Micro:fit - Your DIY Step Counter

Overview

Ever wonder how your smartwatch knows exactly how many steps you've taken? In this exciting project, we'll demystify fitness tracking technology by creating our own step counter using a micro:bit! Unlike expensive commercial devices, our DIY fitness tracker will help you understand the basic principles of motion detection and how simple sensors can count your daily steps.

Using the micro:bit's built-in accelerometer, we'll program it to detect movement patterns that match walking or running motions. You'll learn how real fitness trackers work while building your own wearable device that displays your step count right on the LED matrix. Best of all, you'll gain hands-on experience with physical computing, data processing, and real-world sensor applications.

Whether you're interested in wearable technology, fitness tracking, or just love creating cool gadgets, this project offers a perfect blend of computer science and physical activity. By the end, you'll have your very own working step counter and a deeper understanding of the technology we use every day!

> NOTE
> You do not need a micro:bit to do this tutorial you can use the simulator built into the MakeCode editor.

What you will Learn

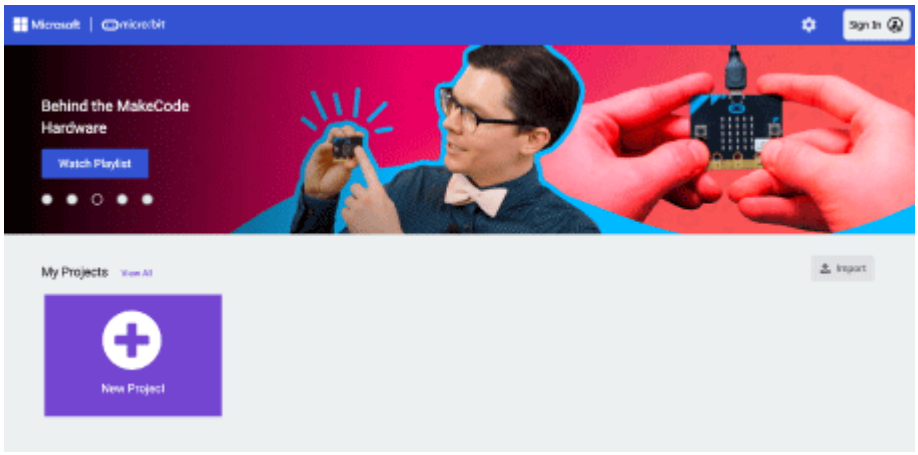
- [ ] How to create and use a variable.
- [ ] How to use the micro:bit on shake function.
- [ ] How to use a forever loop.
- [ ] How to display a number on the LED matrix.
- [ ] How to use the button function.

Let's open our code editor.

Navigating to MakeCode

1. Open your favourite browser (we recommend Google Chrome) or if you are using a mobile phone or tablet open the micro:bit app.

2. Within the address bar of the browser type makecode.microbit.org or on a tablet or phone press create code.



3. Select **New Project** and give it the name FitBit Clone.

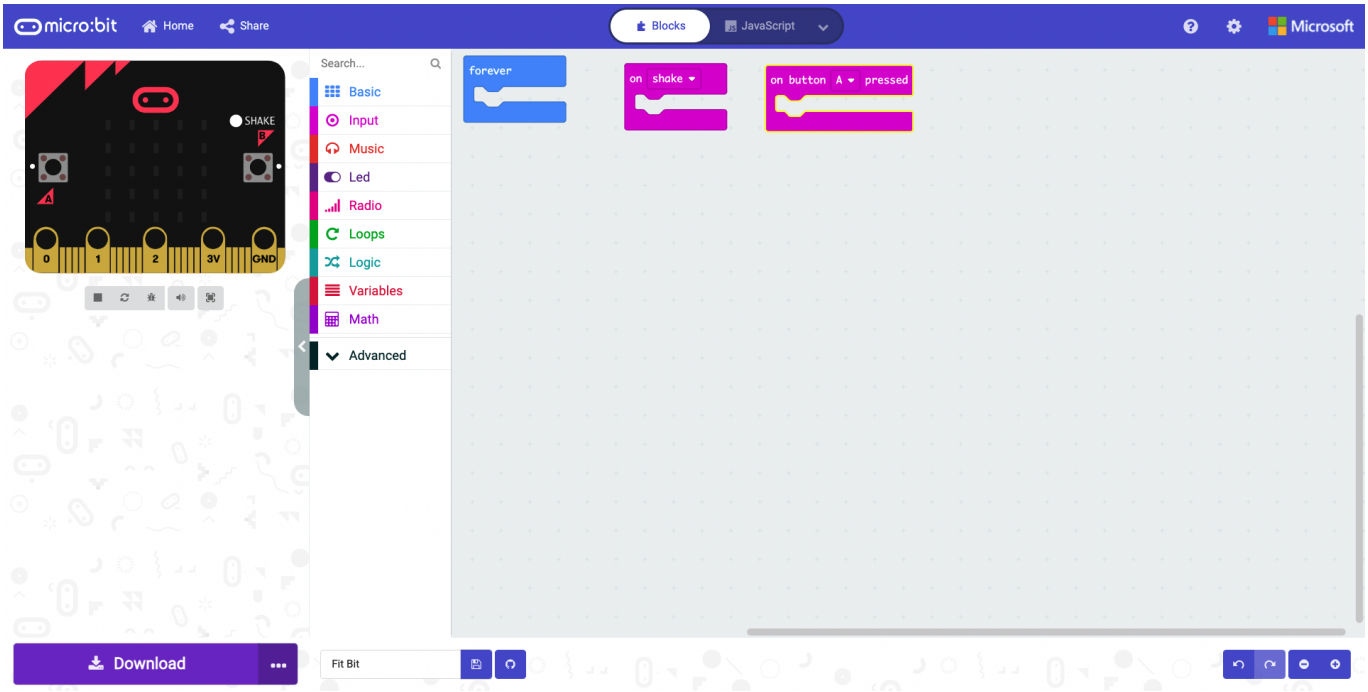
We are now ready to start coding!

Coding

Getting Started

1. Select and drag the `on start` block to the left of the screen and drop it on the **bin** icon to delete it.
2. From the Input menu, select and drag the `on shake` block to the code area and drop it.
3. From the Input menu, select and drag a `on button A pressed` block to the code area and drop it.

Your code area should look like this:



Creating a Variable

> WHAT IS A VARIABLE
> Think of a variable as a box that stores information that can be used throughout our program. We

> give variables a descriptive name so we and others can understand what is going on within our program.

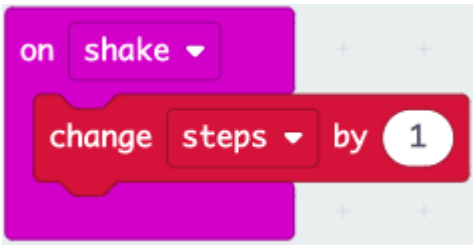
1. From the Variables menu select **make a variable...**.
2. Type **steps** and select OK or press Enter on your keyboard.

Change Steps By

1. From the Variables menu, select and drag a `change steps by 1` block to the code area and attach it within the `on shake` function.

Every time the micro:bit detects a shake it will increase the variable steps by 1.

Your code should look like this:



Show Number

1. From the Basic menu, select and drag a `show number 0` block to the code area and attach it within the `forever` block.
2. From the Variables menu, select and drag a `steps` block to the code area and attach it within the **0** of the `show number` block.

This will run forever and display the number of steps on the LED matrix.

Your code should look like this:

Set Steps To 0

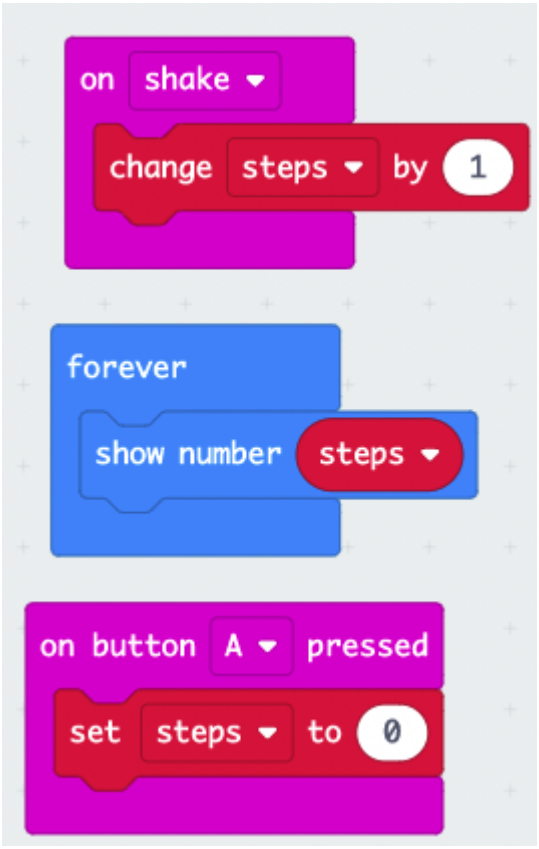
From the Variables menu, select and drag a `set steps to 0` block to the code area and insert it within the `on button A pressed` block.

This will reset the step counter back to 0 when button A is pressed.

Your code should look like this:

Completed Code

Here is our completed code for the step counter.



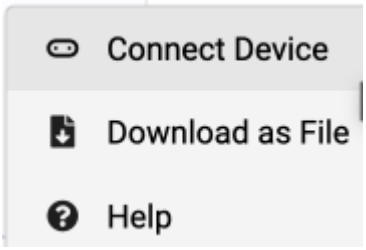
Let's move on and download the code to our micro:bit.

Downloading the code to the micro:bit

> NOTE
> If you have already paired your micro:bit to your computer, you can skip this part and just select the **Download** button.

1. Select the **3 dots** next to **Download**.

2. Select **pair device** a pop-up will come on screen to show you how to connect the micro:bit to the computer. Select **pair device** again.



3. Select **BBC micro:bit xxxx** and Select **connect**.

4. Select Download.

Now that we have downloaded our code, let's find out how to use the step counter.

How to Play

Well done you have created your very own FitBit clone step counter.

Web Browser

Using the micro:bit simulator you can drag the mouse over it and see it move or there is a dot with **shake** next to it, you can select this and it will simulate a shake.

Using the micro:bit

Once you have downloaded the code to your micro:bit you can shake the micro:bit and see your steps add up. To make this more realistic find a way to strap the micro:bit to your leg or shoes and go for a walk and see how many steps you have done at the end.