

10 activities for the BBC Micro:Bit

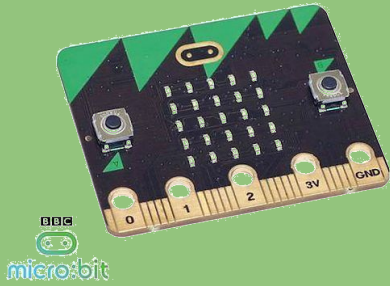
CAS National Conference Workshop
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Objectives

- Overview of the Micro:Bit and basics
- Basic commands
- Downloading the .hex file and running it on device
- Input commands
- Variables
- Conditional selection



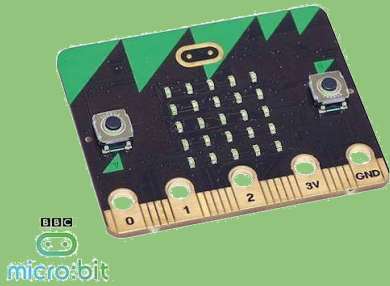
Overview

What is it?

- A pocket-sized codeable computer
- 25 red LEDs that light up, flash messages etc.
- Has two programmable buttons.

Other features

- Can use as a games controller (e.g Kodu)
- On board motion detector
- Built in compass
- Bluetooth connectivity

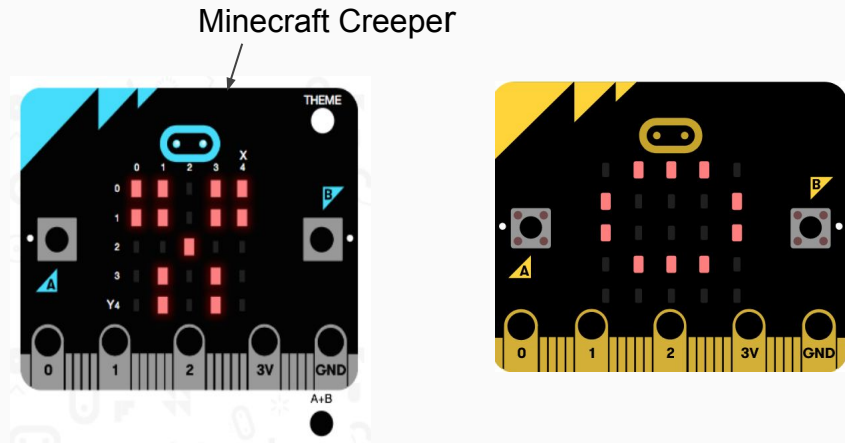


Emulator

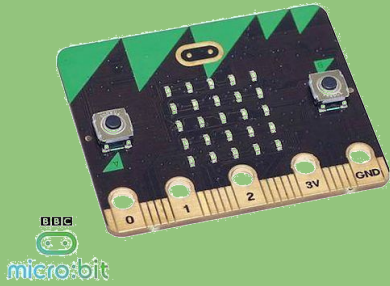
Getting to know the Micro:Bit (Basic commands)

Activity 1: Smiley Face

Task: Make a smiling face, then run it on the emulator. What other shapes, pictures can you get it to display?



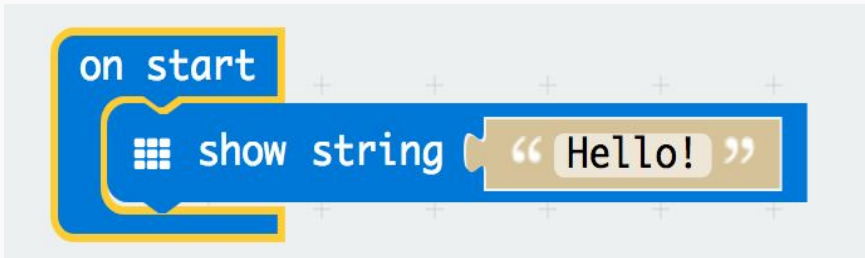
Challenge: Now try running your code on the device itself (you will need to download the code and drag the .hex file to the Micro:Bit folder).



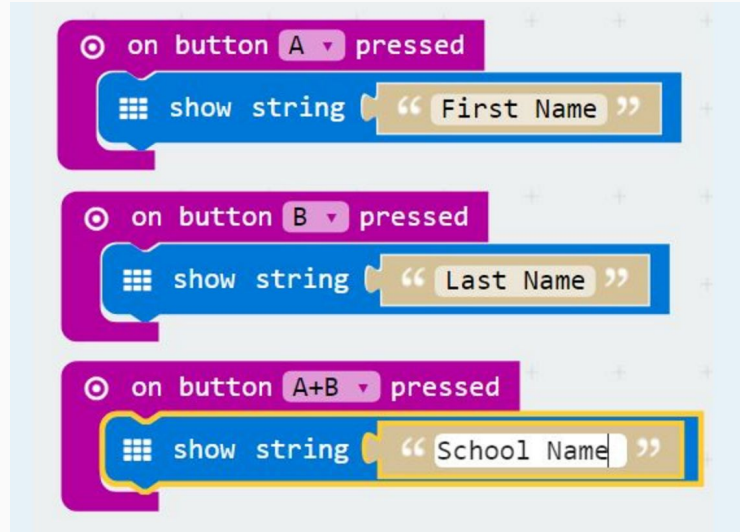
Input Commands

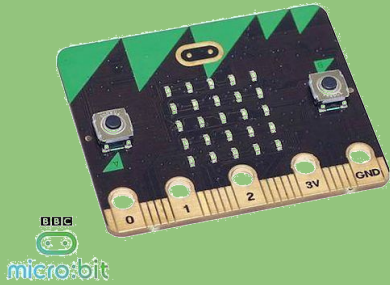
Different ways to run your code

Activity 2: Scrolling name badge



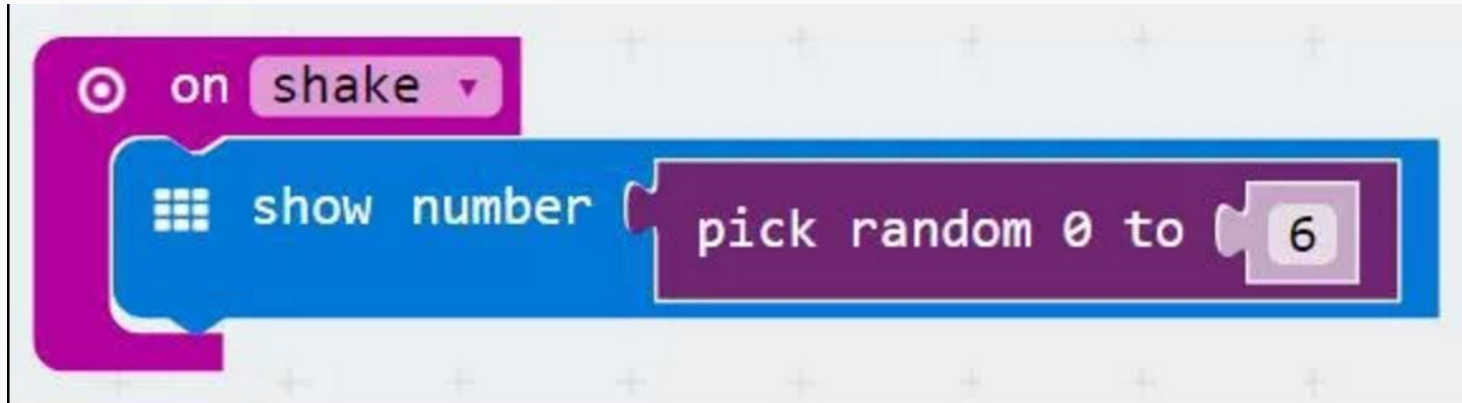
Task: Make yourself a scrolling name badge! How about using a different command (e.g. 'on shake').



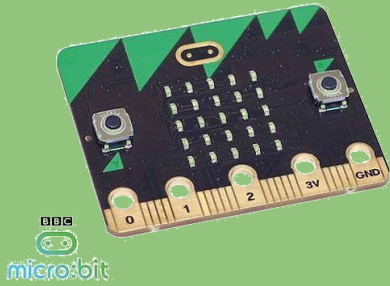


Input Commands

Activity 3: Dice Emulator



Challenge: Can you make the dice pick from 12 numbers? Can you run it based on a different input command?



Input Commands

Activity 4: Game of chance

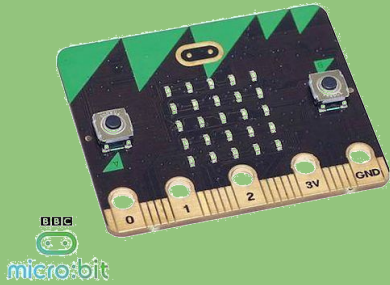
```
show string " SELECT A BUTTON "
```

```
on button A pressed  
do show string " YOU WIN "
```

```
on button B pressed  
do game over
```

Task: Make a simple game for a peer to play whereby they have a 50/50 chance of winning depending on which button they press (**selection**)

Challenge: Can you add a different condition (e.g. 'on shake' or when button a and b are pressed together it displays the words "try again").

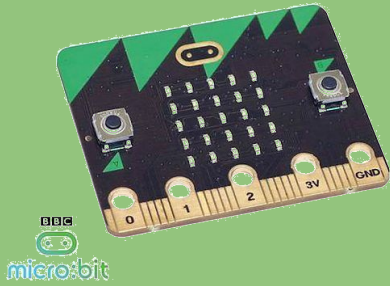


Input Commands

Activity 5: Rock, Paper, Scissors

Three Scratch-style 'on button pressed' blocks are shown in a row. Each block has a purple header with a radio button icon and a dropdown menu. The first block is for 'on button A pressed', the second for 'on button B pressed', and the third for 'on button A+B pressed'. Each block contains a blue 'show icon' block with a 5x5 grid of black squares. The grid in the 'A+B' block has two red squares in the top row, representing the number 3.

Task: Make a version of 'Rock, Paper, Scissors' to play against a partner!

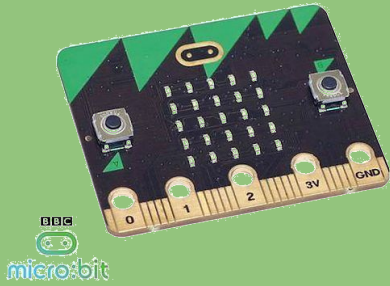


Using Variables

Activity 6: Make a thermometer!

Task: Make a thermometer by adding a 'temperature' **variable**

```
on shake
  set Temp to temperature (°C)
  show number Temp
```



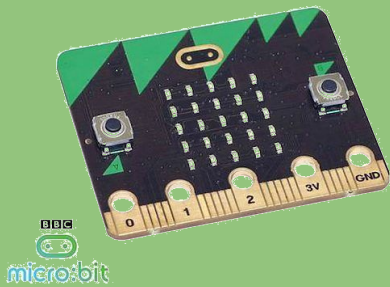
Conditional Selection

Activity 7: Rock, Paper, Scissors

Task: Extend earlier version of 'Rock, Paper, Scissors' to include **conditional selection** (i.e. output will only happen if certain condition is met otherwise something else will happen instead).

Language of selection 'if, then and else'

```
on shake
  set image to pick random 0 to 2
  if (image = 2)
    then show icon [rock icon]
  else if (image = 1)
    then show icon [paper icon]
  else show icon [scissors icon]
```



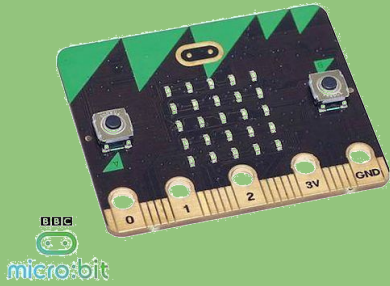
Conditional Selection

Activity 8: Fortune Teller (Project 3 from Code Club Micro:Bit projects)



```
on button A pressed
  set answer to pick random 0 to 1
  if (answer = 0)
  then show string "No"
  else show string "Yes"
```

Challenge: Can you make your Micro:Bit say something like 'Maybe' or 'Ask again' if the answer is 2. To get this working, you'll also need to change your code to choose a random number between 0 and 2! Tip: You can right-click on a block to duplicate the block and its contents

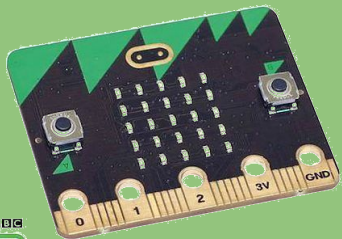


Conditional Selection

Activity 9: Making a compass

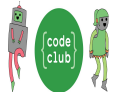
Task: Can you make use of the Micro:Bit's motion detector to create your own Compass

```
forever
  set degrees to (compass heading (°))
  if (degrees < 45 or degrees > 315)
  then
    show string " N "
  else if (degrees < 135)
  then
    show string " E "
  else if (degrees < 225)
  then
    show string " S "
  else
    show string " W "
```



micro:bit

Conditional Selection



Activity 10: Reaction game (Code Club Project 6)

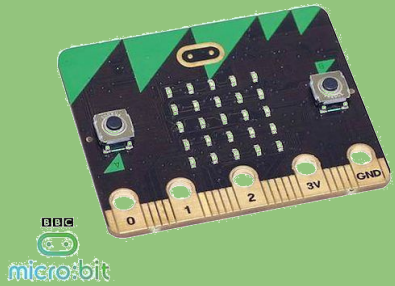
Challenge: Can you use two variables called Player A and Player B to keep track of each player's score? You'll need to set both scores to 0 at the start of the game by placing code inside the 'on start' block and add 1 to whichever player wins each round. You'll also need to think of a way to display the score.

Getting Started

```
forever loop
  pause (ms) 1000
  pause (ms) pick random 0 to 4000
  show leds
  while not button A is pressed and not button B is pressed
  do
    pause (ms) 20
  if button A is pressed
  then
    show leds
  if button B is pressed
  then
    show leds
  pause (ms) 1000
  clear screen
```

on start

```
set playerA to 0
set playerB to 0
```



Links/Acknowledgements

[Code Club Projects \(Micro:Bit\)](#)

[Matt Moore Blog](#)

[Range of Micro:Bit lesson plans, resources and activities \(Ellie Overland\)](#)

Any Questions?

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