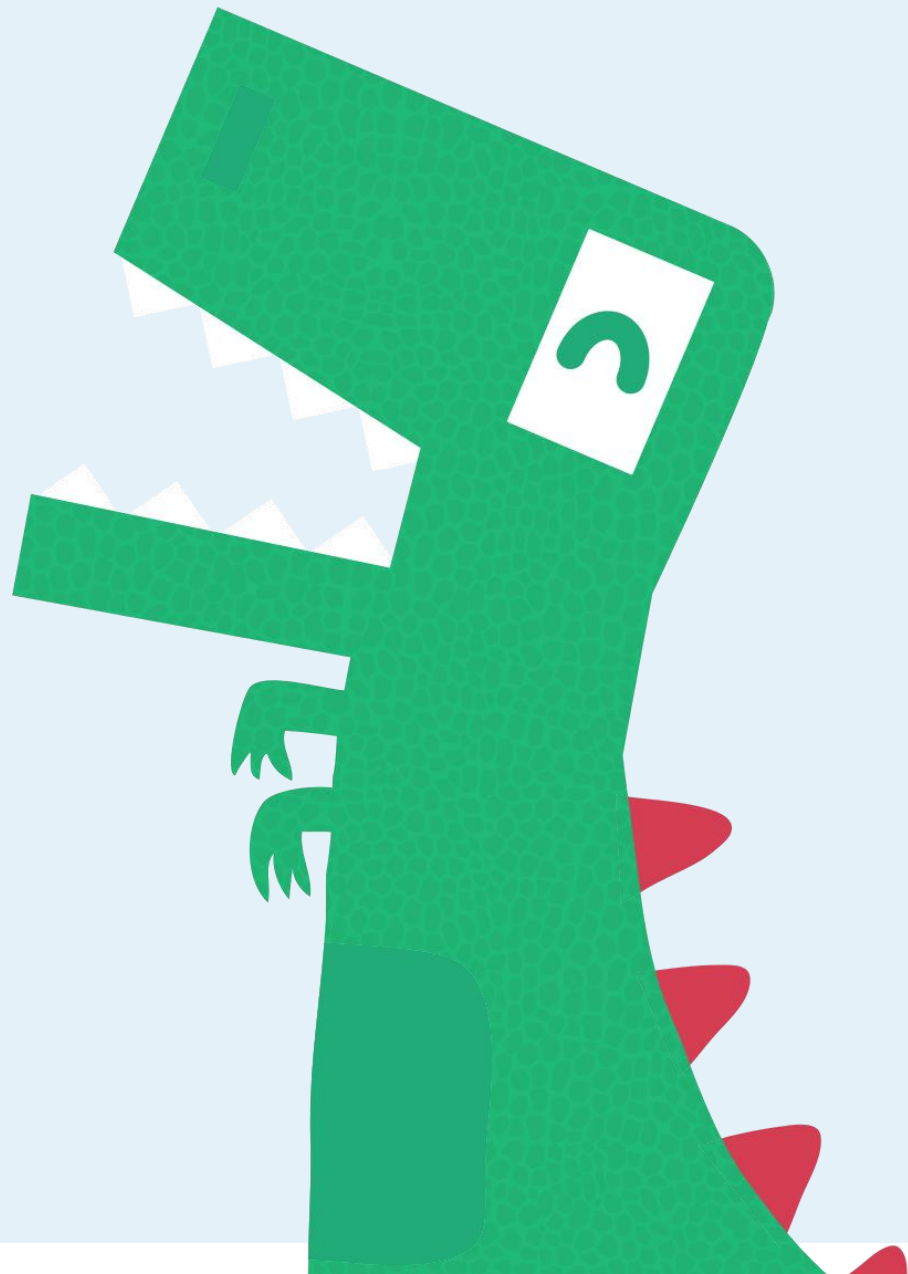


Student workbook

# Micro:bit tools

Code Playground



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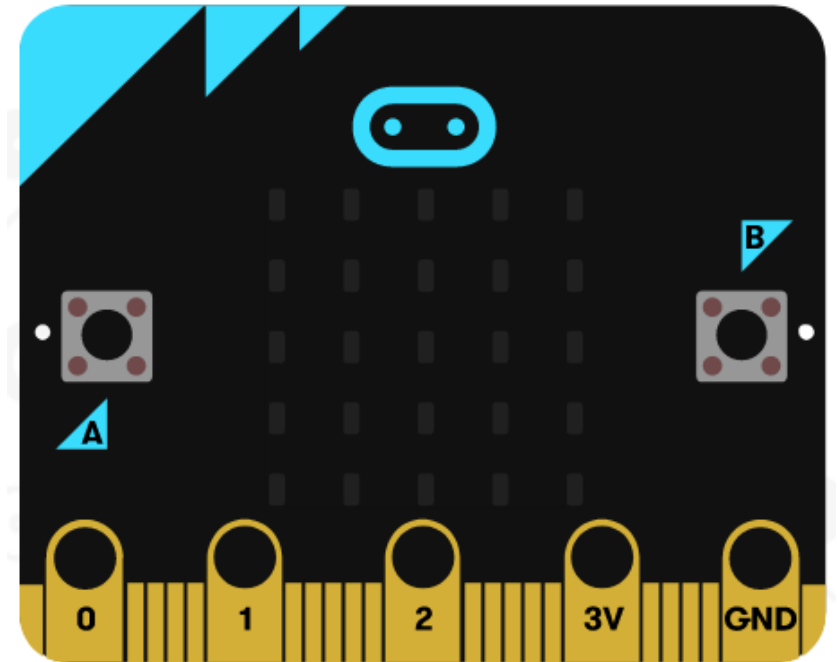
## Micro:bit tools

### Micro:bit projects

Learn the basics of using the BBC Micro:bit in your projects and start learning about physical computing. Don't have a micro:bit? That's ok you can use the emulator on the micro:bit coding editor. Visit the 'Let's code' page to choose your editor:

<https://microbit.org/code/>

Hope you enjoy the workbook!



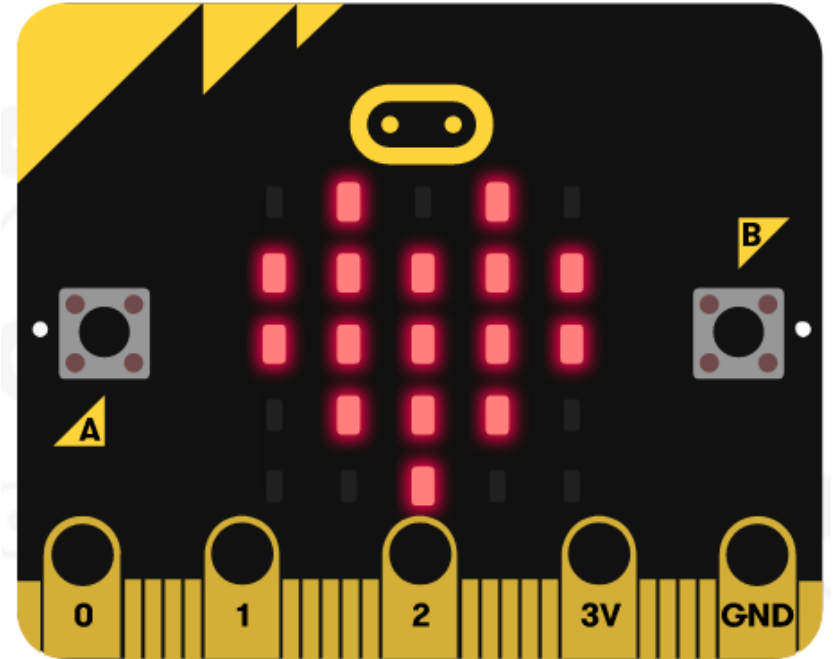
# Micro:bit tools

Micro:bit projects

## Get started

Can you make the Micro:bit flash your name? Can you make a heart flash on the screen?

\*\*Top tip – you might want to use the buttons to activate your code.



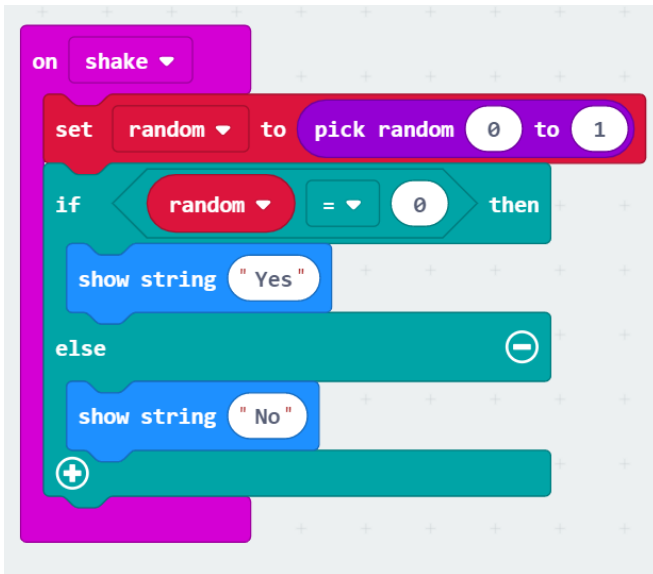
# Micro:bit tools

Micro:bit projects

## Fortune teller

Code your micro:bit into a fortune teller. Is it going to rain at the weekend? Will your team win? The micro:bit will predict your future!

This code will help you tell your fortune. You can use the MakeCode block editor or the Python editor:



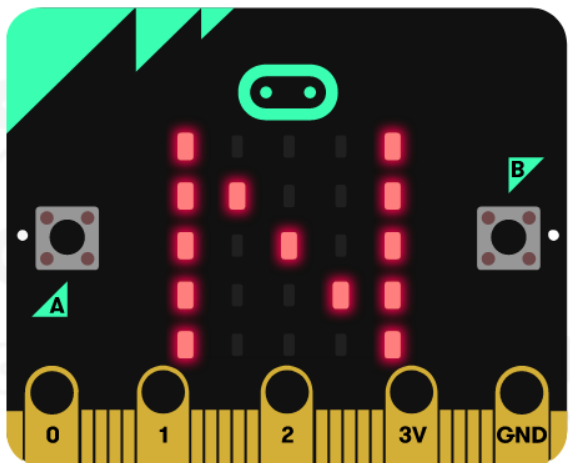
```
1 let random = 0
2 input.onGesture(Gesture.Shake, function () {
3     random = Math.randomRange(0, 1)
4     if (random == 0) {
5         basic.showString("Yes")
6     } else {
7         basic.showString("No")
8     }
9 })
10
```

# Micro:bit tools

Micro:bit projects

## Compass – MakeCode block editor

Stuck in the wilderness with only your micro:bit, laptop and a battery? Let's turn your micro:bit into a compass so you can get home (before your battery runs out).



Now you've set up the code for a basic compass, can you add in the code for headings NE, SE, NW and SW?

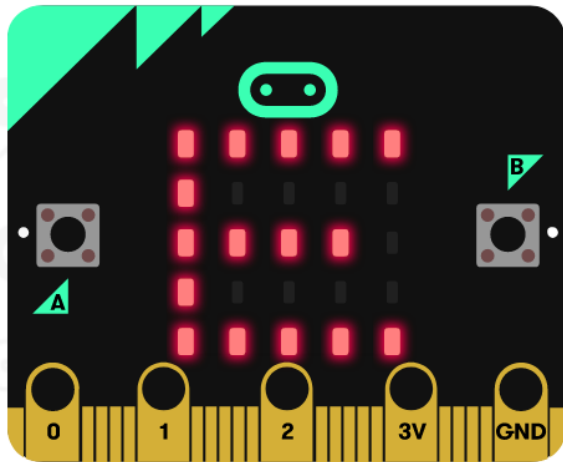
```
on button A pressed
  set heading to compass heading (*)
  if heading >= 45 and heading <= 134 then
    show leds
  else if heading >= 135 and heading <= 224 then
    show leds
  else if heading >= 225 and heading <= 314 then
    show leds
  else
    show leds
```

# Micro:bit tools

Micro:bit projects

## Compass – Python editor

If you want more of a challenge try using the Python editor.



Now you've set up the code for a basic compass, can you add in the code for headings NE, SE, NW and SW?

```

1  let heading = 0
2  input.onButtonPressed(Button.A, function () {
3      heading = input.compassHeading()
4      if (heading >= 45 && heading <= 134) {
5          basic.showLeds(`
6              #####
7              # . . . .
8              ##### .
9              # . . . .
10             #####
11             `)
12     } else if (heading >= 135 && heading <= 224) {
13         basic.showLeds(`
14             . #####
15             # . . . .
16             . ##### .
17             . . . . #
18             ##### .
19             `)
20     } else if (heading >= 225 && heading <= 314) {
21         basic.showLeds(`
22             # . . . . #
23             # . . . . #
24             # . # . #
25             # . # . #
26             . # . # .
27             `)
28     } else {
29         basic.showLeds(`
30             # . . . . #
31             # # . . . #
32             # . # . #
33             # . . # #
34             # . . . . #
35             `)
36     }
37 })
38

```

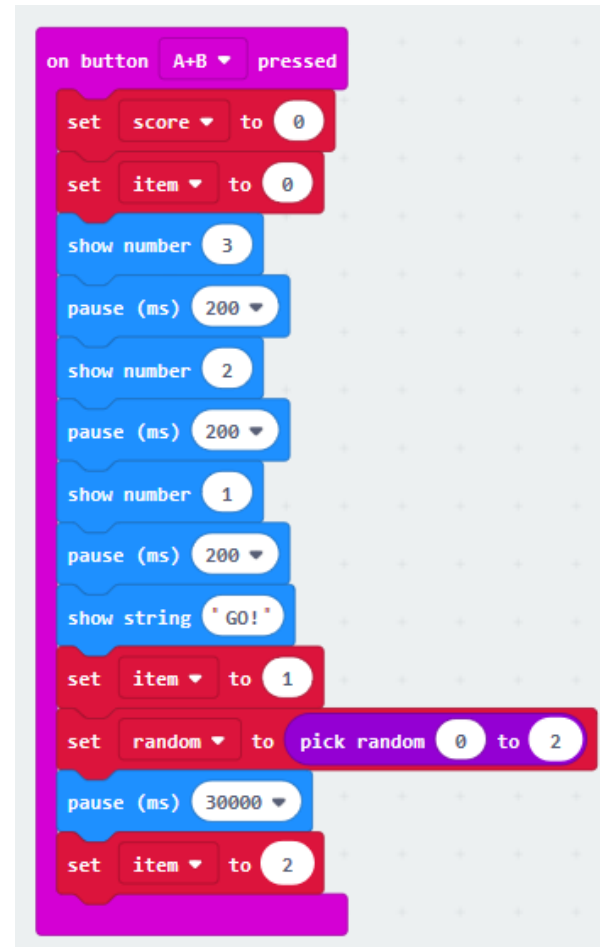
# Micro:bit tools

## Micro:bit projects

### Press it

Lets play a game! Test your reactions against the micro:bit by using the buttons and the accelerometer feature. Press the A or B button when the arrow points to it, or shake your micro:bit when it displays a cross. You have 30 seconds to get as many points as possible, but be careful – get it wrong and you'll lose points!

There's are several scripts to make this game work, add them all to your micro:bit to create the project. This script controls the start of the game.



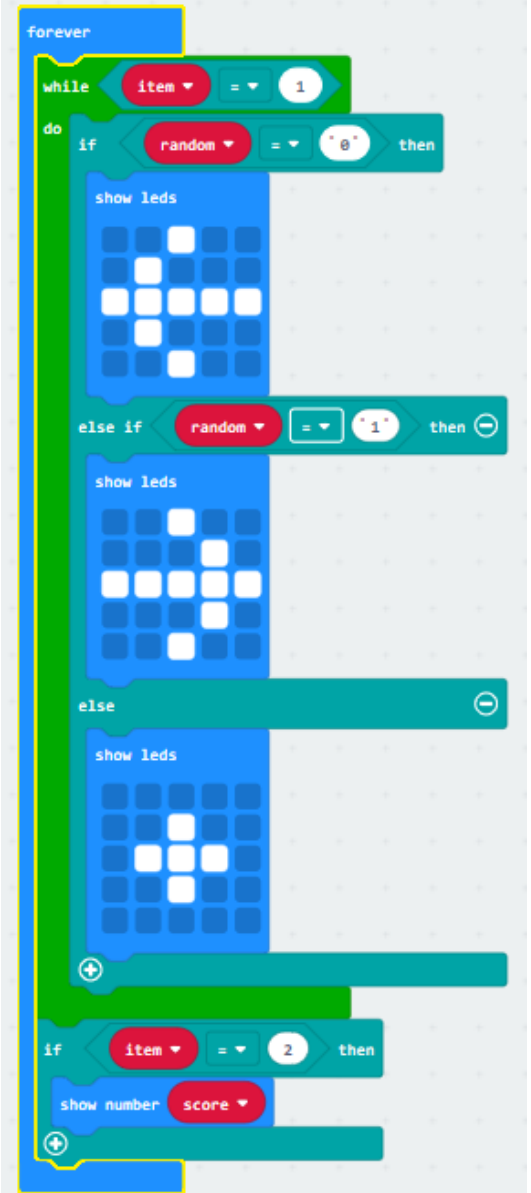
```
on button A+B pressed
  set score to 0
  set item to 0
  show number 3
  pause (ms) 200
  show number 2
  pause (ms) 200
  show number 1
  pause (ms) 200
  show string "GO!"
  set item to 1
  set random to pick random 0 to 2
  pause (ms) 30000
  set item to 2
```

# Micro:bit tools

Micro:bit projects

## Press it - continued

This script controls which option shows on the micro:bit for the game play.



```
forever
  while item = 1
    do
      if random = 0 then
        show leds
      else if random = 1 then
        show leds
      else
        show leds
    +
  if item = 2 then
    show number score
  +
```

The image shows a Scratch script for a Micro:bit project. The script is contained within a 'forever' loop. It starts with a 'while' loop where 'item' is equal to 1. Inside this loop, there is a 'do' block containing three conditional 'if' statements, each followed by a 'show leds' block. The first 'if' statement checks if a random number is equal to 0. The second 'else if' statement checks if a random number is equal to 1. The third 'else' statement is a catch-all. Below the 'do' block, there is a plus sign to add more code. After the 'while' loop, there is an 'if' statement that checks if 'item' is equal to 2. If true, it shows the number 'score'. There is another plus sign at the bottom of the script.

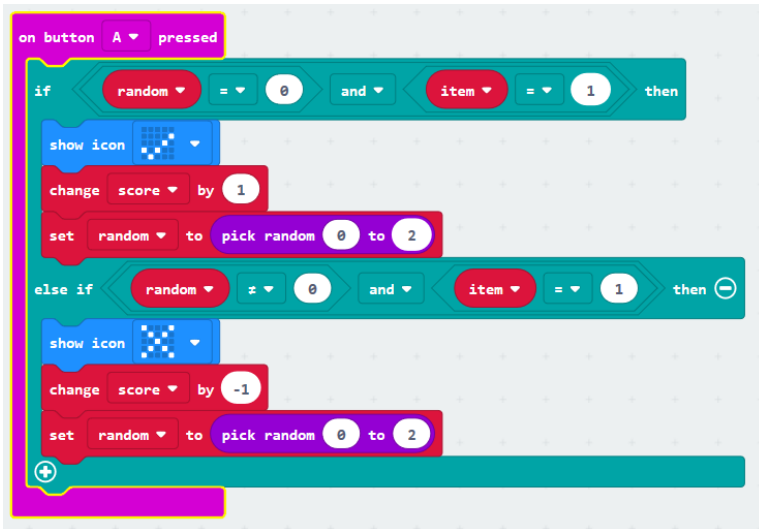


# Micro:bit tools

## Micro:bit projects

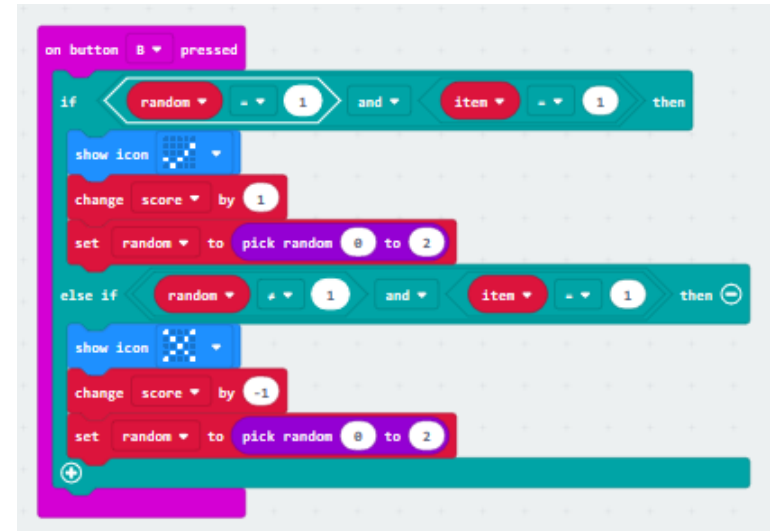
### Press it - continued

These scripts control what happens when the player chooses either button or the shake option. Once you've added these, your game will be ready to play.

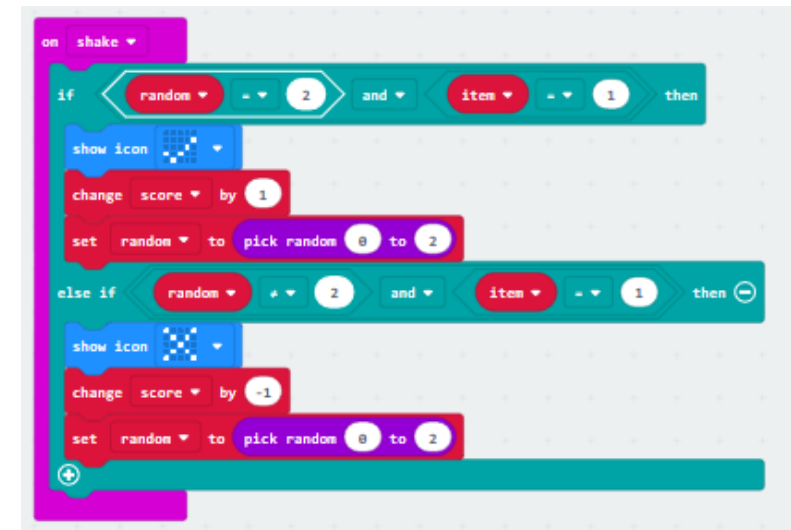


```
on button A pressed
  if random = 0 and item = 1 then
    show icon
    change score by 1
    set random to pick random 0 to 2
  else if random ≠ 0 and item = 1 then
    show icon
    change score by -1
    set random to pick random 0 to 2
```

Can you upgrade the game to display a 'Game Over' message? Instead of losing points when you get it wrong, how about ending the game? Instead of playing to a timer, code your game so you can keep playing until you make a mistake



```
on button B pressed
  if random = 1 and item = 1 then
    show icon
    change score by 1
    set random to pick random 0 to 2
  else if random ≠ 1 and item = 1 then
    show icon
    change score by -1
    set random to pick random 0 to 2
```



```
on shake
  if random = 2 and item = 1 then
    show icon
    change score by 1
    set random to pick random 0 to 2
  else if random ≠ 2 and item = 1 then
    show icon
    change score by -1
    set random to pick random 0 to 2
```

# Notes

## Code Playground

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