Thermistor is a type of Resistor that can change its resistance value when the temperature that it is exposed to changes.

There are a few things you need to know before we can use our Thermistor.

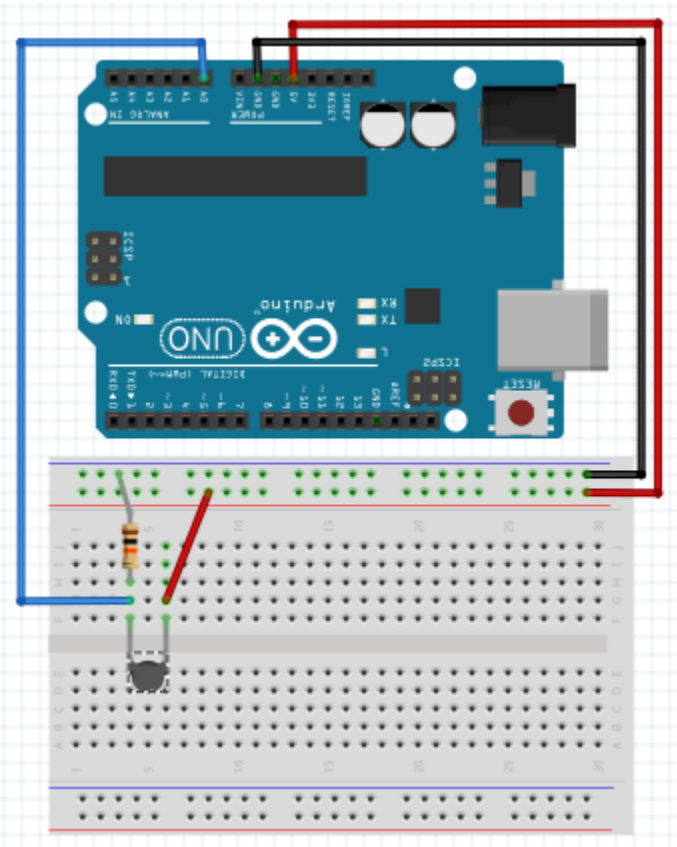
Thermistor have two values (**Resistance Value** and **Beta Value**) We need to know both of them before we can use it.

Resistance Value will be the same as the Resistor paired with it
Example: a 10Kohm Thermistor must be used with a 10Kohm Resistor

Make sure we have the **Beta value** for this Thermistor (given by the factory). We need this for temperature calculation.

STEMKRAF - TUTORIAL PARTS
https://github.com/teaksoon/stemkraf

```
Program: tp06A_Thermistor_raw
  (1/2): Thermistor raw readings
       :
       : by TeakSoon Ding for STEMKRAF (OCT-2021)
```



Hardware:
1x Arduino Uno
1x Solderless Breadboard

   Jumper wires

1x Thermistor 10Kohm Beta3380
1x Resistor 10Kohm

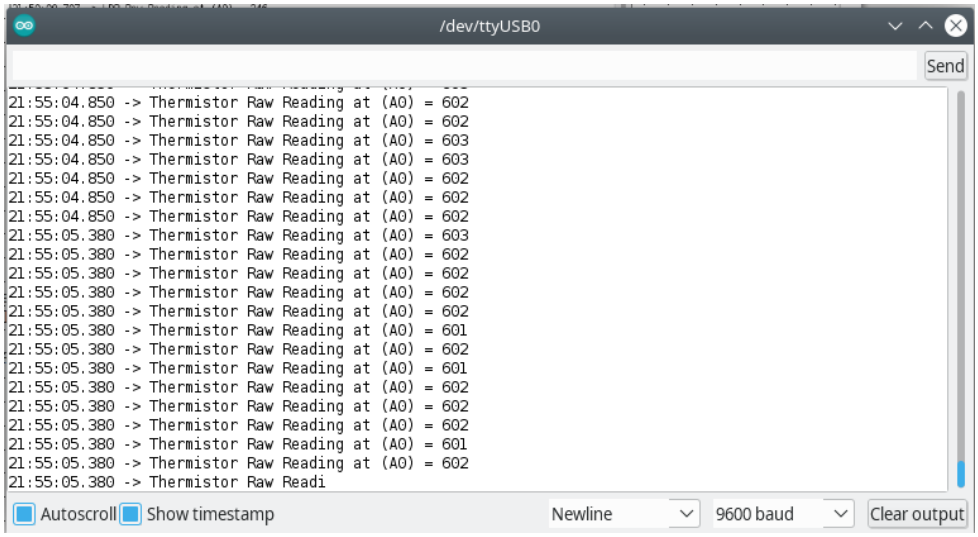
```
Program: tp05A_LDR_raw
  (2/2): LDR raw readings
       :
       : by TeakSoon Ding for STEMKRAF (OCT-2021)
```

```
// Program: tp06A_thermistor_raw
//        : Thermistor raw readings
//        :
//        : by TeakSoon Ding for STEMKRAF ( OCT-2021 )
// ------------------------------------------------
//
#define THERMISTOR_PIN   A0

void setup() {
  pinMode(THERMISTOR_PIN, INPUT); // this is optional
  Serial.begin(9600);
}

void loop() {
int pinValue;
  pinValue = analogRead(A0);
  Serial.print("\nThermistor Raw Reading at (A0) = ");
Serial.print(pinValue);
}
```

- Upload this program with the Arduino IDE Software
- Open up the Serial Monitor from the Arduino IDE Software
- See the Thermistor readings from A0 on Serial Monitor



The Thermistor resistance change according to the room temperature that it is exposed to, which will effect the Voltage on the A0 pin, giving us different readings.

This reading however needs to be converted to Temperature, we can use the following function,

```
float sk_thermistor3380_celsius(int analogPinValue) {
// This is for Beta3380, 10Kohm Thermistor use with 10Kohm Resistor
const float tBeta     = 1.0/3380.0;   // Beta=3380
const float tControl  = 1.0/298.15;   // Control=25 Celsius to Kelvin
float t_kelvin, t_cel;
  t_kelvin  = 1.0/(tControl+(tBeta*(log((1023/(float)pinValue)-1.0))));
  t_cel     = t_kelvin-273.15;  // Kelvin to Celsius
  return t_cel;
}
```