Sensing Temperatures

Y9 Digital Electronics Lesson 3

Task 1: Temperature Readings

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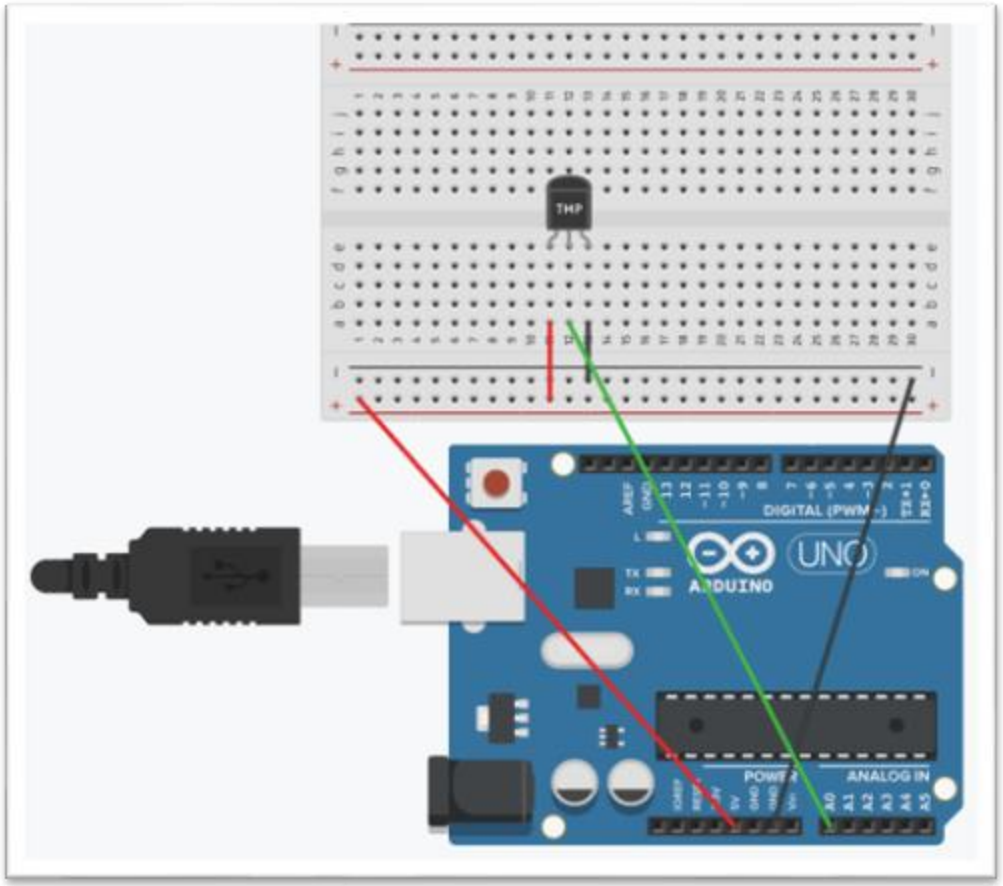
Add a temperature sensor to read the rooms temperature and output it to the Arduino consol.

The Circuit



The Code

```
1
2  int sensorPin = A0;
3  int ledPin = 4;
4
5  void setup() {
6    Serial.begin(9600);
7    pinMode(ledPin, OUTPUT);
8  }
9
10 void loop() {
11   int sensorValue = analogRead(sensorPin);
12   float voltage = sensorValue * (5.0 / 1023.0);
13   float temperatureC = (voltage - 0.5) * 100;
14
15   Serial.print("Temperature: ");
16   Serial.print(temperatureC);
17   Serial.println(" °C");
18
19
20 }
```

Task 2: Adding an LED output

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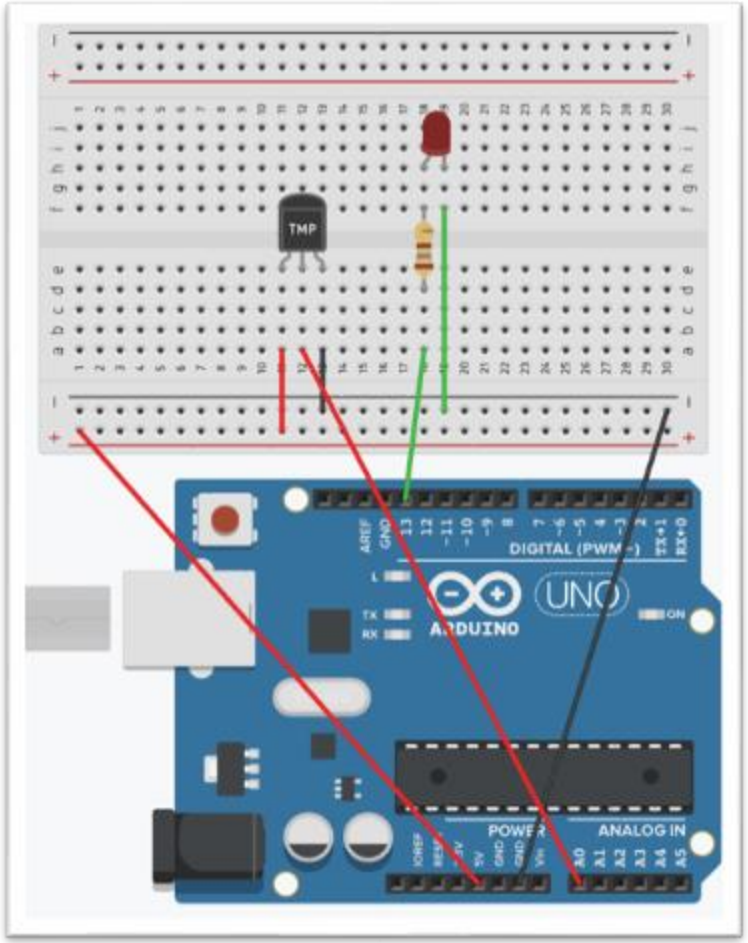
Add an LED which lights up if the temperature is above 20 degrees. You will need to adjust your code to send an output to an LED if the temperature variable > 20.

The Circuit



The Code

```
int sensorPin = A0;
int ledPin = 13;

void setup() {
  Serial.begin(9600);
  pinMode(ledPin, OUTPUT);
}

void loop() {
  int sensorValue = analogRead(sensorPin);
  float voltage = sensorValue * (5.0 / 1023.0);
  float temperatureC = (voltage - 0.5) * 100;

  Serial.print("Temperature: ");
  Serial.print(temperatureC);
  Serial.println(" °C");

 // Turn LED ON if temperature is above 20°C
  if (temperatureC > 20) {
    digitalWrite(ledPin, HIGH);
  } else {
    digitalWrite(ledPin, LOW);
  }
}
```

Task 3: Independent Challenge

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Adjust your circuit to have a different LED light up depending on the temperature.

- LED A: Turns on if the temperature is 15 or below.
- LED B: Turns on if the temperature is between 15 and 30.
- LED C: Turns on if the temperature is above 30 degrees.