MakeCode

tinyurl.com/MicrobitWorkshop

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Microsoft MakeCode

Just works always, everywhere

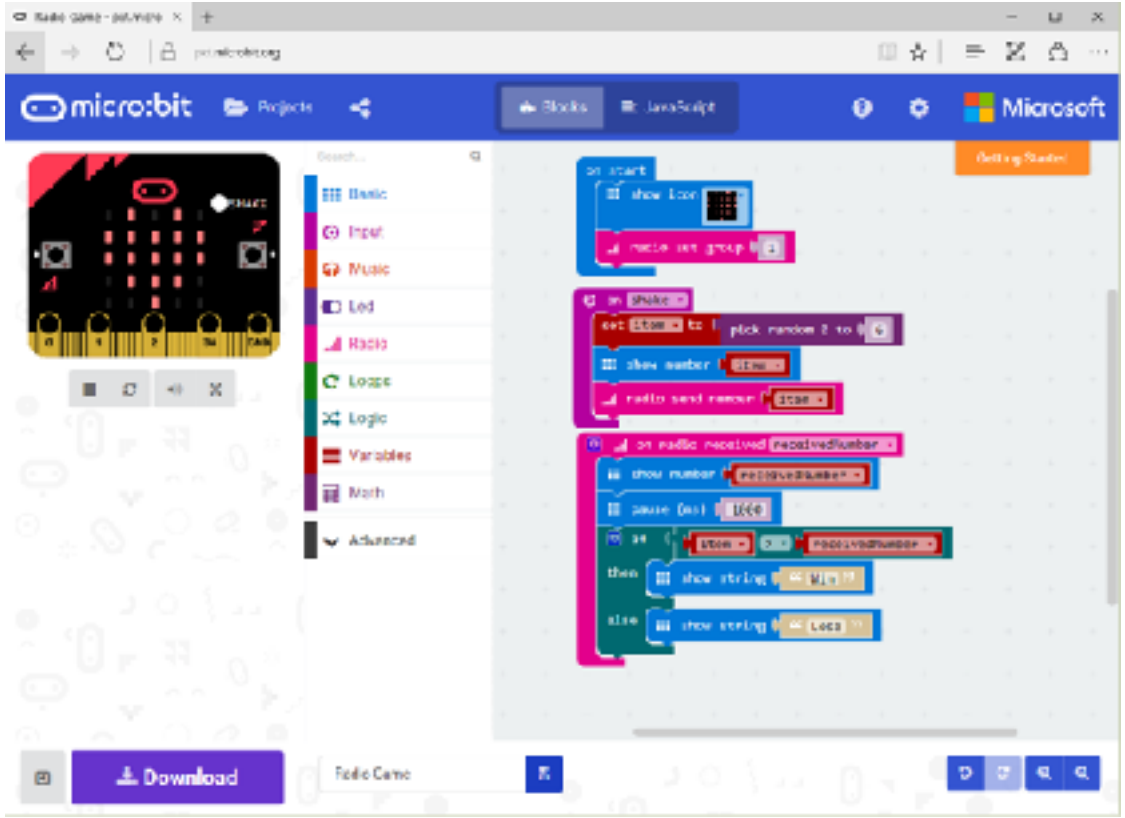
- Free web-based IDE
- Offline capabilities

Real skills

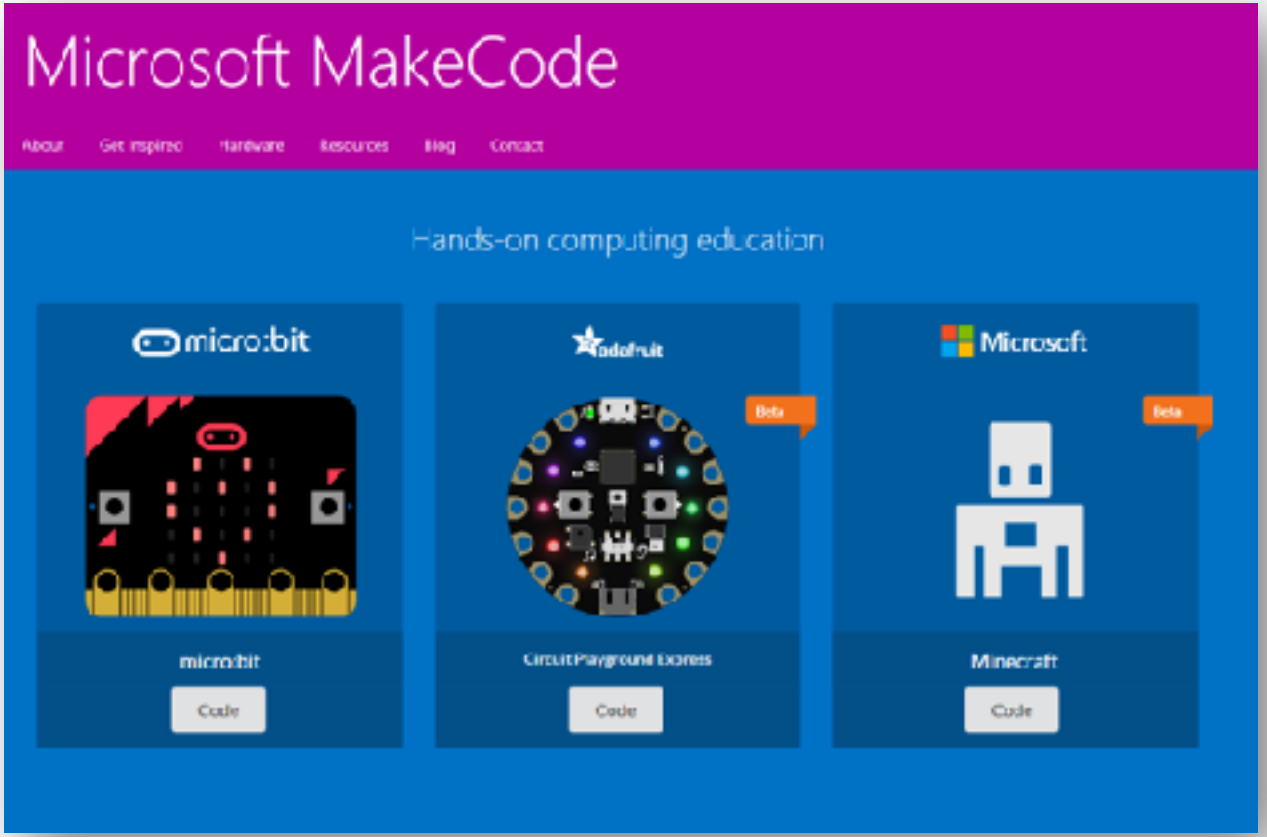
- Block to Text editor progression
- JavaScript, VS Code extension

Make CS fun and tangible

- Easy drag & drop deployment
- Simulator for quick iteration



MakeCode.com



Micro:bit Programming

MakeCode: Block-based

MakeCode: JavaScript

MicroPython

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Today

Overview of hardware

Download and run programs

Explore challenges

Q&A

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Example Projects

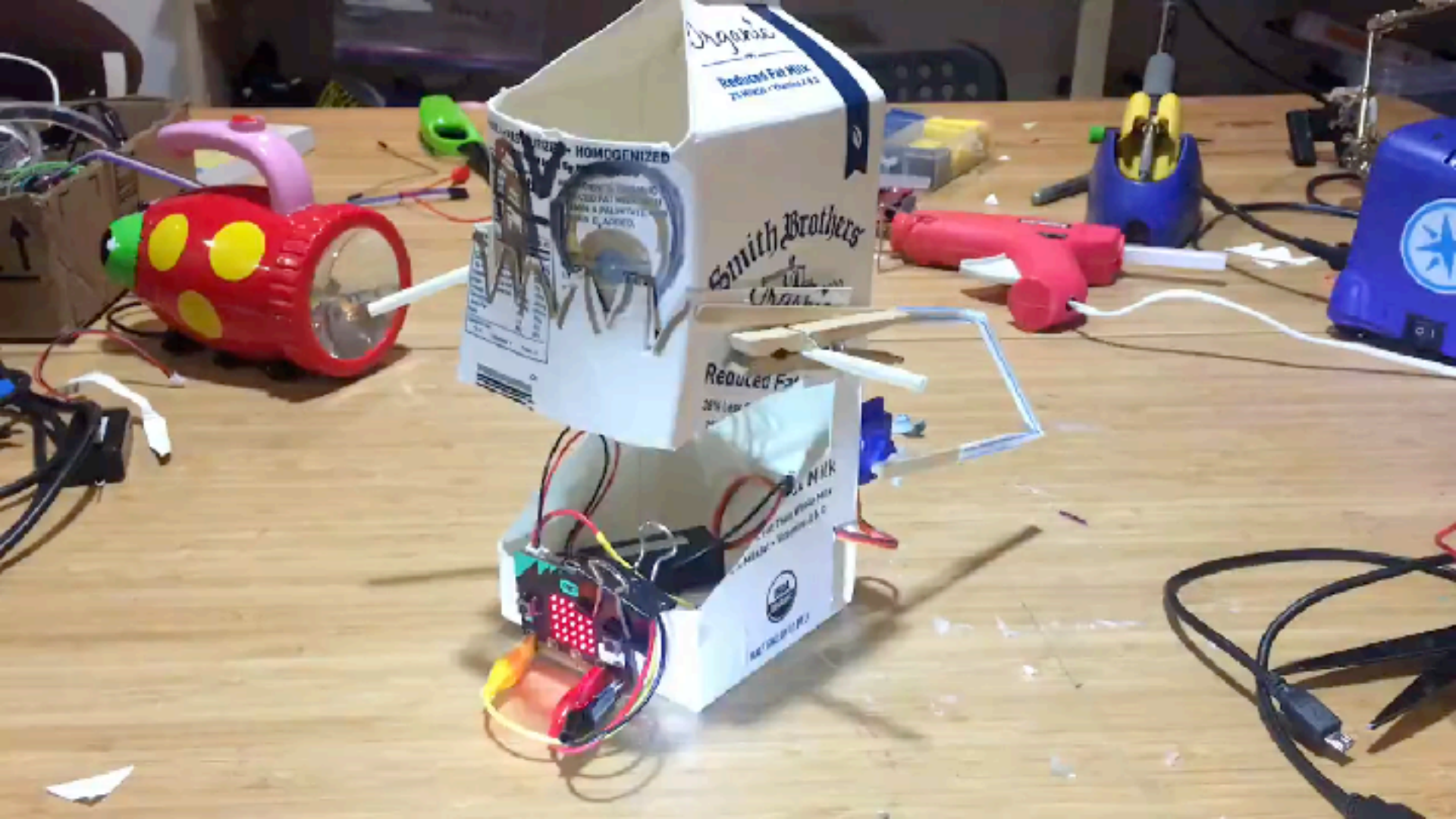
Wrist Cuffs

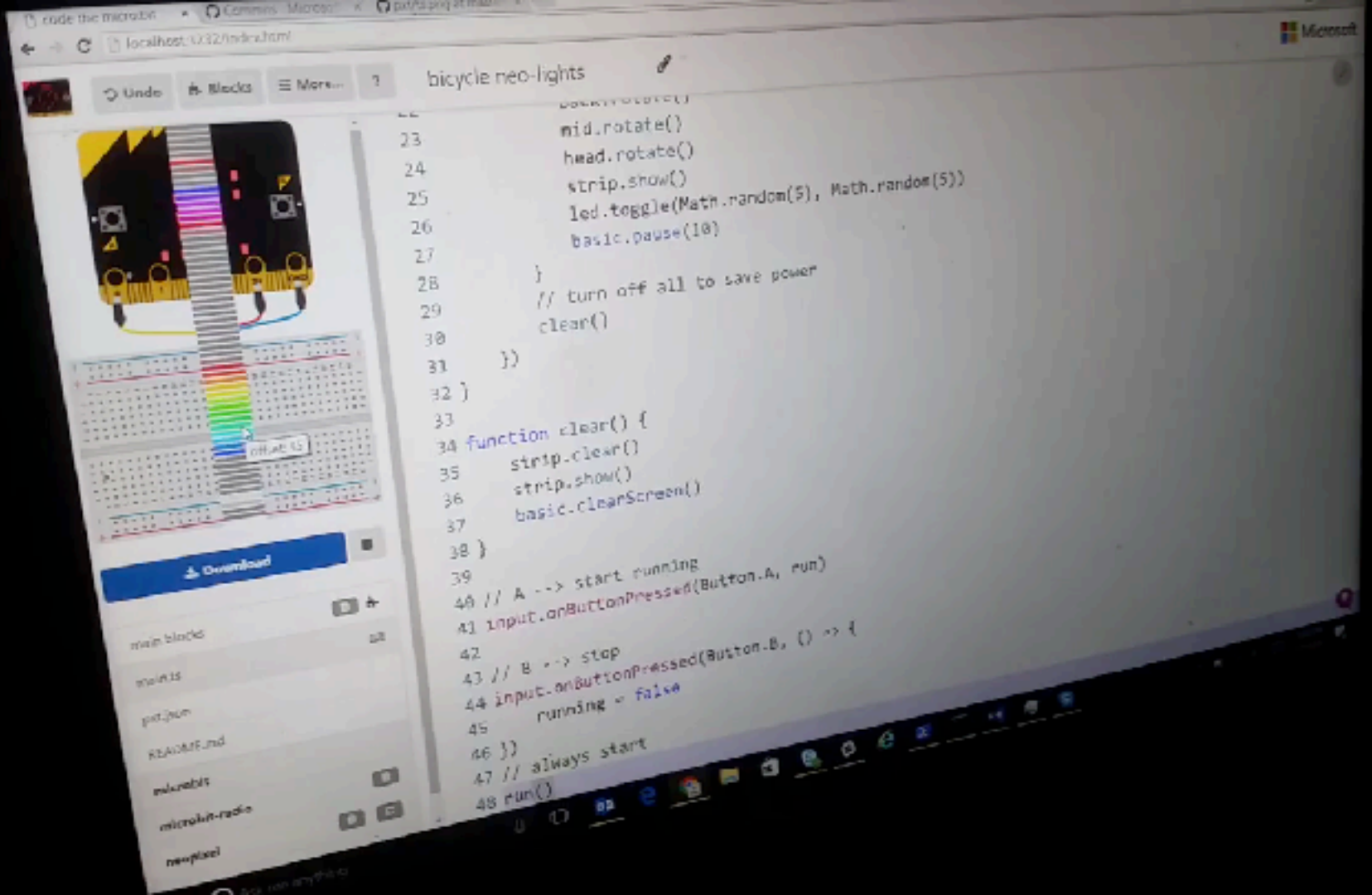
Magic Wands

Air Guitars

Wallet / Purse

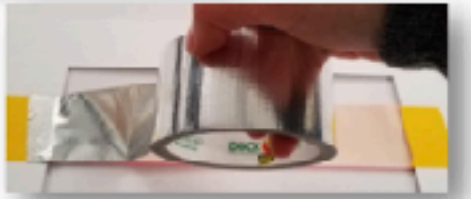
Light Monsters


HOMOGENIZED
Smith Brothers


Undo
Blocks
More...
bicycle neo-lights
Download
main.blocks
main.ts
pxt.json
README.md
neopixel
mid.rotate()
head.rotate()
strip.show()
led.toggle(Math.random(5), Math.random(5))
basic.pause(10)
// turn off all to save power
clear()
function clear() {
strip.clear()
strip.show()
basic.clearScreen()
// A --> start running
input.onButtonPressed(Button.A, run)
// B --> stop
input.onButtonPressed(Button.B, () => {
running = false
// always start
run()

Make a micro:bit Wrist Cuff

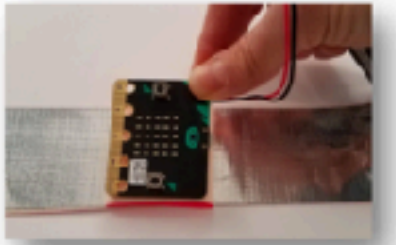
1. Using the frame provided, cut 2 strips of duct tape and stick them back-to-back



2. Cut tape off of the frame

Make a micro:bit Wrist Cuff

3. Loop a piece of duct tape to stick on your micro:bit



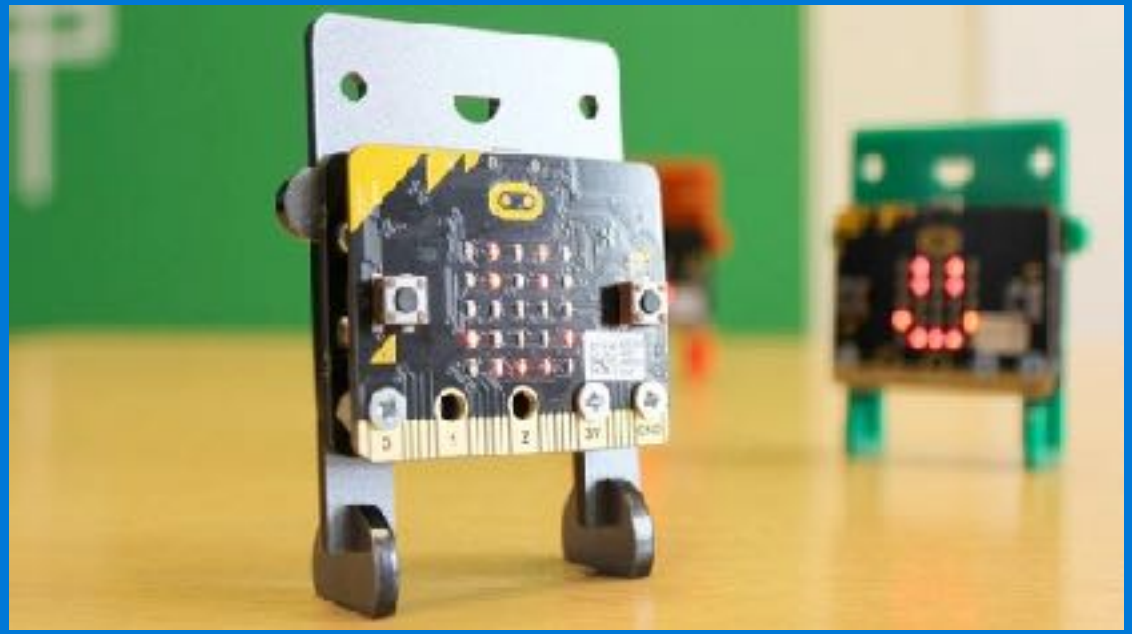
4. Tape the battery pack on the opposite side

5. Stick on Velcro tabs at the end of your wrist cuff as fasteners

6. Decorate!



micro:bit hardware



Hardware: What makes up a computer?

Inputs

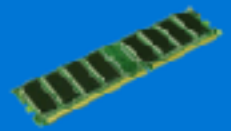
- Keyboard
- Mouse
- Touch screen
- Camera
- Microphone
- Game Controller
- Scanner

Central Processing Unit (CPU)

"chip"

Memory

RAM (short term)

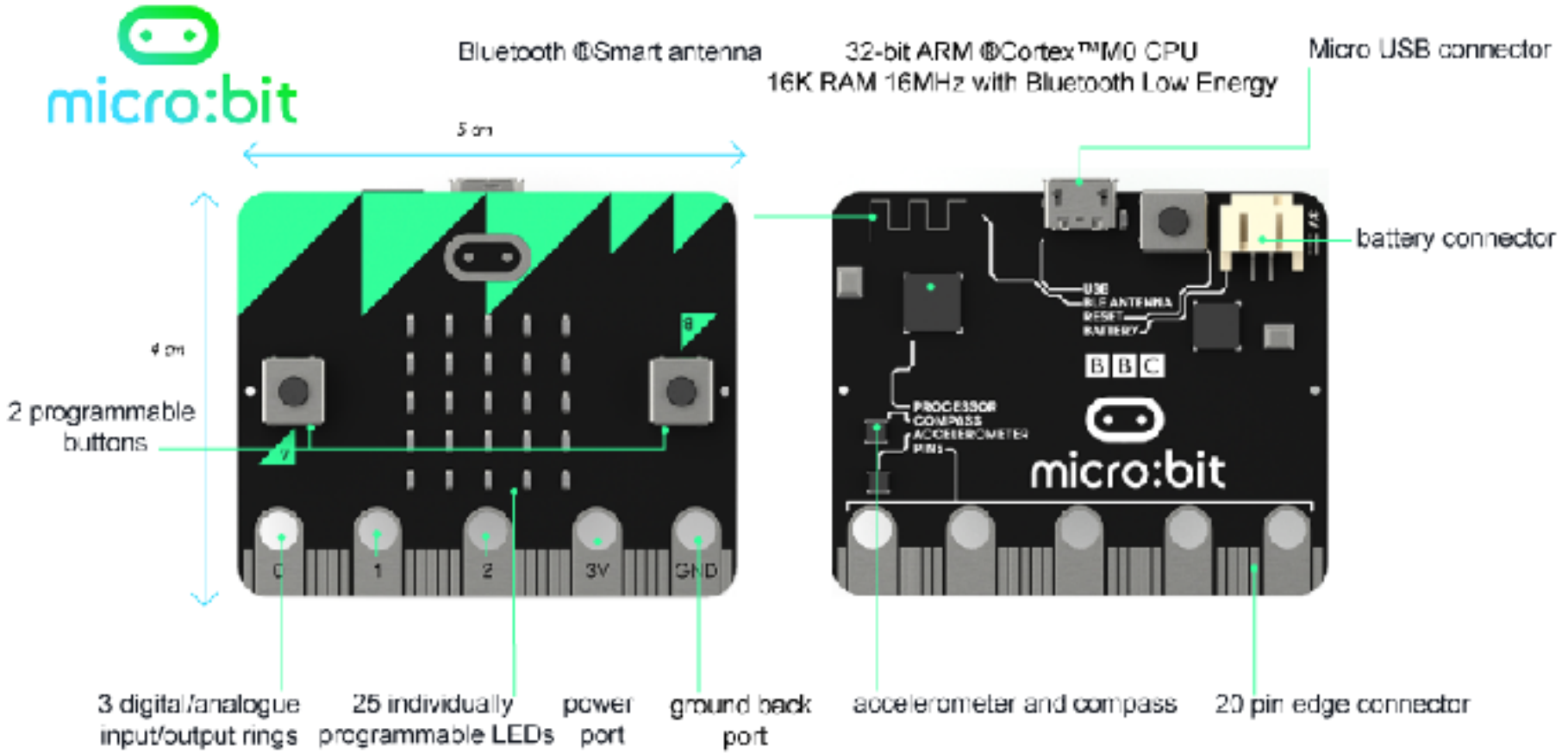


Storage (long term)

"hard drive"

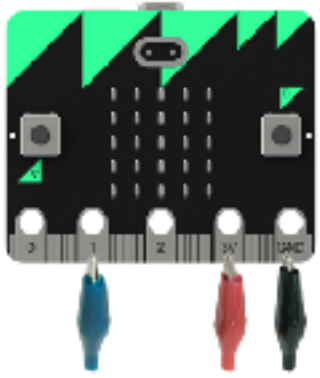
Outputs

- Monitor or Screen
- Headphones or Speakers
- Printer



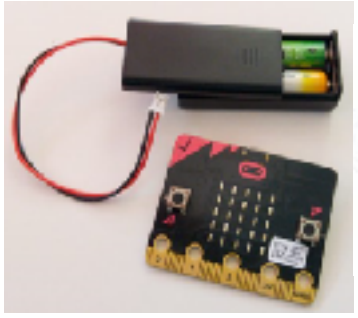
http://microbit.org/hardware/

Micro:bit accessories



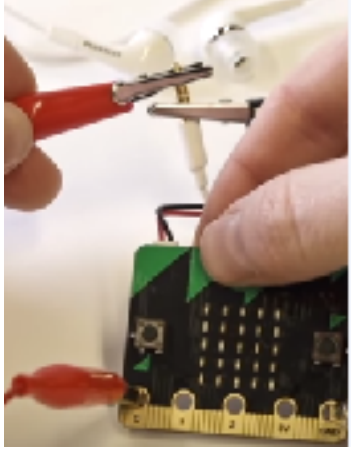
Crocodile Clips

Battery Pack & USB cable

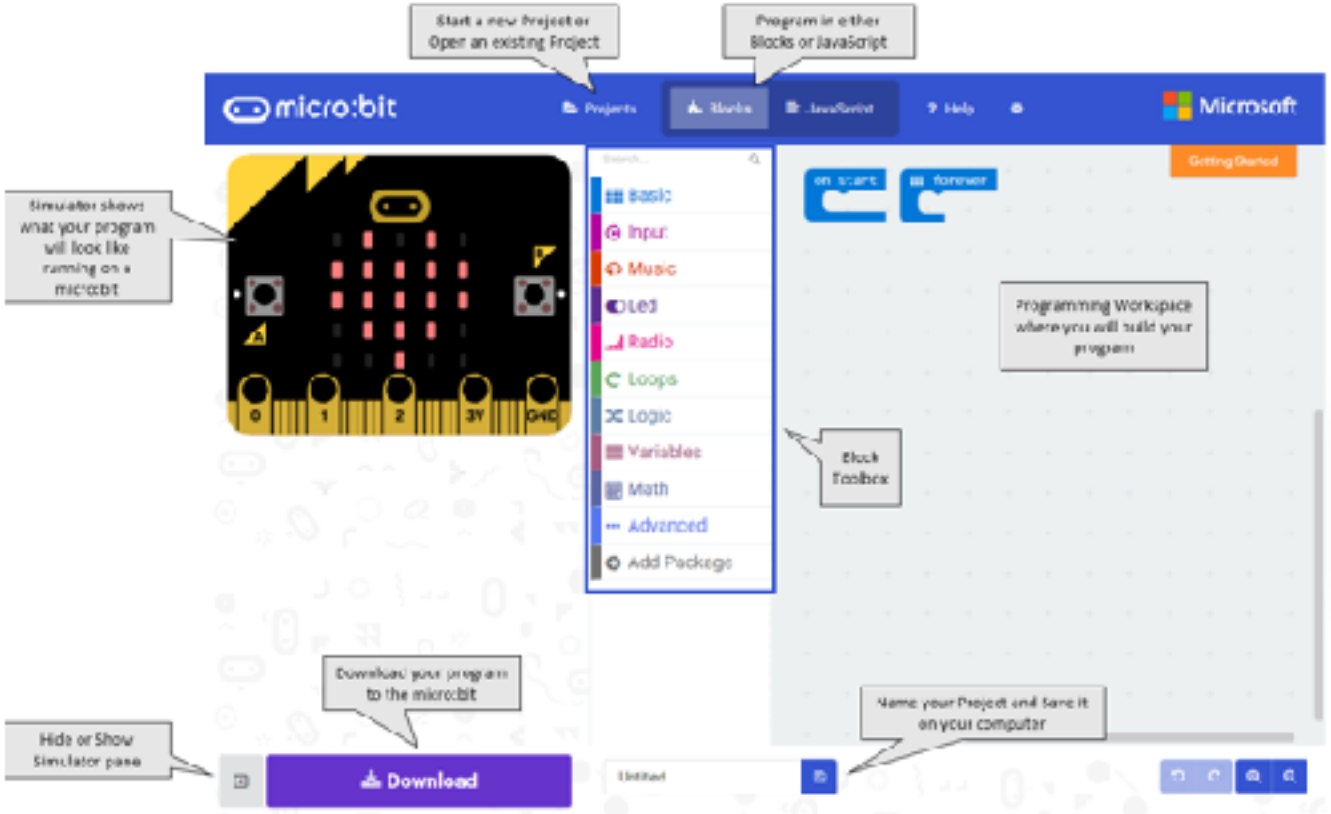


Maker Kits

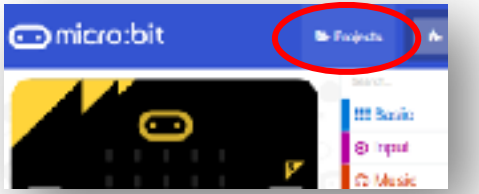
Headphones

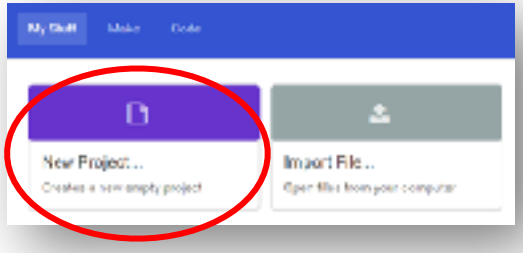


Start a Project



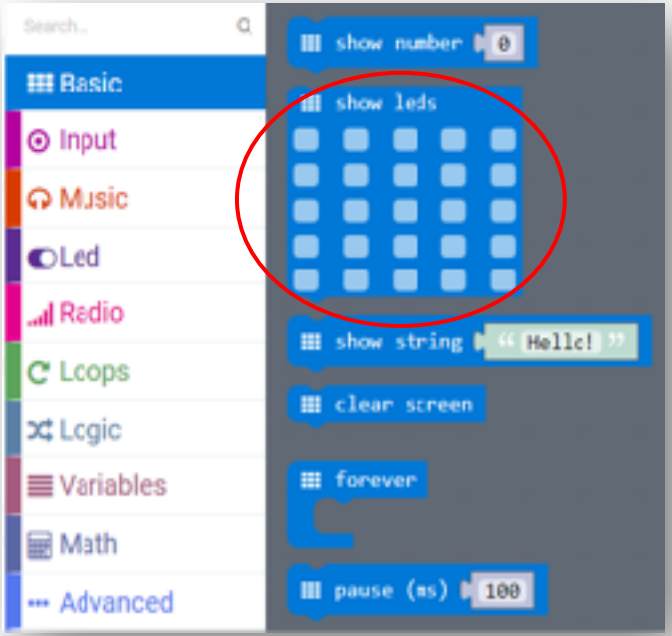
Start a New Project



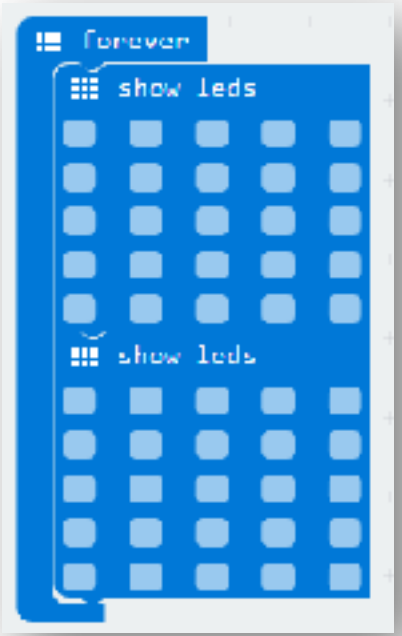


Program an Animation

1. Open the **Basic** Toolbox drawer
2. Drag 2 of the **Show LED** blocks onto your Workspace



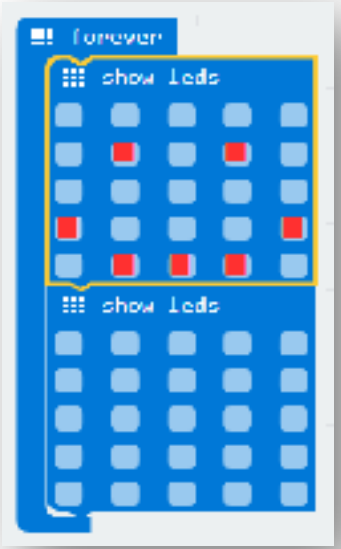
3. Position them under the **Forever** block to look like this:



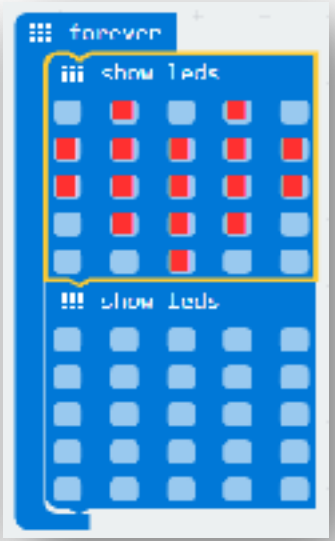
Program an Animation

4. In the first **Show LED** block, click squares to turn on lights to make a design

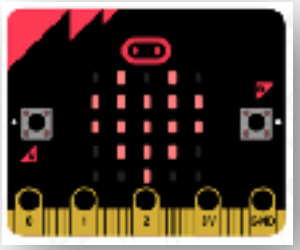
Smiley Face



Heart

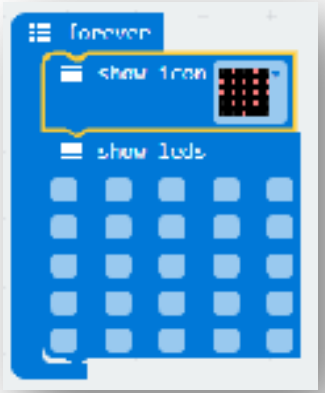


5. Notice your animation running in the Simulator



6. Try replacing the first **Show LED** block with a **Show Icon** block

7. Experiment with other **Basic** blocks

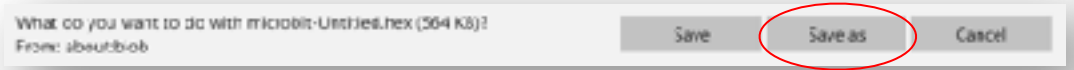


Download your program to the micro:bit

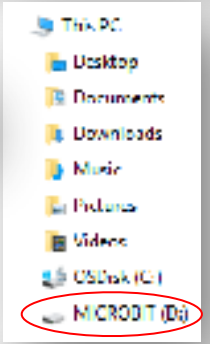
1. Plug in your micro:bit with USB cable

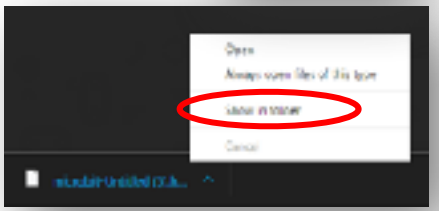
2. Click Download Button

3. Microsoft Edge: Select ‘Save As’ onto your MICROBIT USB drive



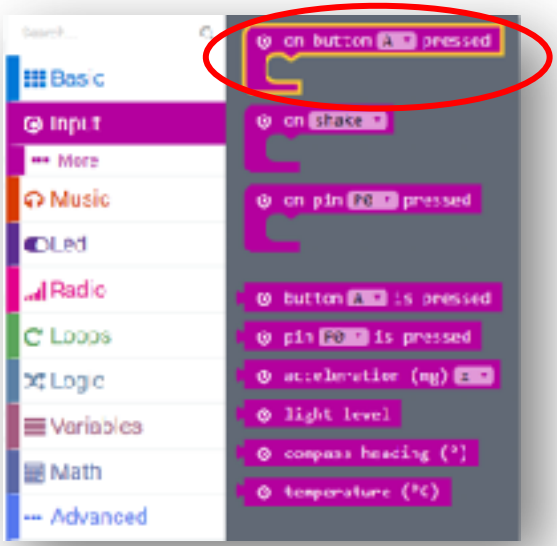
4. Google Chrome: Find the file you downloaded (microbit-Untitled.hex), and copy your file over to the micro:bit drive when it appears on your computer



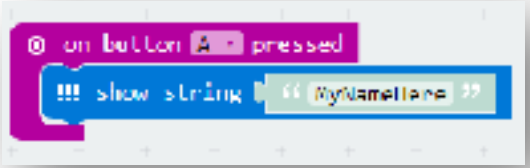


Add Inputs

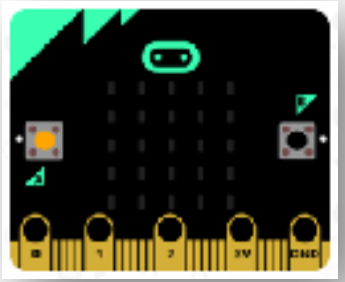
1. Open the **Input** Toolbox drawer
2. Drag a **On Button Pressed** block onto your Workspace



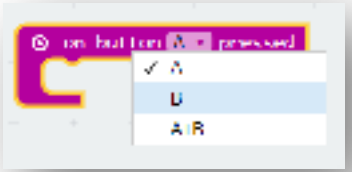
3. Drag a **Show String** block under the **On Button Pressed** block in your program



4. Test your program in the Simulator by clicking Button A

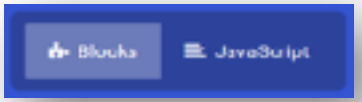


5. Try other inputs



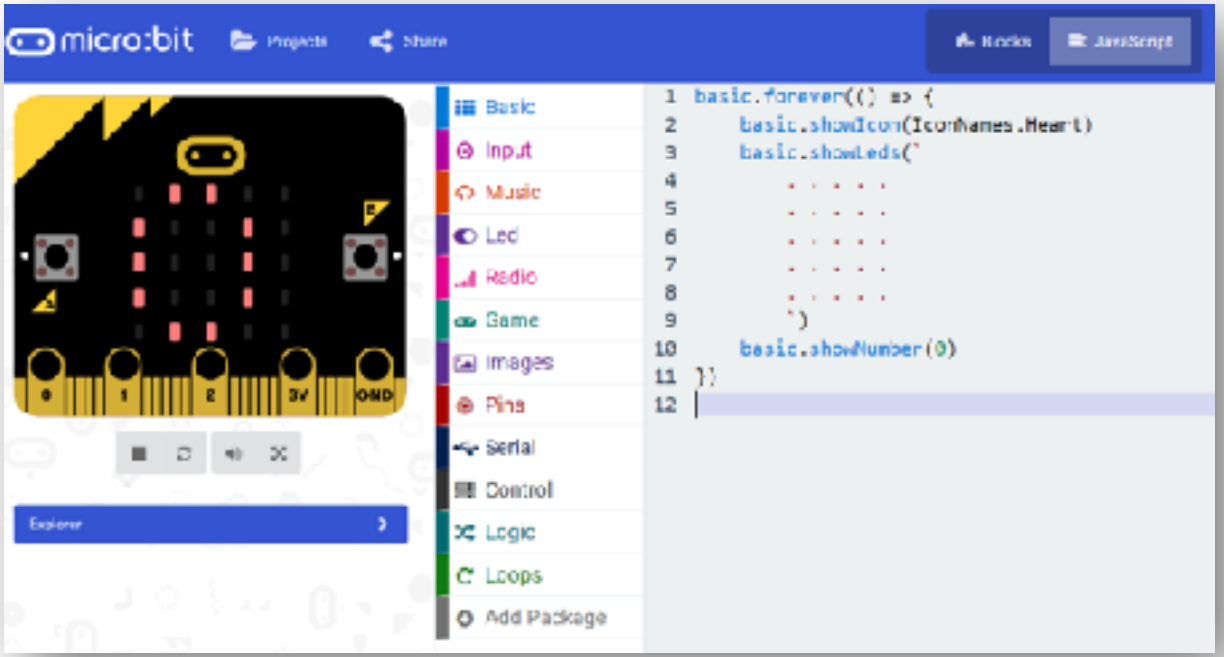
JavaScript Editor

1. Click the JavaScript button at the top



1. Try typing in the following line of code:

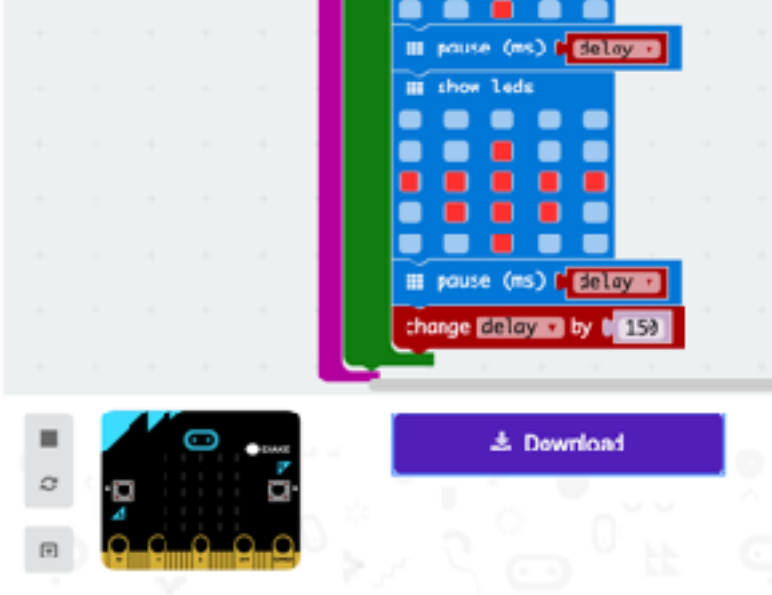
```
basic.showNumber(0)
```



Challenge 1

Fix Board Game Arrow

Download and Import project at: **https://makecode.microbit.org/_9Wf9ECM8tJer**

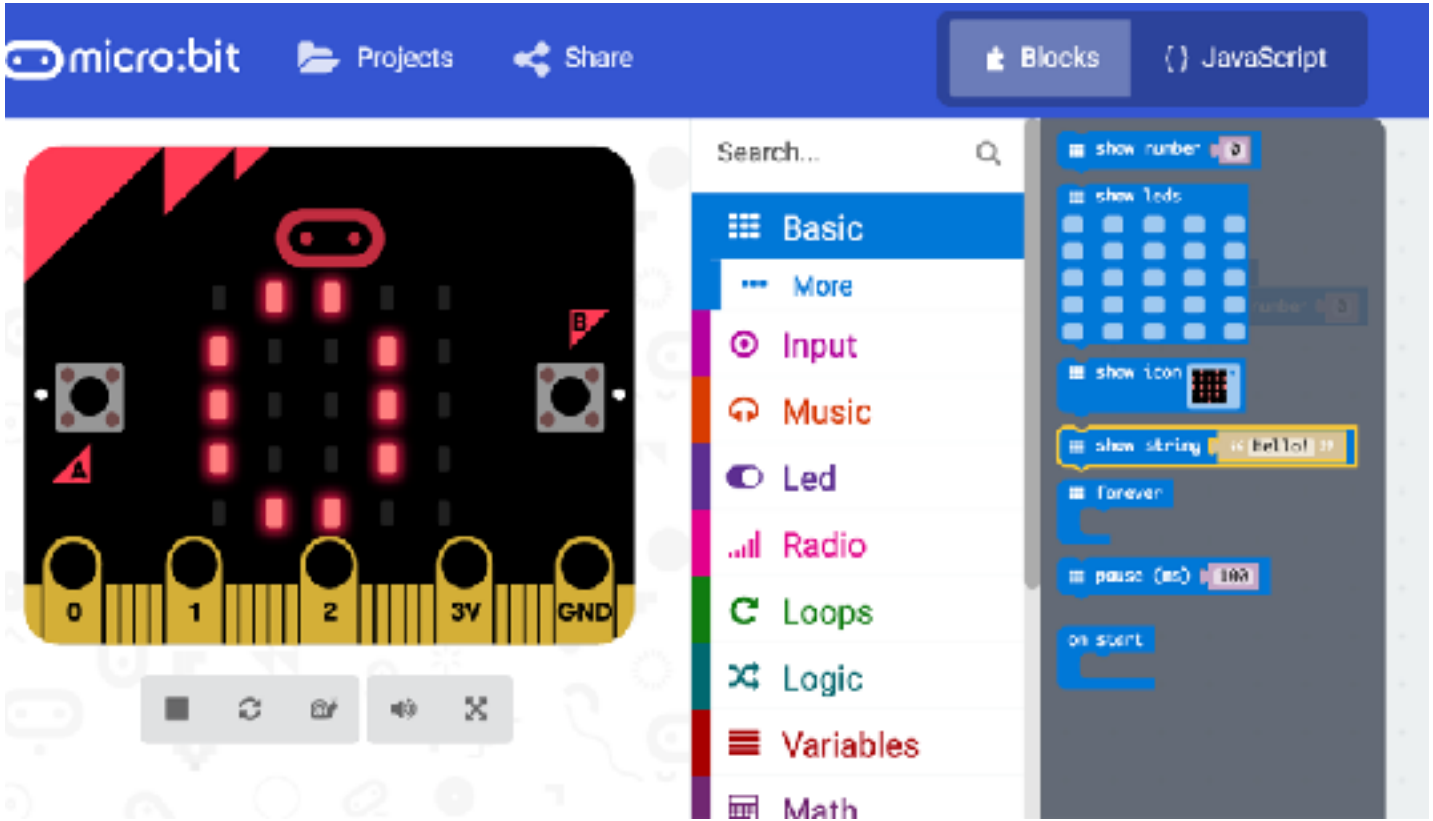


Your goal: When you shake the Micro:bit, the arrow spins and slows down until it lands on a random direction.

The starter code provided always lands on the same direction. How can you fix it?

Challenge 2

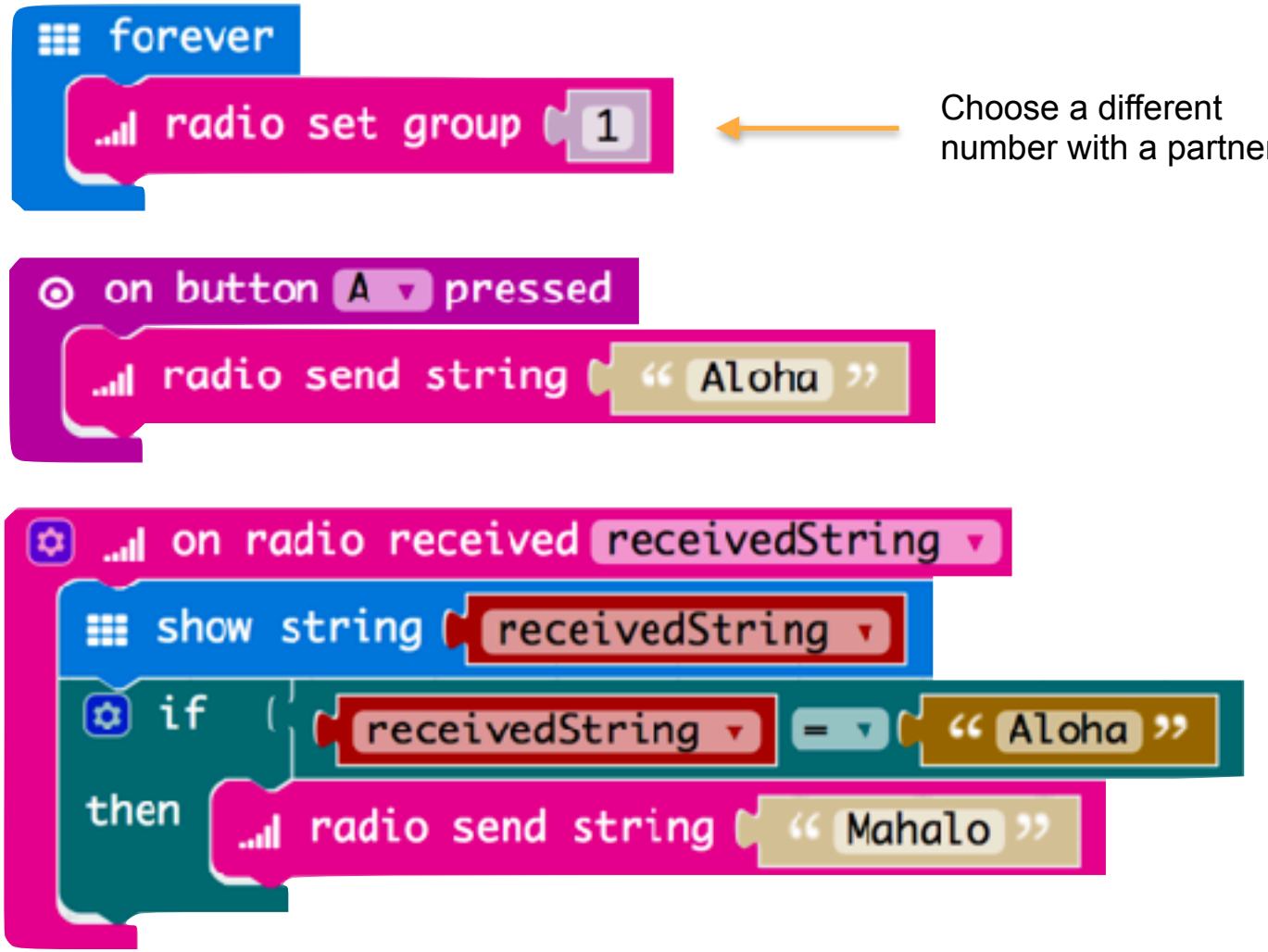
Servo



What are the max and min values for rotation (pitch) on the X axis?

Challenge 3

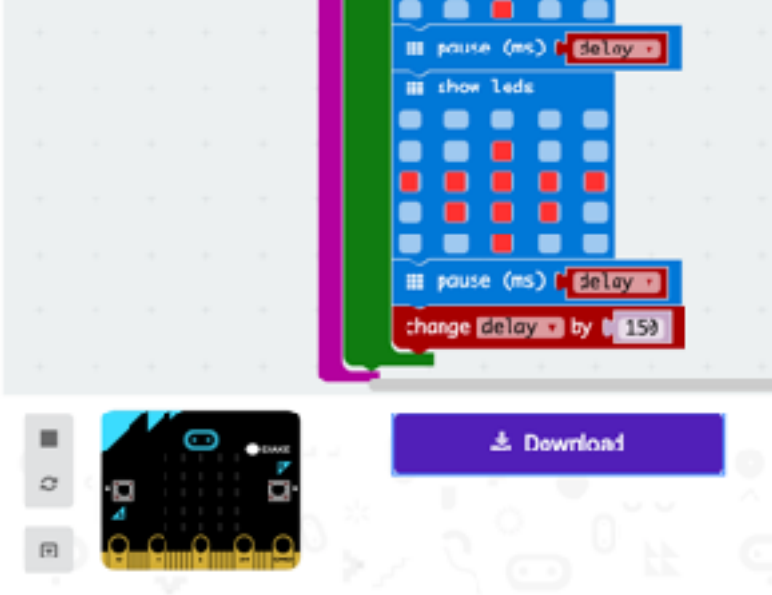
Create Radio Simulation


forever
radio set group 1
Choose a different number with a partner.
on button A pressed
radio send string "Aloha"
on radio received receivedString
show string receivedString
if receivedString = "Aloha"
then
radio send string "Mahalo"

Challenge 4

Install Radio Simulation

Download and Install project at: **https://makecode.microbit.org/_5s12CX7XH983**



Just drag the .hex file to your MICROBIT volume. No need to Import it to the IDE! (Unless you want to check out the JavaScript behind it.)

@dkiang

Slides, links, and resources: tinyurl.com/microbitworkshop
My web site: www.kiang.net