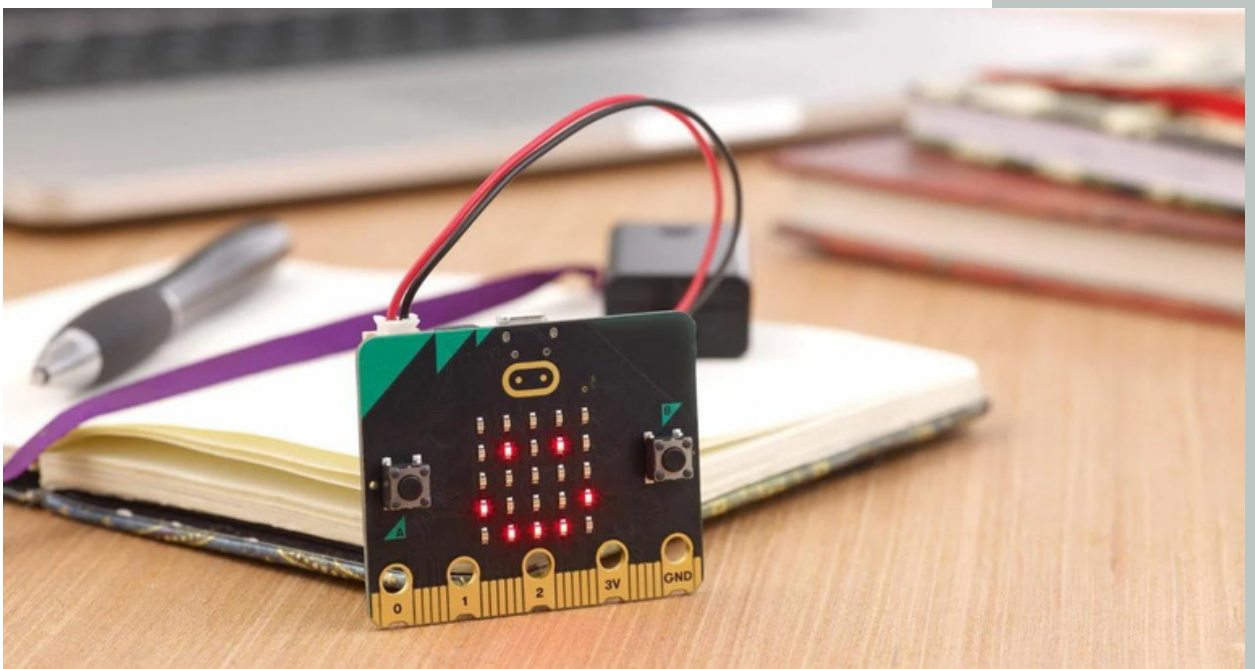


POWER UP YOUR MAKERSPACE WITH MICRO:BITS



MEET THE MICRO:BIT

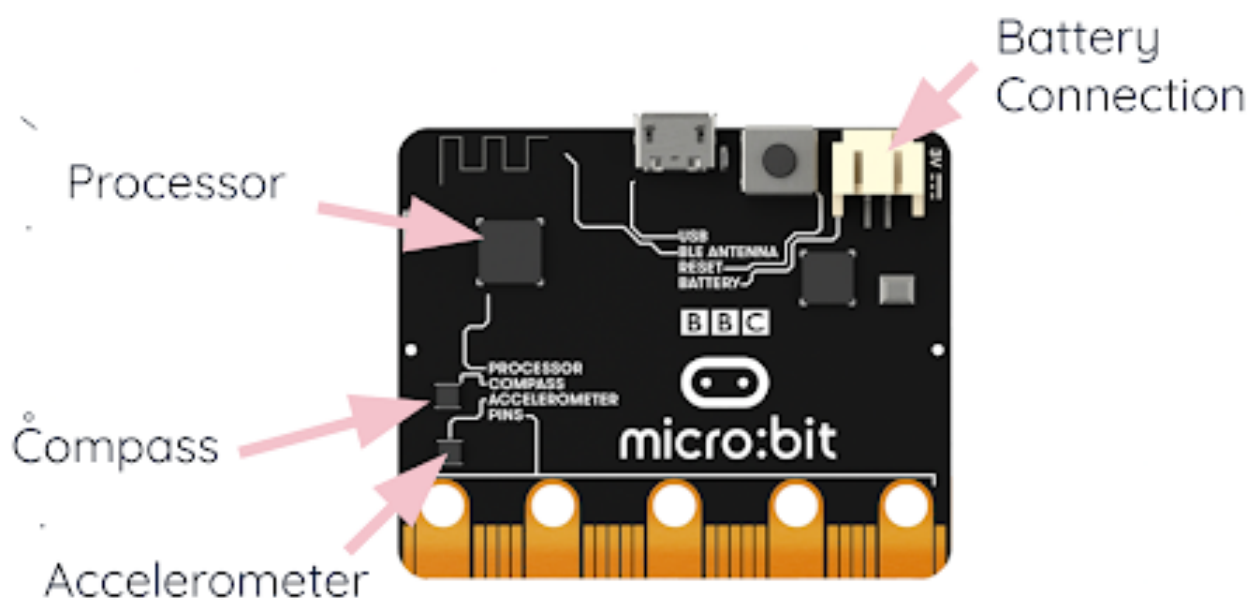
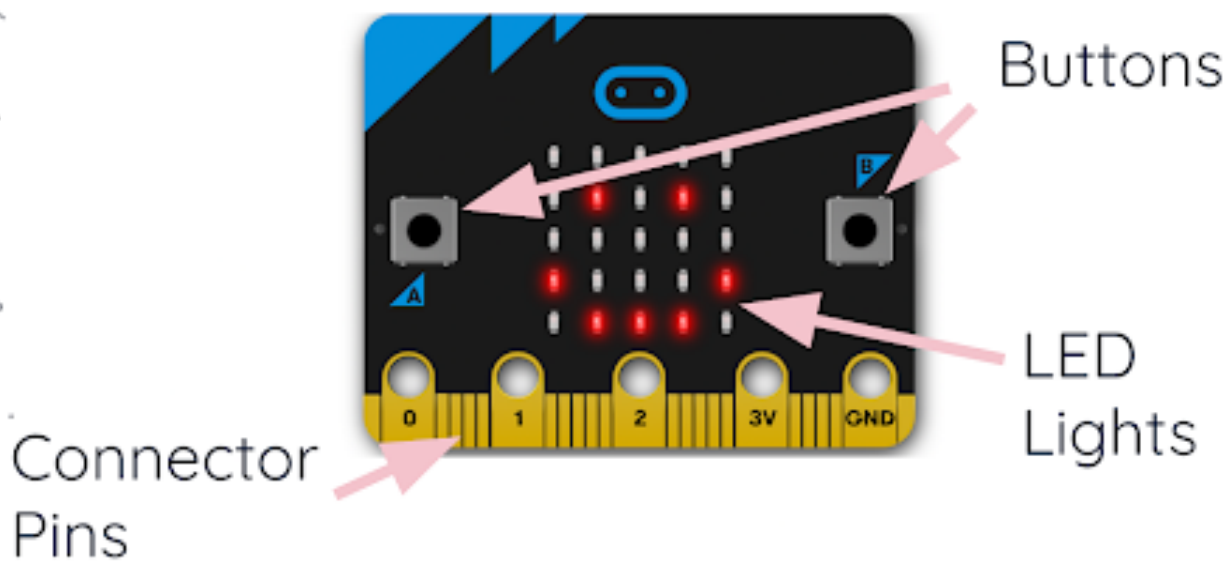
A lot of what we make using technology is often through a screen where we interact with our creations using inputs like a keyboard and mouse.

Physical computing is an approach to taking your creation off the screen onto physical devices so that you can get hands-on with your project.

One way to do this is using the micro:bit – a small computer device that is jam packed with sensors so you can create something that interacts with the world around it.



[Click here to watch the video on YouTube](#)

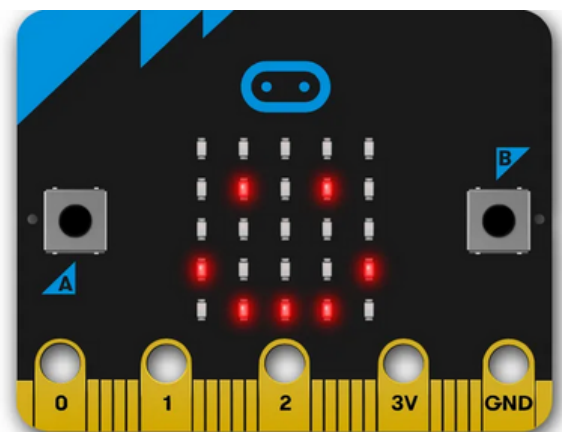


GETTING STARTED

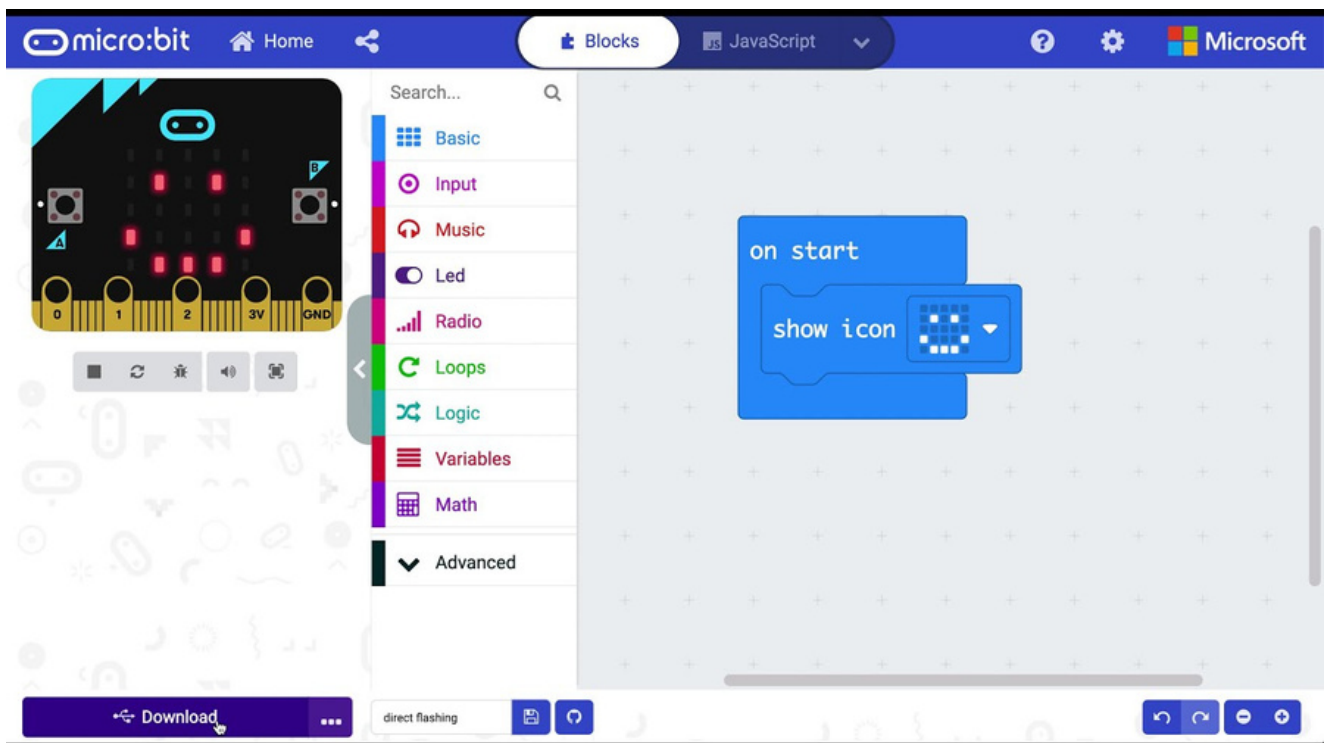
Super easy to get started with all you need is a micro:bit and a device (either a laptop or tablet) and you can start creating and writing code that can be flashed over to the micro:bit to see it run in real time. The micro:bit can be used for so many different projects so it is really easy to link the project to something your group are interested in.

When you head to the [micro:bit website](#), it only takes a few clicks to get straight to coding and making your idea come to life.

Young people can choose between using MakeCode which uses blocks of code just like Scratch where you click and connect instructions together to build a program or if you have someone who is ready for the next steps, they can try programming the micro:bit using Python.



When you're ready to start coding, this is what your screen should look like if you are using the MakeCode coding blocks,



There are 3 main sections that you need to know about. On the far left is a simulation of the micro:bit, this is where you can test out your program before you download it onto the real device. In the middle are all of the coding blocks that you can use in your project and finally, on the right hand side, is where you drag and drop the coding blocks to start clicking them together to build your program. The best way to get started is to jump right in and investigate what each coding block does!

ACTIVITY

MINDFUL MICRO:BIT

Code animations using the LEDs on the micro:bit to help focus on our breathing

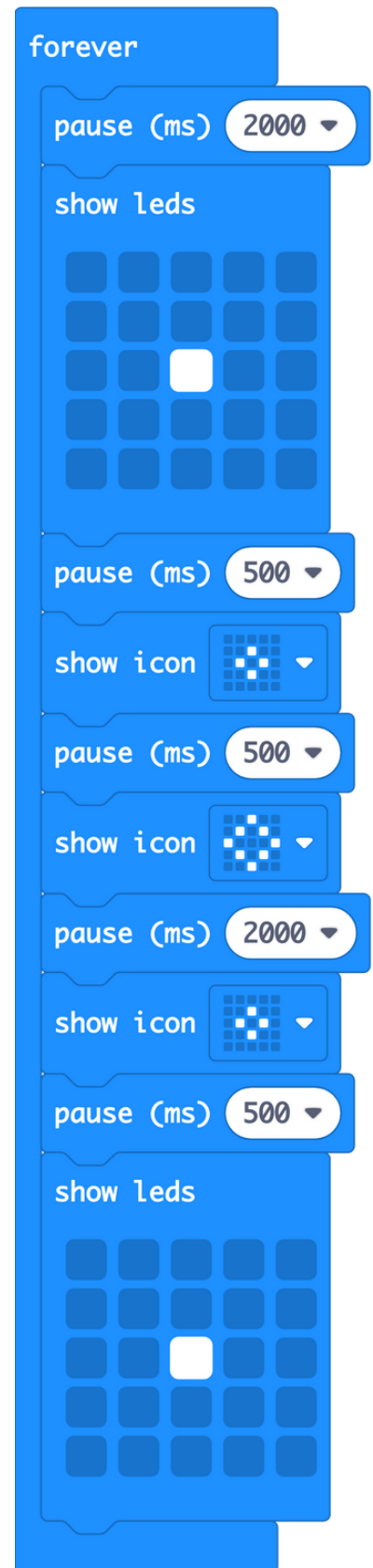
EQUIPMENT LIST

- Micro:Bits
- Devices (laptops/computers or tablets)

HOW DOES IT WORK?

Just like animations, we click together multiple show leds blocks where each block is slightly different than the last so that it looks like the display is moving and helping us to focus on breathing in and out. Don't forget to add a pause block in between each LED change so that there is time for the user to see each part of the animation!

See the guided tutorial -
<https://microbit.org/projects/make-it-code-it/calming-leds/>



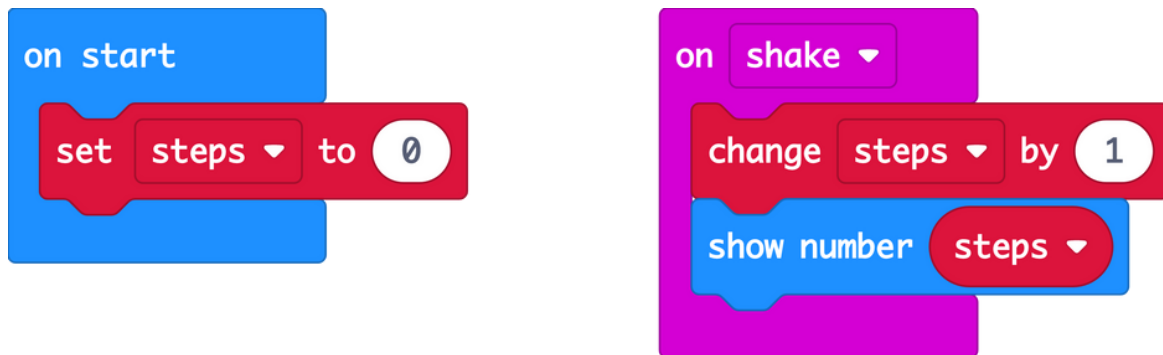
ACTIVITY

FITNESS TRACKERS

Use the accelerometer to sense motion to track the number of steps we take and build fitness trackers

EQUIPMENT LIST

- Micro:Bits
- Devices (laptops/computers or tablets)



HOW DOES IT WORK?

In this project, we are using a motion sensor called an accelerometer. This sensor is in lots of devices, including your phone and is the reason that your phone knows to turn on the screen when you pick it up! When the micro:bit senses some movement we are going to increase our number of steps by 1 and add it to a variable which is what we use in computing science to keep track of data for us.

See the guided tutorial -

<https://microbit.org/projects/make-it-code-it/step-counter/>

ACTIVITY

BOARD GAMES

Code a digital dice and design your own board game that can be used with the dice

EQUIPMENT LIST

- Micro:Bits
- Devices (laptops/computers or tablets)
- Paper, rulers and pens/pencils



HOW DOES IT WORK?

Once again, we need a variable to store the number we have just rolled in our virtual dice but there is one important thing that has happening behind the scenes to help us roll a number to keep it random each time. We use a block pick random and give it 2 numbers so that it knows what kind of number we want back, this makes sure that it picks a random number between 1 and 6 (inclusive).

See the guided tutorial -

<https://microbit.org/projects/make-it-code-it/dice/>

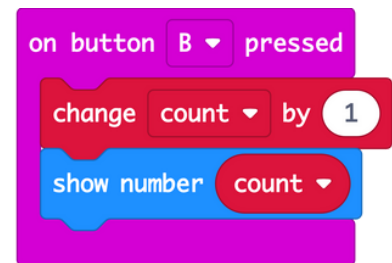
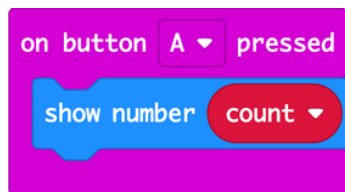
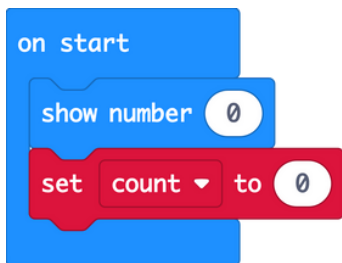
ACTIVITY

CLIMATE ACTION

Create a counting program so that we can keep track of the amount of litter in our local community

EQUIPMENT LIST

- Micro:Bits
- Devices (laptops/computers or tablets)



HOW DOES IT WORK?

This program is really similar to the fitness tracker code, except the only difference is that when we add 1 to the variable that is storing the total count, it waits until button B has been clicked to increase the total instead of waiting for a sensor. Once you have created this program and flashed it over to your micro:bit, take a walk with your group around your local community to count the number of pieces of litter you come across and think about what we could do to reduce the amount of litter.

See the guided tutorial -

<https://microbit.org/projects/make-it-code-it/counter/>

ACTIVITY

ACTIVITY PICKER

Use the power of code to let the micro:bit decide what we do through an activity picker that will choose at random what we do

EQUIPMENT LIST

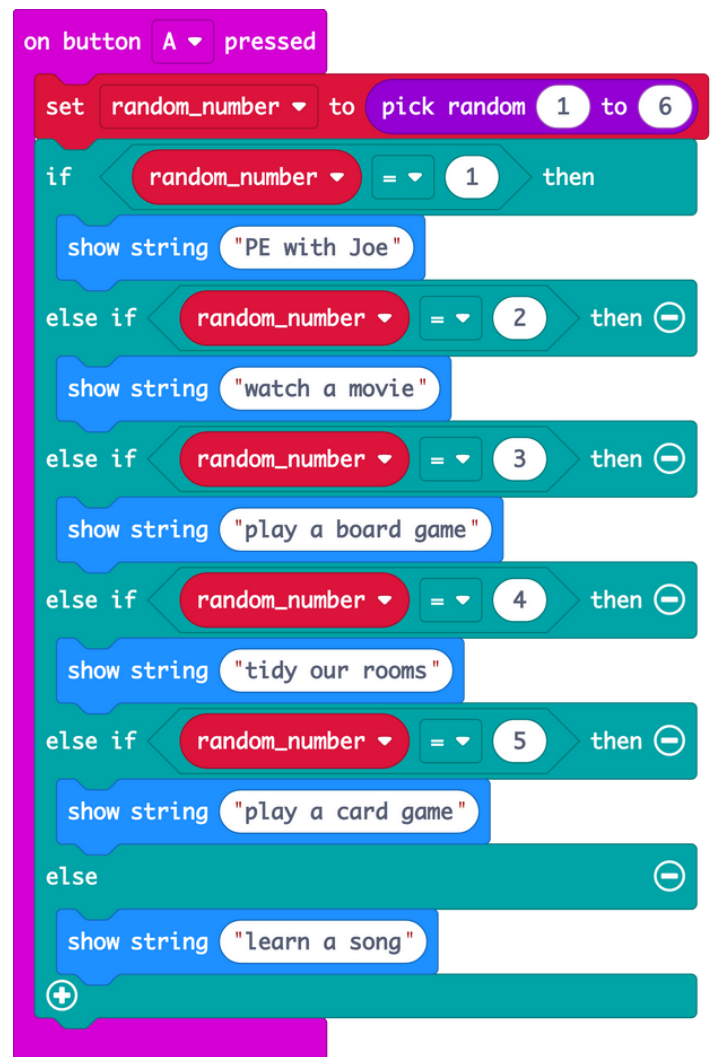
- Micro:Bits
- Devices (laptops/computers or tablets)

HOW DOES IT WORK?

For this program we need another new block called an *if statement*. This block helps the micro:bit to make a decision. We ask for a random number and store that number into the variable *random_number*. The micro:bit then checks this number to work out what to do next, for example, if the random number selected is 2 then the micro:bit will display to the user that they need to watch a movie.

See the guided tutorial -

<https://microbit.org/projects/make-it-code-it/activity-picker/>



MORE PROJECTS TO TRY

Rock, Paper, Scissors	https://microbit.org/projects/make-it-code-it/rock-paper-scissors/
Saving Sea Turtles	https://microbit.org/projects/make-it-code-it/saving-sea-turtles/
Teleporting Ducks	https://microbit.org/projects/make-it-code-it/teleporting-duck/

USEFUL LINKS

- Buy the micro:bit - <https://microbit.org/buy/?location=GB>
- Micro:Bit youtube channel - <https://www.youtube.com/channel/UCJRGThzeb0esPmsEmFkPGg>
- Getting started guide - <https://microbit.org/get-started/first-steps/introduction/>
- More micro:bit projects - <https://microbit.org/projects/>

EXTEND YOUR MICRO:BIT

- [Extended scrolling display](#)
- [Additional sensors](#)
- [Movement buggy](#)