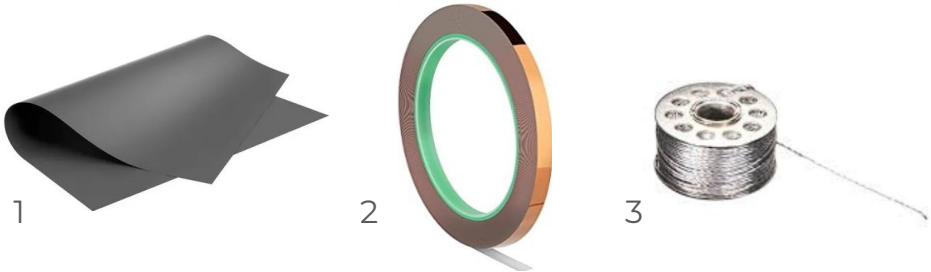
Handcrafting textile sensors

Materials with high resistance

1.Velostat

2.Conductive copper tape

3. Conductive thread



1 2 3

Non conductive

Foam

Fabric glue

Clear tape

Pressure sensors using Velostat

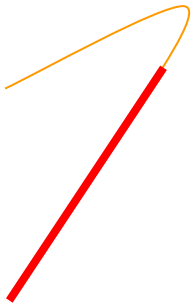
This presentation provides a step-by-step guide to creating pressure sensors using Velostat, a conductive polymer material that changes resistance under pressure. It explains the materials needed, including Velostat, wires, and an Arduino controller, and offers instructions on constructing the sensor pads. The project also includes details on measuring sensitivity with a multimeter, coding for Arduino to read the sensor values, and adding protective covers to the sensors.

Materials list

- **Velostat**
- **Clear tape**
- **Coil wire**
- **Resistor**
- **Arduino UNO controller** or another type (to test functionality)

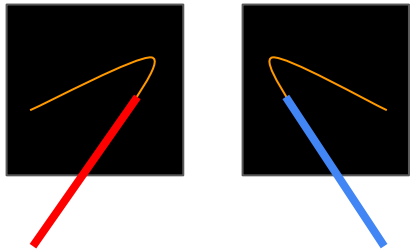
1. Make the sensor

Cut the Velostat to the desired size. In the example, the pieces are 3 x 3 cm squares. Strip the wire so the metal is exposed, and bend it into a U-shape. Attach it with tape so the metal is in contact with the Velostat (see pictures). Repeat the same process with a second Velostat square. Then, make a "sandwich" by placing an additional square of Velostat between the two.

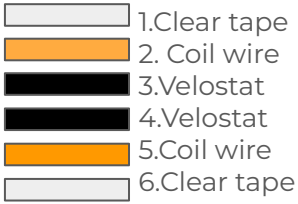


Strip the wire so the metal is exposed, and bend it into a U-shape

Cut 2 pieces of Velostat to the desired size



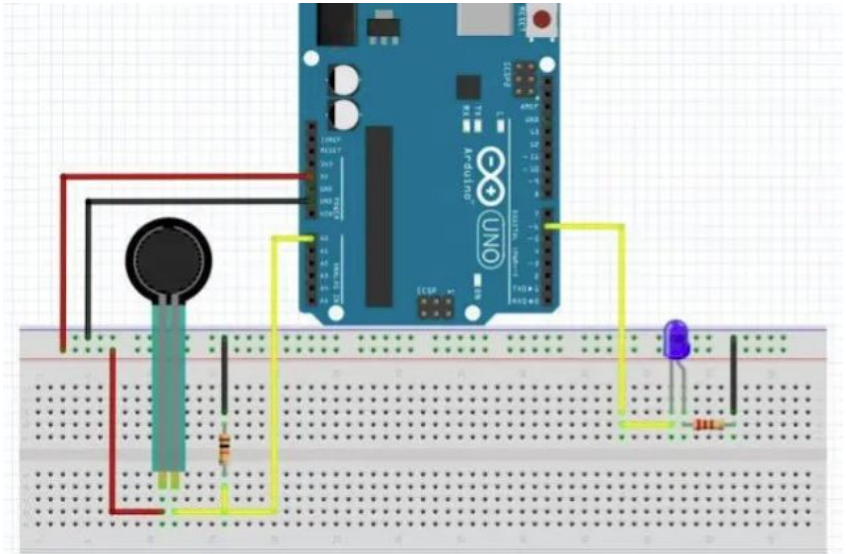
Attach it with tape so the metal is in contact with the Velostat. Repeat the same process



Sensor Sandwich

2. Connections

I’ve attached the code, which simply reads the A0 pin. Once the pressure or force sensor is connected to the Arduino UNO, the next step will be to create a program that adjusts the LED's brightness based on the pressure or force applied to the sensor. Finally, display the data obtained through the serial port so we can verify that the components are functioning correctly.



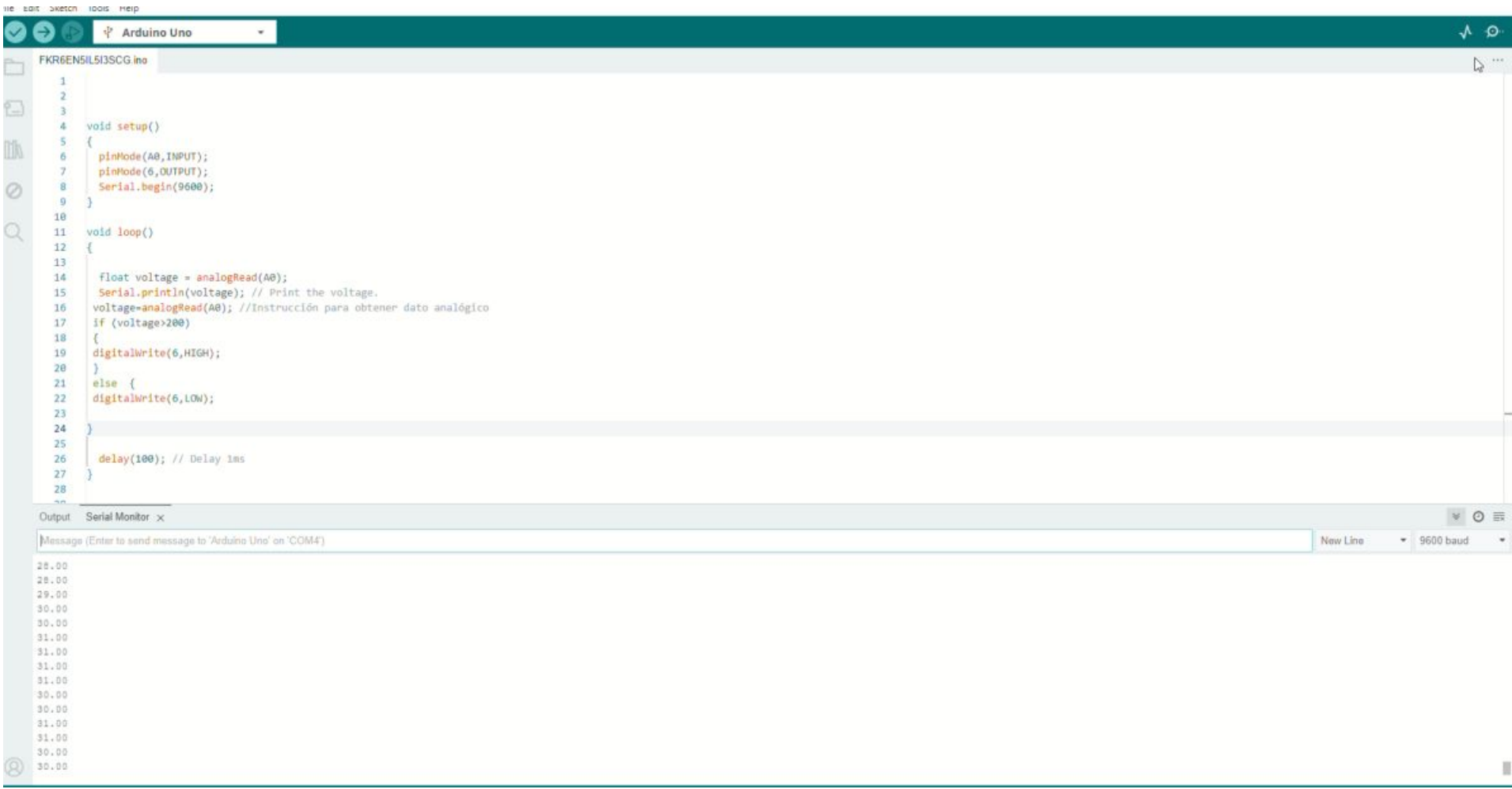
3. Code

```
void setup() {
  pinMode(A0, INPUT);
  pinMode(6, OUTPUT);
  Serial.begin(9600);
}

void loop() {

  float voltage = analogRead(A0);
  Serial.println(voltage);   // Print the voltage.
  voltage = analogRead(A0);  //Instrucción para obtener dato analógico
  if (voltage > 400) {
    digitalWrite(6, HIGH);
  } else {
    digitalWrite(6, LOW);
  }

  delay(100);  // Delay 1ms
}
```


File Edit Sketch Tools Help
Arduino Uno
FKR6EN5IL5I3SCG.ino
void setup()
{
pinMode(A0,INPUT);
pinMode(6,OUTPUT);
Serial.begin(9600);
}
void loop()
{
float voltage = analogRead(A0);
Serial.println(voltage); // Print the voltage.
voltage=analogRead(A0); //Instrucción para obtener dato analógico
if (voltage>200)
{
digitalWrite(6,HIGH);
}
else {
digitalWrite(6,LOW);
}
delay(100); // Delay 1ms
}
Output
Serial Monitor
Message (Enter to send message to 'Arduino Uno' on 'COM4')
New Line
9600 baud
28.00
28.00
29.00
30.00
30.00
31.00
31.00
31.00
31.00
30.00
30.00
31.00
31.00
30.00
30.00