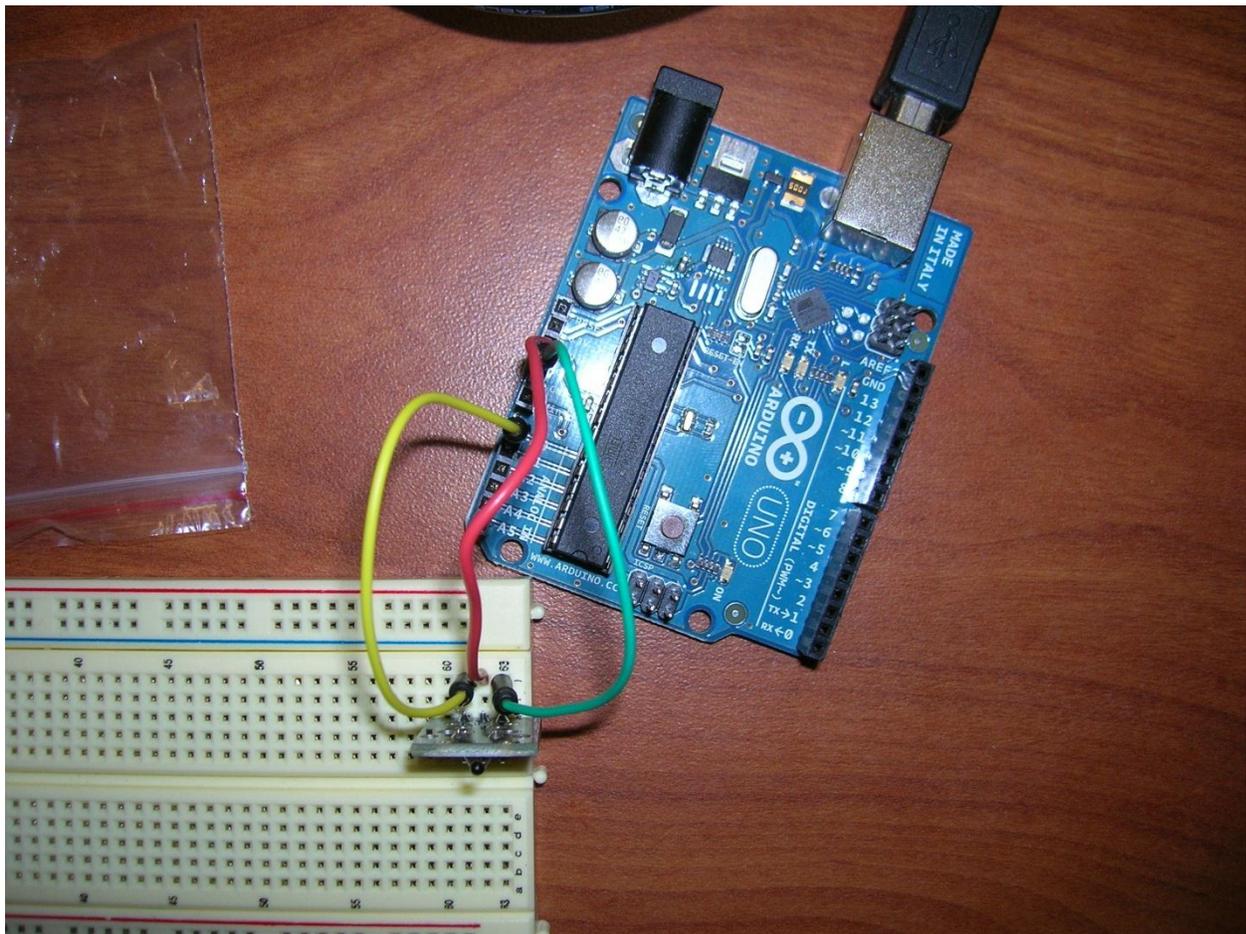


## Keys KY-013 Analog Temperature Sensor

The analog sensor acts as a variable resistor. As temperature increases, the sensor will decrease its voltage output. Once we can measure the voltage output, we can calibrate the sensor and convert the output in voltage to temperature.

Set up the sensor as seen in the picture below



Connect the 5v port to the middle pin of the sensor.

Connect the ground port to the pin on the far right of the sensor (the one closest to the -).

Connect the A0 port to the pin on the far left of the sensor (the one closest to the S).

As always, be very careful not to mix up the wires. You could damage or completely fry the sensor.

To program the board, use the following code.

```
//TMP36 Pin Variables

int sensorPin = 0; //Says we are working with a sensor in analog pin 0

/*
 * setup() - this function runs once when you turn your Arduino on
 * We initialize the serial connection with the computer
 */
void setup()
{
  Serial.begin(9600); //Start the serial connection with the computer
                        //to view the result open the serial monitor
}

void loop()           // run over and over again
{
  //getting the voltage reading from the temperature sensor
  int reading = analogRead(sensorPin);

  // converting that reading to voltage, for 3.3v arduino use 3.3
  float voltage = reading * 5.0;
  voltage /= 1024.0;
```

```
// print out the voltage to the serial port
Serial.print(voltage); Serial.println(" volts");

delay(1000);           //waiting a second
}
```

This code simply reads the voltage output from the temperature sensor and displays this voltage in the serial monitor. You can calibrate the sensor by figuring out what voltages correspond with what temperatures. Just measure the temperature with a different thermometer and see what the corresponding voltage is. Do this at several different temperatures and graph the voltage vs the temperature measured. Throw on a trendline and display the equation. This equation should work to convert the voltage readings to temperature. Just plug in your voltage reading for X.

This code is a fairly basic code and it should work for most analog sensors such as light or sound sensors. For an added challenge, see if you can get the Arduino board to convert and print temperatures for you.