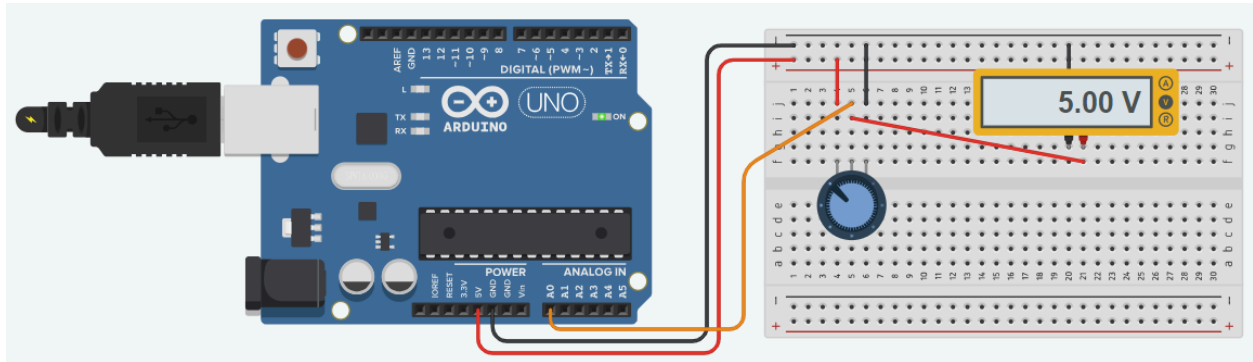


# COMP 1045 Lab 3

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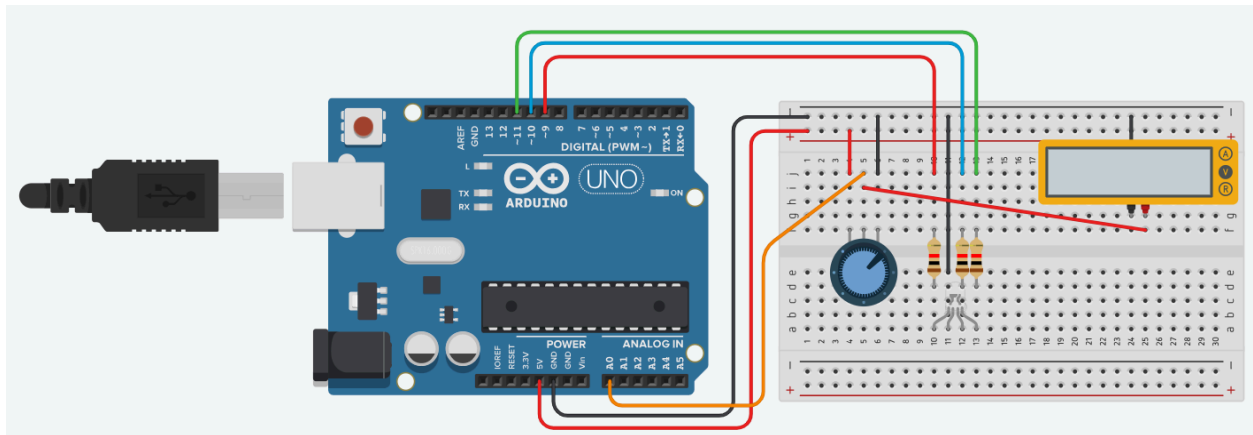
**Level 1:** Upload the source code and run it to show that the voltage changes when you rotate the potentiometer. Also open up the serial monitor on the bottom to see what values you can read from the rotation sensor.

**Tinkercad Link:** <https://www.tinkercad.com/things/4bwMHRv9wxd-assignment3-level-1>

```
int rotationPin = A0; //The rotation sensor is plugged into pin
A0 of the Arduino.
int data=0; //Used to store data from sensor.
void setup() { //The Setup function runs once.
Serial.begin(9600); //This will enable the Arduino to send data
to the Serial
//monitor.
pinMode(rotationPin, INPUT);
}
void loop() { //The loop function runs forever.
data = analogRead(rotationPin); //Read the value from the light
sensor and store it
//in the lightData variable.
Serial.print("Rotation value =");
Serial.println(data); //Print the data to the serial port.
delay(1000); //Wait 1 second (1000mS) before running again.
}
```

**Level 2:** Write a program that displays the following color sequence on the RGB LED (D9-D11) Red, Green, Blue. The speed at which the color changes is controlled by Rotation dial A0 on the board. As you turn the dial the speed of the RGB changes. When the dial is at zero the RGB speed is the slowest, when the dial is at max the speed is at max.

**Tinkercad Link:** <https://www.tinkercad.com/things/fFhe5ZWlggW-assignment3-level-2>



```
const int redPin = 9, greenPin = 10, bluePin = 11;
const int rotationPin = A0;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(bluePin, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  // Read the potentiometer and map its value to a delay time
  int delayTime = map(analogRead(rotationPin), 0, 1023, 1000,
100);

  // Red
  analogWrite(redPin, 255);
  analogWrite(greenPin, 0);
  analogWrite(bluePin, 0);
```

```

delay(delayTime);

// Green
analogWrite(redPin, 0);
analogWrite(greenPin, 255);
analogWrite(bluePin, 0);
delay(delayTime);

// Blue
analogWrite(redPin, 0);
analogWrite(greenPin, 0);
analogWrite(bluePin, 255);
delay(delayTime);
}

```

**Level 3:** Use the rotation sensor to cycle through the colours of the rainbow. (ROYGBP) depending on the value of the rotation sensor. (exL 0-150 = red from 150-300= Orange). Look up the RGB value for each colour and use analogWrite() to get the proper colours.

```

const int redPin = 9, greenPin = 10, bluePin = 11;
const int rotationPin = A0;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(bluePin, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int sensorValue = analogRead(rotationPin);

  // Set the color based on the potentiometer value
  if (sensorValue <= 150) {
    // Red

```

```

    analogWrite(redPin, 255);
    analogWrite(greenPin, 0);
    analogWrite(bluePin, 0);
} else if (sensorValue <= 300) {
    // Orange
    analogWrite(redPin, 255);
    analogWrite(greenPin, 165);
    analogWrite(bluePin, 0);
} else if (sensorValue <= 450) {
    // Green
    analogWrite(redPin, 0);
    analogWrite(greenPin, 255);
    analogWrite(bluePin, 0);
} else {
    // Blue
    analogWrite(redPin, 0);
    analogWrite(greenPin, 0);
    analogWrite(bluePin, 255);
}
delay(500);
}

```

**Level 4:** Create a code that asks the user to input a pattern of colours using R, G or B. Then display that sequence of colours. Ex: "Please input any combination of R, G or B letters". You can assume that they will not use other letters.

```

const int redPin = 9, greenPin = 10, bluePin = 11;

void setup() {
    pinMode(redPin, OUTPUT);
    pinMode(greenPin, OUTPUT);
    pinMode(bluePin, OUTPUT);
    Serial.begin(9600);
    Serial.println("Enter R, G, or B:");
}

void loop() {

```

```
if (Serial.available()) {  
    char color = Serial.read();  
    if (color == 'R') {  
        digitalWrite(redPin, HIGH);  
        digitalWrite(greenPin, LOW);  
        digitalWrite(bluePin, LOW);  
    } else if (color == 'B') {  
        digitalWrite(redPin, LOW);  
        digitalWrite(greenPin, HIGH);  
        digitalWrite(bluePin, LOW);  
    } else if (color == 'G') {  
        digitalWrite(redPin, LOW);  
        digitalWrite(greenPin, LOW);  
        digitalWrite(bluePin, HIGH);  
    }  
    delay(1000);  
    // Turn off the LED before the next color input  
    digitalWrite(redPin, LOW);  
    digitalWrite(greenPin, LOW);  
    digitalWrite(bluePin, LOW);  
}  
}
```