

Getting ready to start

Programming for beginners with the BBC micro:bit

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1 Summary

Summary

Here is a checklist to get you going.

1. Get a micro:bit and test it by connecting the battery.
2. If you use a **Mac or Windows laptop**:
 - check whether you need a USB adapter or a different lead to connect the micro:bit
 - I recommend that you download the [MakeCode Offline App](#).
3. If you use an **iPad**, you **must** download the [micro:bit mobile app](#)
4. If you use an **Android tablet or Chromebook**, check whether you need a USB adapter.
5. Go to the [Microsoft MakeCode](#) web page and create a Microsoft account if you don't already have one.

You're set!

The rest of this document provides further details of the hardware and software required, including links to pages for trouble-shooting.

2 Information

Information on the micro:bit

A vast amount of information is available on the micro:bit. This course is based heavily on the following web sites, particularly the home site [microbit.org](#).

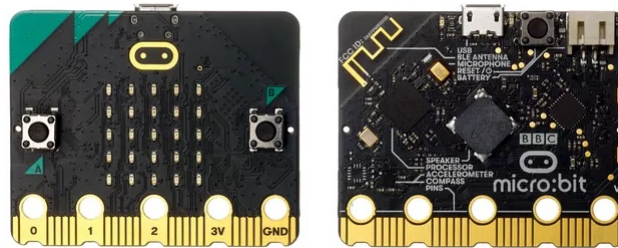
- Home site for BBC micro:bit [microbit.org](#), extremely informative, including:
 - [Getting started](#), used to test the micro:bit
 - [User guide](#)
 - [Let's code](#)
 - [Mobile apps for iPad and Android tablets](#)
 - [Lots of example projects](#), some of which we shall try
- [Microsoft MakeCode](#), which we shall use to construct our programs
- [MakeCode reference](#) and [micro:bit Help and Support](#)
- [micro:bit developer community](#) for greater technical depth

3 Hardware

Hardware required

You need a:

1. BBC micro:bit
2. device on which to construct your programs (laptop or tablet)
3. connection between them (wired or wireless) to download your programs



The top of the board is on the left. It has an array of LEDs, two pushbuttons and a touch sensor, with the micro:bit logo top centre.

BBC micro:bit board

You need the 'new' version (V2, released in 2020) of the [BBC micro:bit](#). I suggest the [Kitronik micro:bit V2 Go Pack](#), which comes in a box with:

- micro:bit V2 board
- USB-A cable (you may need an additional adapter)
- battery holder with 2 × AA batteries
- quick start guide

The cost is £18 including VAT, plus postage.



Fold the handy cardboard battery box to complete the unit.

Download a [template](#) for the battery box if the card is not included.

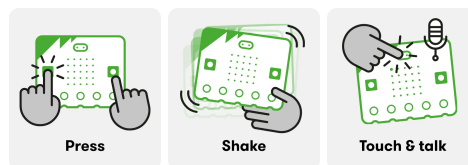
Test the micro:bit

Testing the micro:bit is simple: connect the battery and it should spring to life!

- The battery connector is fiddly. The plug (connected to the battery pack) has a ridge along one side, which should go **downwards** (next to the back of the micro:bit). You might like to colour the top face of the plug for clarity.

The micro:bit should squeak and display a heart. You can then:

- press button A (left), B (right) or both together
- shake the board
- hold your finger on the micro:bit logo near the top, talk, release your finger and listen to a (terrible) recording of your voice.



What if it doesn't work?

A fresh micro:bit should run the 'meet the micro:bit' program out of the box as described in the previous slide. If you have an older micro:bit (perhaps donated by a grandchild), you should refresh it. This may require two steps.

1. Check that the **firmware** is the current version (0257) and update it if necessary. I think that this can be done only with a wired connection.
2. Update the 'meet the micro:bit' program. I think that this can be done over Bluetooth or with a wired connection.

Please see the linked web pages for details; most people will not need to do this.

The **firmware** is software that is stored in the interface chip so that the micro:bit can communicate with a computer using USB or over Bluetooth.

When it is powered from the battery, the micro:bit can be turned off by holding down the reset button on the back for a few seconds. Press the reset button again to wake the micro:bit. Alternatively, disconnect the battery.

4 Device for programming

Hardware for constructing the program

This can be one of:

- **laptop computer** (Mac or Windows) with a USB socket
- **iPad** with Bluetooth
- **Android tablet** with a USB socket or Bluetooth

I **strongly** recommend that the screen should be at least 250 mm or 10 inch (diagonal), a standard sized iPad or other tablet.

The only software required for constructing programs is a web browser and any standard, up-to-date browser should work (Mozilla Firefox, Apple Safari, Google Chrome, Microsoft Edge). Internet Explorer (IE) is *not* supported but it is unlikely that you are still using it. Consult [minimum requirements](#) if necessary.

The next slide shows a summary of the options, followed by details of different systems.

ChromeOS is also supported but I have no experience of this system.

Summary of options for programming and downloading

You need a computer of some sort to construct the program and a connection to download the program into the micro:bit, where it runs.

Device	Programming		Downloading	
	web browser	app	USB	Bluetooth
Mac laptop	✓	✓	✓	✗
Windows laptop or tablet	✓	✓	✓	✗
iPad	✓	✓	✗	✓
Android tablet	✓	✓	✓	✓
Chromebook	✓	✓	✓	✓

✓ You are advised to use USB rather than Bluetooth for downloading from an Android device if possible.

Laptop (or desktop) computer

Laptops running MacOS or Windows (including the Microsoft Surface) work well.

- A USB cable is required to connect the computer to the micro:bit. See later for details: **you may need an adapter**.
- I recommend that you download the [MakeCode Offline App](#), which is available for Windows and MacOS. This reduces the load on the network and should be more responsive.

iPad

These also work well.

- The iPad connects to the micro:bit by Bluetooth. You must enable this on the iPad and need to download the [micro:bit mobile app](#) from the Apple App Store.
- It is simpler to construct programs within the app rather than using the web browser.

Consult the support page [micro:bit iOS app: creating and sending programs on an Apple iPad or iPhone](#) if you run into problems.

Android tablet or Chromebook

I do not have an Android device and have not been able to test how well they work.

- An Android device can connect to the micro:bit either by USB (recommended) or by Bluetooth.
 - **You may need an adapter if you use a USB cable**; see later.
 - If you use Bluetooth, you must enable this on your device and download the [micro:bit mobile app](#) from the Google Play Store.
- You can construct programs either within a web browser (probably Chrome, recommended) or by using the app.

Consult the support page [Using the micro:bit on Android](#) if you run into problems.

Microsoft account

We shall construct our programs with [Microsoft MakeCode](#), either on the web or within an app. You need an account to store your work so that you can return to your programs after leaving the web page.

1. Go to the [MakeCode](#) web page and click on **Sign In** (top right).
2. If you use Windows, Microsoft Office or Outlook Mail, you probably have a Microsoft account already. Sign in with your existing credentials. You can also sign in with a Google or Clever account.
3. If you don't have any of these accounts, click on Sign up.

Make sure that you log in every session or your programs will vanish!

The MakeCode home page has lots of tutorials, some of which we shall follow.



5 Connection

Connection by Bluetooth

A connection is needed to download programs from the computer to the micro:bit:

- **USB cable** for laptop computers, Android tablets and Chromebooks (not iPads)
- **Bluetooth** for tablet computers (iPads, Android tablets and Chromebooks)

To use Bluetooth, you must download the [micro:bit mobile app](#) from the Apple App Store or Google Play. We'll see later how to pair the device and micro:bit.



Connection by USB cable – *check carefully*

The Go Pack comes with a cable to connect the micro:bit to a laptop or Android tablets. The micro:bit uses a micro-USB connector and the standard cable has a USB-A plug for the computer. This is the original type of USB connector, used for over 20 years. It is rectangular and must be inserted the correct way around.

Newer laptops and tablets use the smaller, rounded (and far more capable) USB-C connector, which can be inserted either way around. If you have one of these, then you also need either:

- USB-C to micro-USB cable (available from [Kitronic](#))
- USB-C to USB-A **adapter** (shown with USB-C plug on left, USB-A **socket** on right – not plug)



The connector must allow data transfer, not just charging. Further details [here](#).

Shops also sell ‘USB-C to USB-A cables’, often called just ‘USB-C to USB cables’, but these have a USB-A plug rather than a socket so *they will not work!* Data transfer is sometimes called ‘syncing’ or ‘synching’. An example of a suitable device from Apple is the [USB-C to USB Adapter](#), price £19. They also sell more comprehensive adapters with extra outputs, such as HDMI. [Wait-rose](#) stock the same adapter. Other products are shown on Currys web page for [USB cables and adapters](#). The connector that I have called a ‘USB-A socket’ may also be called a USB-A female connector: you need a USB-C male to USB-A female cable. **Please check with me if you have any questions** – it’s confusing.

Test the USB connection

Use the USB cable to connect the micro:bit to your computer. Don’t connect the battery pack because the USB cable provides power.

- The micro:bit should run the ‘meet the micro:bit’ program as before.
- On the computer, the micro:bit should appear as a disk drive called MICROBIT (probably the D: drive on Windows).

You don’t need to look at the contents of the disk drive. For completeness they are:

- DETAILS . TXT – technical information, such as the version of the firmware
- MICROBIT . HTM – a web link to the [features](#) of the micro:bit
- MY_DATA . HTM – data that you have stored on the micro:bit (if any)

iPads do not support USB disk drives, even if they have USB sockets, and therefore cannot use a wired connection. Use Bluetooth instead.

Consult the support page [How do I connect the micro:bit to my computer](#) if you run into problems.