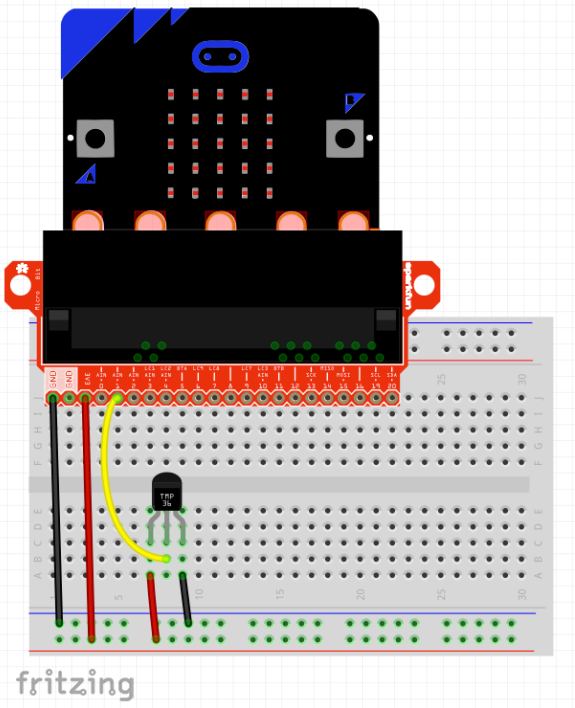
Temperature Sensing with a Microbit



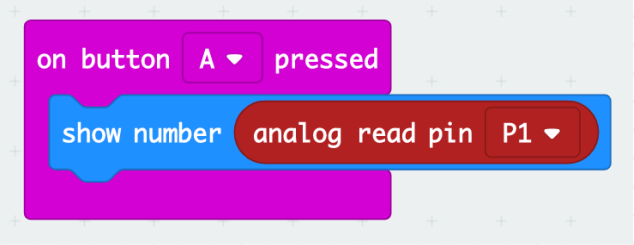
Materials: TMP35 or TMP36 temperature sensor, breakout connector, breadboard, connector wires, USB connector.

Setup your Microbit with:
- Black to GND
- Red to 3V
- Yellow to Pin 1

On the TMP36 sensor with the flat side facing you connect:
- Red to left post,
- GND to right post,
- Yellow to middle post.

Write a test program that shows the number being output by the sensor.

https://makecode.microbit.org/#

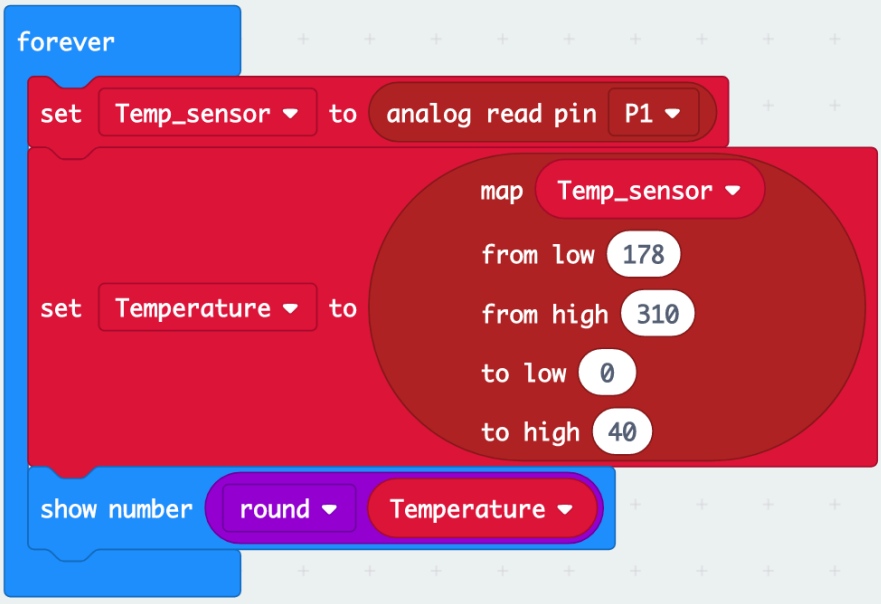


* The sensor outputs more voltage as it gets warmer. At 25°C it outputs 0.75 volts. A temperature increase of 1°C increases the output by 0.01 volts. The Microbit outputs about 3.15 V.

Create a new program:
Create a Variable called **Temp_sensor.**
Create a variable called **Temperature.**
Set the variable **Temp_sensor** to read the Analog **Pin 1.**

Analog pins read values from 0 to 1023. These values can be remapped to the variable **Temperature** with the **Set Temperature** to **Map** block.
The **from** settings are the P1 output range.
The **to** settings are the absolute temperature range for the TMP36 sensor (-55°C - +150°C)
The **Map** block converts the analog read numbers to Temperature readings between 0°C and 40°C.
This was calculated using the standard that the TMP36 emits 750mV with 3.15V @ 25°C.

(0.75/3.15) * 1024 = 244 the analog read for 25°C



The **round** (Math function) gives a whole number reading vs decimal.

Data Sheet for sensor http://ctms.engin.umich.edu/CTMS/Content/Activities/TMP35_36_37.pdf