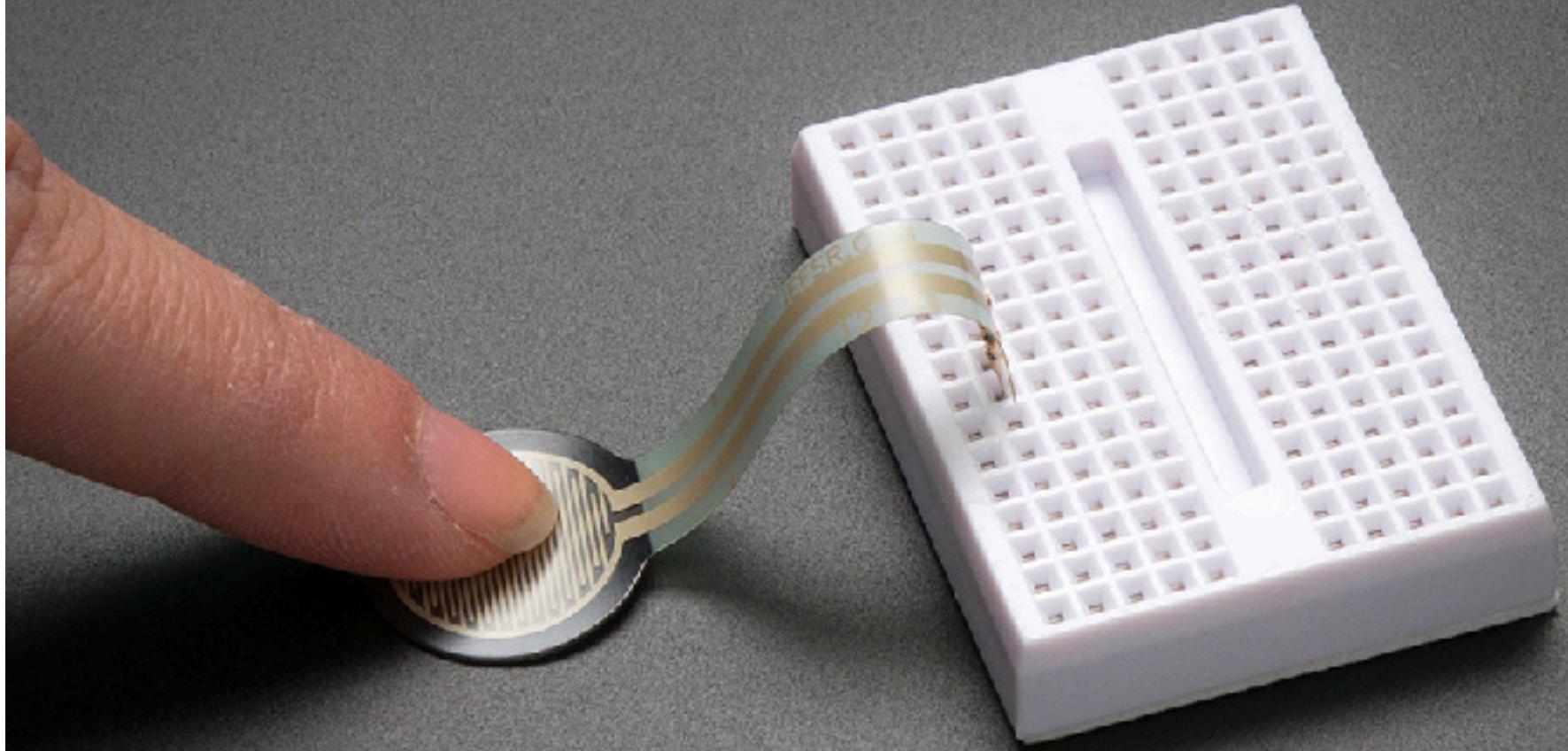
# Flex Sensor

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



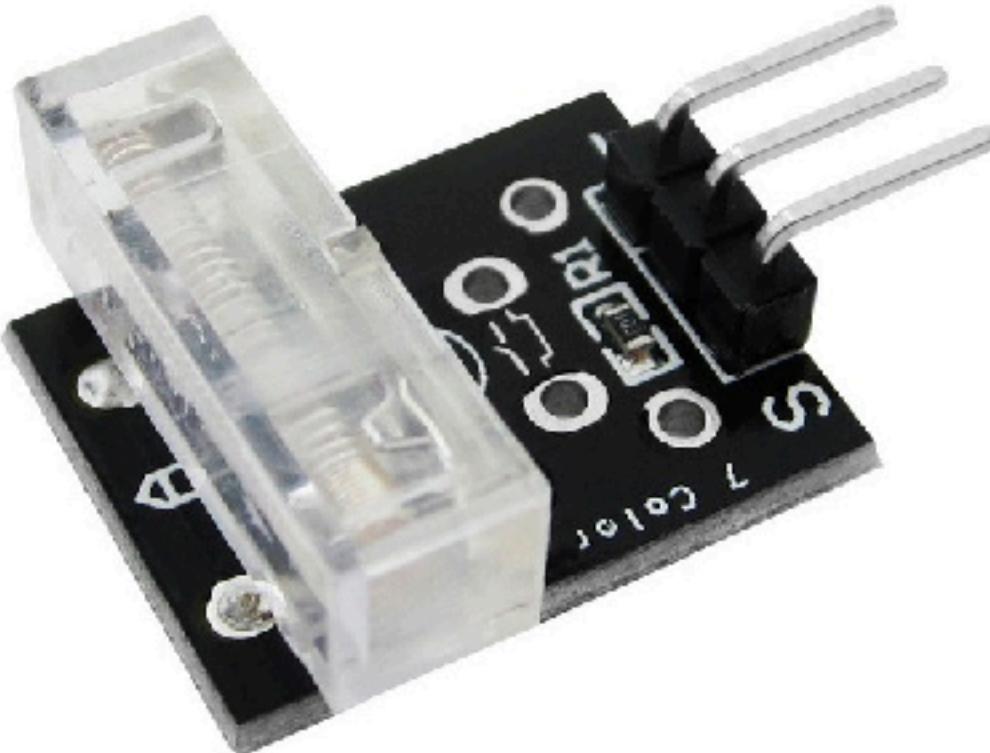
# Force Sensing Resistor (FSR)

[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



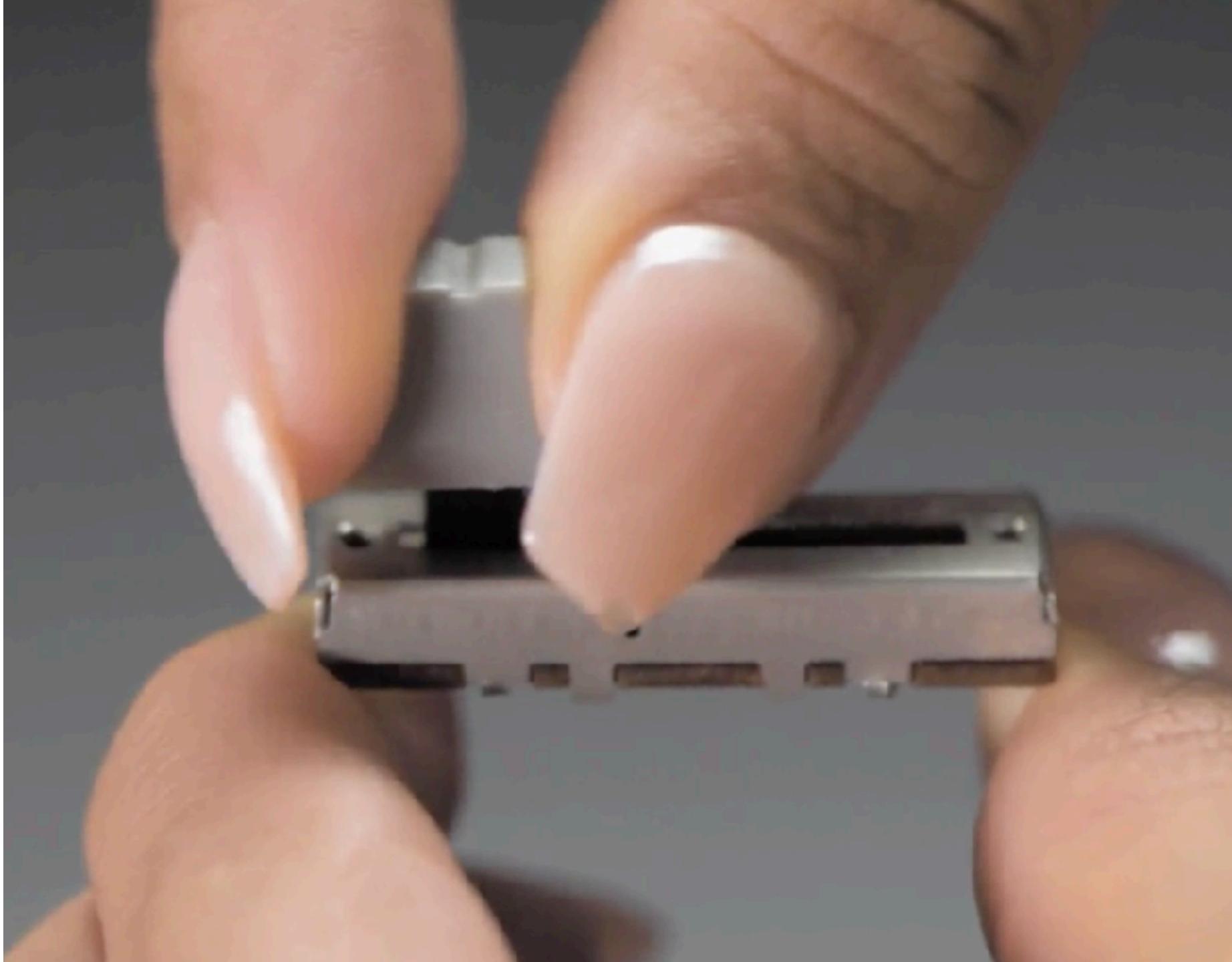
Large amount of resistance

# Potentiometer



# Linear Potentio meter

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

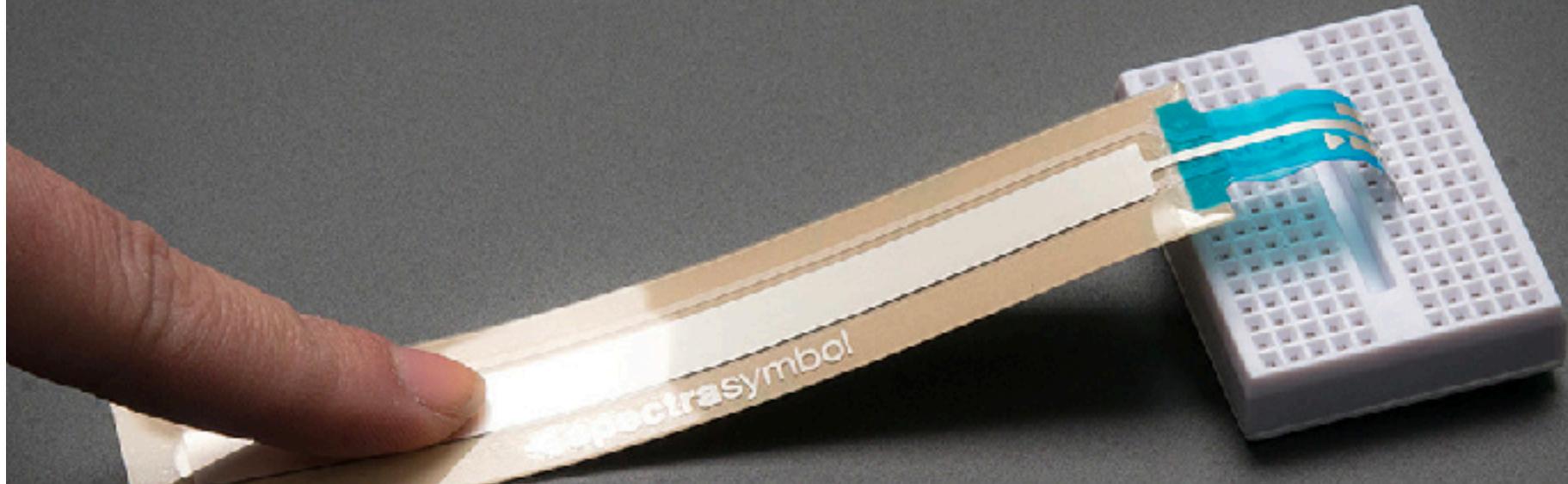


# Soft Potentio meter



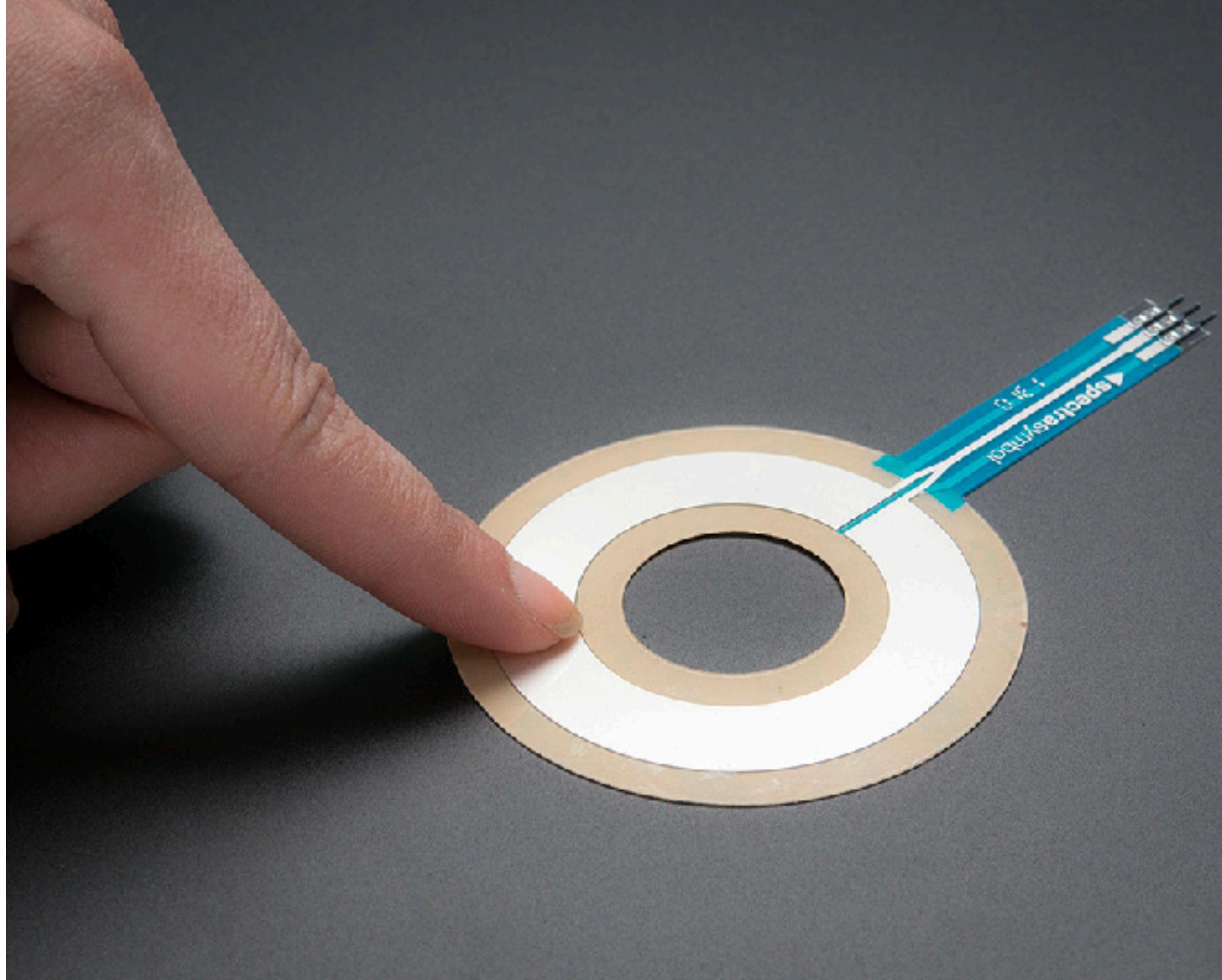
# Soft Potentio meter

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



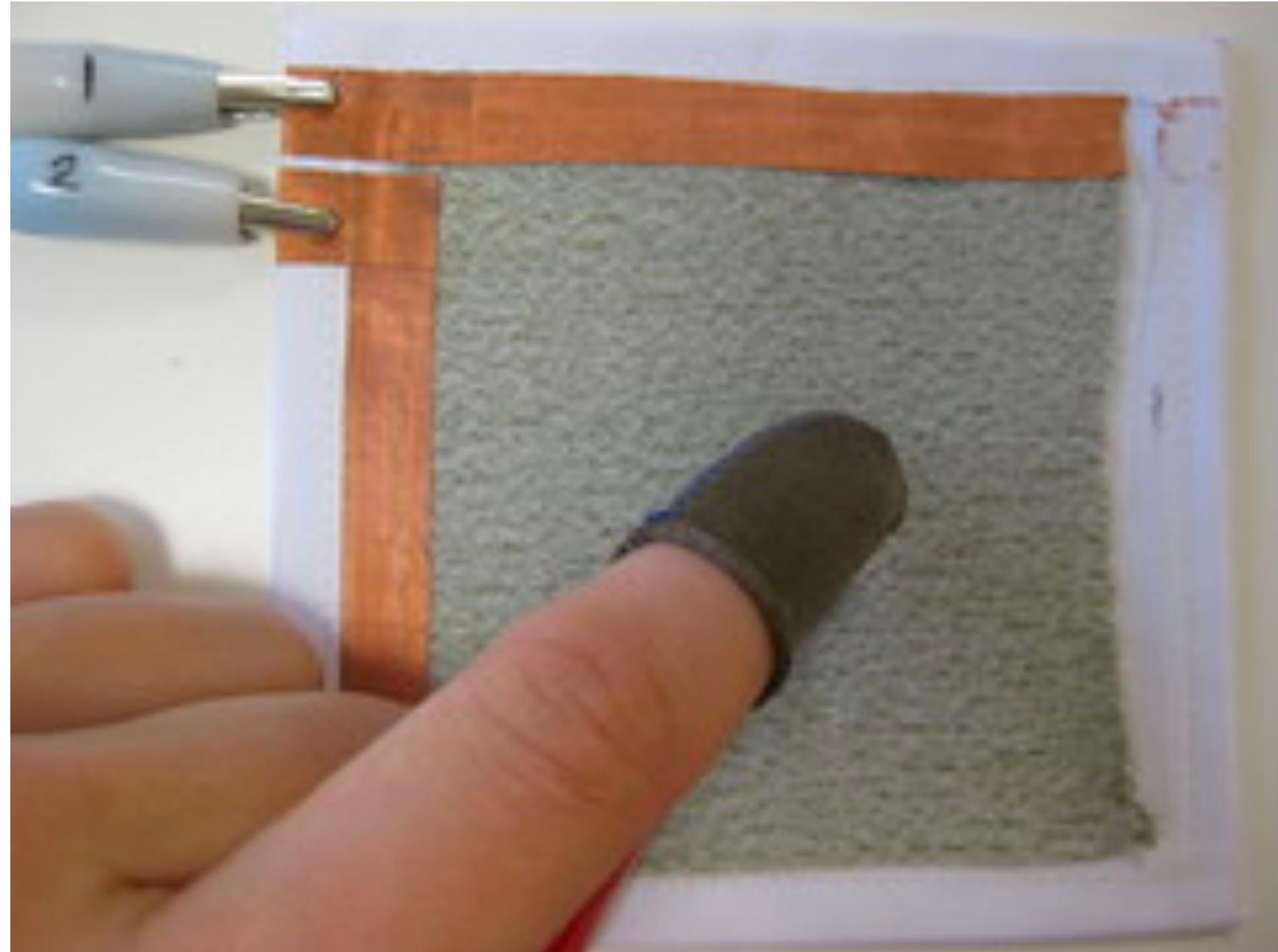
# Linear Potentio meter

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



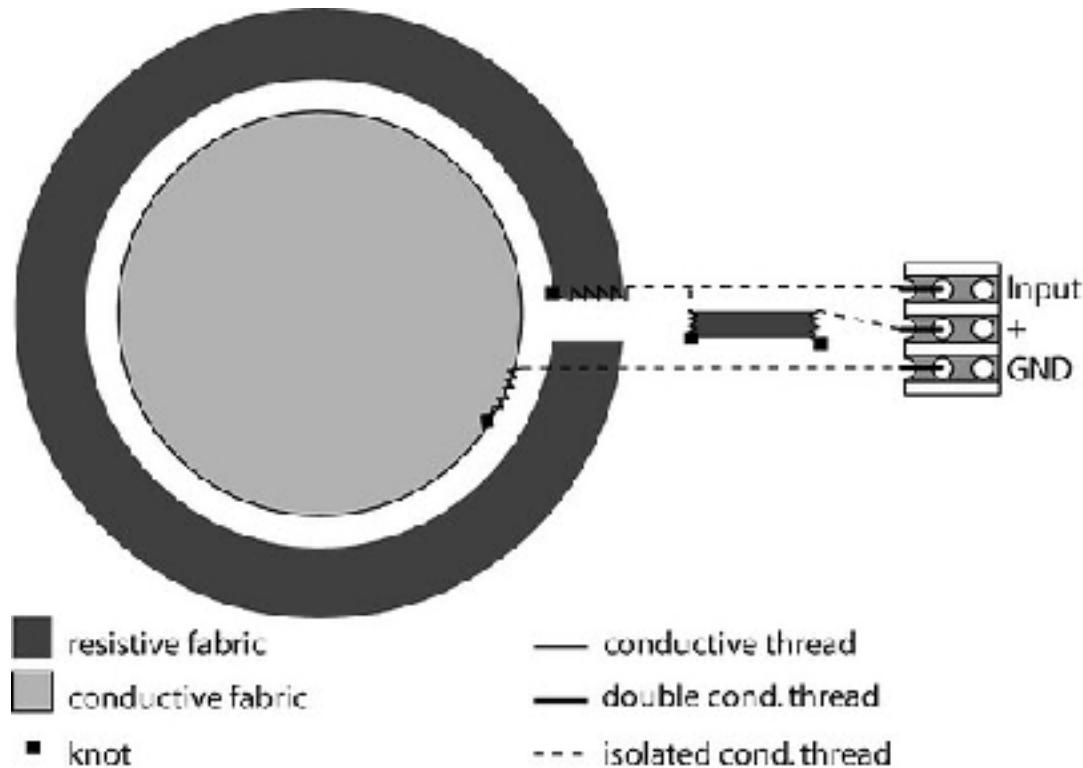
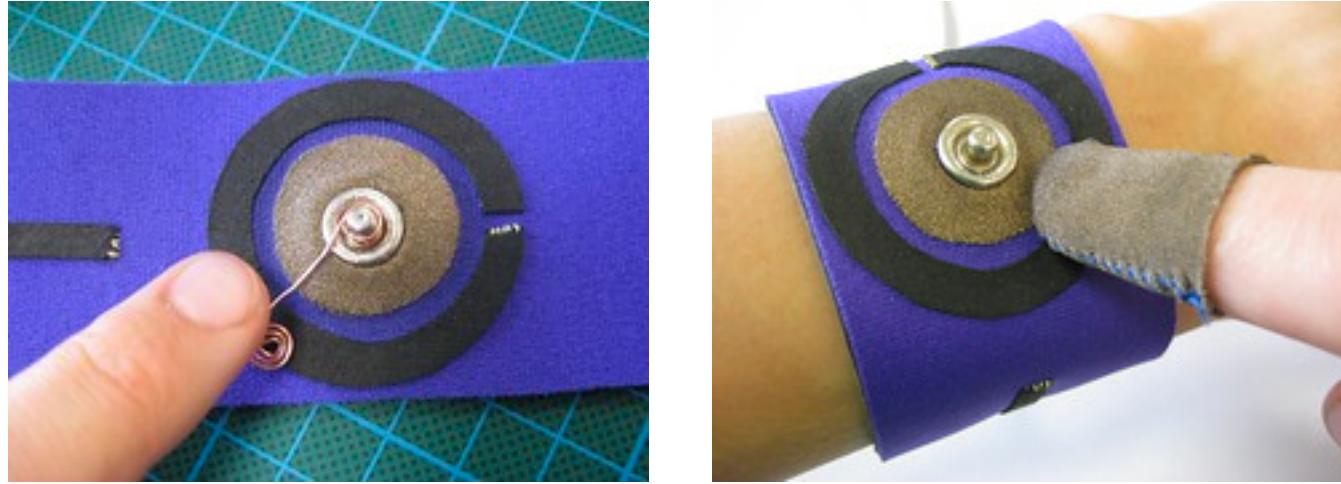
# Linear Potentio meter

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



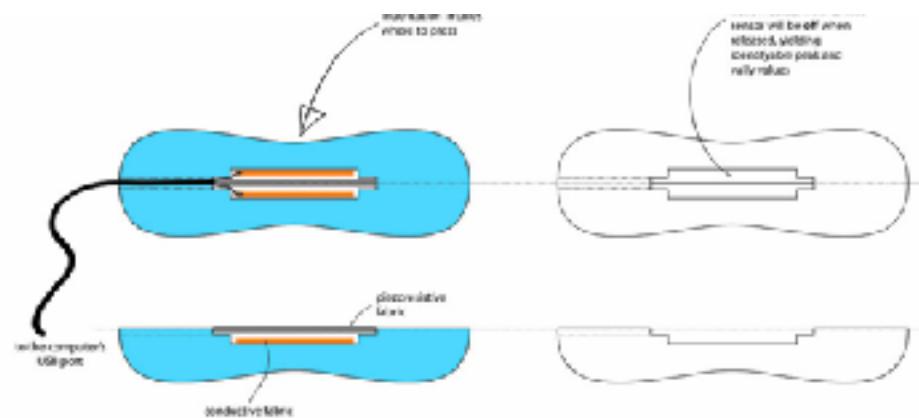
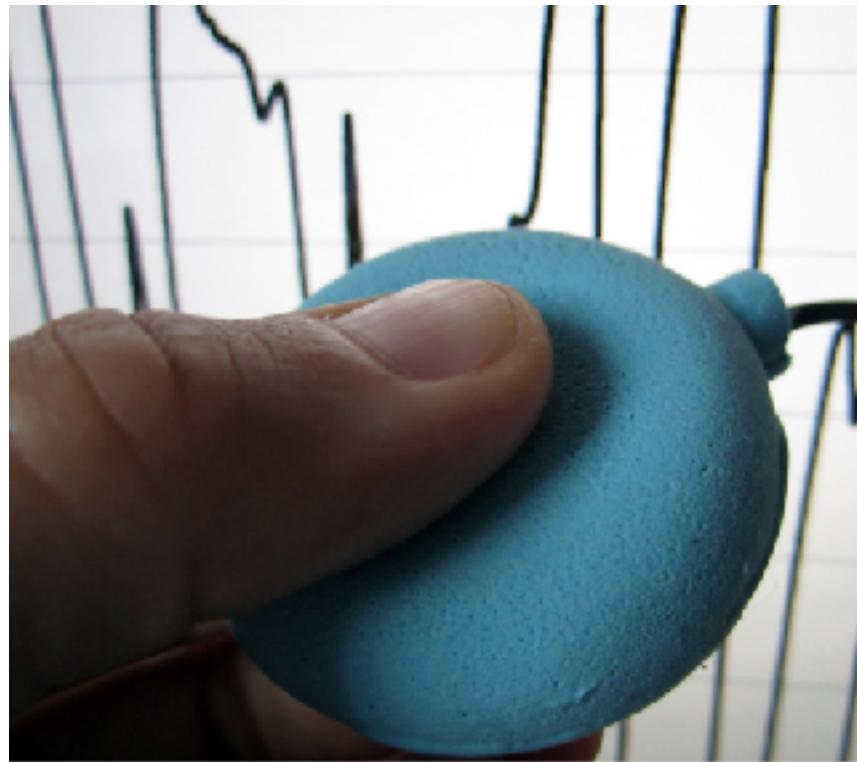
# Soft Potentio meter

[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!**

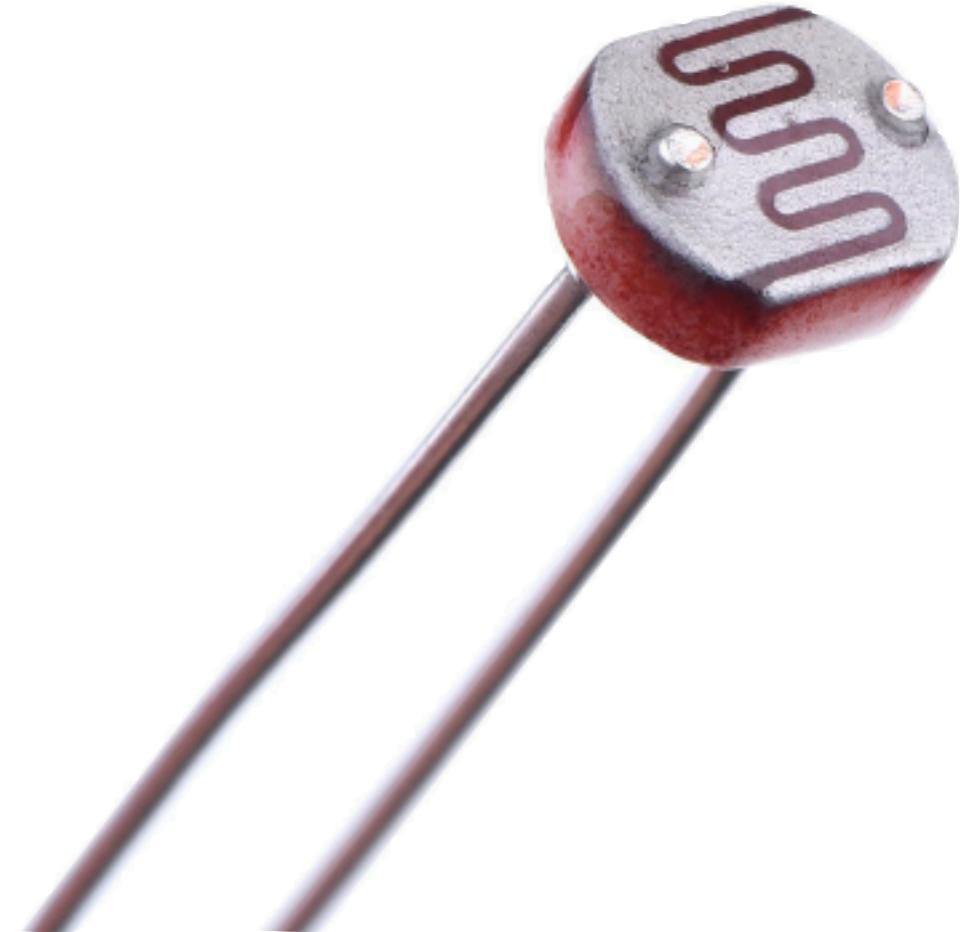


# Method 3: Chemical properties

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>

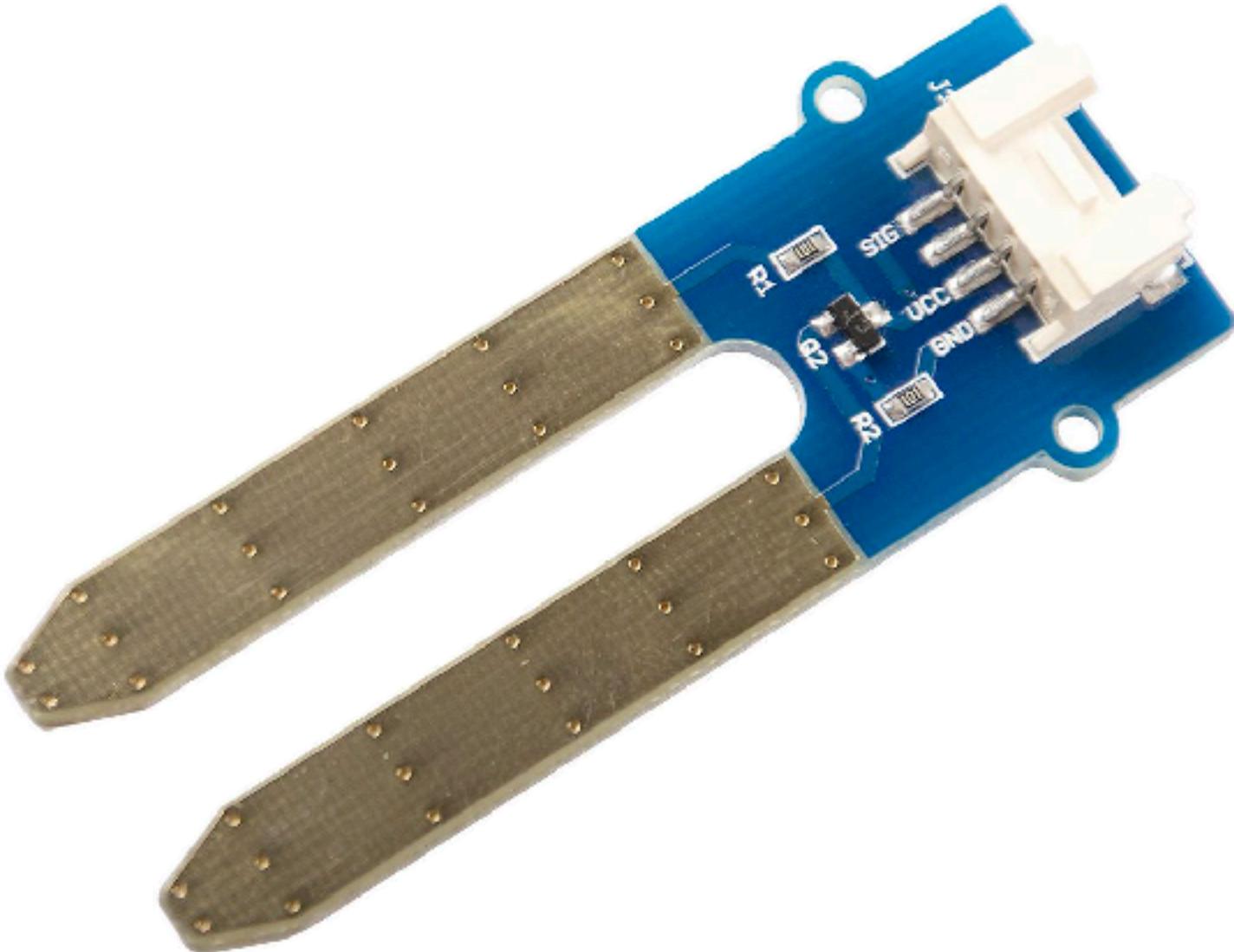
<https://www.amazon.com/Electronics-Salon-Normally-Thermostat-Assortment-Temperature/dp/>

# Temperature switch



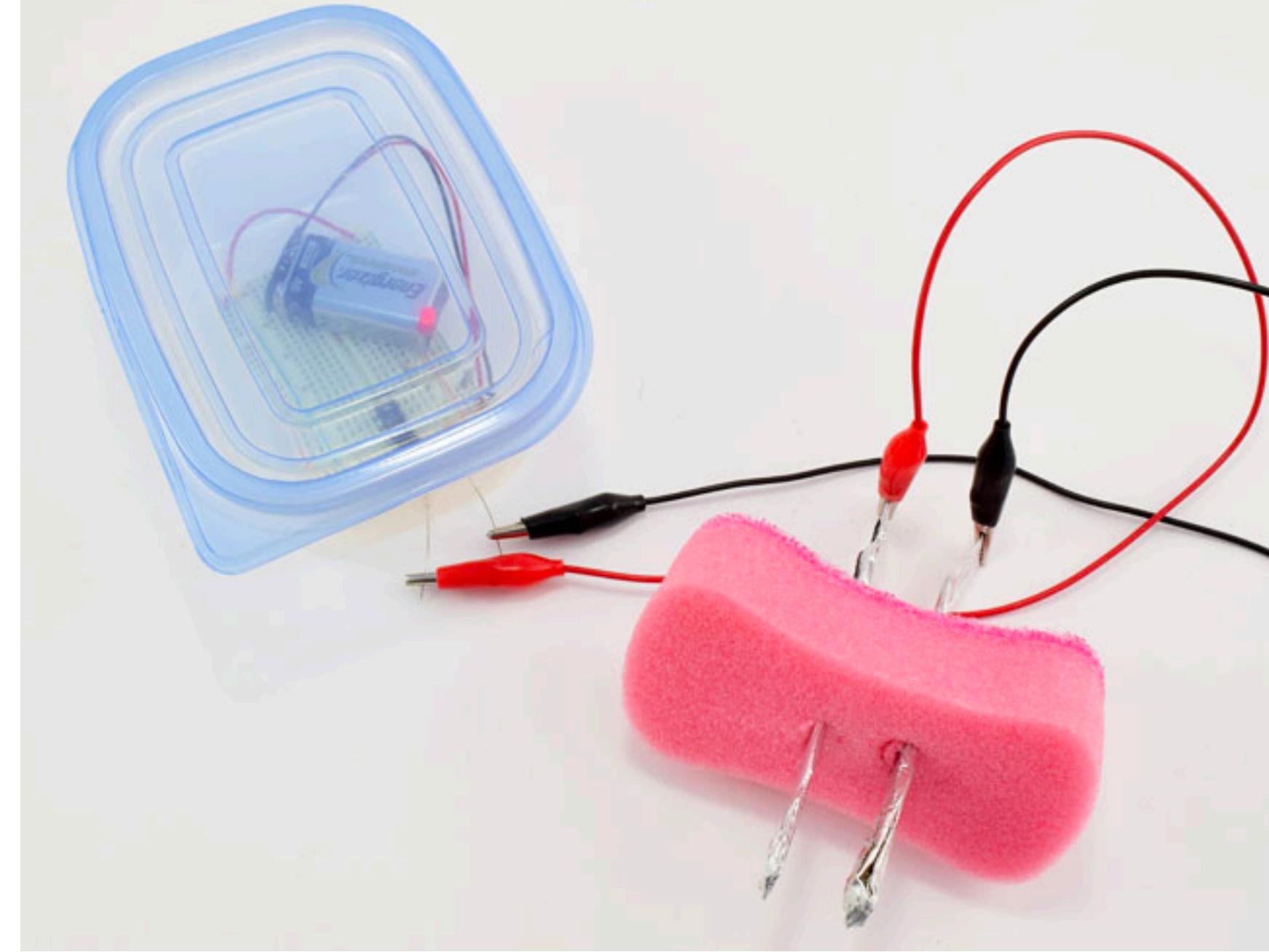
# Moisture Sensor

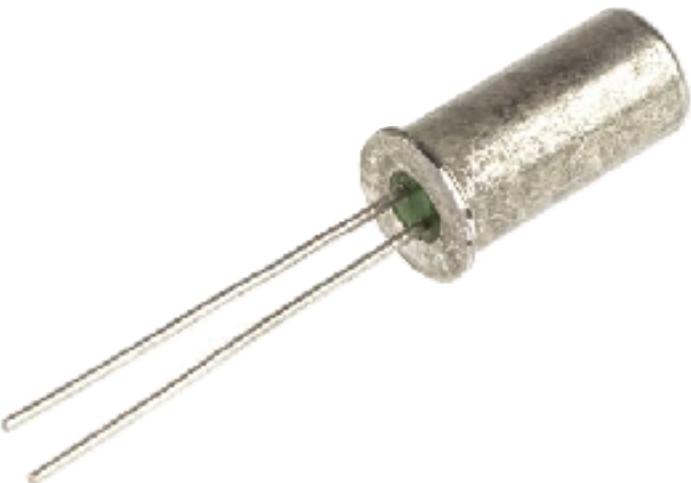
[https://  
www.instructabl  
es.com/id/DIY-  
SOIL-  
MOISTURE-  
SENSOR-  
CHEAP-YET-  
ACCURATE-/](https://www.instructables.com/id/DIY-SOIL-MOISTURE-SENSOR-CHEAP-YET-ACCURATE/)



# Moisture Sensor

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





Magnetic  
Switch /  
Reed Switch

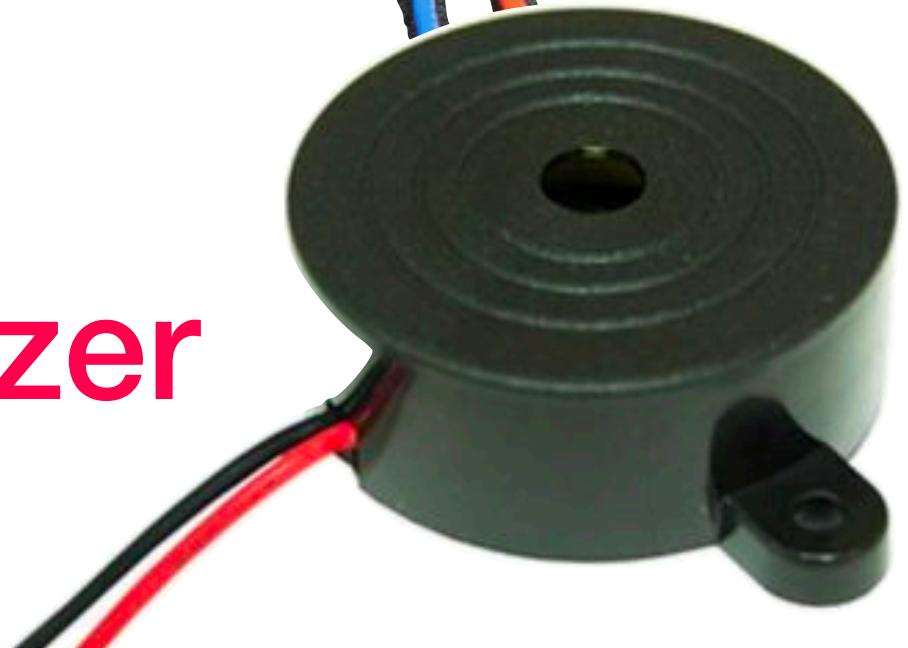


Tilt  
Switch /  
sensor

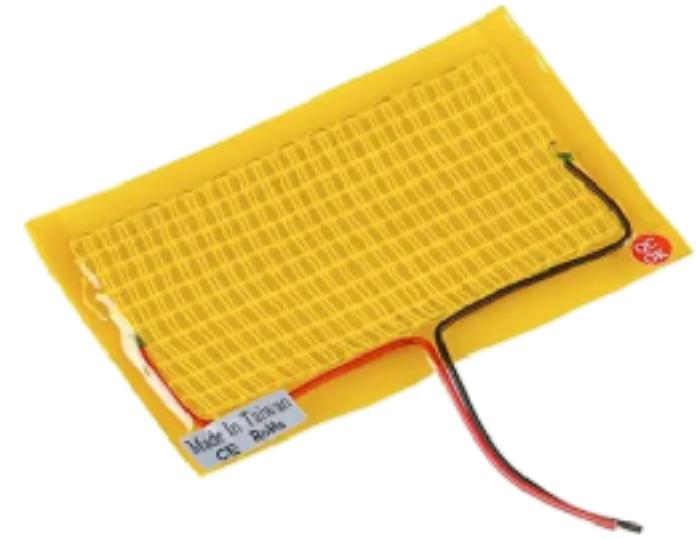
Vibration  
Motor



Buzzer



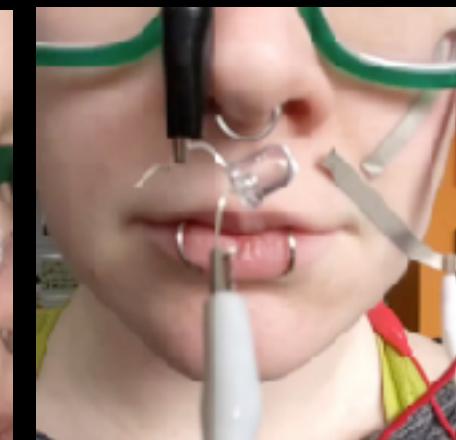
Fan

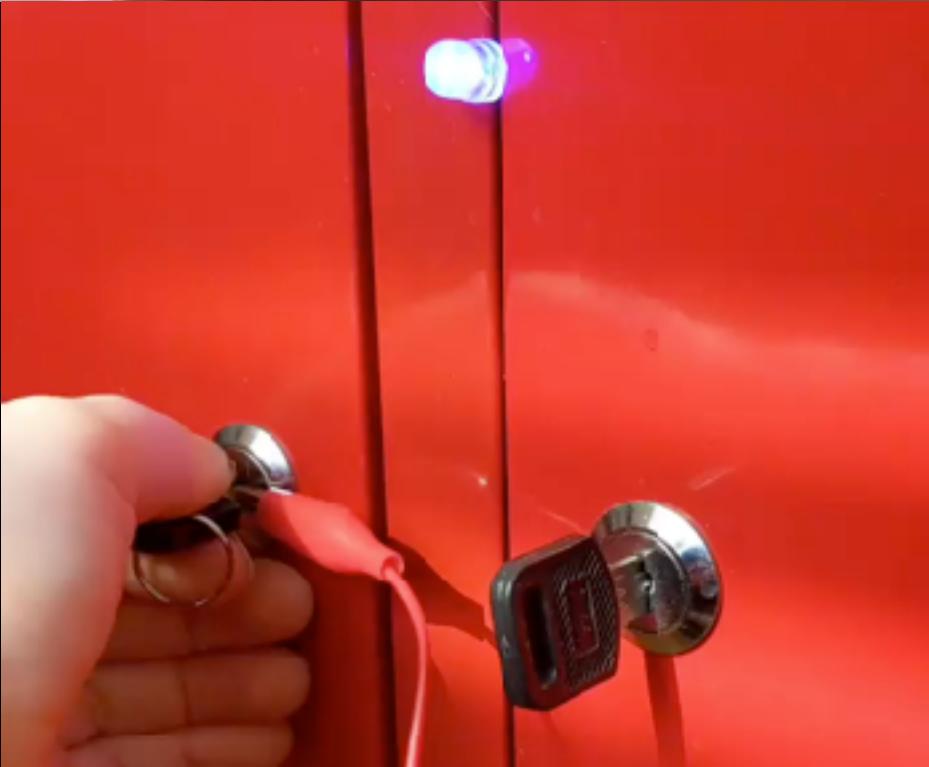


Heating  
pad

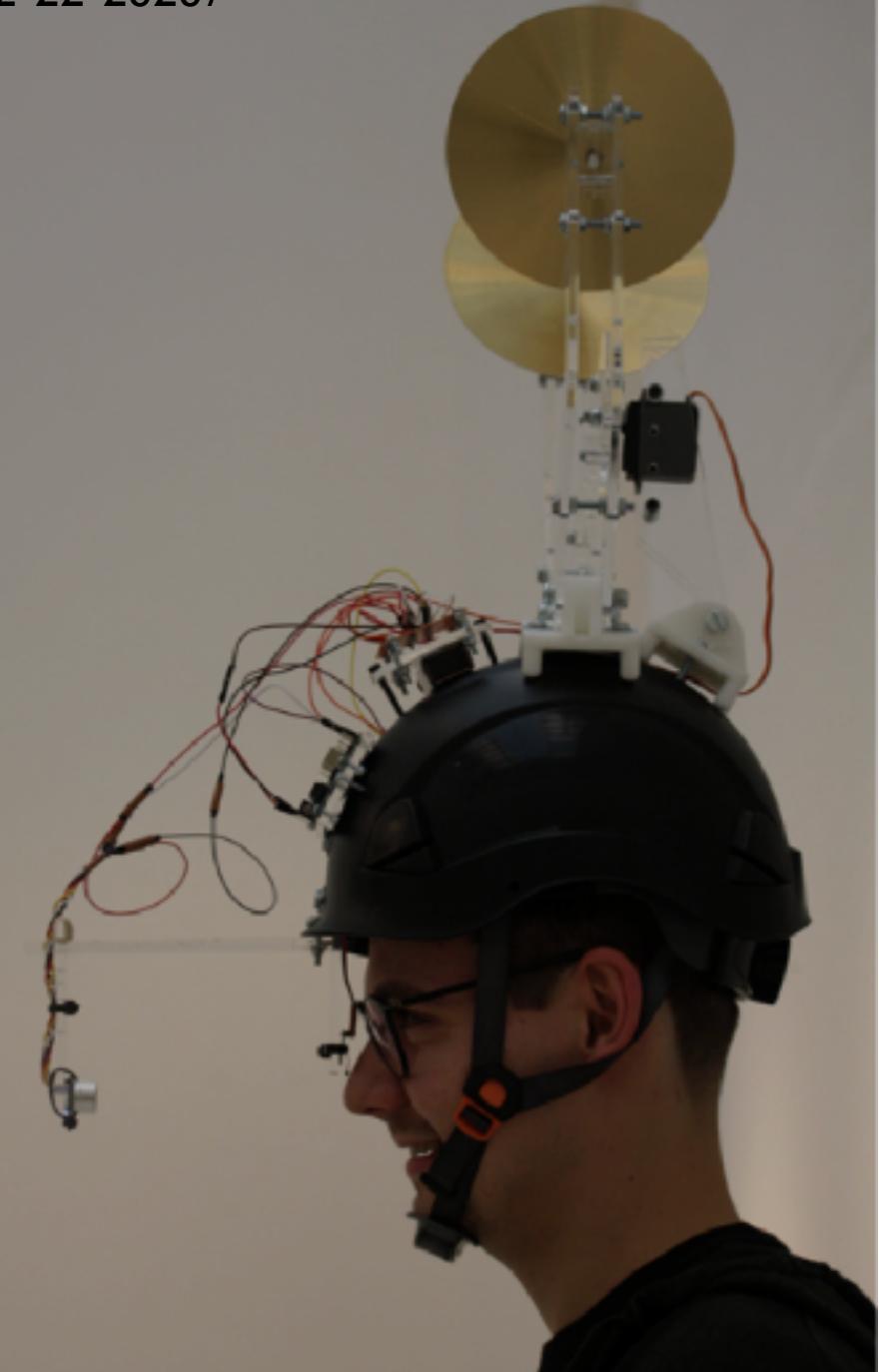
Peltier







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

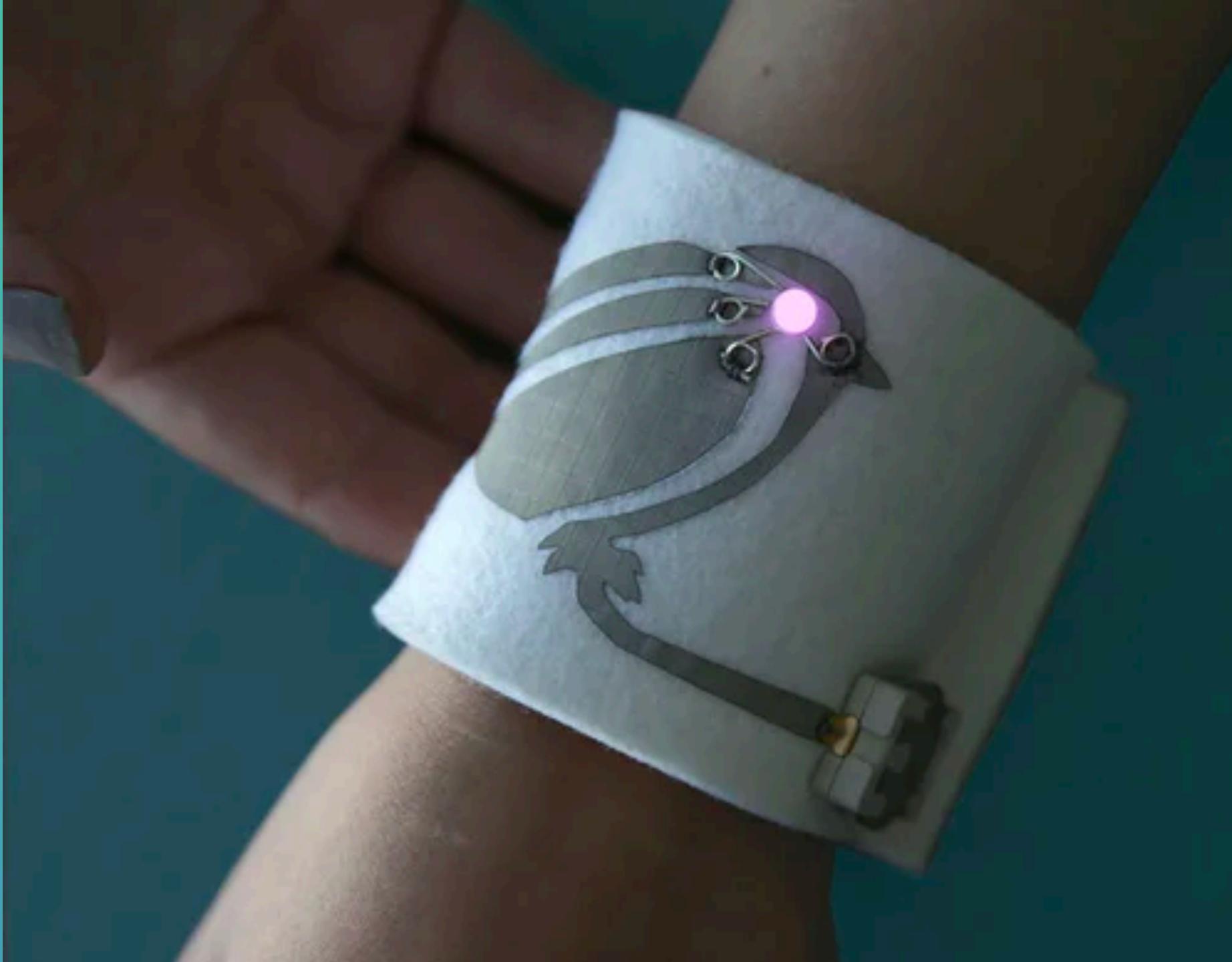
<https://www.instructables.com/id/12-Ways-to-Store-Your-Coin-cells/>



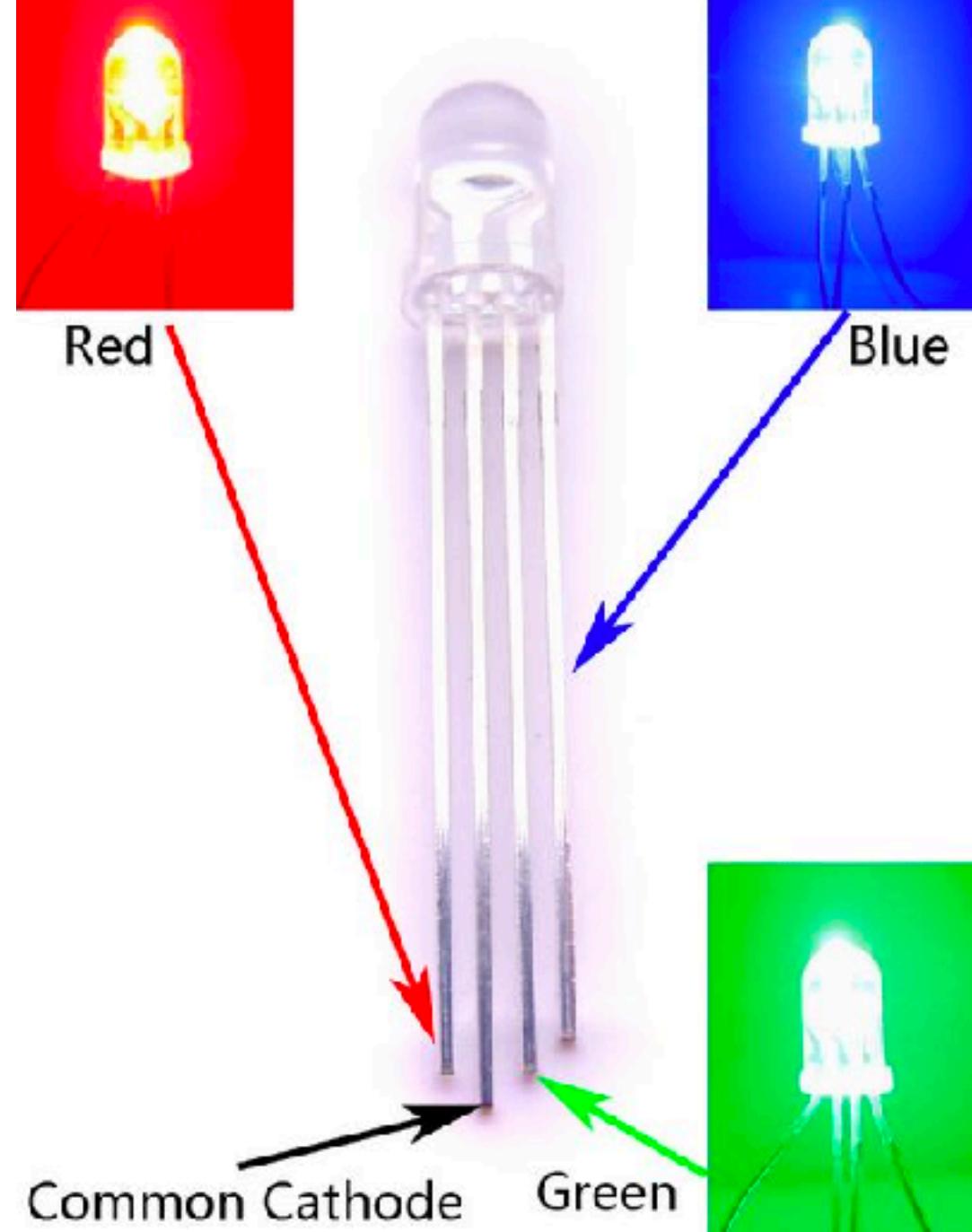
# In Class exercise

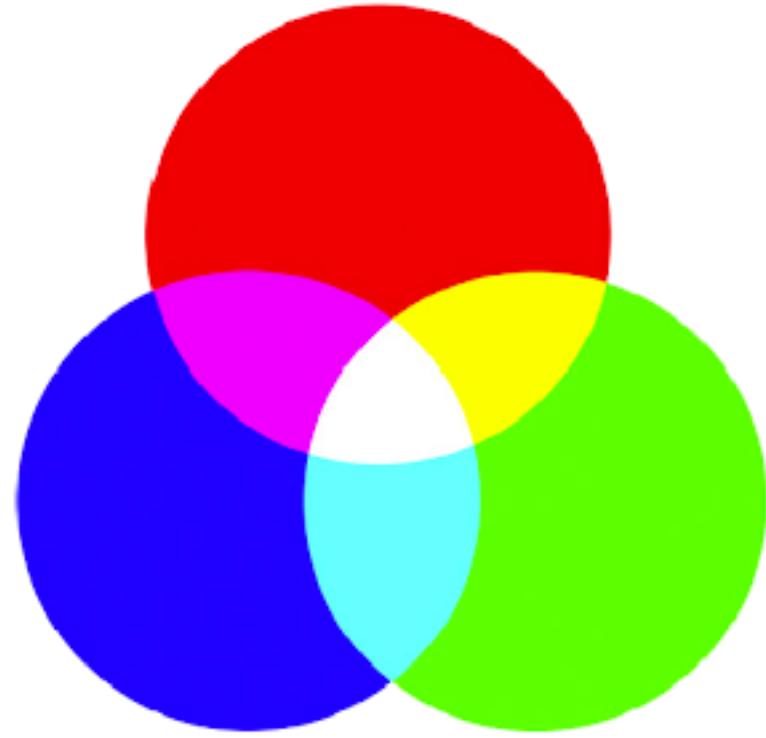
[https://  
www.instructables.  
com/id/Color-  
Mixing-LED-  
Bracelet/](https://www.instructables.com/id/Color-Mixing-LED-Bracelet/)

# RGB color mixer Bracelet



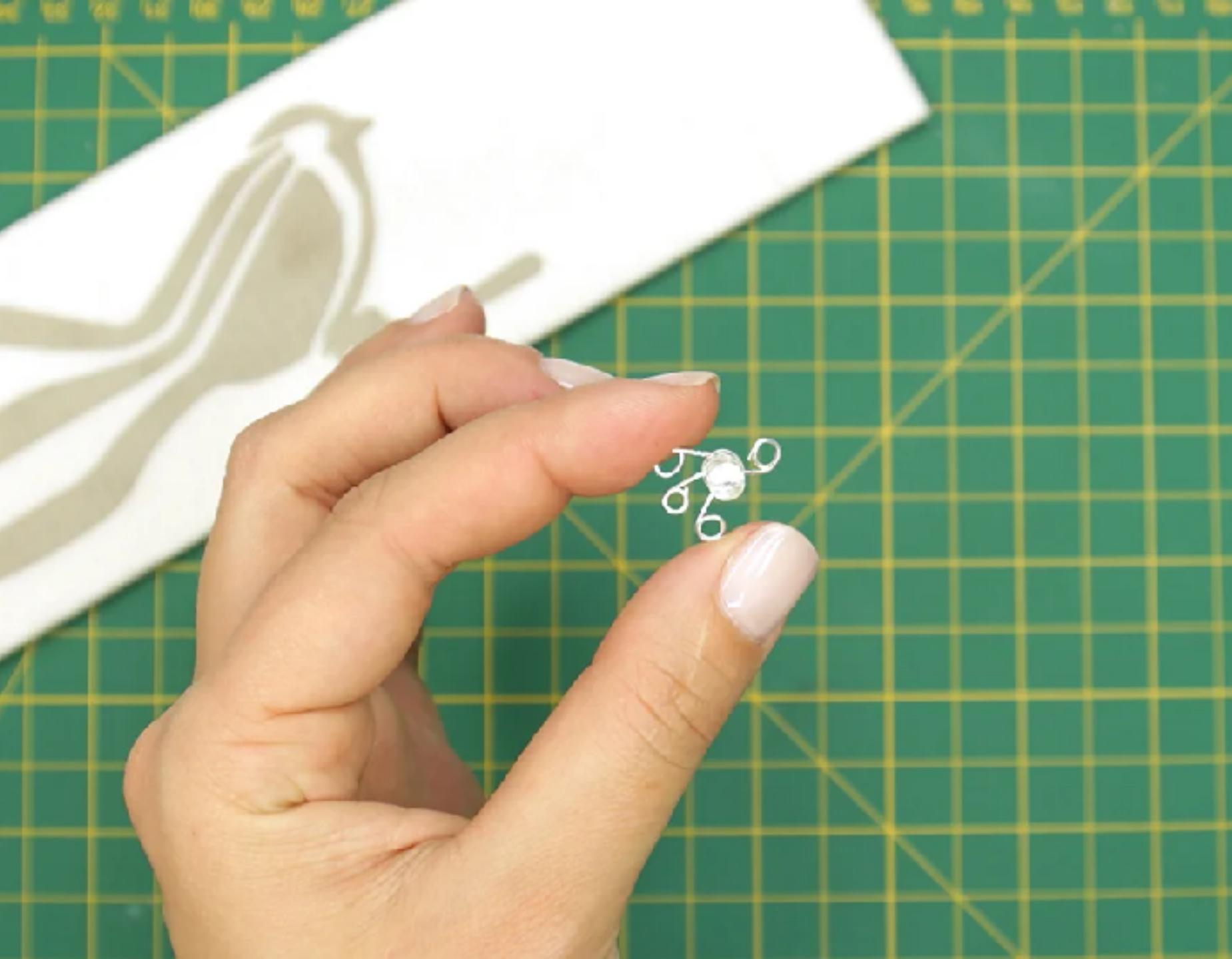
# RGB LED

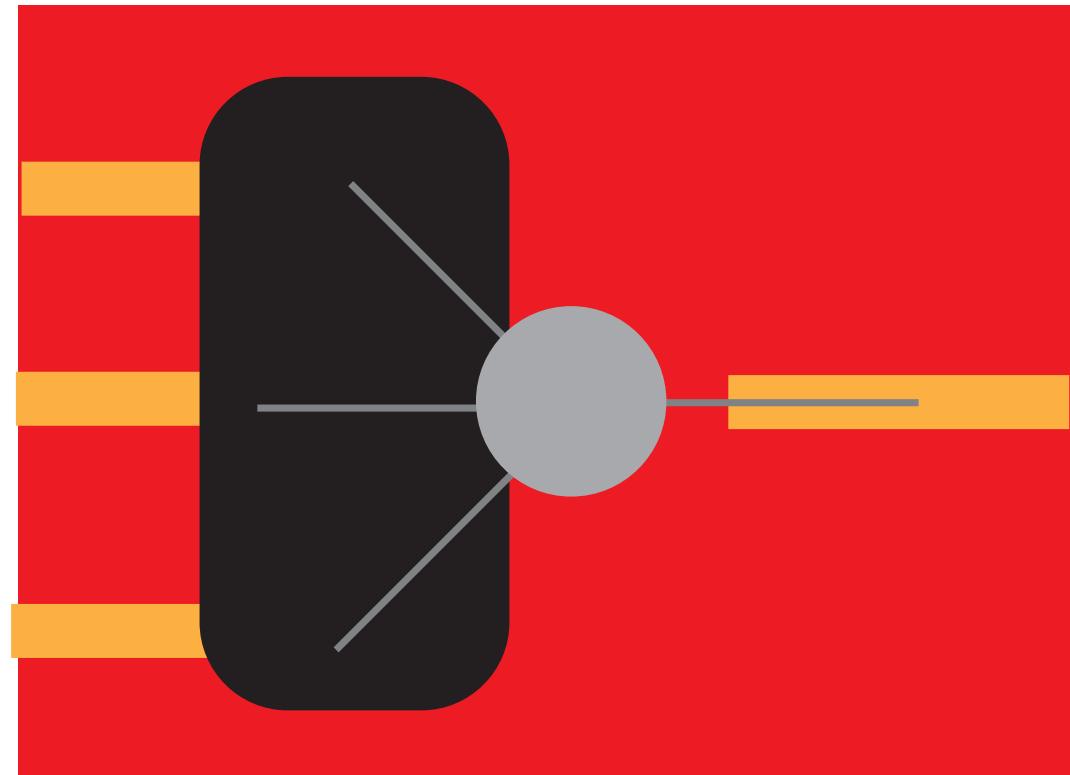
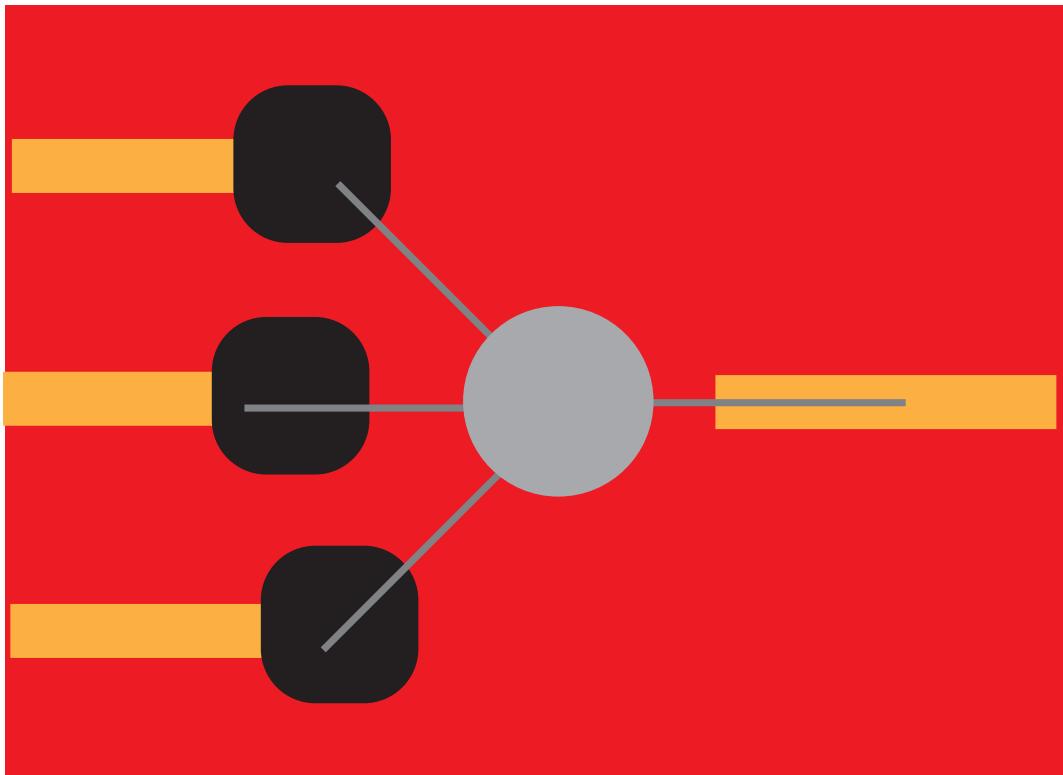




[https://  
www.instructables.  
com/id/DIY-SOIL-  
MOISTURE-  
SENSOR-  
CHEAP-YET-  
ACCURATE-/-](https://www.instructables.com/id/DIY-SOIL-MOISTURE-SENSOR-CHEAP-YET-ACCURATE-/)

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.