Microbit | Beginner | 10 Mins

1 Overview

Ever wondered how a smartwatch or fitness band counts your steps? In this project, you're going to build your very own step counter using a micro:bit!

Inside your micro:bit is a clever little sensor called an accelerometer. It can feel when the micro:bit moves. We'll use it to spot every step you take, add them up, and show the total on the LED matrix (the grid of lights on the front).

The best bit? When you're done, you'll have a real working fitness tracker you can pop on and take outside. Don't worry if something doesn't work first time, that's all part of coding. Let's give it a go!

🎯 What you'll learn

- How a light sensor measures the light around it
- How to use an if/else block to make a decision
- How to switch an RGB LED on and off automatically

2 What you'll need

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- The micro:bit MakeCode editor
- micro:bit
- micro USB cable
- battery pack for the micro:bit (optional)

3 Key words

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Variable

A variable is something that can change. Think of it like a labelled box: you pop something inside, and the label tells you what it is. You can swap what's inside whenever you like.

A variable called score might start at 0, then change to 1, 2 and 3 as you collect points in a game.

Accelerometer

An accelerometer is a tiny part inside the micro:bit that senses movement, like tilting, shaking or being turned over. It turns that movement into numbers your code can react to.

A bit like the sensor in a games controller that knows when you tilt it to steer, the accelerometer notices when the micro:bit moves.

LED Matrix

The LED matrix is the grid of little red lights on the front of the micro:bit. By switching them on and off in patterns, your code can show numbers, letters and tiny pictures.

Like a mini scoreboard made of dots, the LED matrix lights up to spell out your step count.

Forever loop

A forever loop repeats its instructions again and again without ever stopping (until you switch off or reset). It's perfect for anything you want to keep happening over and over.

Like a clock's second hand that keeps ticking round and round, a forever loop keeps running the same steps over and over.

Button

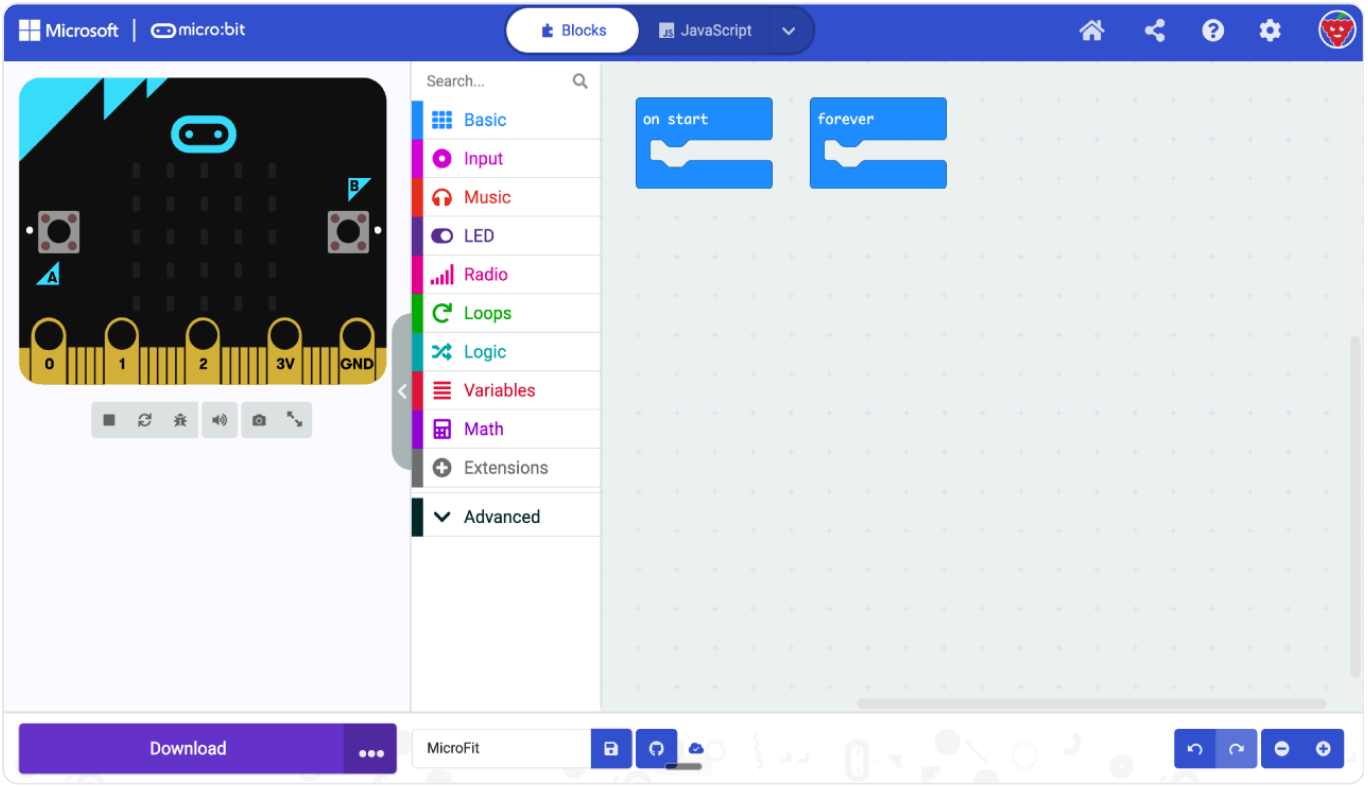
A button is a switch you press to tell your project to do something. The code can check whether it's being pressed or not.

Pressing a doorbell is just like pressing a button, one press sends a signal that makes something happen.

4 Set up your micro:bit

On a Computer

1. Open your favourite web browser. We recommend either Google Chrome or Microsoft Edge.
2. In the Address bar type makecode.microbit.org.
3. Select **New Project** and give it the name **MicroFit**.

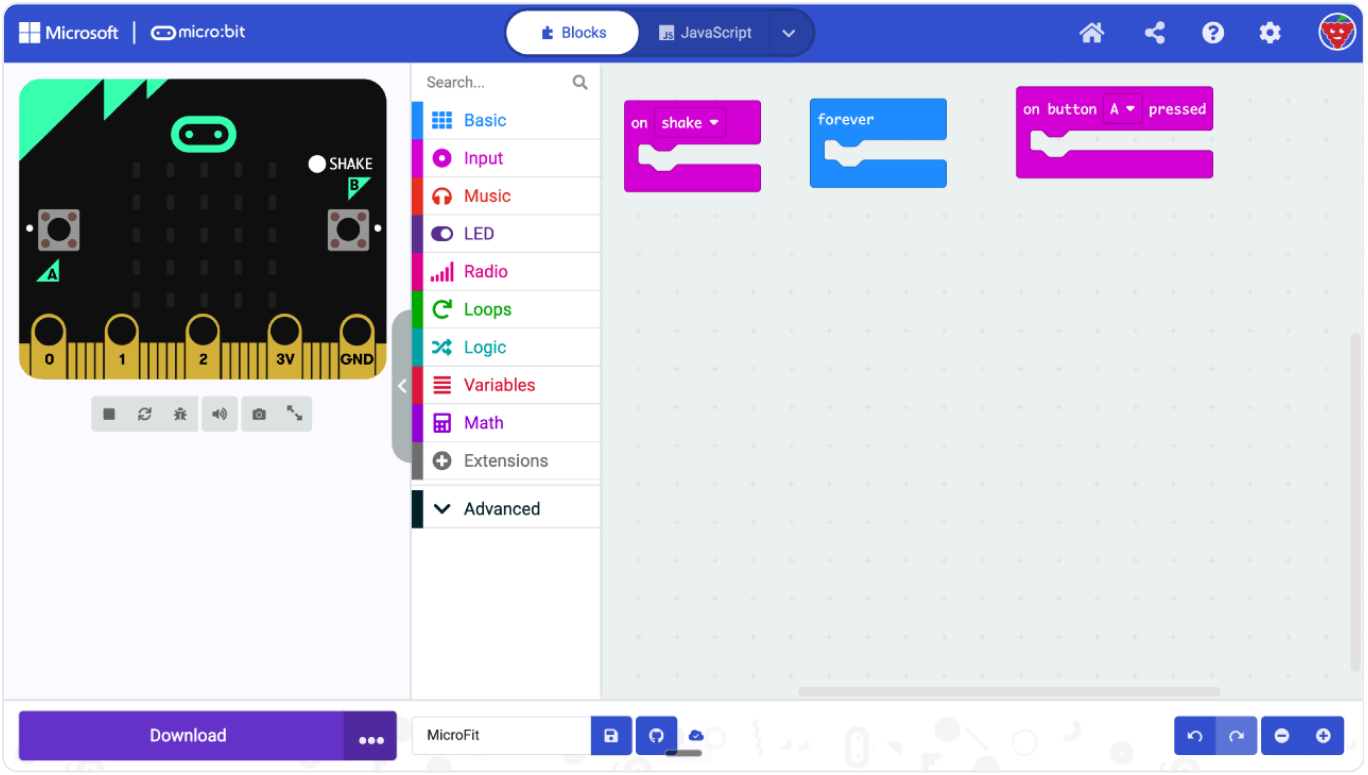


On a Tablet or Phone

1. Open the **micro:bit app**. If you don't have the app yet you can download it from your devices app store by searching for **micro:bit**.
2. Select **Create Code**.
3. Select **New Project** and name it **MicroFit**.

5 Set up the Code Area

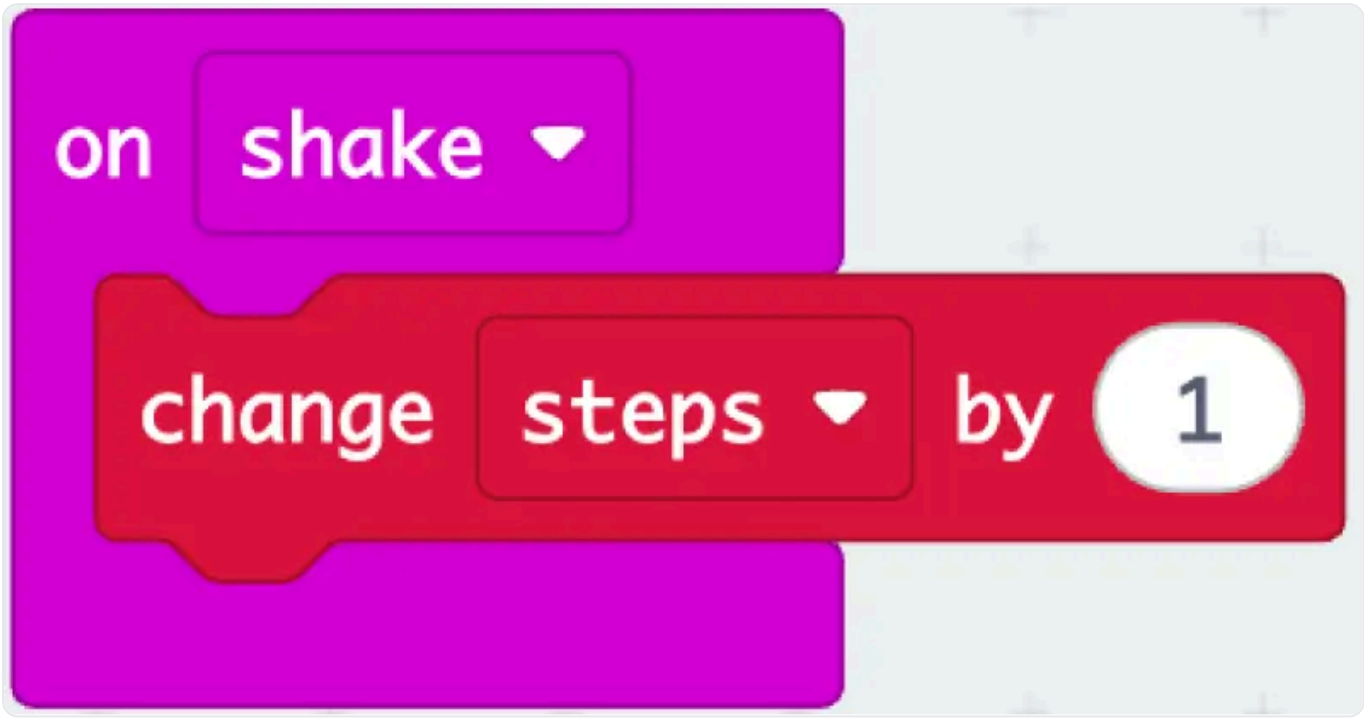
1. Select the `on start` block and drop it on the **bin** icon to delete it.
2. Select **Input**. Select a `on shake` block and drop it within the code area.
3. Select **Input**. Select a `on button A pressed` block and drop it within the code area.



6 Change Steps by 1

1. Select **Variables**, choose **Make a Variable**, and name it **steps**.
2. Snap a `change steps by 1` block inside the `on shake` block.

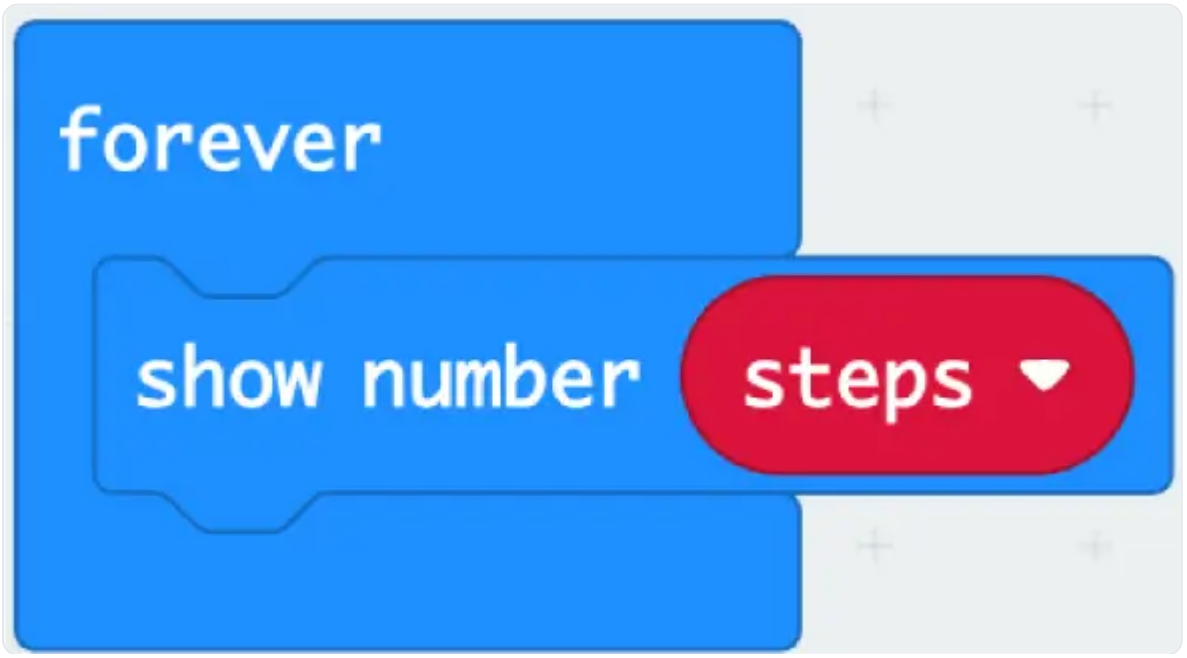
Every time the micro:bit detects a shake, it adds one to your steps variable.



7 Show the number of steps

1. Select **Basic**, then snap a `show number` block inside the `forever` block.
2. Select **Variables**, then snap a `steps` block onto the `show number` block, where it says **0**.

This forever loop keeps running and shows your step count on the LED matrix



8 Reset the steps to zero

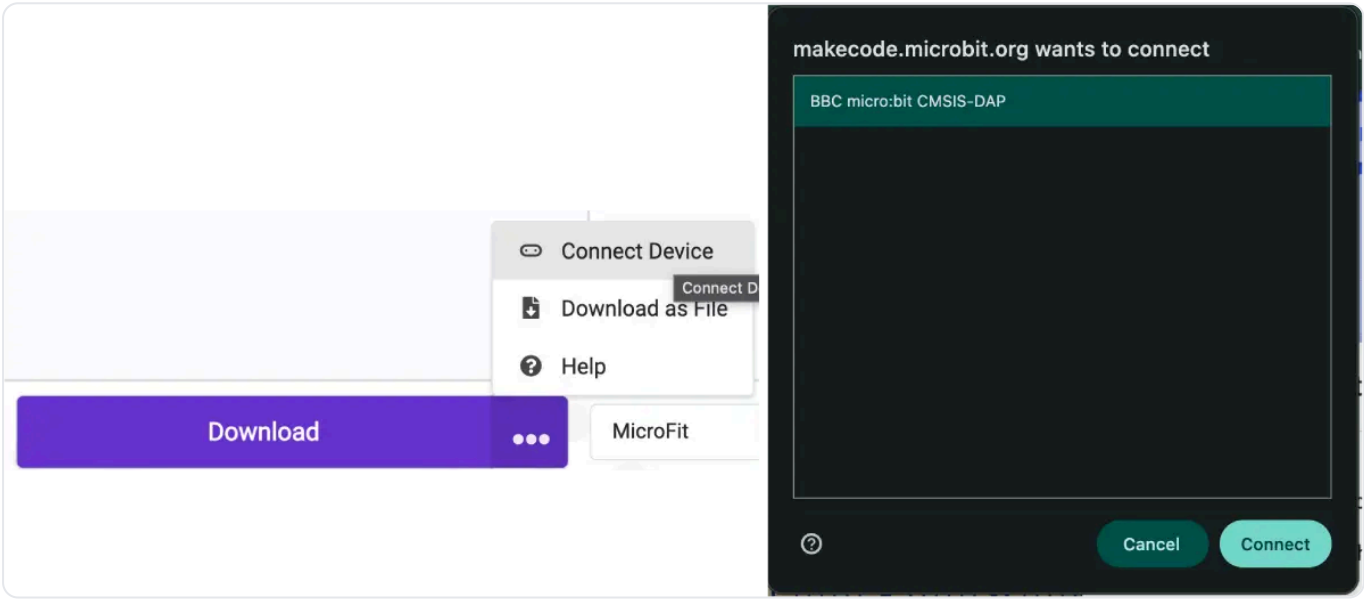
Select **Variables**, then snap a `set steps to 0` block inside the `on button A pressed` block.

Now, pressing button A on the micro:bit resets your step variable back to zero.

9 Downloading Your Code

Using a Computer

1. Select the **three dots** next to **Download**.
2. Select **Connect Device**.
3. A pop-up will show you how to connect the micro:bit to the computer. Keep following the on-screen instructions.
4. Select **BBC micro:bit XXX** and select **Connect**. The XXX is your own micro:bit's name, so don't worry if it looks a little different.
5. Select **Download**.



Using a tablet or phone

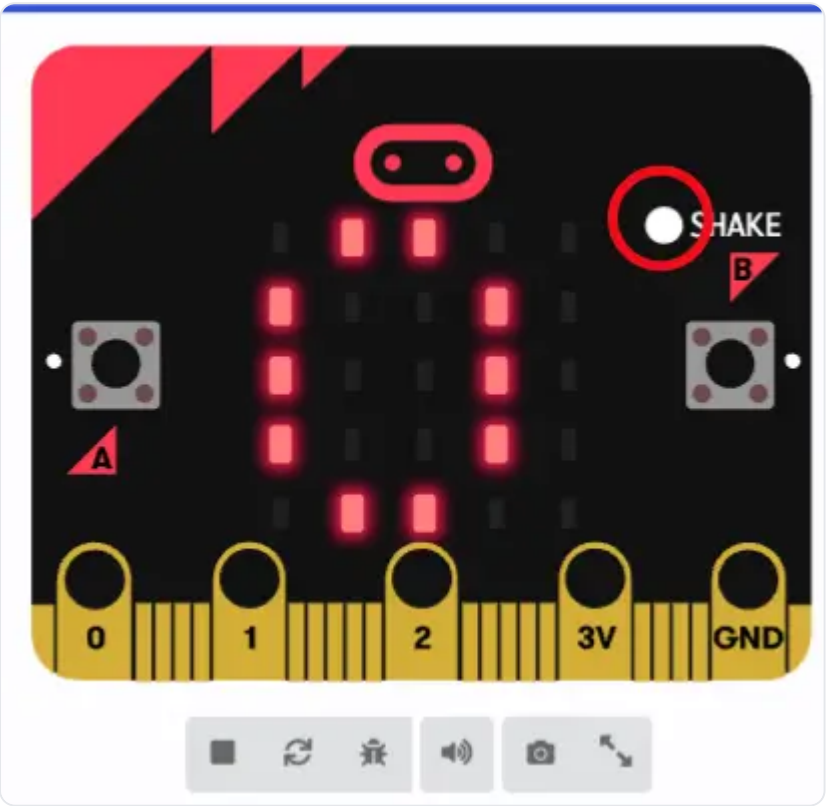
1. Select **Download**.
2. Follow the on-screen instructions to pair the micro:bit with the micro:bit app.

Once you've finished the on-screen steps, your code downloads to your micro:bit.

10 Run it and Watch

Shake the micro:bit to watch your steps go up. Pop a battery pack on, attach the micro:bit to your wrist or ankle, and head outside to see how many steps you can rack up!

Dont Have a microbit We can test it on the MakeCode editor by selecting the **white dot** next to **shake** on the micro:bit simulator and watch our steps counter climb everytime we select the dot.



11 Try it yourself

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Challenge: Set yourself a step goal! Add an `if` block inside the `forever` loop to check when `steps` reaches a target, like 20. When you hit it, make the micro:bit show a happy face or play a sound to celebrate, then press button A to reset and go again.

12 Stuck? Quick fixes

Problem	Try this
The number doesn't go up when I shake it	Check your `change steps by 1` block is inside the `on shake` block. Give the micro:bit one firm, clear shake.
The count jumps up by lots at once	A big wobble can look like several shakes. Try one single, definite shake each time.
Nothing shows on the LED matrix	Make sure the `steps` variable is snapped inside the `show number` block, and that `show number` is inside the `forever` block.
The number doesn't change straight away when I shake fast	That's okay, it's still counting! The micro:bit can't show the new number while the last one is still scrolling. Stop shaking for a moment and your latest total will pop up.
Button A won't reset the steps	Check the `set steps to 0` block is inside the `on button A pressed` block.
My code won't download to the micro:bit	Use a data USB cable (not a charge-only one), make sure the micro:bit is paired, and try a different USB port.