Micro:bit Part 1 : Game Controller

Student Workbook

Introduction

Welcome Minecrafter! This lesson is designed to help make a games controller for Minecraft Education, using a micro:bit version 2. Once you have completed this lesson, you will have a basic game controller. Let's get started!

What do I Need?

To complete this exercise, you will need:

- A licensed copy of Minecraft Education, version 1.20 or higher. For more information about getting Minecraft Education, you should read the section How do I get Minecraft Education?
- A micro:bit version 2.0 or higher. You can't complete this exercise on micro:bit version 1.
- A PC running Minecraft Education, that has a Bluetooth connection capability that you can access, or equivalent device which can run Minecraft Education.
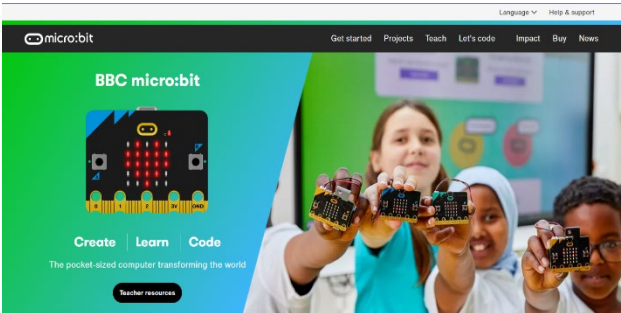
Steps in Process

There are four steps to creating a micro:bit controller for Minecraft:

1. Code your micro:bit using the right extensions.
2. Download code to the micro:bit.
3. Pair your micro:bit using Bluetooth.
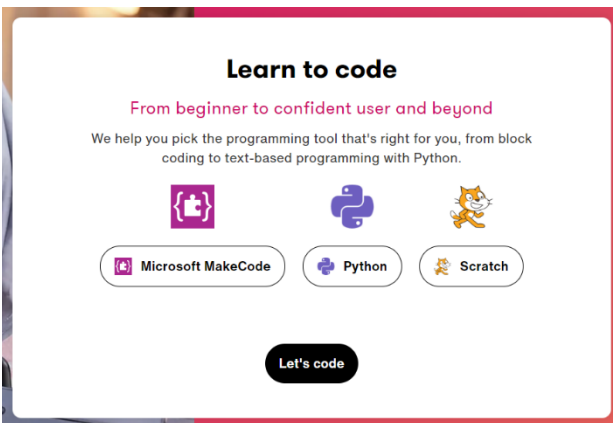4. Test your controller with Minecraft Education
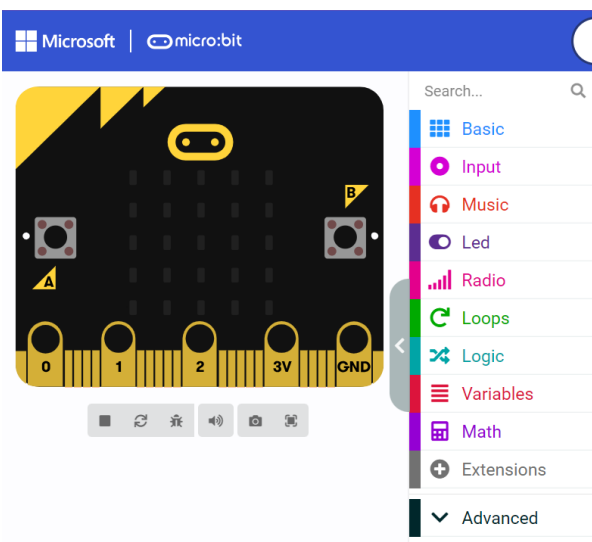
Let's get started.
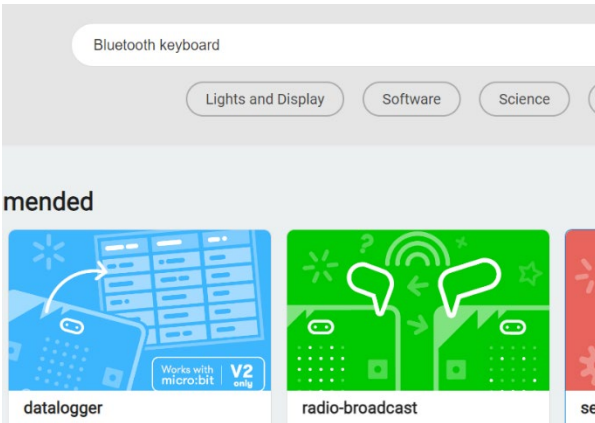
Step 1: Code your micro:bit Controller!

Make your way to [Micro:bit Educational Foundation | micro:bit (microbit.org)](microbit.org) website.
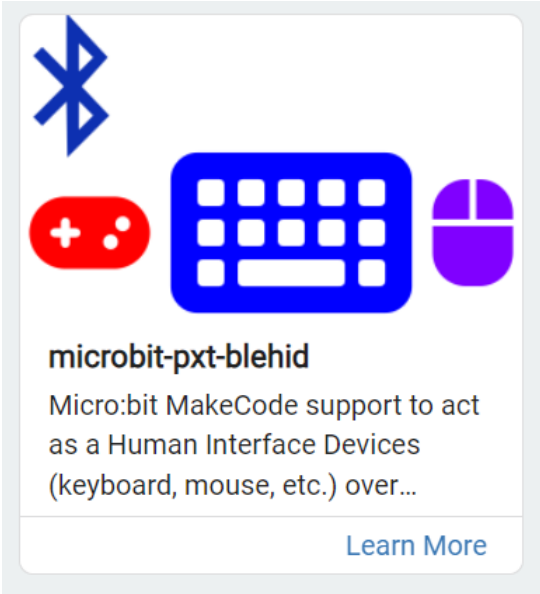
Scroll down and find the section **learn to code**. Click on the link for Microsoft MakeCode.

On the micro:bit page, scroll down to the **extensions** menu.

In the search menu, type **Bluetooth keyboard** and press **enter**.

One of the extensions displayed is **microbit-pxt-blehid**. Click on this extension and it will install, and you will be returned to your micro:bit coding page.

Before we can program the micro:bit we also need to connect it via Bluetooth to our device.

Head down to the pair your micro:bit section so you can see how!
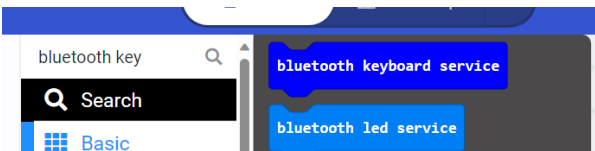
In the search box type **bluetooth key** and you should see **bluetooth keyboard service** appear as a code block. Drag this code block to the **on start** block.

When run, it will start a service that will connect your Micro:Bit to a computer
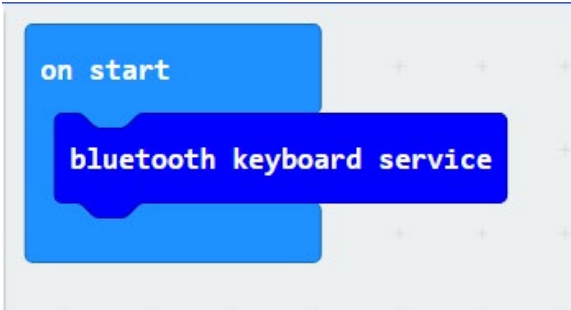
and allow it to be used as a keyboard. Your Micro:Bit only has a small number of keys, so we can make them send keyboard combinations and information to the computer.
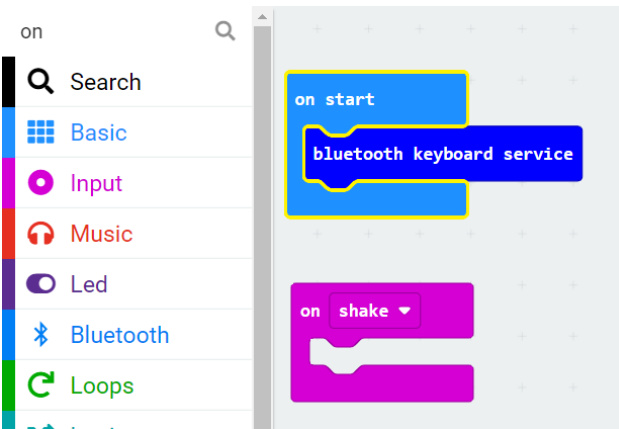
Now that we have started up the keyboard function, we can start on making a controller!

We want to make it so when you tilt up, down left or right you go that direction in Minecraft.

So first we need to search for **on** and grab the block **on shake**.
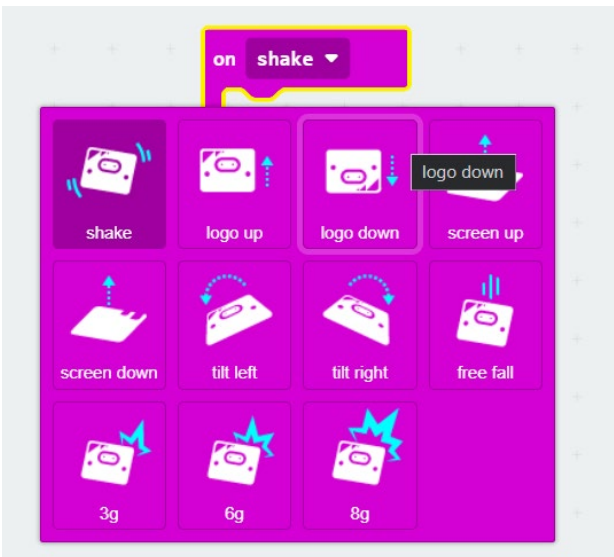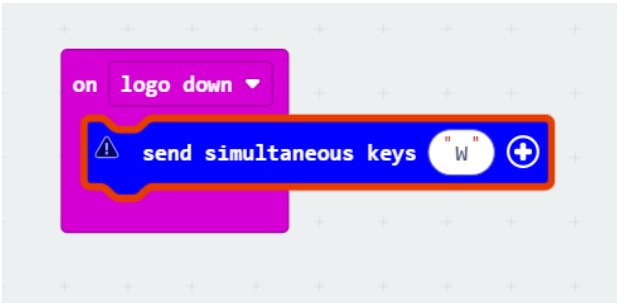

Next, we need to select the drop-down button to the right of **shake**.
We get this menu up and you should select **logo down**.

Now search for **send** and this will show the block **send simultaneous keys**. Drag this block onto the **on logo down** block.

Type the letter **W** into the white space.

Now you might have an error like in the photo above, but that's because we haven't given it a condition yet.

Hit the **plus icon** beside the **W** and you will get something like this.

Finishing touches, to visually show what direction we are heading we are going to add some LEDs to the block!

Search **show** and grab the block **show leds** and add it to your blocks.
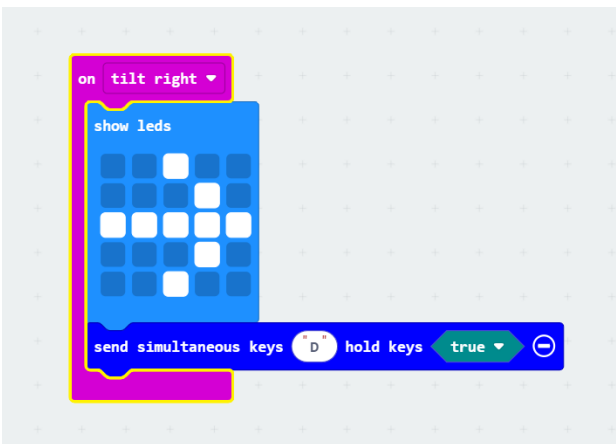
Then add an arrow going forwards.
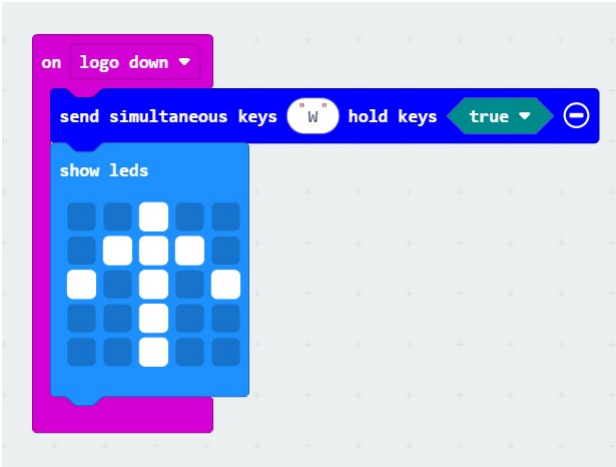
You should end up with something like this!

When run, this code will now send a **W** key signal every time you tilt the **logo down** on your micro:bit.
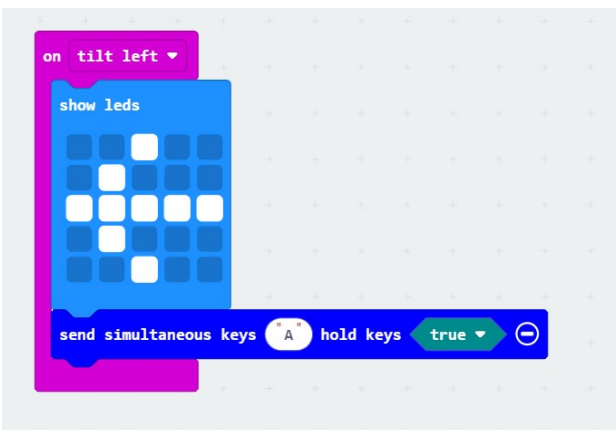
W is the key used to move forwards in Minecraft.

Now all we need to do is repeat this for all the rest of the directions.

Going right would look like this. We add another **on shake** block and change it to **tilt right**, add the **simultaneous keys** block and set the key to **D**.
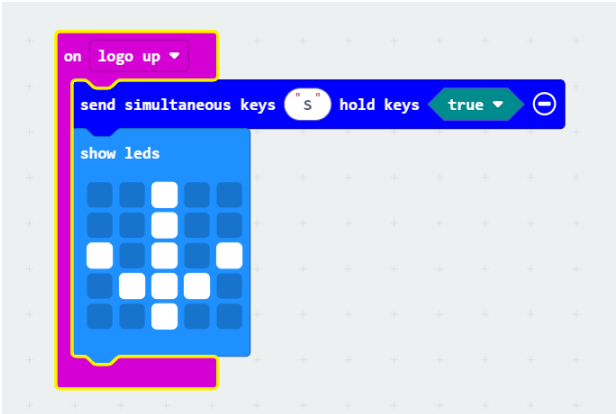
Then finally add the **show leds** block showing the direction we are going!

Going left would look like this.

We add another **on shake** block and change it to **tilt left**, add the **simultaneous keys** block and set the key to **A**.
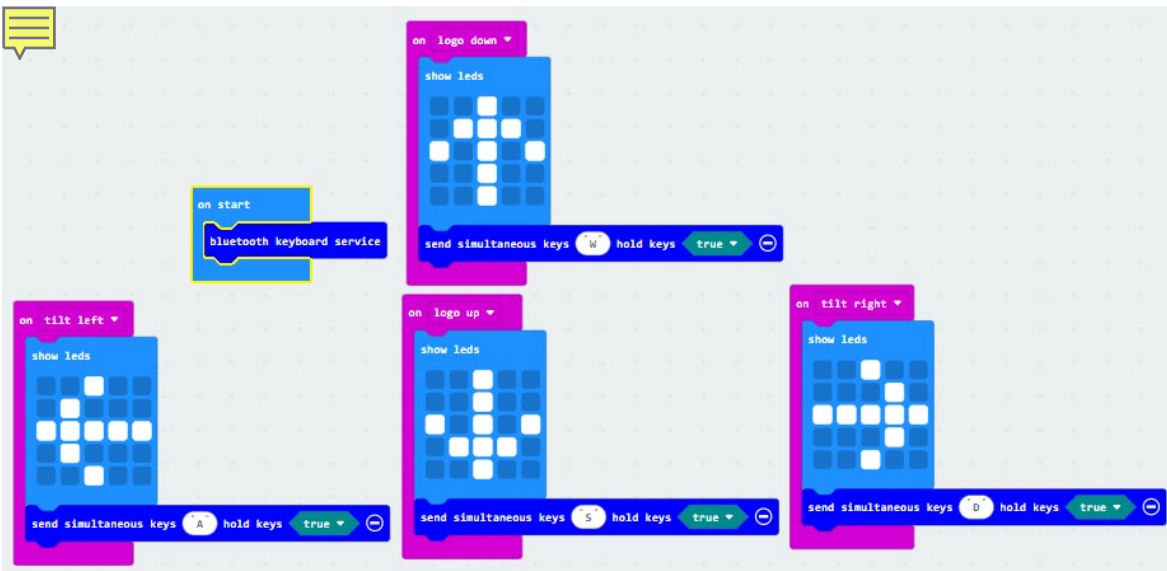
Then finally add the **show leds** block showing the direction we are going!

Finally going backwards would look like this!

We add another **on shake** block and change it to **logo up,** add the **simultaneous keys** block and set the key to **S**.

Then finally add the **show leds** block showing the direction we are going!
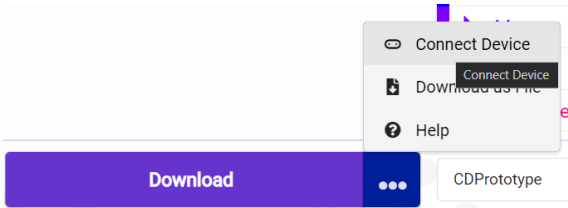

This is the code we end up with

All these commands together will allow the player to move forwards, backwards left and right within Minecraft.
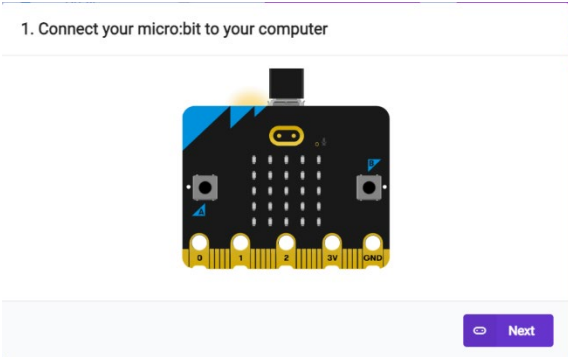Now all that is left to do is **test it**!

Step 2: Downloading your code to the micro:bit

To **download** your code, first we need to connect your device. Select the **…** beside the **download button** and hit **connect device**.

Follow the instructions to **connect your micro:bit** to your computer.
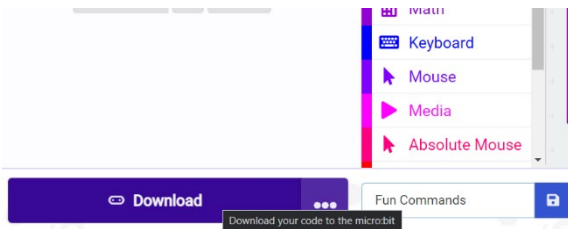
Once your micro:bit is connected, anytime you want to send code to your micro:bit you just hit the **download button!**

This sends you code to the micro:bit so that you can get testing!

Step 3: Pairing your micro:bit using Bluetooth

The micro:bit will need paired the first time you use it with your computer, using Bluetooth. This process is different depending on your operating system.

Using another operating system other than Windows? Check out the link below for other operating system specific guides.
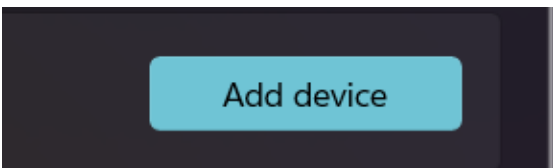
https://makecode.microbit.org/pkg/bsiever/microbit-pxt-blehid

Windows 11
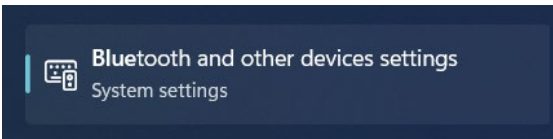
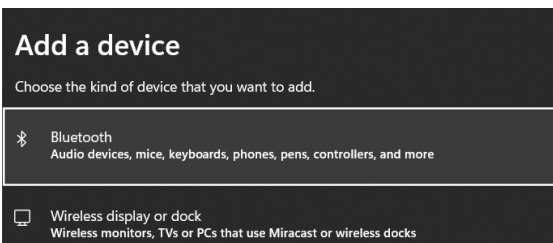First, we need to find the Bluetooth settings.
Click on the start icon and search for Bluetooth in your apps.
You will see "Bluetooth and other devices settings", select this.

On the page there is an add device button.

It may look a little different than this but as long as it says add device it should all do the same thing.

Select the Bluetooth option from the menu.
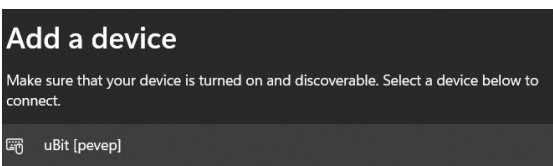
Make sure your micro:bit in plugged in to your pc or that the battery pack is plugged in otherwise it won't show up.

Select your micro:bit from the list.
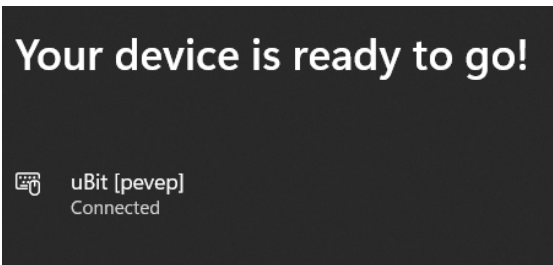
It will come up with something like this showing your micro:bit is paired to your device.

Step 4: Testing your code with Minecraft Education
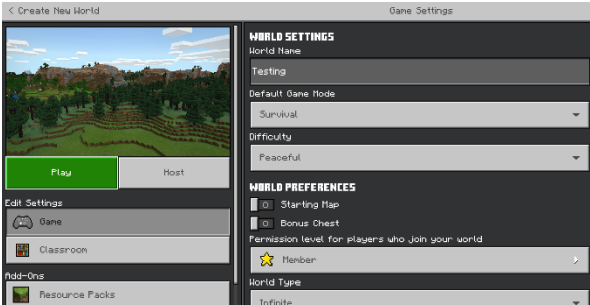
Open Minecraft Education and select **create new**.

Name this world anything you want, I am naming mine "Testing". Then **hit play**!

Now feel free to test the controller we just made.

Just **tilt your micro:bit** the direction you want to go!

An **arrow** should display on your micro:bit just like this.

How do I get Minecraft Education?

These are the stages involved in getting started with Minecraft on your devices.

Check the system requirements

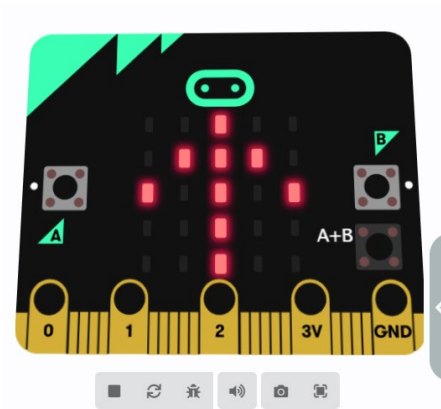For this project, Minecraft Education can be installed on Windows or MacOS. To ensure your experience with Minecraft Education is top-notch, make sure your devices meet the minimum system requirements. To check if your device supports Minecraft Education, see System Requirements.

Try Minecraft: Education Edition for free

Minecraft Education is available for anyone to try. If you have an Office 365 Education account or a Microsoft 365 account, you can start a free trial of Minecraft Education. The trial is a fully functional version of Minecraft Education. The only limit is the number of times you can sign in. If you don't have an Office 365 Education account or a Microsoft 365 account, you can still try one of the demo lessons available for Minecraft Education. To learn more about trying Minecraft Education, check out Try Minecraft Education for free.

Purchase licenses

Minecraft Education licenses are purchased via a yearly subscription. Individual licenses can be purchased directly from Microsoft or, if you're part of an eligible educational institution, you can connect with a partner to purchase volume licenses. To learn more about purchasing Minecraft Education licenses, see Purchasing Options for Minecraft Education Licenses.

Create users accounts and assign licenses

To play Minecraft Education, each user requires a license. The license allows the user to sign into the game on any supported device. An IT administrator creates user accounts in Microsoft 365 Admin Centre then assigns licenses to users. The process for assigning licenses depends on how the licenses were purchased. To learn more about creating user accounts, see Add Users and Assign Licenses at the Same Time in the Microsoft 365 Admin Centre Help.

To learn more about assigning licenses in the Microsoft 365 Admin Centre, see Manage Licenses for Camps, Clubs, Homeschool and Other Organizations.

Install Minecraft Education

Minecraft Education can be installed on supported devices manually or through system management software. The installation process depends on the device you are deploying it to.

To learn more about installing Minecraft Education, see the installation guides for each device:

- Installation Guides