MICROBIT PROGRAMMING (BLOCK-BASED)
(Time required 30-45 minutes session)

Introduction
In this activity, we will use a sensor to measure ambient temperatur. You will add an external extension of code to MakeCode that will make using the temperature sensor easier and then put the sensor to good use... measuring the air temperature

Parts Needed (included in the kit):
1x micro:bit
1x Micro B USB Cable
1x micro:bit Breakout (with Headers)
1x Breadboard
5x Jumper Wires
1x TMP36 Temperature Sensor

TMP36 Temperature Introduction
The TMP36 is a low-voltage precision centigrade temperature sensor. It provides a voltage output that is linearly proportional to the Celsius temperature. It also doesn't require any external calibration to provide typical accuracies of ±1°C at +25°C and ±2°C over the −40°C to +125°C temperature range. The output voltage can easily convert to temperature using the scale factor of 10 mV/°C. If you are looking at the flat face with text on it, the center pin is your signal pin, the left-hand pin is supply voltage (3.3V in this tutorial), and the right-hand pin connects to ground.
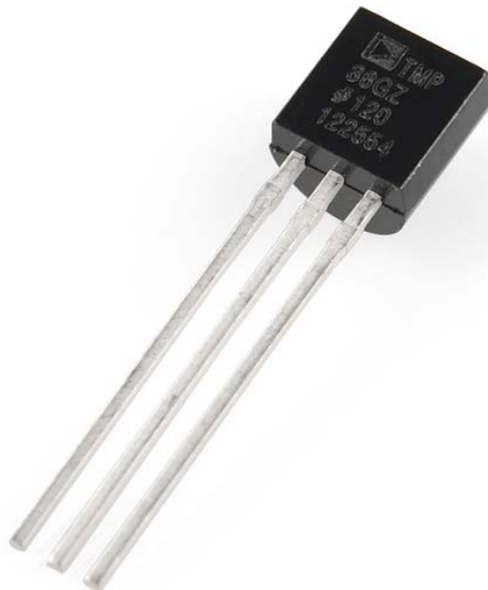
Temperature Activity Wiring Diagram
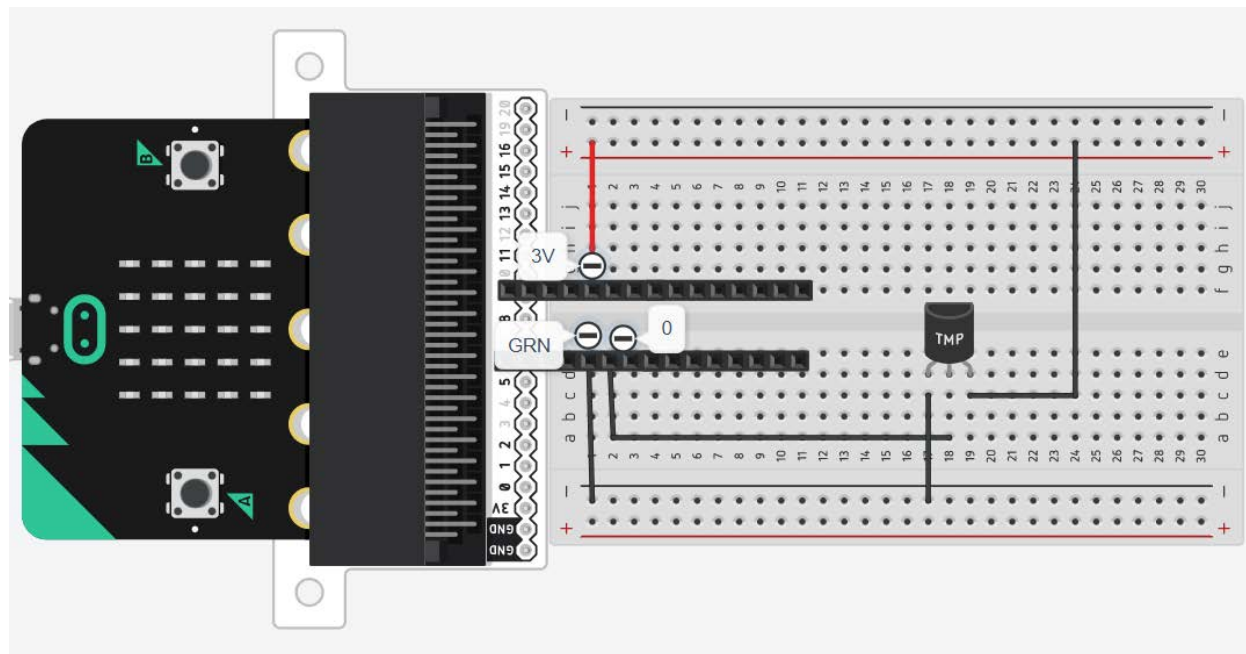

Adding an External Extension

Extension in MakeCode used to be referred as libraries, now they are referred as extensions. The extension for the TMP36 temperature sensor already have the complicated math included for you, therefore you do not have to worry about writing one.

Show Number

The Show Number block accepts a number value and then displays it on the LED array. That's it! Pretty simple. If the number is longer than a single digit, it will automatically scroll the value for you.

Building the "Temperatur Activity"

**Step 1:** Go to https://makecode.microbit.org/# and create a New Project
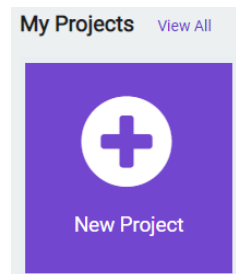
Step 2: Click on New Project and give it a project name **Temperature Activity** and click Create

Create a Project 😄😄😄 ✖

Give your project a name.

Temperature Activity

> Code options

Create ✔
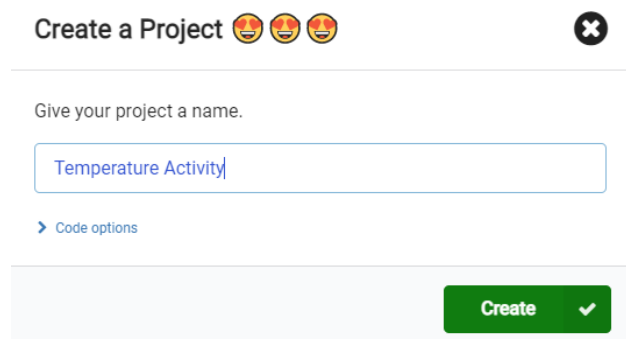
Step 3: Once the MakeCode is launched, click on the **Advance | Add Extensions** category, then clik on the plus (+) to search for the extension. Type Gator-temp in the textfield

Extensions
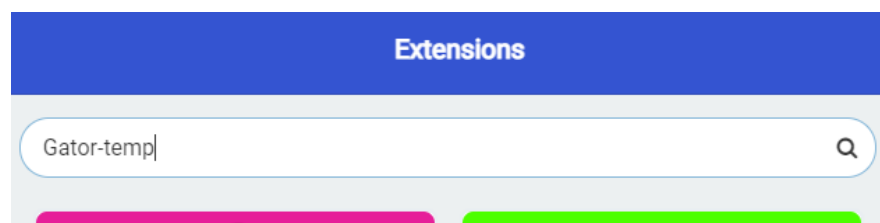
Gator-temp 🔍

Step 4: Select the gator-temp. The extension will be added to the Category menu.

TEMP
GND 3.3V
gator-temp
Learn more
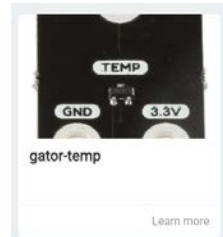
Step 5: Click on the **Variable** category and create a variable named **degreeC** then select and drag the **set degreeC to 0** into **forever** block

forever
set degreeC ▾ to 0

Step 6: Click on the **Gatortemp** category then select and drag the **Get Temperature on pin P0 in F** block into the **set degreeC to 0** block

forever
set degreeC ▾ to Get Temperature on pin P0 ▾ in F ▾
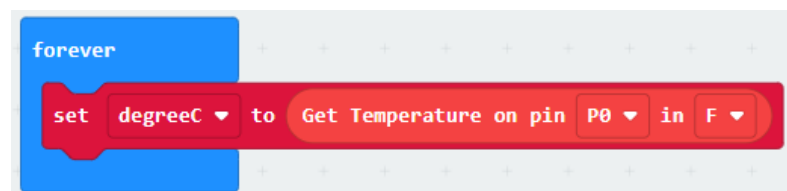
Step 7: Click on the **Basic** category then select and drag the **show number <0>** block into the **forever** block

Step 8: Click on the **Varibles** category then select and drag the **degreeC** block into the **show number <0>** block

Step 9: Click on the **Basic** category then select and drag the **pause ms()** block into the **forever** block. Change its value of 100 to 500 ms.
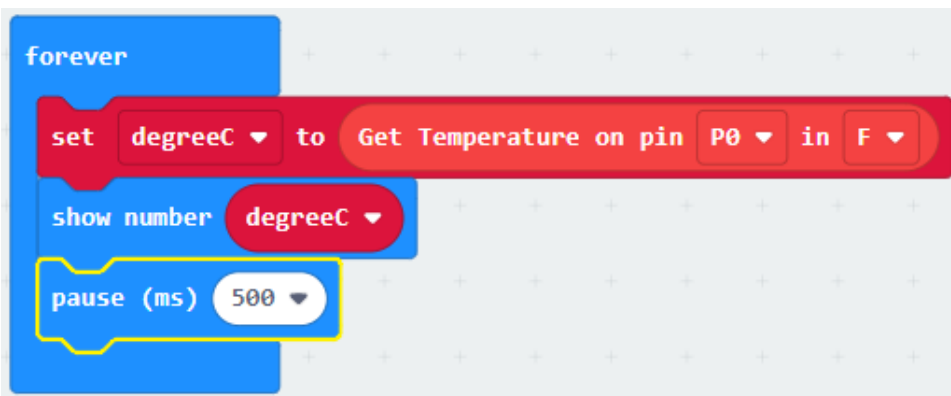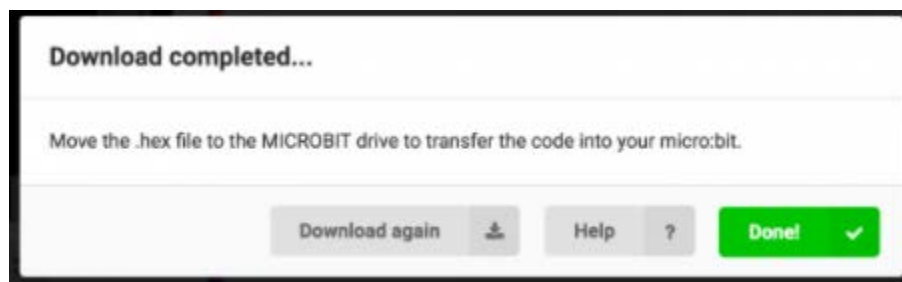

Final Prototype
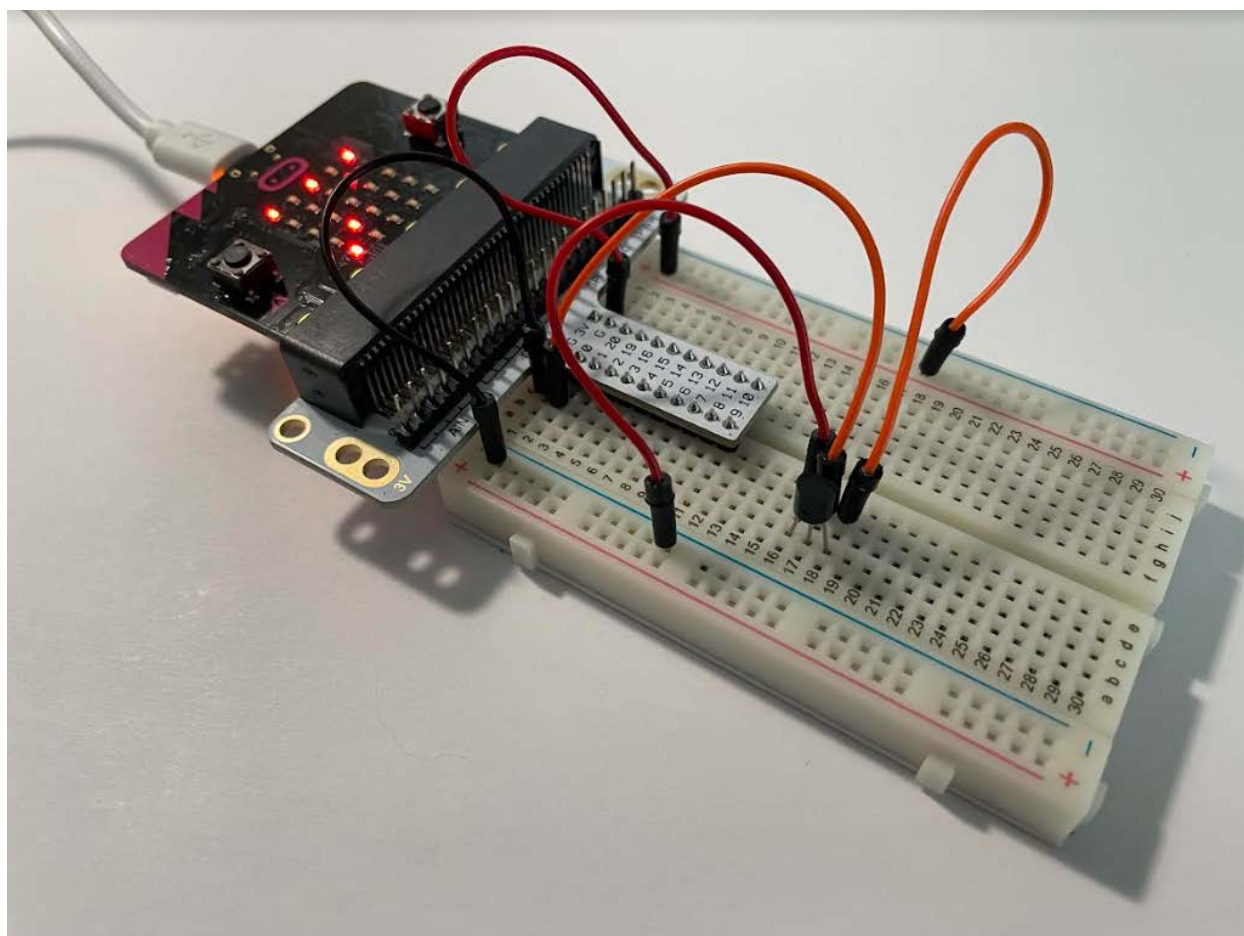
Plug the USB cable to the micro:bit

Step 10: Click the download button in the lower lefthand corner of the code window. It will downloaded most probably in the Downloads folder

Step 11: Simply click and drag your program file from its download location to your micro:bit drive, which shows up as an external device.

Step 12: When your micro:bit turns on, the temperature reading from the TMP36 temperature sensor will be displayed and scrolled across the LED array.

Congratulations! You have successfully completed this activity.

Reference: Sparkfun Inventor's Kit for micro:bit Experiment Guide
https://learn.sparkfun.com/tutorials/sparkfun-inventors-kit-for-microbit-experiment-guide