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EXAMPLE CODE

The following examples are the basic framework to use some (not all!) of the sensors.

Note: Merely copying and pasting the code will not be sufficient to have a successful project. You must incorporate your own logic and sequencing to the code!

AIR PRESSURE SENSOR (BMP180)

BMP180_Sensor

```
/**
 * Majority of source code:
 * https://lastminuteengineers.com/bmp180-arduino-tutorial/
 * MUST INSTALL 'Adafruit BMP085 Library'
 */

#include <Wire.h>
#include <Adafruit_BMP085.h>
#define seaLevelPressure_hPa 1013.25

Adafruit_BMP085 bmp;

/**
 * For this sensor to work, the SCL pin must be connected to A5
 * and the SDA pin must be connected to A4
 *
 * A5 -> SCL
 * A4 -> SDA
 */
void setup() {
  Serial.begin(9600);
}

void loop() {
  Serial.println(bmp.readTemperature()); //temperature in C
  Serial.println(bmp.readPressure()); //pressure in Pascal
  Serial.println(bmp.readSealevelPressure());
  Serial.println(bmp.readAltitude(seaLevelPressure_hPa * 100)); //altitude in meters

  delay(500);
}
```
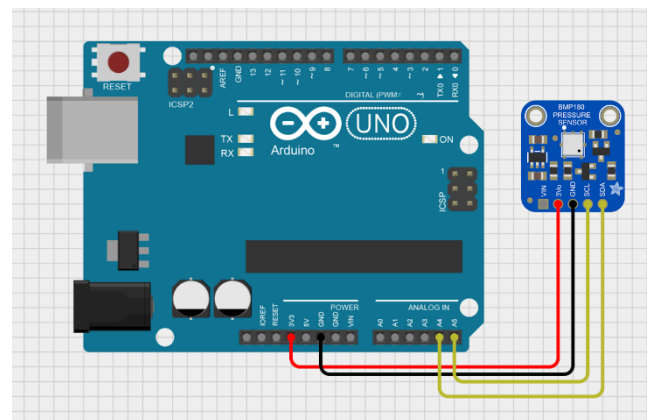
As mentioned in the code, you need to connect analog pin A5 to SCL and pin A4 to SDA

PROXIMITY IR (PIR) SENSOR

PIR_Sensor

```
/**
 * PIR Sensor Code:
 *
 * NOTE: You must turn both orange dials all the
 * way counter clockwise, otherwise it will not work
 */

void setup() {
  pinMode(2, INPUT); // declare sensor as digital input on pin 2
  Serial.begin(9600);
}

void loop(){
  if(digitalRead(2) == HIGH){
    Serial.println("Motion Detected!");
  }
  if(digitalRead(2) == LOW){
    Serial.println("No Motion");
  }
  delay(500);
}
```

LEFT MOST PIN = GND
RIGHT MOST PIN = 5V
MIDDLE PIN = SIGNAL
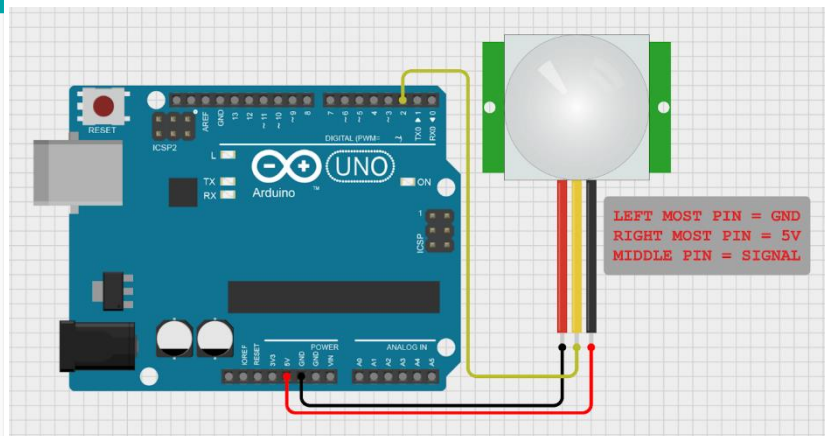
IR DISTANCE SENSOR

```
Distance_Sensor
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
}

void loop() {
  // put your main code here, to run repeatedly:
  Serial.println(analogRead(A2));
  delay(500);

  /**
   * Students: the output will be a value from 0 to around 500.
   * This isn't a very helpful distance measurement. For bonus
   * points, determine a way to display the actual distance in
   * centimeters!
   */
}
```
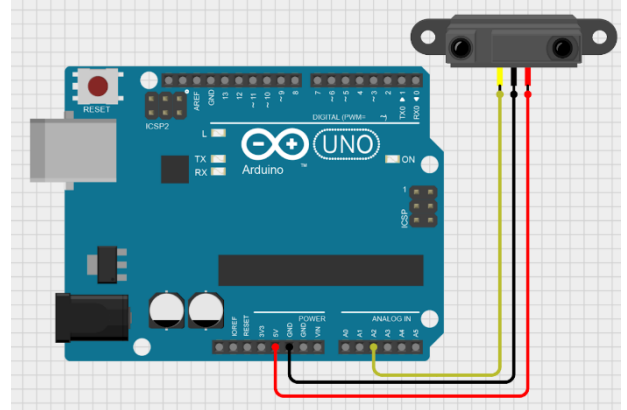

HUMIDITY SENSOR (DHT 11)

```
DHT_Sensor
/**
 * Majority of code source:
 * https://create.arduino.cc/projecthub/techno_z/dht11-temperature-humidity-sensor-98b03b
 */
#include <dht.h>
dht DHT;

void setup(){
  Serial.begin(9600);
}

void loop(){
  DHT.read11(A4); //analog pin A4

  Serial.print("Temperature = ");
  Serial.println(DHT.temperature);
  Serial.print("Humidity = ");
  Serial.println(DHT.humidity);
  Serial.println("");
  delay(1000);

  /**
   * Students: the temperature sensor doesn't give absolute
   * temperature very well. Try and calibrate the value by adding
   * an offset to the room temperature reading!
   */
}
```

For the schematic: just follow the pin labels on the sensor! It is super easy

SOIL MOISTURE SENSOR

```
Soil_Sensor
void setup() {
  Serial.begin(9600);
  // note that the potentiometer dial is for
  // the digial output only
}

void loop() {
  // put your main code here, to run repeatedly:
  Serial.println(analogRead(A4));
  delay(500);
  /**
   * Students: if time and space permits, try to calibrate the
   * soil moisture sensor using dry and wet dirt.
   */
}
```

The soil moisture sensor will look slightly different in real life. Follow the board pin names

If you leave the soil moisture sensor powered ON for long periods of time within soil, the **leads will corrode**. For bonus points, try to determine a way to power the sensor only when you want to take readings (i.e use an NPN transistor to switch the power to the sensor using a digital out pin)
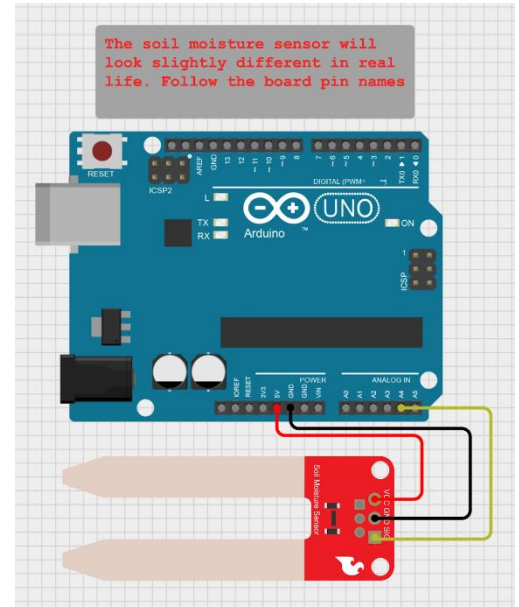
GAS SENSOR (MQ 135)

```
Gas_Sensor
void setup() {
  Serial.begin(9600);
}

void loop() {
  int gas_level = analogRead(A2);
  Serial.println(gas_level);

  //try taking a slow breath on to the sensor
  delay(500);
}
```

Your gas sensor will look different in real life. Follow the pin labels on the sensor

Note: the gas sensor will start to heat up slightly and make a strange odor. This is because the gas sensor works by ionizing the gas.
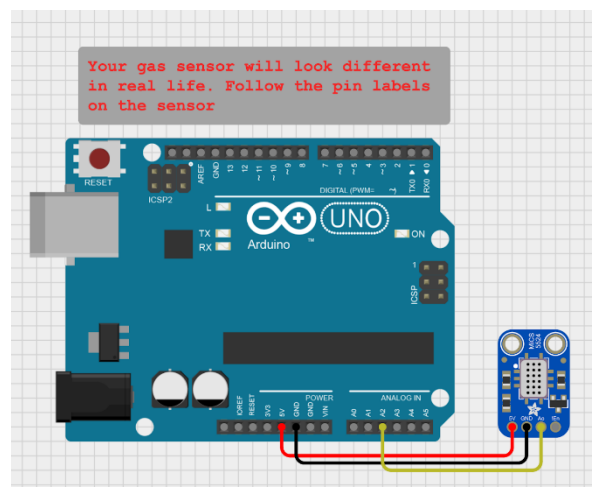
FINAL REMARKS

Some of the sensors/mechanisms are in the Arduino example code database! For example, the servo motor and LCD screen both have example code built into the Arduino software.

To access built in example code, go to **File -> Examples -> [select example]**

For additional examples and code, please reach out to Jason Rock (the Arduino expert!)