

Bootcamps for Emerging Technologies and essential Skills

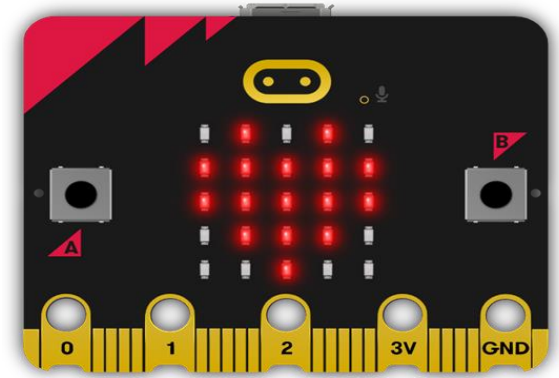


Robotics and AI

BBC MICRO:BIT WORKSHOP



What is a BBC Micro:Bit?



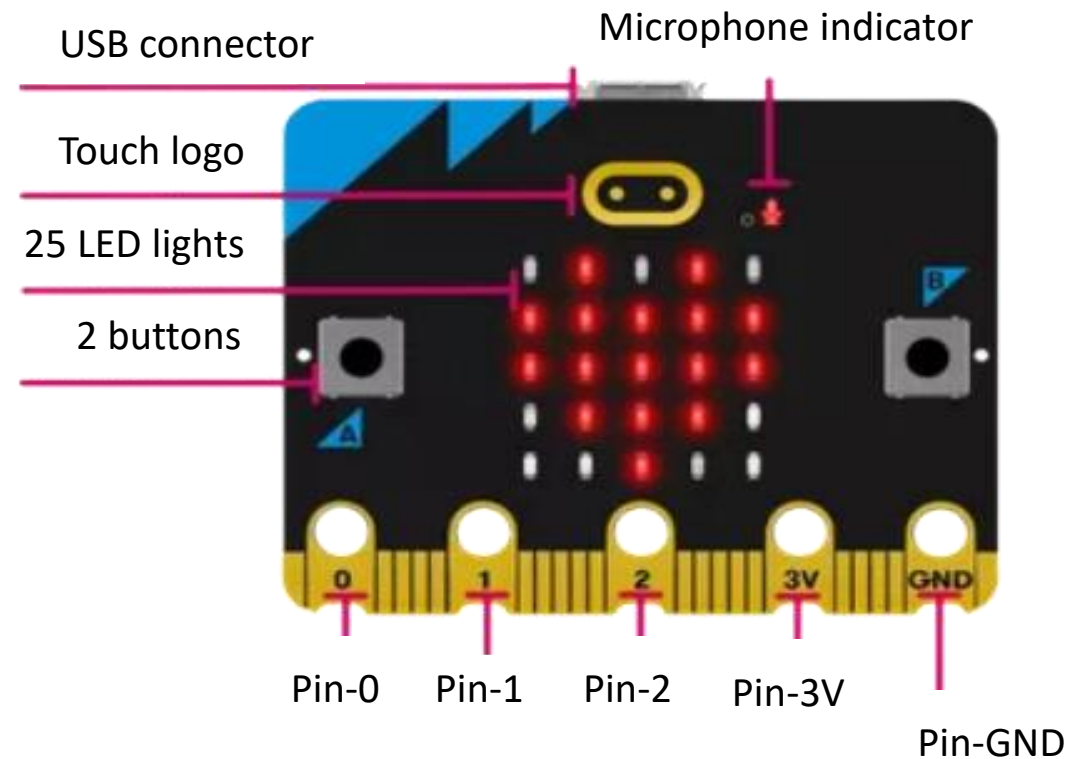
- pocket-sized, lightweight, open-source programmable microcontroller (small computer).
- goal of introducing young students to computer programming and digital technology.
- provides a simple and accessible platform for learning about coding, electronics, and creative problem-solving and activities related to Science, Technology, Engineering, Arts, and Mathematics (STEAM).

Micro:bit features (front side):

Micro USB Socket - connects the micro:bit to a computer or laptop, to transfer programs.

Microphone - has a built-in microphone. The microphone LED will light up if the microphone is measuring sound levels and also indicates where the microphone is located.

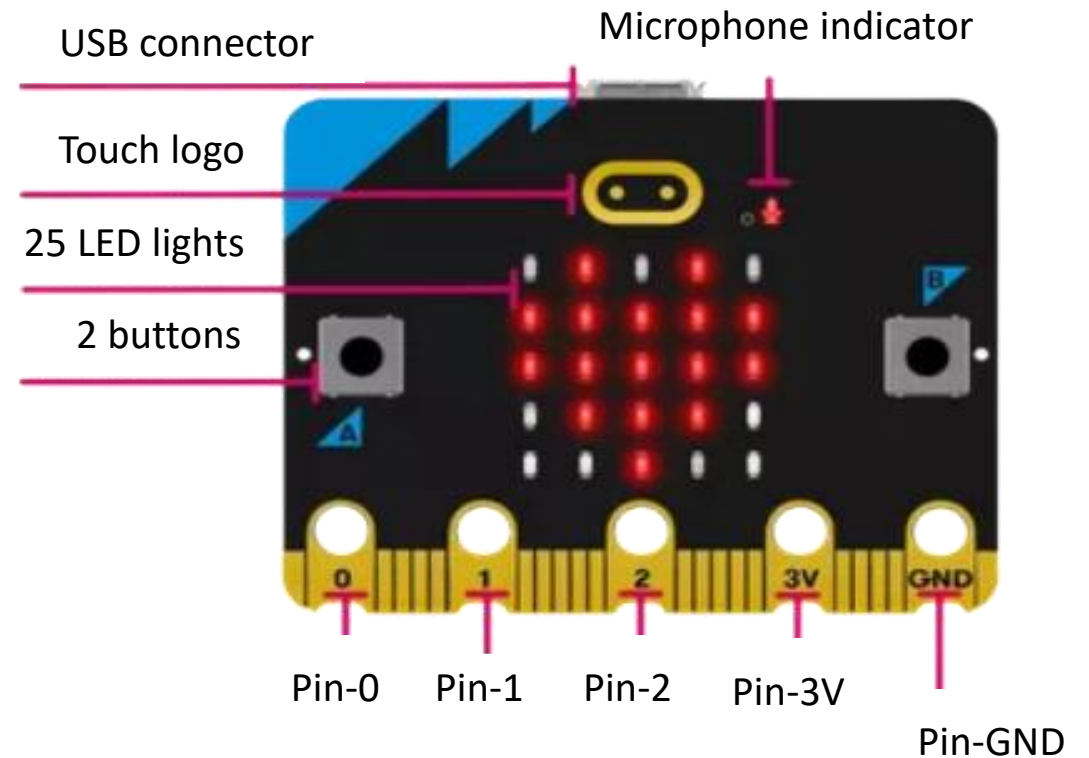
Touch sensor - the gold logo also works as a touch sensor. It can be used as an extra button in your programs.



Micro:bit features (front side):

LED Display and Light Sensor - 25 LEDs arranged in a 5x5 grid. The LEDs can be used for displaying pictures, words, and numbers. They can also act as sensors and measure light levels.

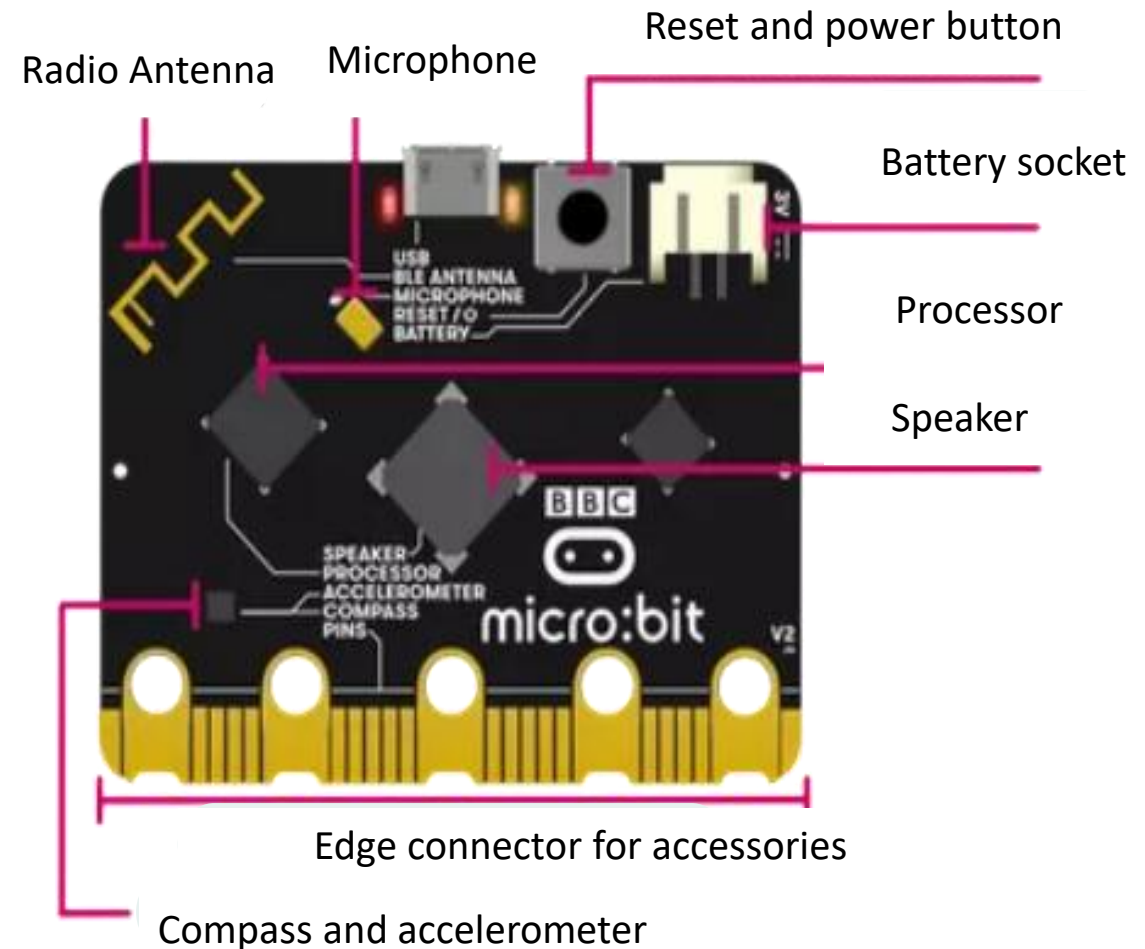
Buttons - two buttons, A and B, on the front. The buttons can be pressed separately or together. Pressing the buttons can be used to trigger code.



Micro:bit features (back side):

Radio and Bluetooth - the micro:bit can communicate wirelessly with other micro:bits using radio waves. Tablets can also connect to the micro:bit wirelessly via Bluetooth.

Reset button - reset the micro:bit, restart a program from the beginning, or place the micro:bit into power-saving sleep mode by holding the button and waiting until the red LED on the left goes dark before releasing the button.

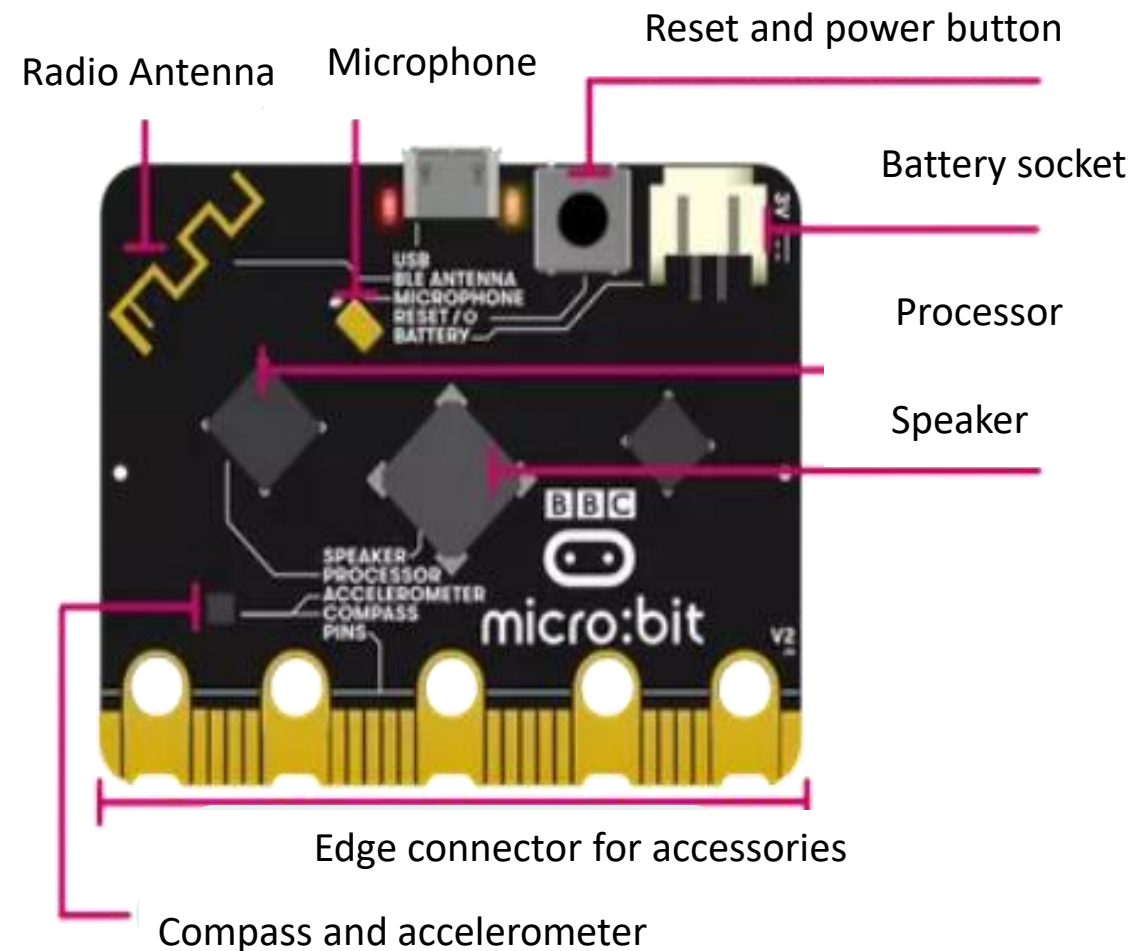


Micro:bit features (back side):

Battery - powered using a battery pack. Instead of using a computer to power it.

Processor - contains a microprocessor, the 'brains' of a computer. It receives the inputs, runs the programs, and gives outputs. It fetches, decodes, and carries out the instructions coded on an online micro:bit editor.

Temperature Sensor - inside the processor, can give you an approximation of the air temperature (Celsius).

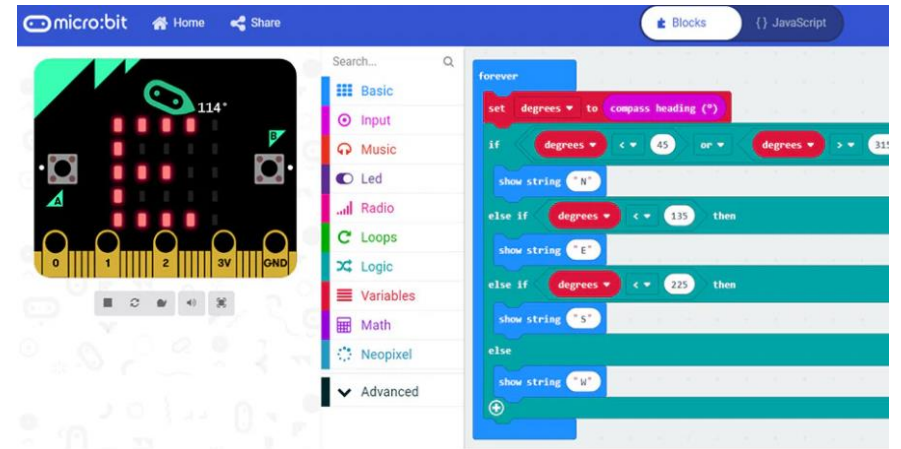












What is MakeCode?

- user-friendly
- web-based platform
- designed for coding and programming education.

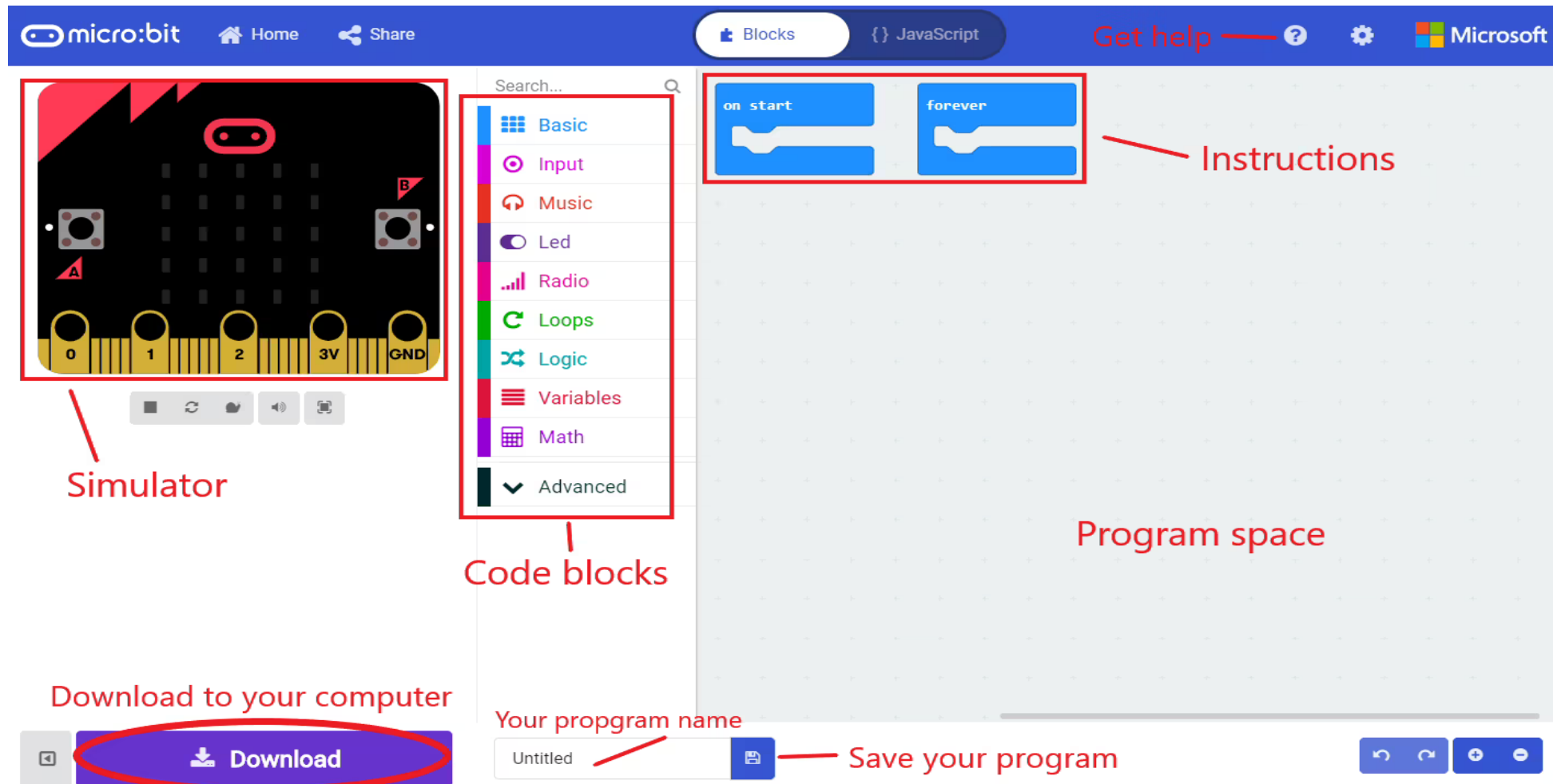
It offers a block-based coding interface where users can drag and drop visual code blocks to create programs.

The platform supports various devices, including the BBC micro:bit, and features online simulators for virtual testing.



 Basic	access to basic micro:bit functionality
 Input	events and data from sensor
 Music	generation of music tones
 Led	control of the LED screen
 Radio	communicate using radio packets
 Loops	loops and repetition
 Logic	logic operators and constants
 Variables	variables
 Math	more complex operators
 Advanced	functions, arrays, text, game, images, pins, serial, control

What is MakeCode?



The screenshot shows the MakeCode web interface for the micro:bit. At the top, there is a navigation bar with 'micro:bit', 'Home', 'Share', 'Blocks', and 'JavaScript' tabs, along with 'Get help', a settings gear, and the Microsoft logo. The main workspace is divided into several sections:

- Simulator:** A red-bordered box on the left shows a virtual micro:bit board with a grid and various components like the camera, microphone, and LEDs. Below it are icons for simulation, refresh, and volume.
- Code blocks:** A red-bordered box in the center-left contains a search bar and a list of block categories: Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, and Advanced.
- Instructions:** A red-bordered box at the top right of the workspace highlights two blue blocks: 'on start' and 'forever'.
- Program space:** The large grid area on the right where code blocks are placed.
- Download to your computer:** A red-bordered box at the bottom left highlights a purple 'Download' button.
- Your program name:** A red-bordered box at the bottom center highlights the 'Untitled' text field.
- Save your program:** A red-bordered box at the bottom right highlights a blue save icon.

How can a BBC micro:bit be used:



step counter



dice



thermometer



stopwatch



nightlight



guitar



reaction games



name badge



rock, paper, scissors game



clap-o-meter

animal tracker



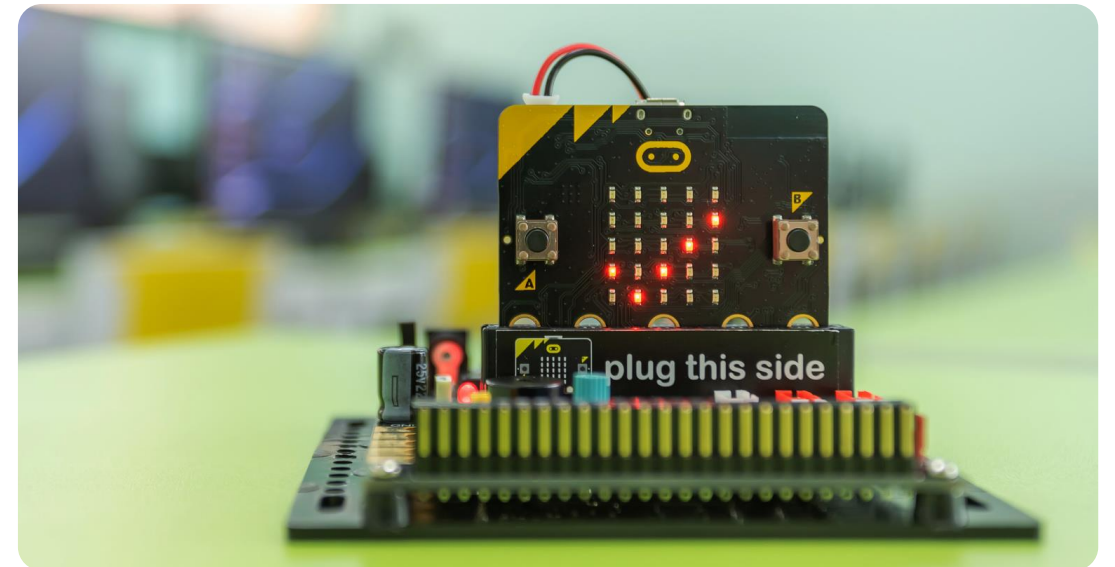
Micro:bit activities

Activity #1: PixelPlay

Activity #2: Melody Maker

Activity #3: Environmental Monitor

Activity #4: Robo Move



Activity #1: Pixel Play

1. Go to the “ Basic “ block

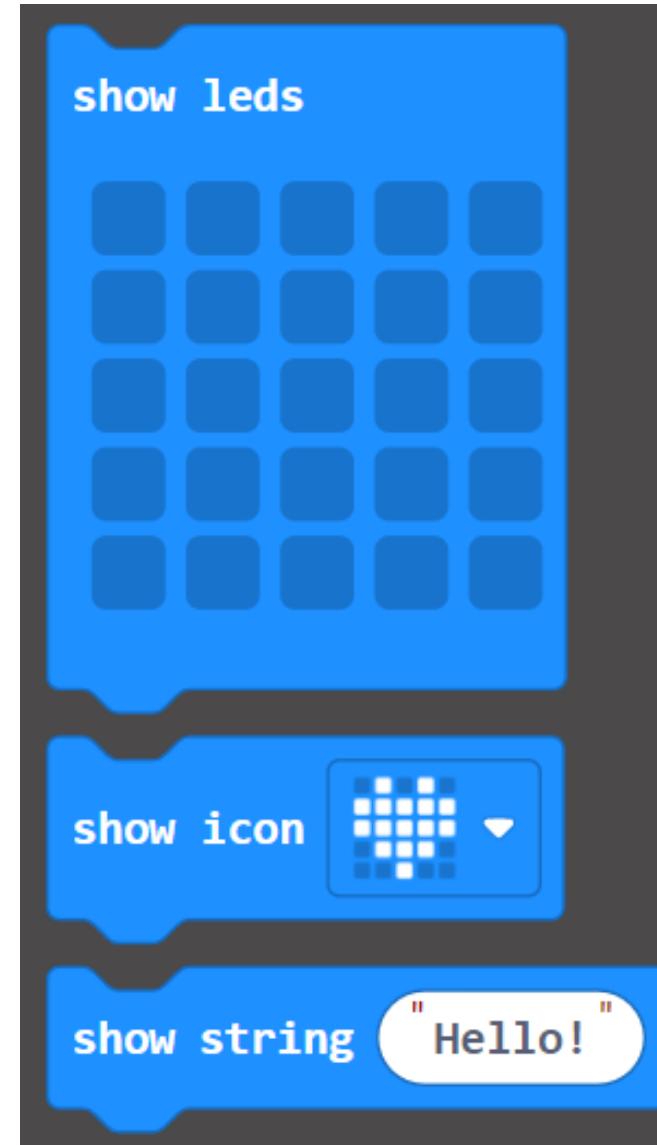


2. Choose one of the following blocks:

“ show leds “ : draw your own icon

“ show icon “ : choose one of the default icons

“ show string “ : write a message



Activity #1: Pixel Play

For this activity, you can use the following blocks:

“ on start ” : runs your code once

“ forever ” : repeats the code forever

“ pause ” : pause for specific milliseconds

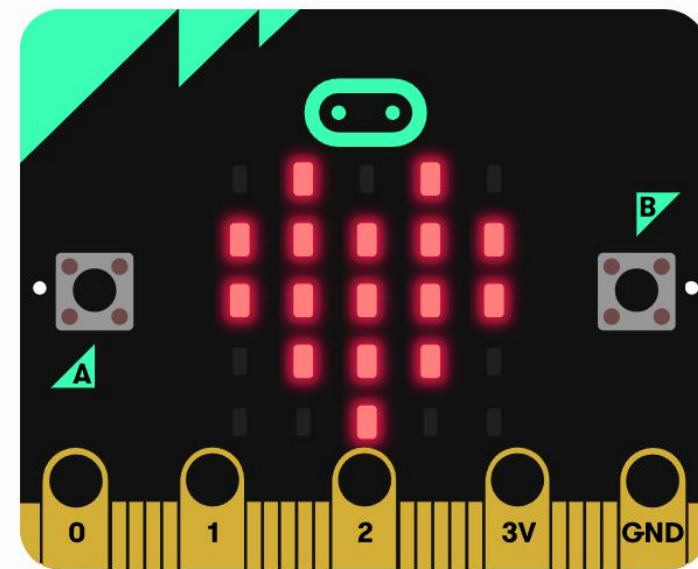
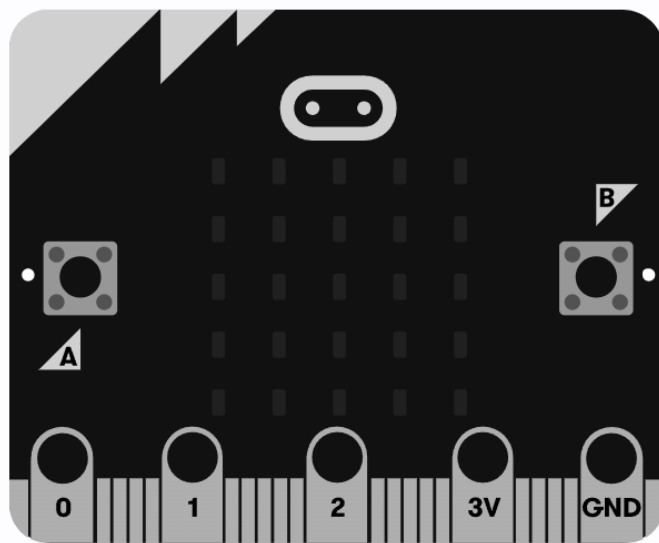
“ on shake ” : to view something as soon as you shake (accelerometer reading)

You can also add loops or logic blocks to make your code a bit more advanced

Activity #1: Pixel Play

3. There are two methods to test your program (this applies to all activities) :

a. Use the simulator on the left (press play/stop/restart)



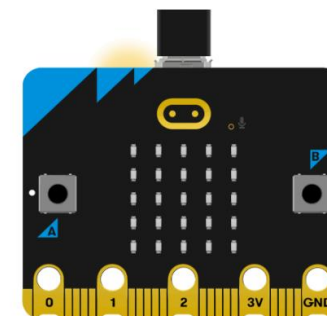
Activity #1: Pixel Play

b. Download the code on the microbit device.

- First press “ Download “.
- Then follow the instructions.



1. Connect your micro:bit to your computer



Next

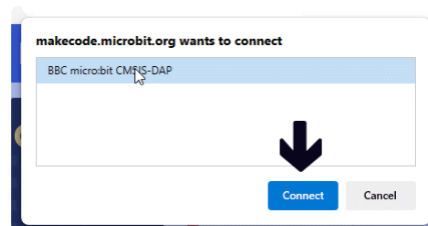
2. Pair your micro:bit to your browser



Press the Pair button below.

A window will appear in the top of your browser.

Select the micro:bit device and click Connect.



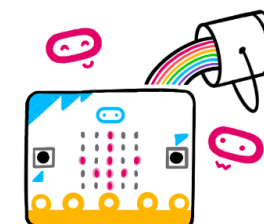
Download as File

Pair

Connected to micro:bit



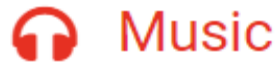
Your micro:bit is connected! Pressing 'Download' will now automatically copy your code to your micro:bit.



Done

Activity #2: Melody Maker

1. Go to the “Melody” block

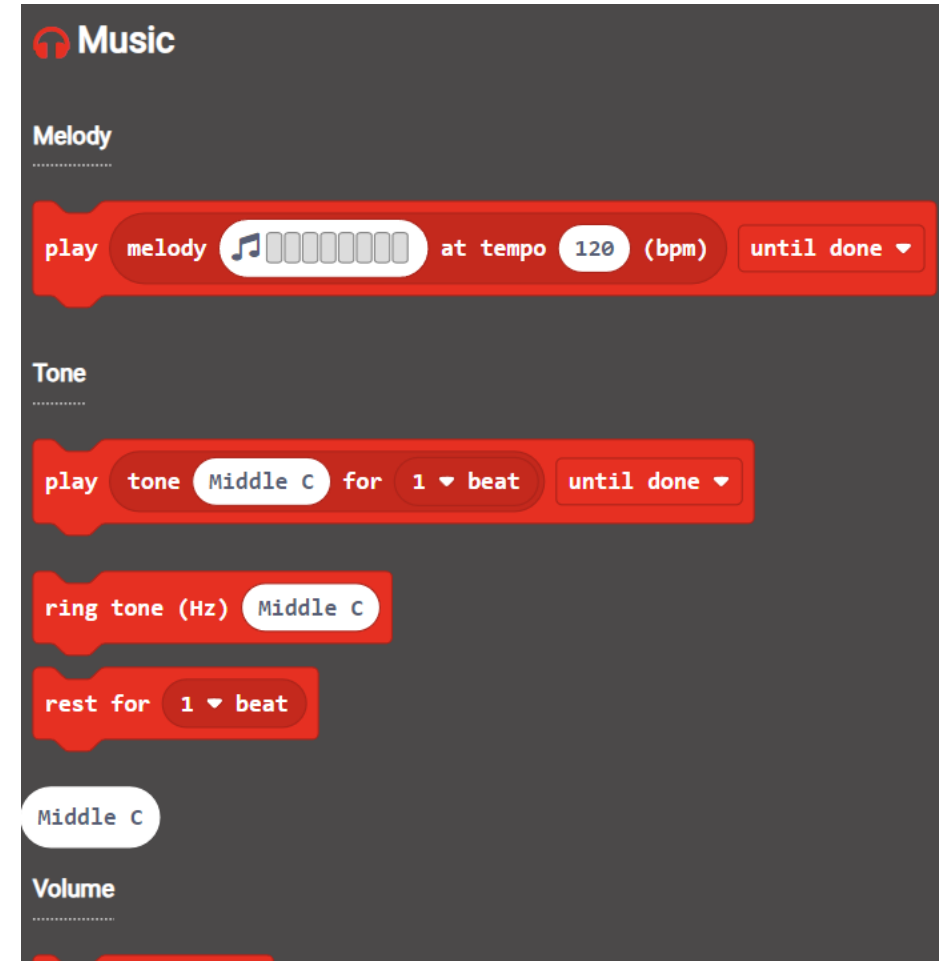


2. Choose one of the following blocks:

“play melody”

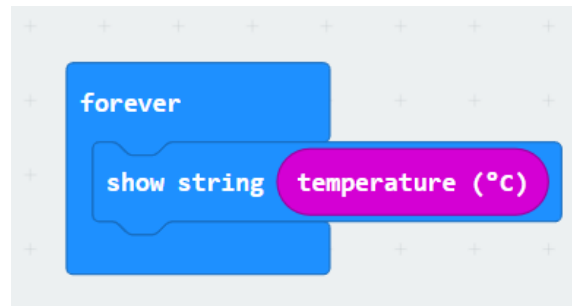
“play tone”

“show string”



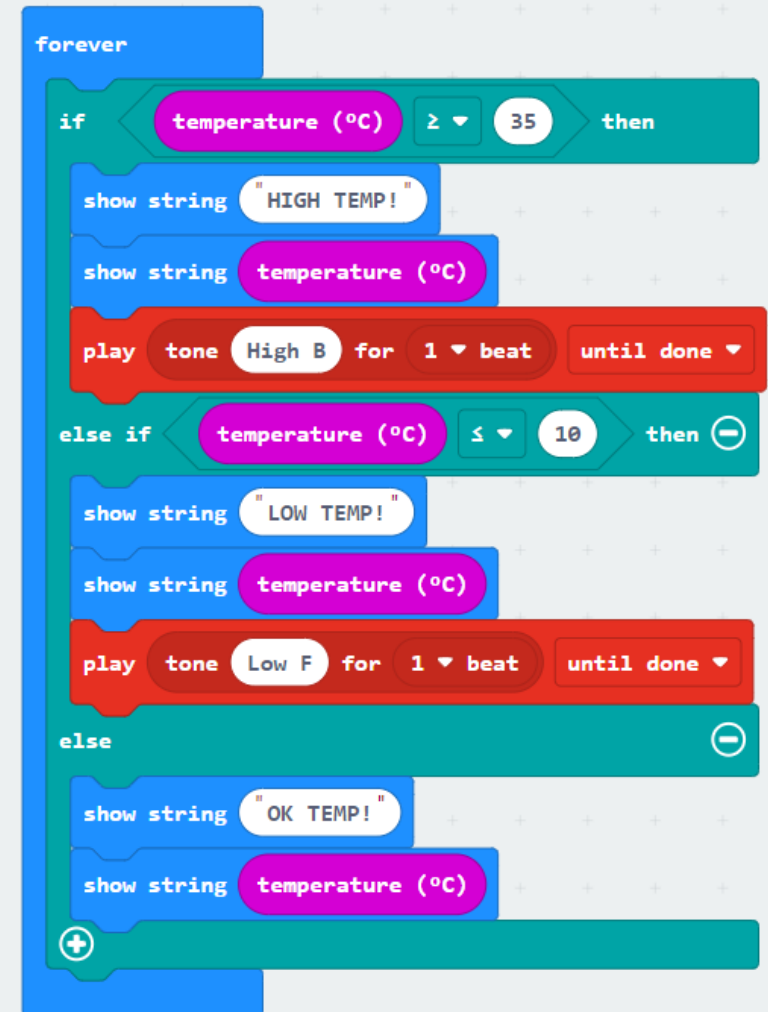
Activity #3: Environmental Monitor

1. Use this code to display the room temperature



```
forever
  show string temperature (°C)
```

2. Use the code on the right to play an alarm and send a warning when the temperature is too high or too low.

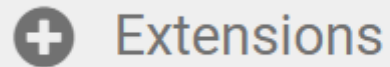


```
forever
  if temperature (°C) ≥ 35 then
    show string "HIGH TEMP!"
    show string temperature (°C)
    play tone High B for 1 beat until done
  else if temperature (°C) ≤ 10 then
    show string "LOW TEMP!"
    show string temperature (°C)
    play tone Low F for 1 beat until done
  else
    show string "OK TEMP!"
    show string temperature (°C)
```


*This activity requires the Kitronik Servo: Lite kit

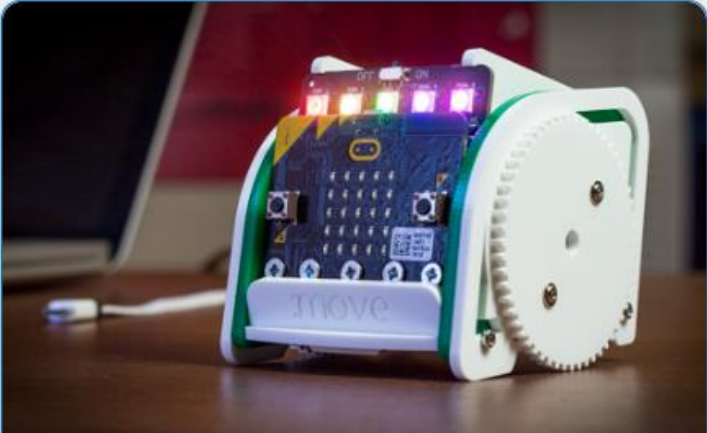
Activity #4: Robo Move

1. Go to the “ Extensions “ block



2. Scroll down and select the “kitronik-servo-lite” extension

3. You should now see the following block:



kitronik-servo-lite
Blocks to simplify using Kitronik Servo:Lite board in PXT

[Learn More](#)

Activity #4: Robo Move

4. From the servo:lite block you can now choose any of the following (please put the robot on the floor)

5. Choose one of the following blocks:

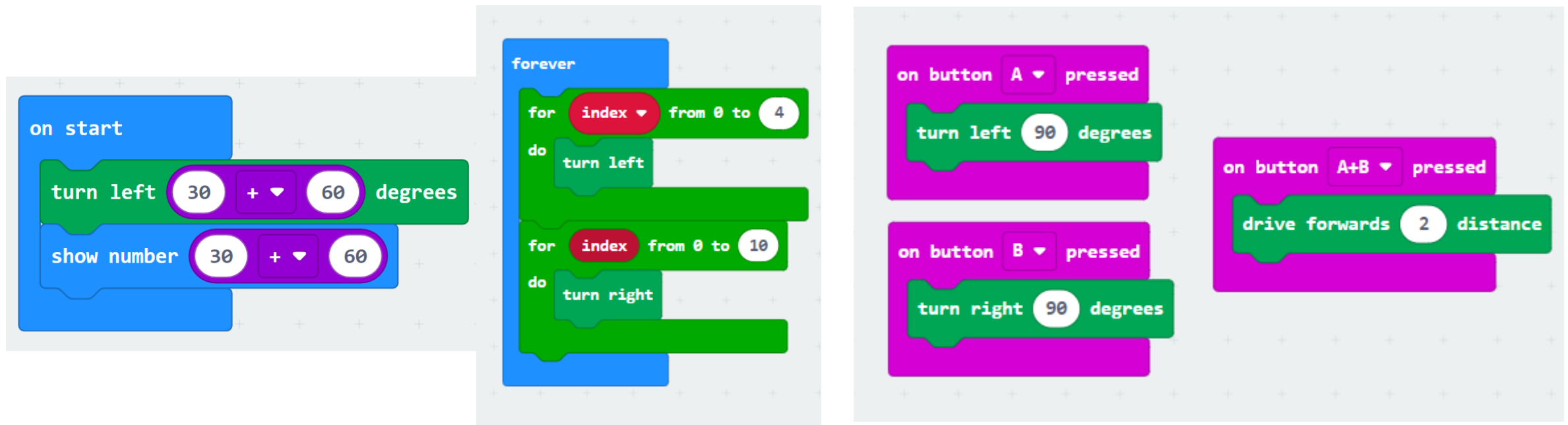
“ turn left /left ” : at certain degrees or default

“ drive backwards / forwards” : at certain distance or default



Activity #4: Robo Move

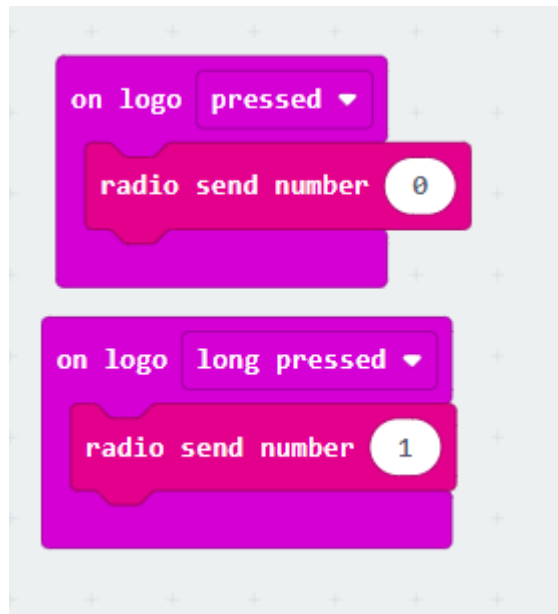
6. You can also incorporate math, loops, and logic blocks to make a more advanced projects:



The image displays four distinct Scratch code snippets on a light gray grid background. The first snippet, on the left, is an 'on start' block containing a 'turn left' block with a math block (30 + 60) and a 'show number' block with a math block (30 + 60). The second snippet is a 'forever' loop containing two 'for' loops: the first loops 'index' from 0 to 4 with a 'do' block 'turn left', and the second loops 'index' from 0 to 10 with a 'do' block 'turn right'. The third snippet is an 'on button A pressed' block containing a 'turn left 90 degrees' block. The fourth snippet is an 'on button A+B pressed' block containing a 'drive forwards 2 distance' block. The fifth snippet is an 'on button B pressed' block containing a 'turn right 90 degrees' block.

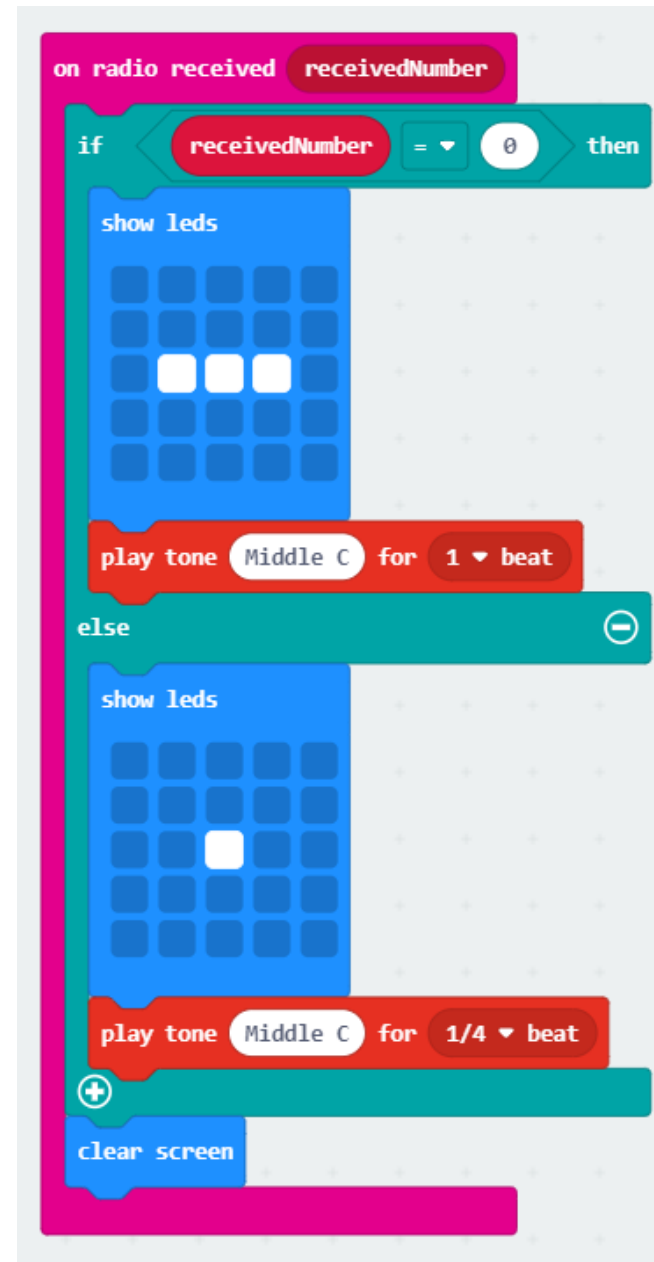
Other activity

Morse code: combines the radio, screen, logo touch sensor, logic (if/else statement), and tone



```
on logo pressed
  radio send number 0

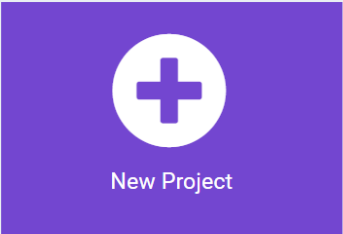
on logo long pressed
  radio send number 1
```

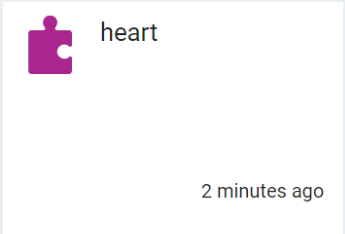


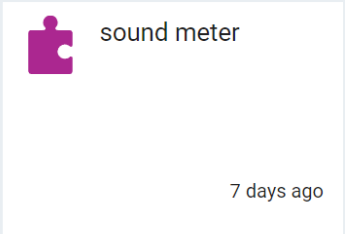
```
on radio received receivedNumber
  if receivedNumber = 0 then
    show leds
    play tone Middle C for 1 beat
  else
    show leds
    play tone Middle C for 1/4 beat
  clear screen
```

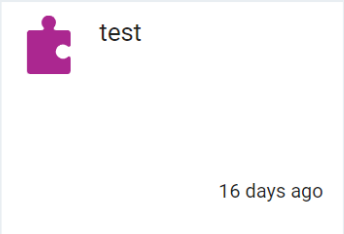
Additional material

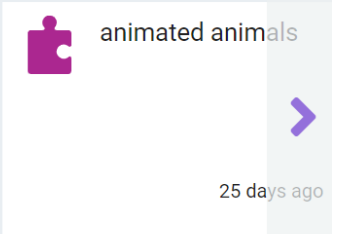
My Projects [View All](#) Import

 **New Project**

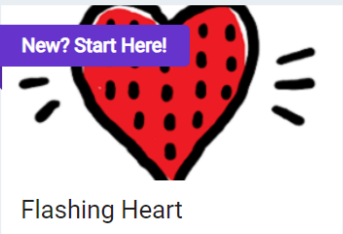
 heart
2 minutes ago


 sound meter
7 days ago


 test
16 days ago


 animated animals
25 days ago


Tutorials

 **New? Start Here!**
Flashing Heart






 Name Tag

 Smiley Buttons

 Dice

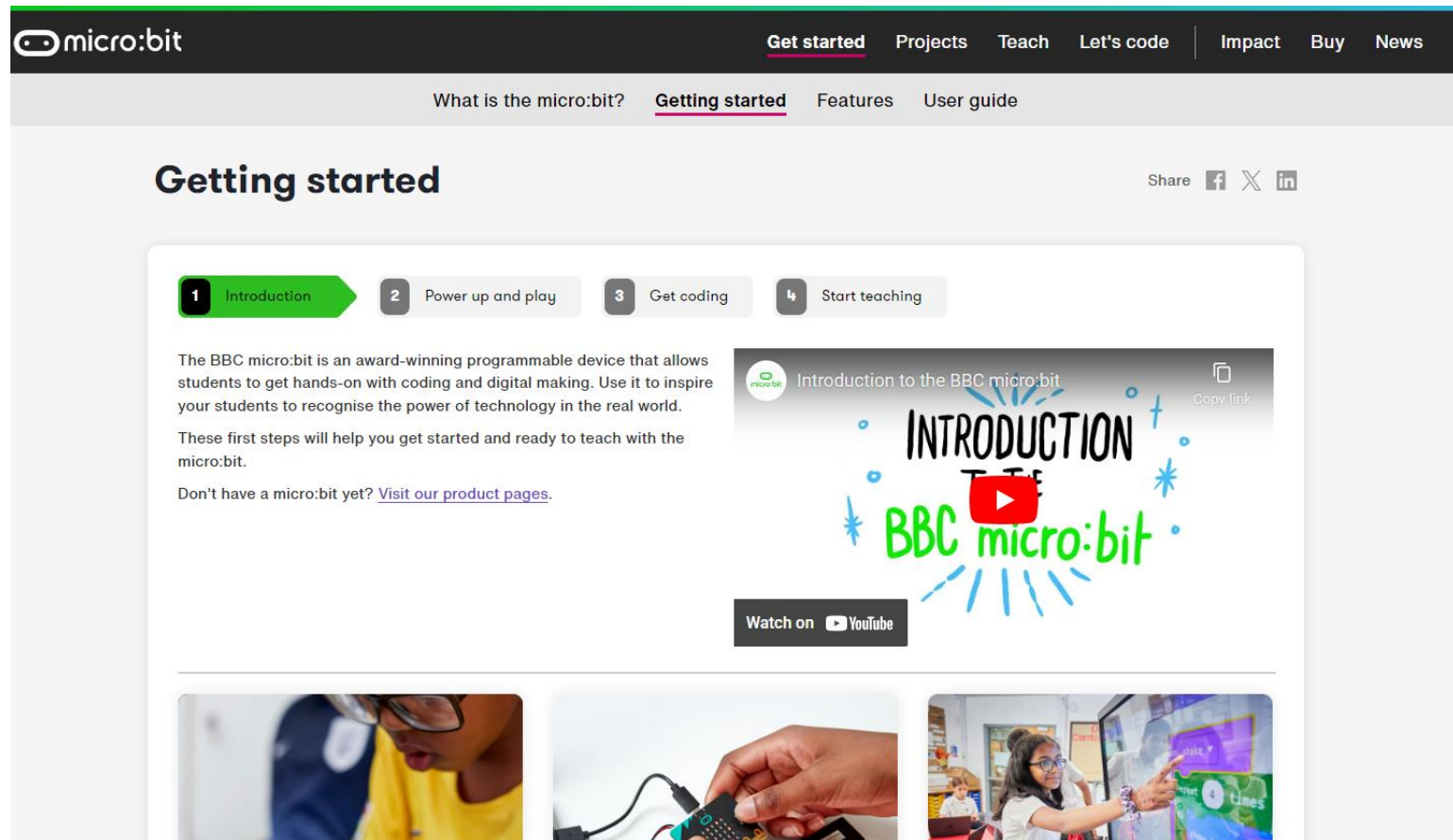
 Love Meter

Tutorials for the new micro:bit (V2)

<https://makecode.microbit.org/#>

Additional material



The screenshot shows the 'Getting started' page on the micro:bit website. The navigation bar includes 'micro:bit', 'Get started', 'Projects', 'Teach', 'Let's code', 'Impact', 'Buy', and 'News'. Below the navigation, there are links for 'What is the micro:bit?', 'Getting started', 'Features', and 'User guide'. The main heading is 'Getting started' with social sharing icons for Facebook, X, and LinkedIn. A progress bar shows four steps: 1. Introduction (highlighted), 2. Power up and play, 3. Get coding, and 4. Start teaching. The text describes the BBC micro:bit as an award-winning programmable device for students. A video player is embedded with the title 'Introduction to the BBC micro:bit' and a 'Watch on YouTube' button. Below the video are three small images: a student looking at a screen, hands plugging a cable into a micro:bit, and a student pointing at a digital display.

<https://microbit.org/get-started/getting-started/introduction/>

Additional material

Classroom resources

Resources to support your classroom teaching with the micro:bit including student handouts, reward certificates and wall display materials

Type

- Certificates (1)
- Glossaries (2)
- Other resources (2)
- Projects (6)
- Student activities (3)
- Student worksheets (5)

17 results



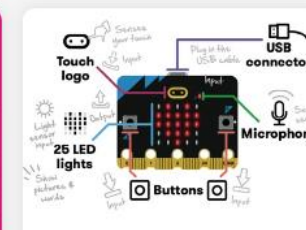
Algorithm planning sheet (scaffolded)

Hand-outs to help structure the thinking and planning process



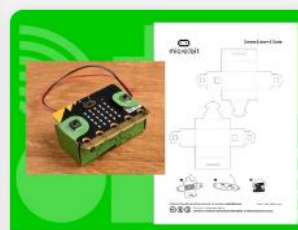
Algorithm planning sheet blank

Use to plan algorithms before writing code.



Annotated micro:bit poster

All the features of the micro:bit labelled



Battery pack holder template

Print, cut out and make your own micro:bit battery pack holder.



Certificates for learners

Celebrate your students' achievements



Glossary

Summary of key computing vocabulary



Please fill out the
evaluation form



Online educational platform



Includes:

- All educational material
- All relative videos and other resources
- All the recorded sessions
- Registration link for the bootcamps
- QUIZ for certification



www.learn.betesproject.eu

→ FOR FREE, you only need to register!

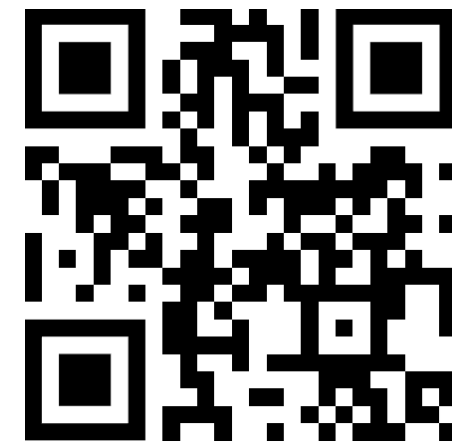




For more information:

www.betesproject.eu

www.facebook.com/BETESproject



Thank you!

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☎ + 357 96520112 (Cyprus)

