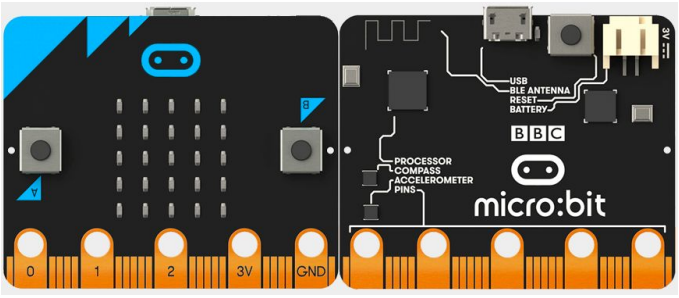
Connect to the BBC micro:bit

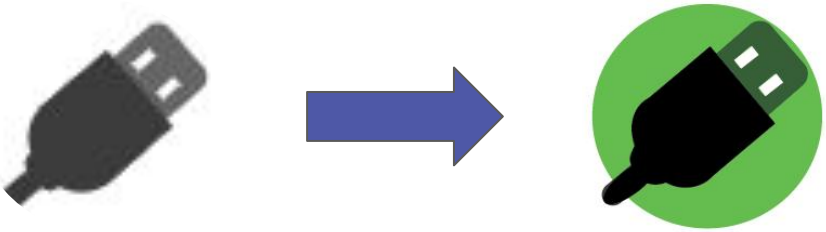
Visit microblocks.fun and download MicroBlocks for free!

Note: On Macs, you will need to right click on the MicroBlocks app and select Open.

Connect the BBC micro:bit to a computer with a USB cable (note: make sure the USB cable is not a *power only* USB).



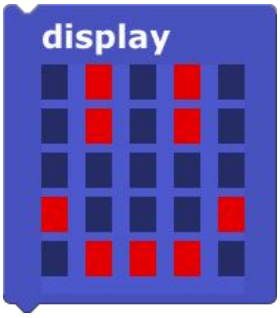
In the upper left corner of the MicroBlocks window, you will see a USB icon. When you plug in your micro:bit, you should see the USB icon turn green. You are now ready to code your micro:bit!



Click the LED display category along the left side of the MicroBlocks window.

LED Display

Drag the *display* block into the scripting area and click it to see your micro:bit light up!

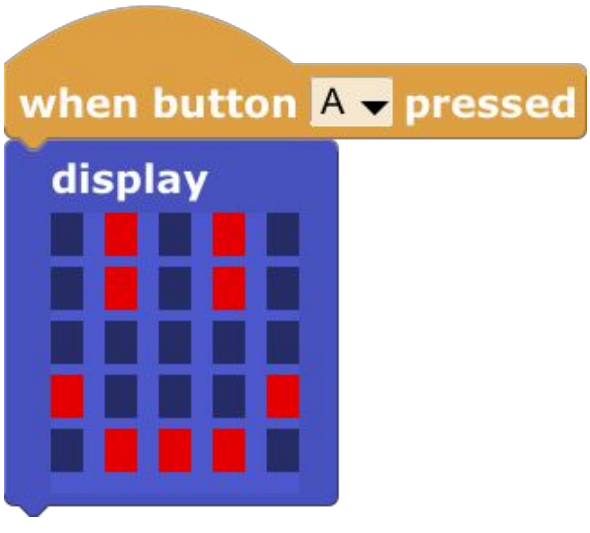


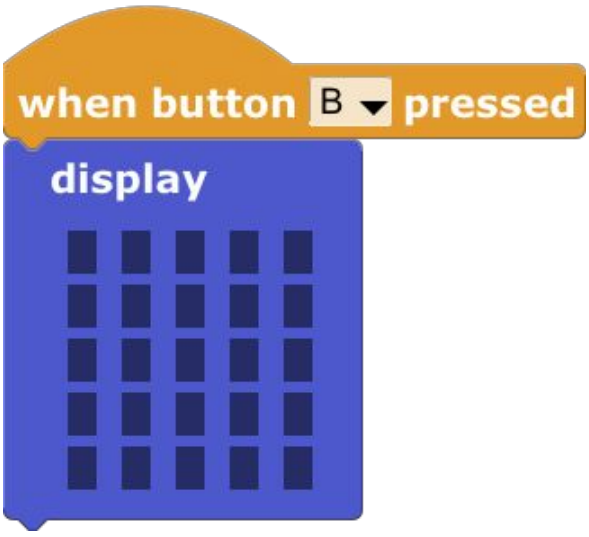
Buttons & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

Go to the Control blocks and drag these two blocks into the scripting area.

Try out these scripts to make the buttons on the BBC micro:bit turn the LED display on and off!



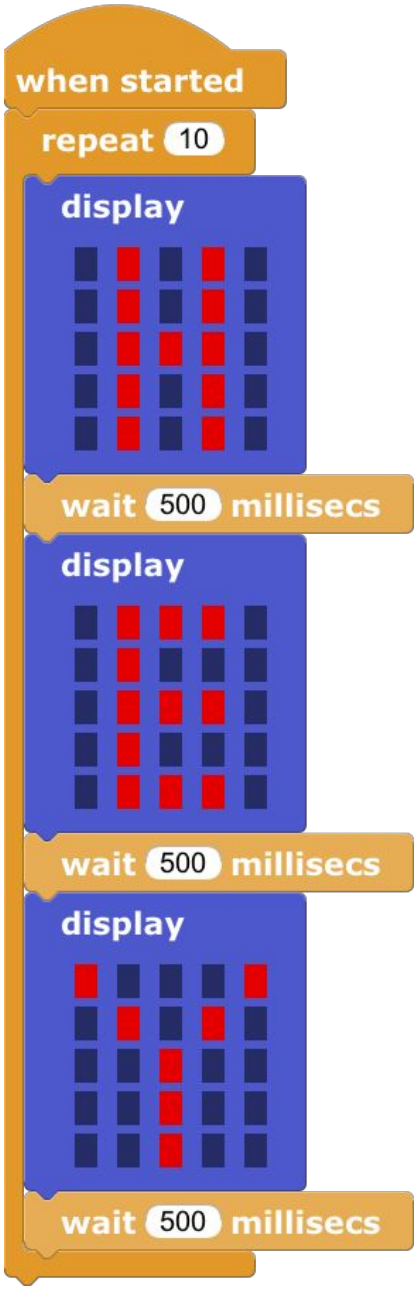


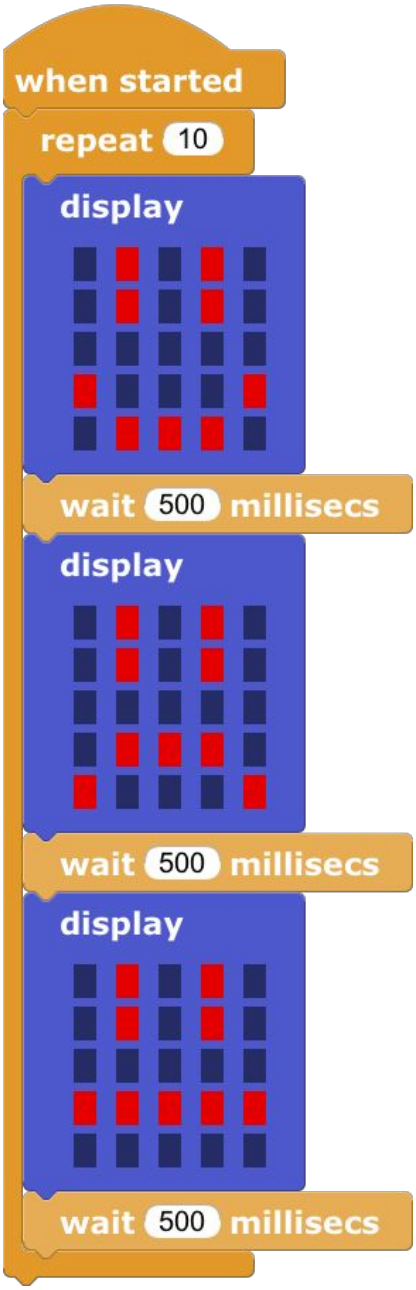
You can edit the LED display by clicking directly on the boxes in the display block. Customize it to make your own images! Hint: click on a box and move while holding down the mouse button to change multiple boxes at once.

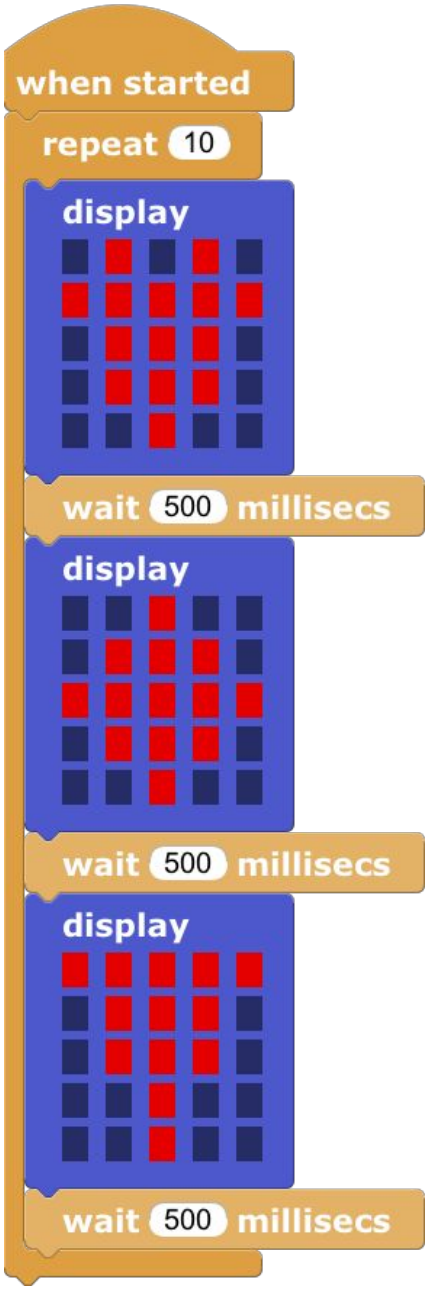
Animations & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

Create animations of letters, numbers, shapes, and symbols using the display, wait, and repeat blocks! Can you make your name?



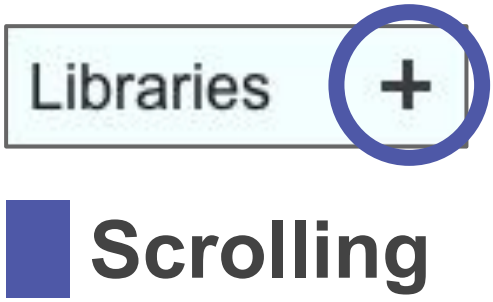


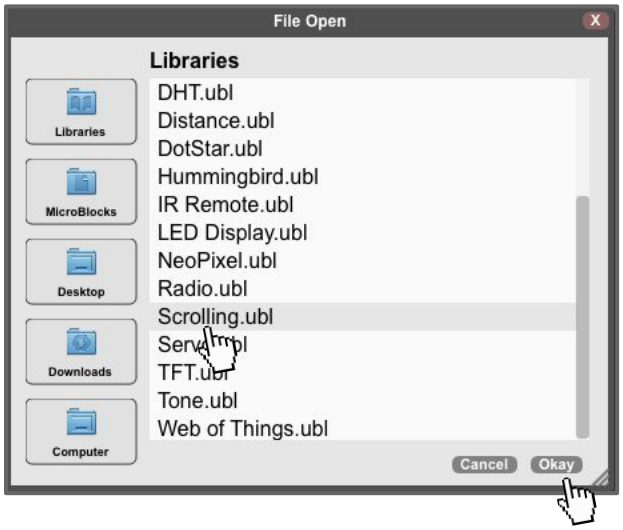


Scrolling Text & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

To create text that scrolls across the LED display of the micro:bit, you will need to add a library. Click on the plus next to libraries and select scrolling.





Drag the *scroll text* block into the scripting area.
Click the text to customize it!

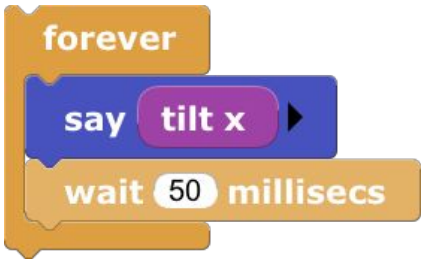
You can also scroll numbers across the micro:bit LED display.
Try out this script to create a countdown!

Sensors & the BBC micro:bit

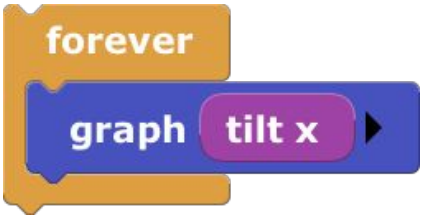
Connect the BBC micro:bit to MicroBlocks.

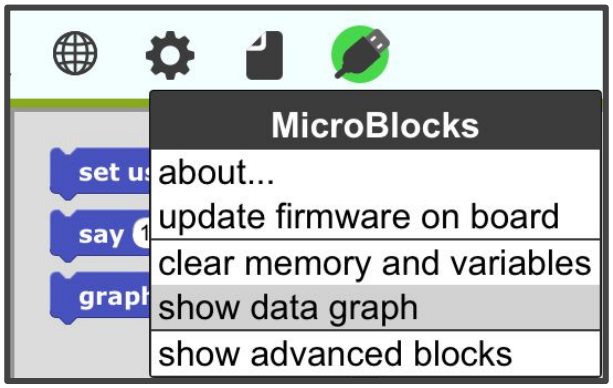
The BBC micro:bit has a few sensors built right in! They include tilt, temperature, and light sensors.

Using this script, you can show the output of a sensor. Click directly on the *tilt x* block to see what number the tilt sensor is reporting.

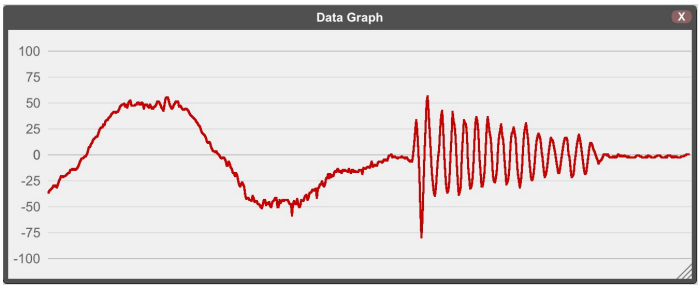


Graphing is another way to explore sensors. Click on the gear icon in the upper left corner and choose *show data graph*.



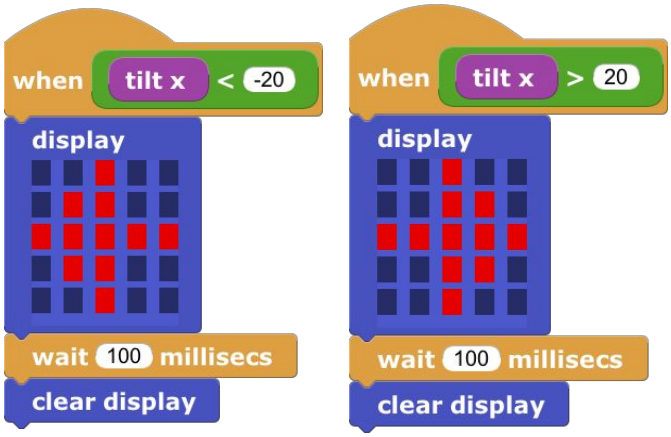


As you tilt the micro:bit, you should see the line change. Try shaking it gently to see something like this!

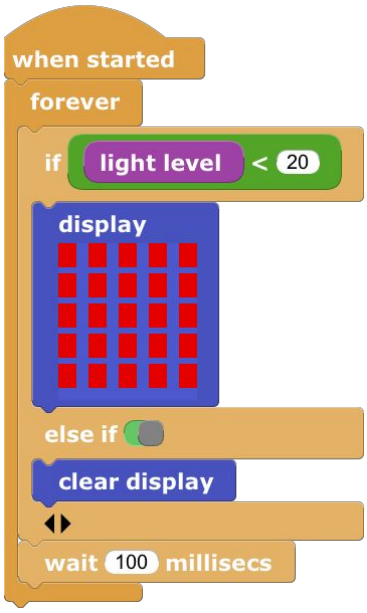


Sensors & the BBC micro:bit

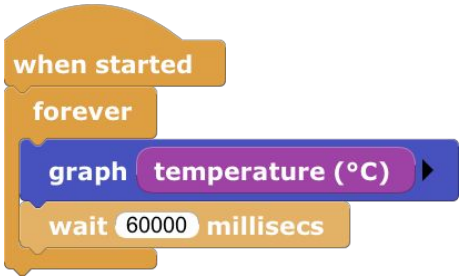
Try out the scripts here to change the LED display when the micro:bit is tilted.

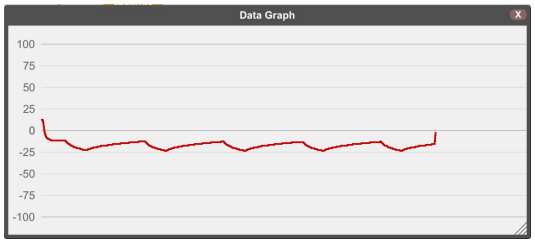


The micro:bit also has a light sensor. The script to the right makes the LED display turn on when it gets dark. Try turning on and off the lights in the room to see how the micro:bit responds!



The micro:bit also has a built in temperature sensor. This graph shows the temperature every minute over the course of many hours. The data was collected with the micro:bit in the freezer and the USB cable leading out to the laptop. Why do you think the temperature goes up and down?





Sensors & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

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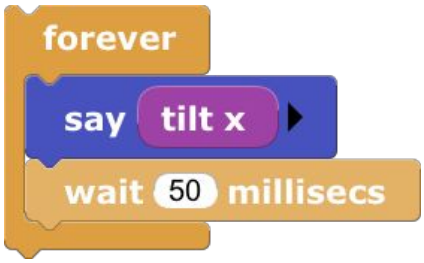

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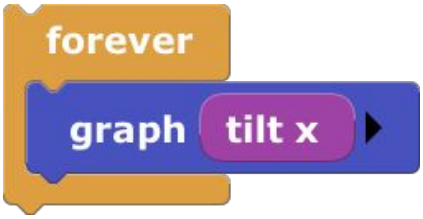

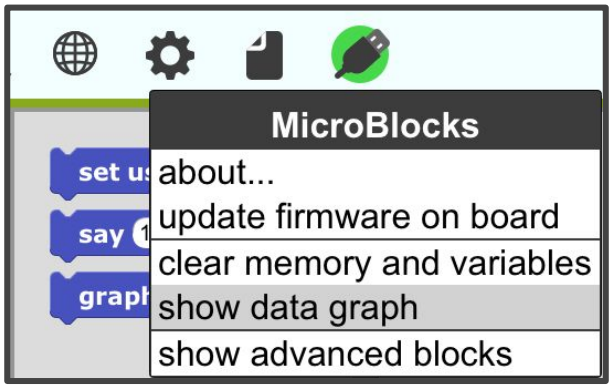

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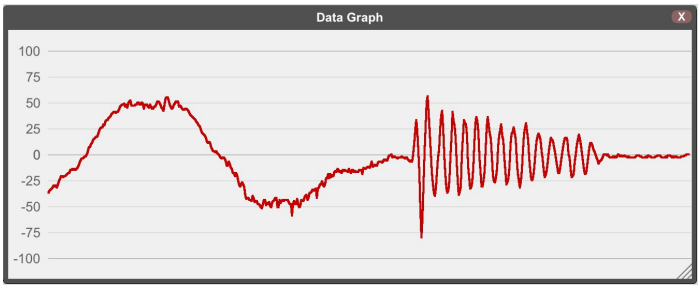
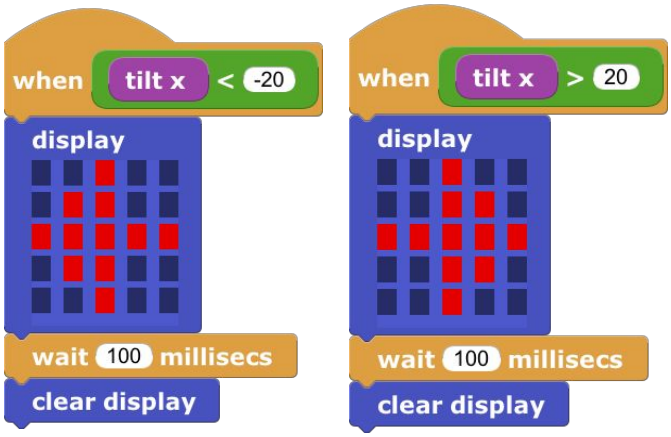


Sensors & the BBC micro:bit

Try out the scripts here to change the LED display when the micro:bit is tilted.



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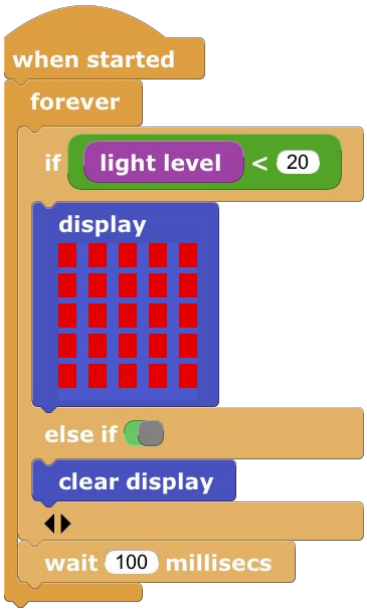

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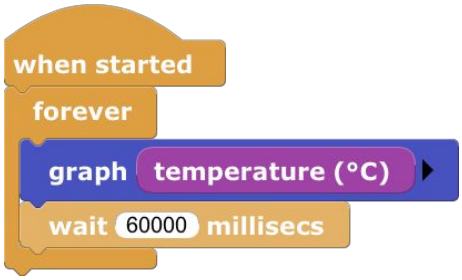
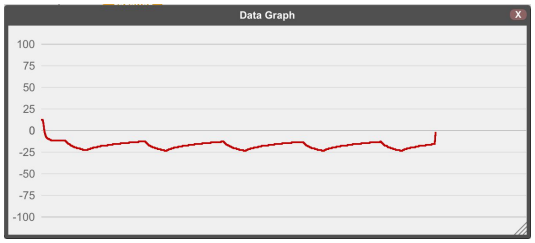
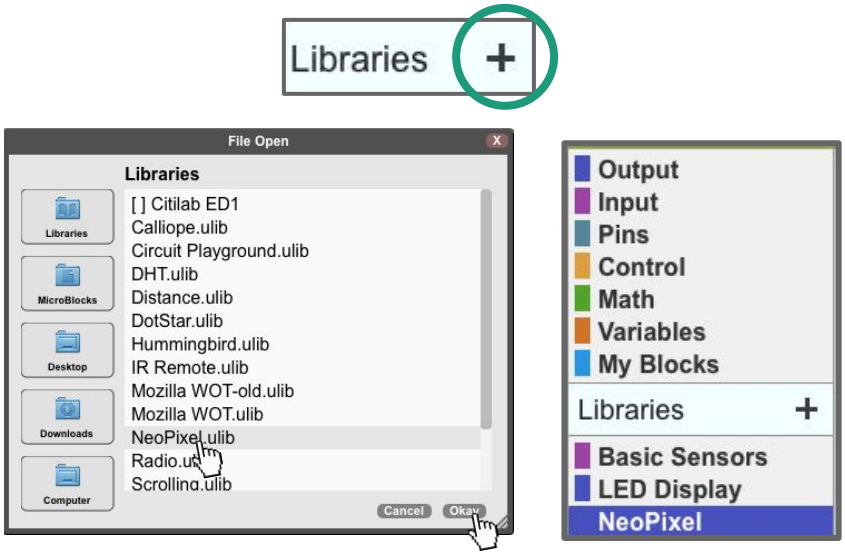




NeoPixels & the BBC micro:bit

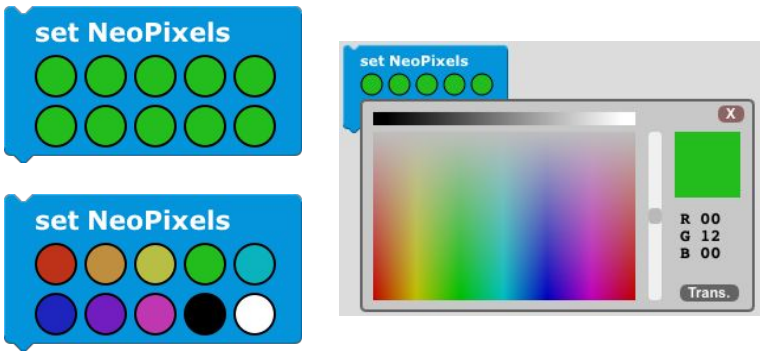
Connect the BBC micro:bit to MicroBlocks.

To get started using NeoPixels, import the NeoPixel library.

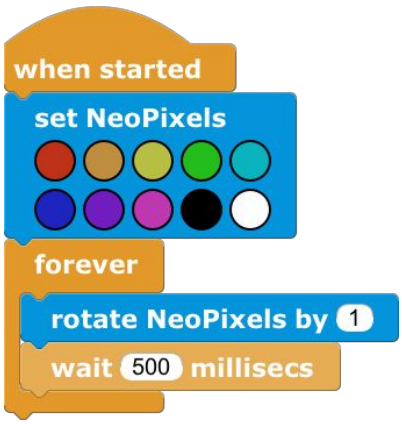


Next, drag the *attach NeoPixel* block to the scripting area. Input the number of NeoPixels you are working with and the pin they are attached to on your micro:bit.

Drag the *set NeoPixels* block to the scripting area and click on it. Your NeoPixels should light up! Change the NeoPixels by selecting the green circles and customizing the colors.



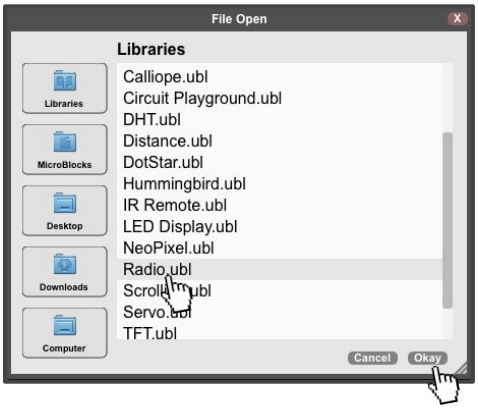
To make it look like the rainbow is moving, rotate each NeoPixel by one when the program is started.

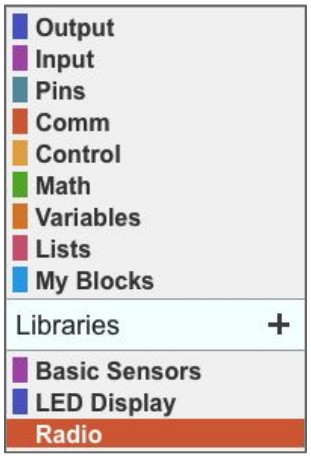


Radio Blocks & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

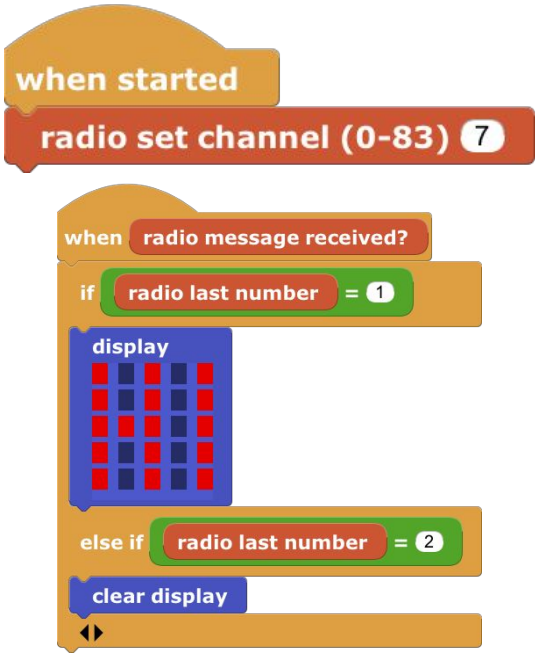
Radio blocks are a great way to control your micro:bit remotely. You will need two micro:bits: one to be the sender and the other to be the receiver.
Follow the steps below to get your micro:bits communicating with each other!



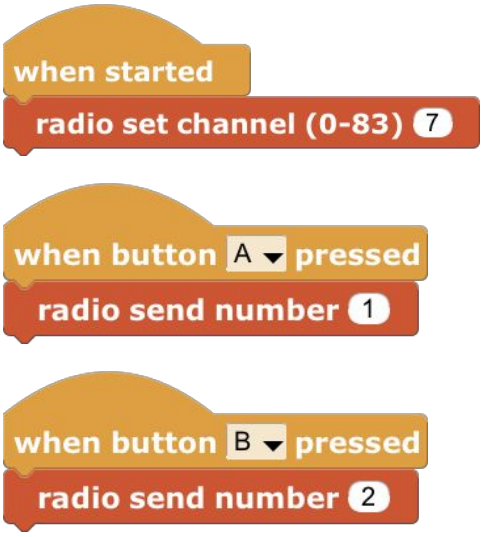


Receiver Code

After you write this script, disconnect this micro:bit and attach it to a battery.



Sender Code



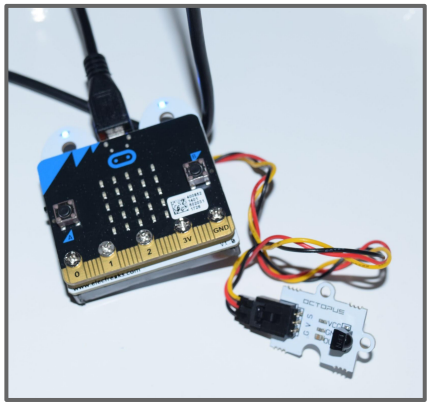
Note: If people near you are also using radio blocks, use different channels to avoid confusion!

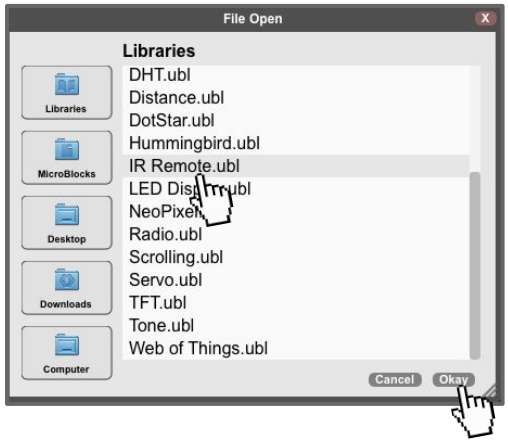
Remotes & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

For this activity, you will need to connect an IR sensor to the micro:bit. Depending on the sensor, you may do this using alligator clips or an extension board. In this example, we are using the ring:bit to connect an external IR sensor.

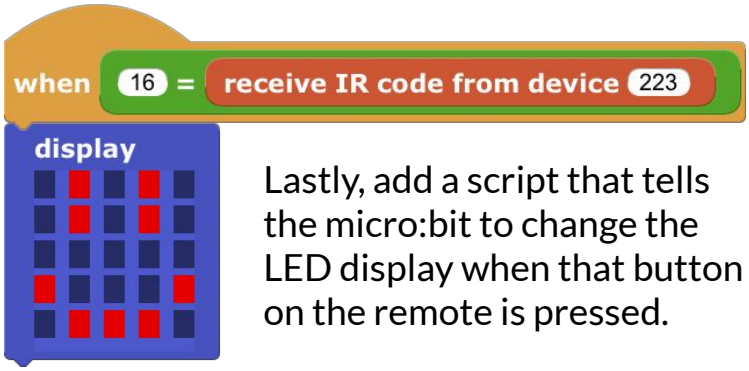
Next, import the **IR Remote** library.





Drag the *test IR* block into the scripting area and click on it. You will see a green glow around the block. Point the remote towards your sensor and press a button. Every button you press will pop up with a new code.

Attach the IR receiver to a pin using this script.



If you connect a speaker to pin 0, you will "hear" the IR signal:

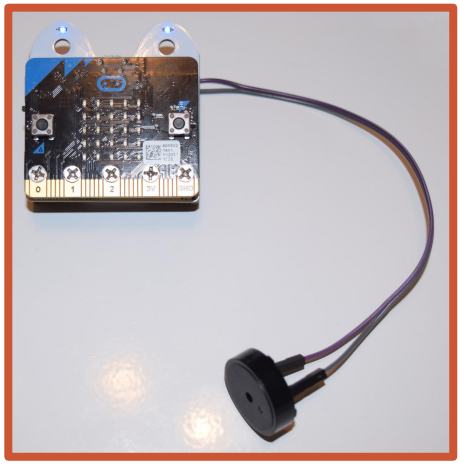
Lastly, add a script that tells the micro:bit to change the LED display when that button on the remote is pressed.

Hint: remember to click GO so you see a green glow around your script. That's how you know your script is running!

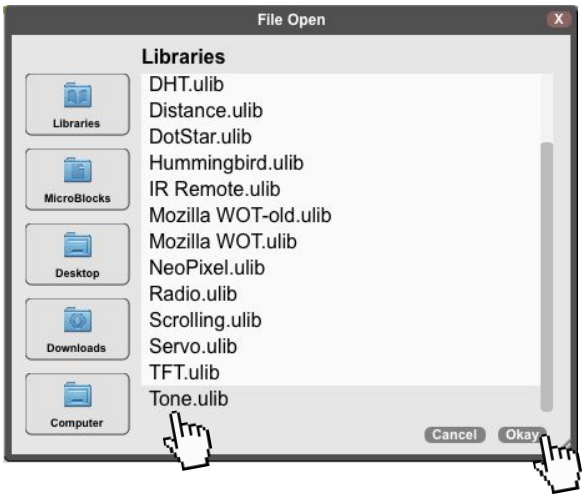
Sound & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

Connect a sound device to the BBC micro:bit using alligator clips or an extension board. In this example, we are using a piezo speaker connected to a ring:bit extension board.

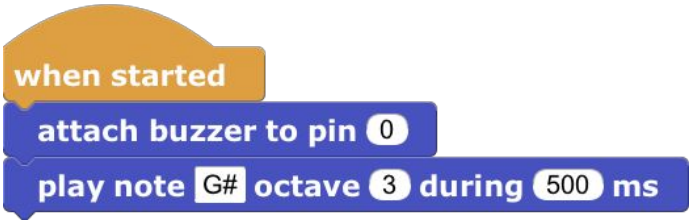


Next, import the **Tone** library.

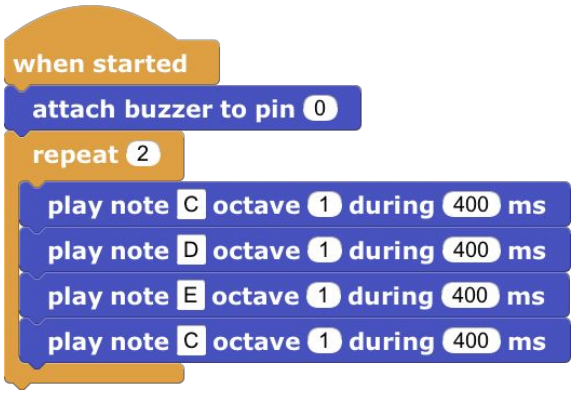


To play a tone, start by dragging an *attach buzzer* block to the scripting area and change the number to the pin that is attached to your speaker. In this case, the piezo is attached to pin 0.

Add a *play note* block and select the note, octave, and duration. Play around with these to make different tones!



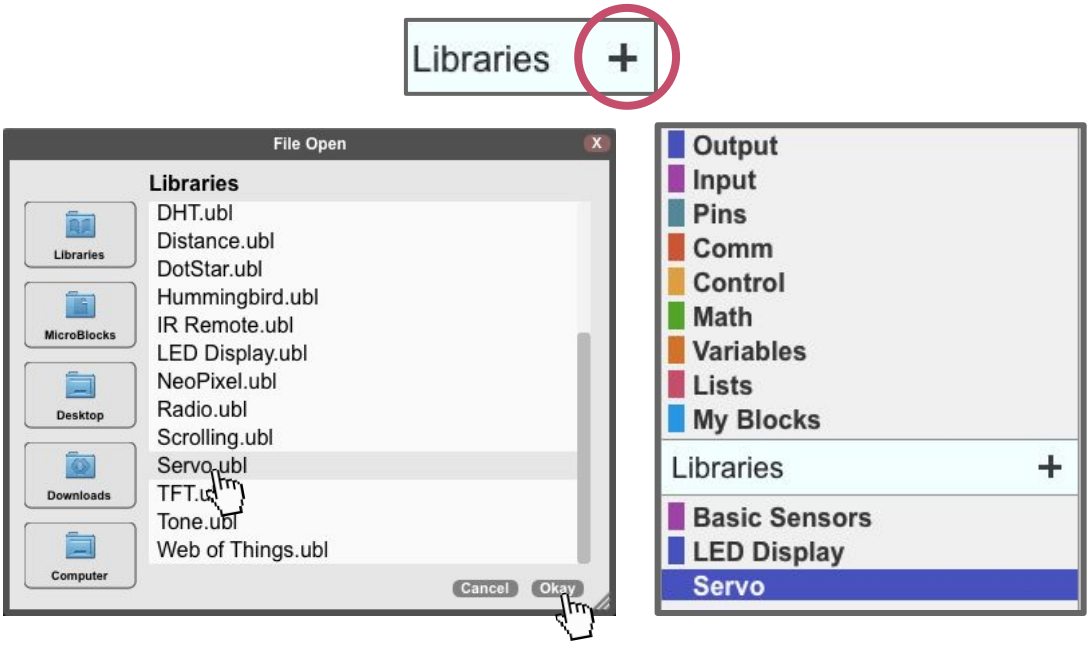
Snap different *play note* blocks together to make music! Can you finish this song?



Servos & the BBC micro:bit

Connect the BBC micro:bit to MicroBlocks.

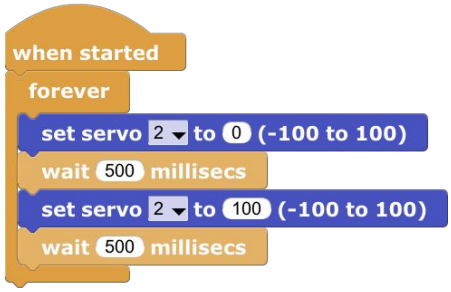
Servos are small motors that can bring a project to life. Connect a servo to your micro:bit using alligator clips or an extension board. Next, import the **Servo** library.



Drag an *attach servos* block into the scripting area and specify which pins your servos are attached to (e.g. pins 1 and 2). You can have up to four servos numbered 1 to 4.

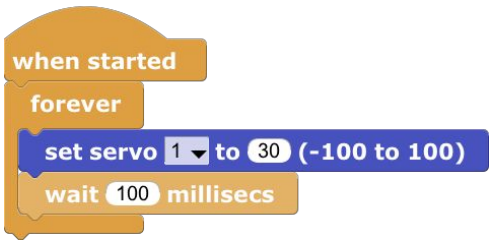
Position Servos

Position servos move to a specific angle and stay there. You control what angle they move to. Try this code to see your position servo move!



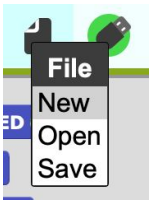
Continuous Servos

Continuous servos spin continuously like a motor. You can control their speed and direction. Try this code to make your servo spin. What happens if you increase or decrease from 30? How about -30?



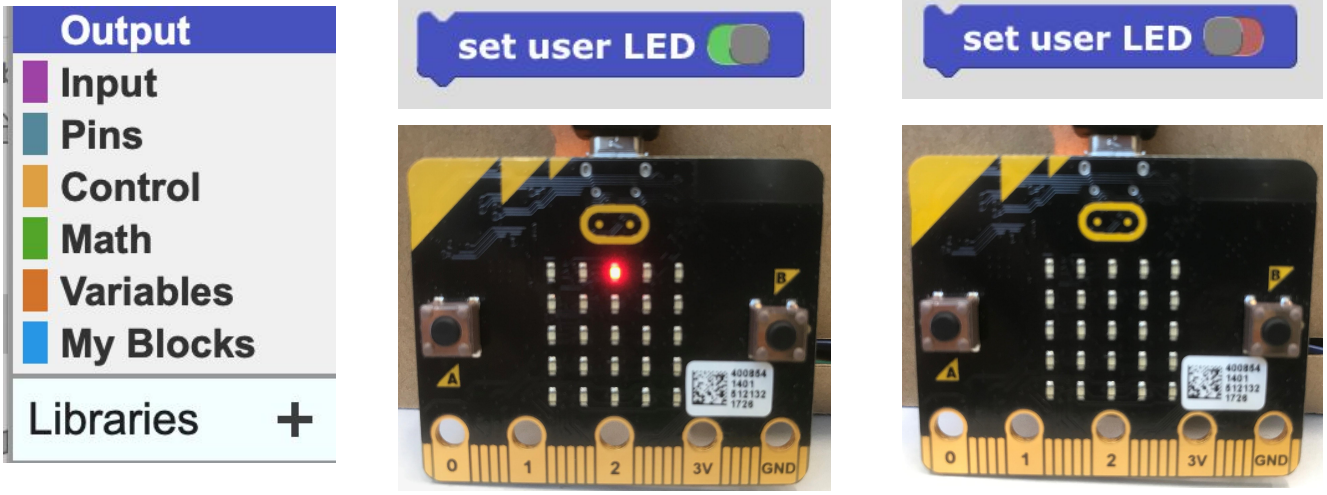
Hello LED - basic

Connect the BBC micro:bit to MicroBlocks.
(Make sure the icon turns green.)

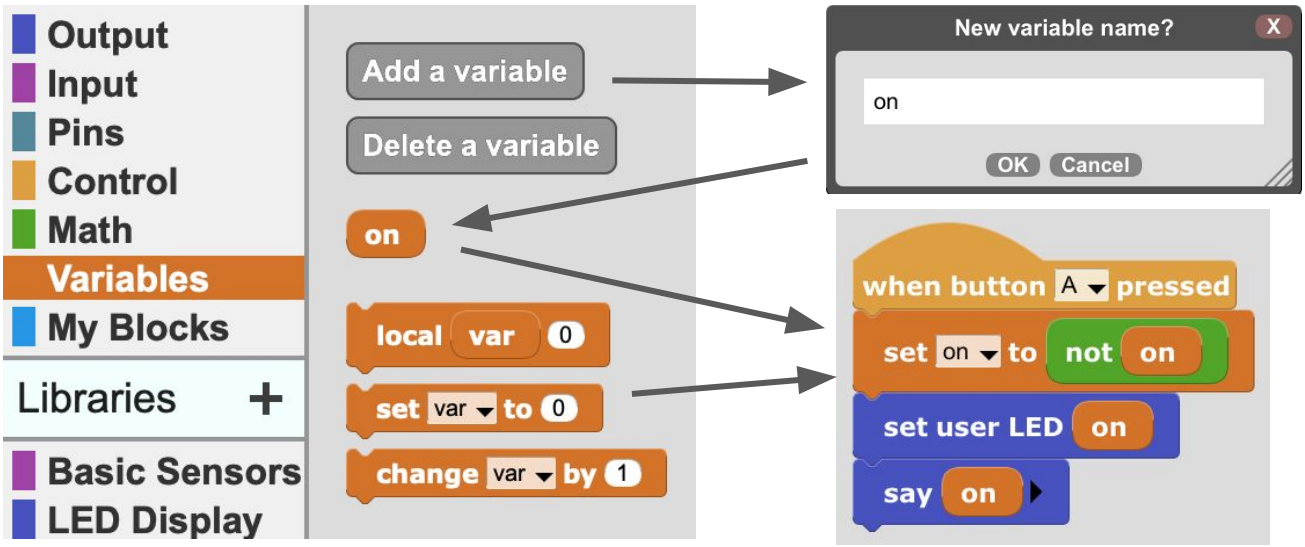


Select “New” to start with a clean screen.

Click set user LED with the switch state on and off.



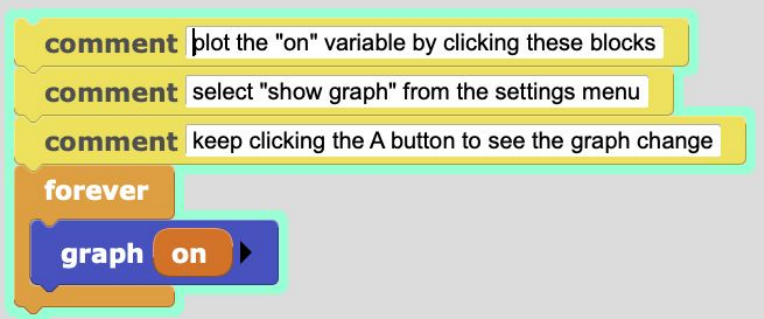
Create an on variable to control the LED state, and trigger the state change with a button press.



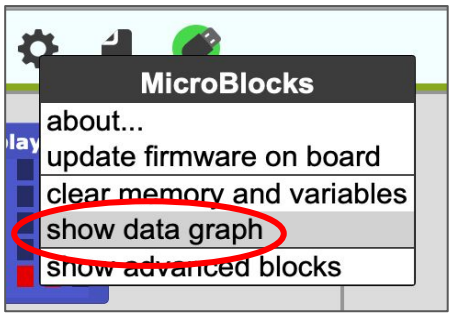
Hello LED - graphing data

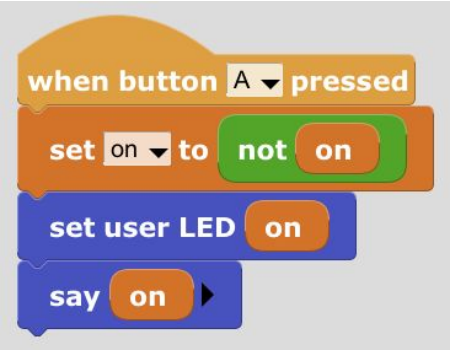
Example “HelloLED-graph.ubp”.

Log the on variable so that you can graph its state.

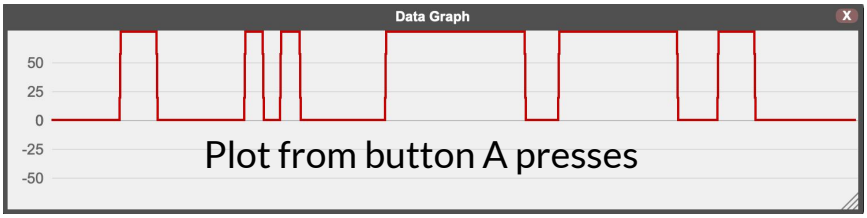


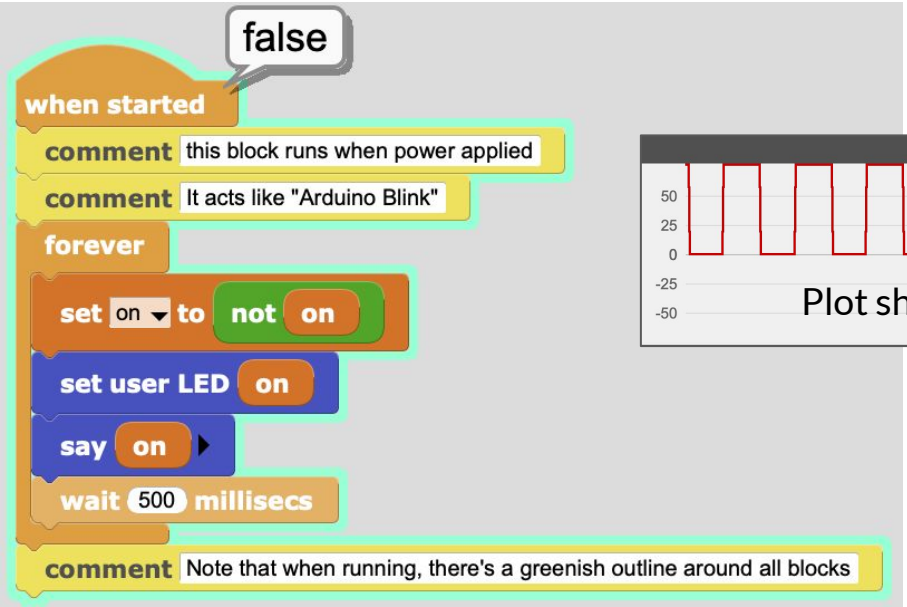
Select “show graph data” from the MicroBlocks “gear” menu.



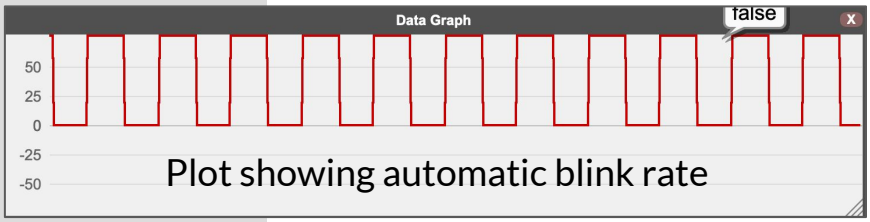


Press button A to see the LED/graph toggle.





Click ▶ to see the LED blink.



What happens if you change the wait time?

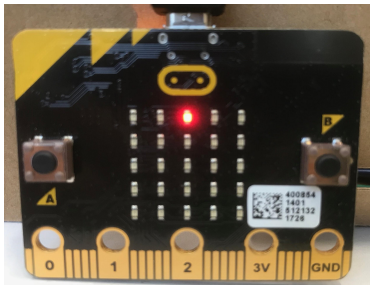
Hello LED - radio broadcasting to all

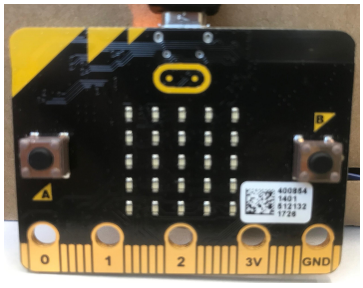
Example “HelloLED-radio.ubp”.
Run same program on 2 or more micro:bit boards.

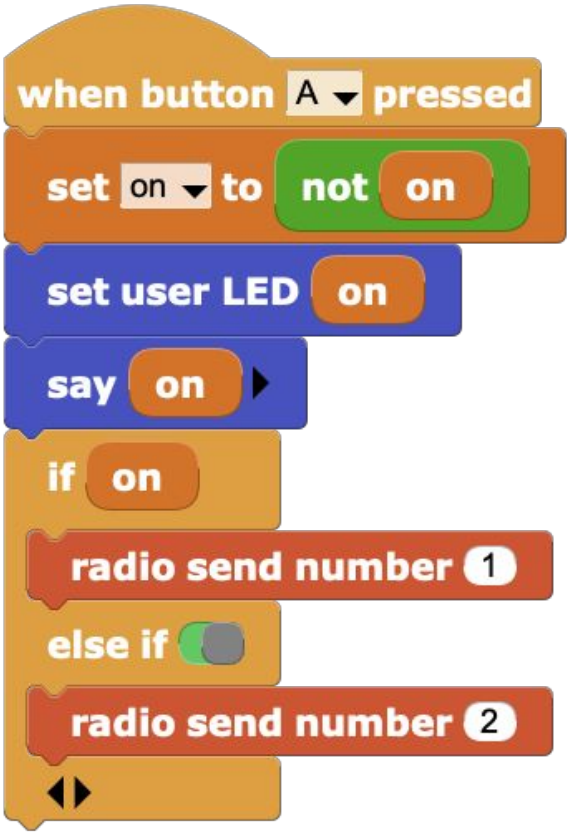
Set the LED state on your own board, and broadcast the change to everyone else as well!

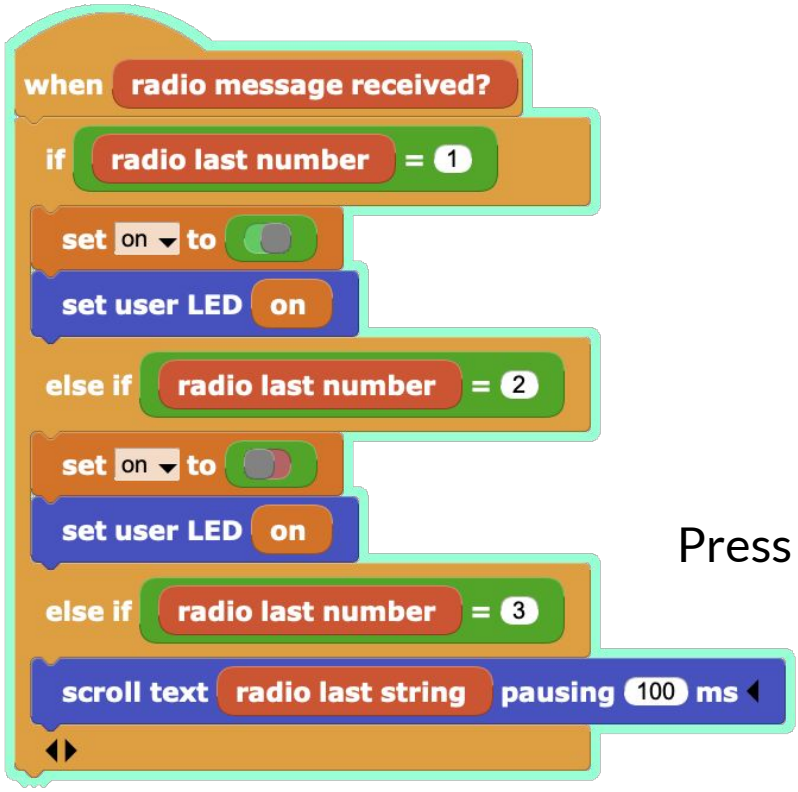
Radio “1” = LED on
Radio “2” = LED off
Radio “3” = “text” your name

Press button A to see the user LED toggle.

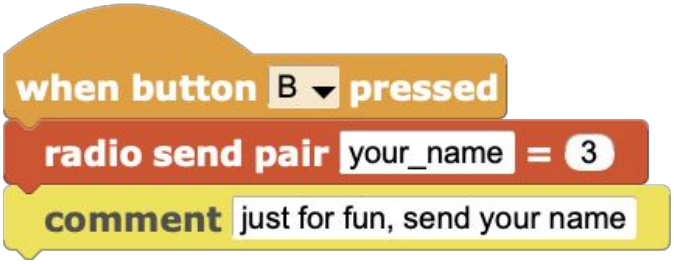






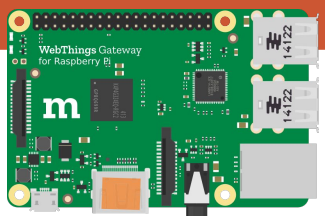


Press button B to broadcast your name.



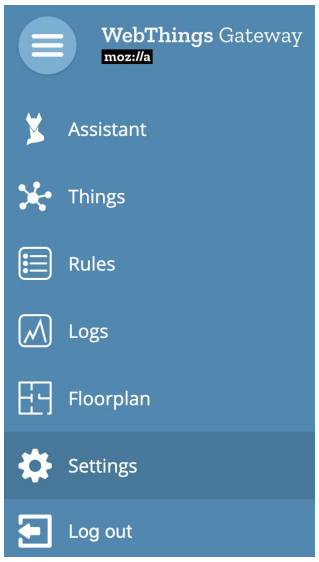
Share and receive messages with other micro:bit boards.

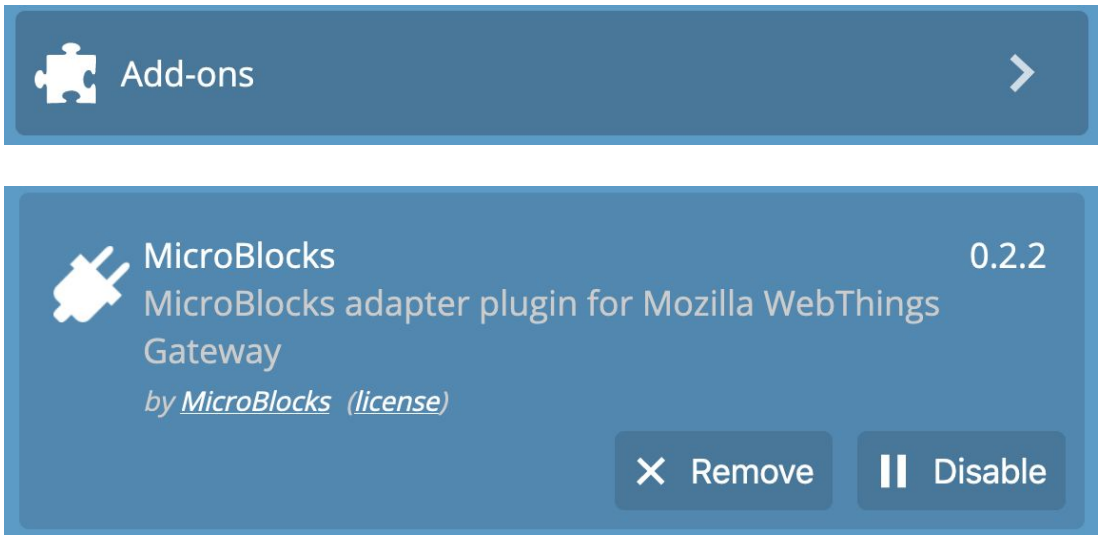
Mozilla WebThings Gateway



First set up a **Mozilla WebThings Gateway**
https://iot.mozilla.org/gateway

For boards connected to the gateway over USB, you must also install the **MicroBlocks Add-on**. Under **Settings** > **Add-ons**, if the MicroBlocks Add-on is not installed, click "+" to browse and add it.

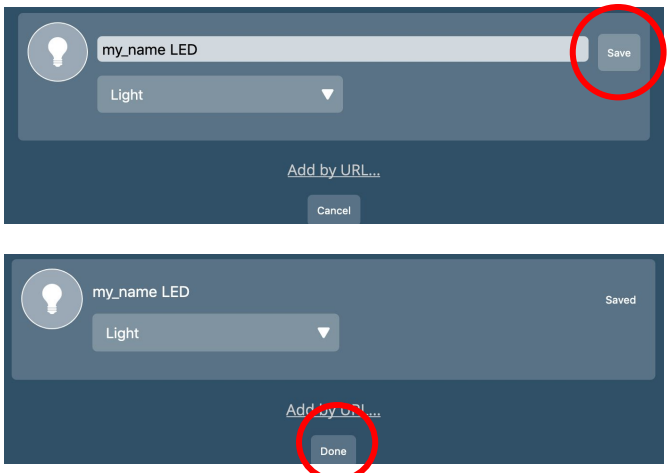




Connect the micro:bit over USB then click "+" from the "Things" page to discover and add the micro:bit as a "web thing".

Click "+"

Discovery scan (Click "Save", "Done")



New Thing added!

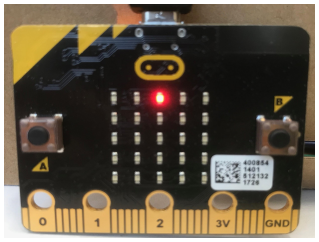
(Tip: in MicroBlocks, change the thing "Hello LED" to **your name** to more easily identify your board.)

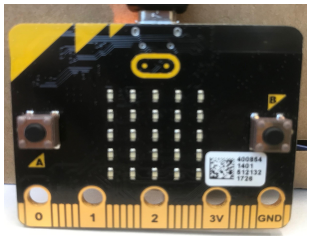
http://microblocks.fun

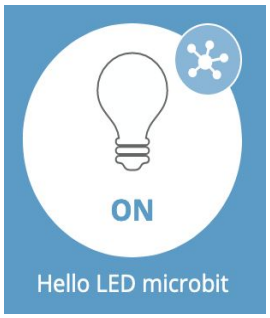
HelloLED - webthing

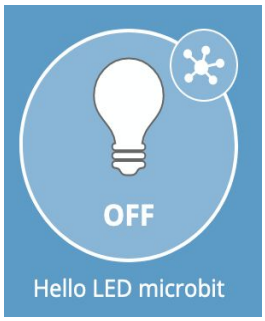
Example “HelloLED-webthing.ubp”.
After running the example, connect the micro:bit board to the WebThings Gateway via USB.

Press button A to toggle the user LED.

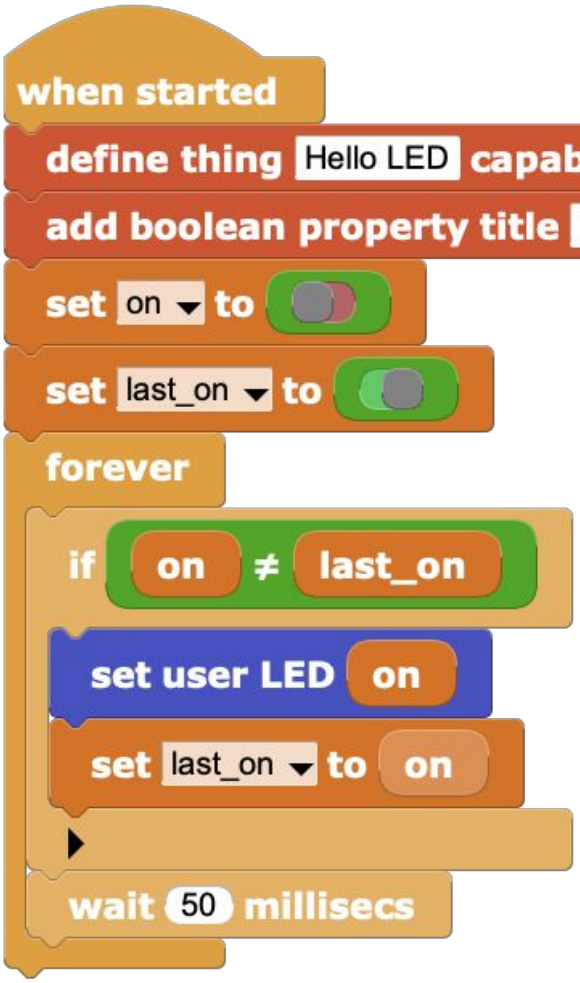


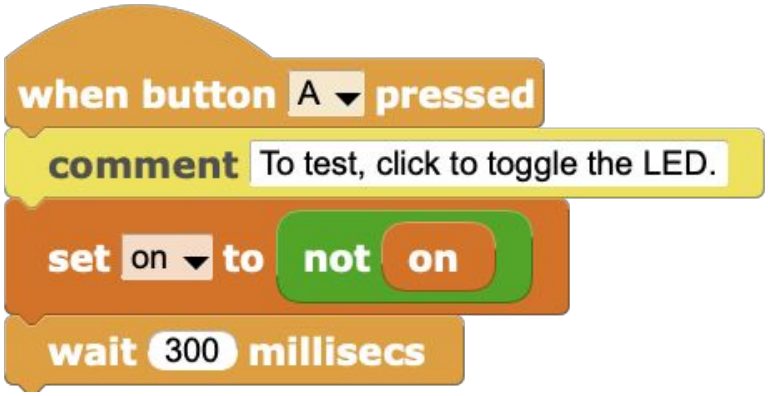






Or press the web page icon to toggle the LED.

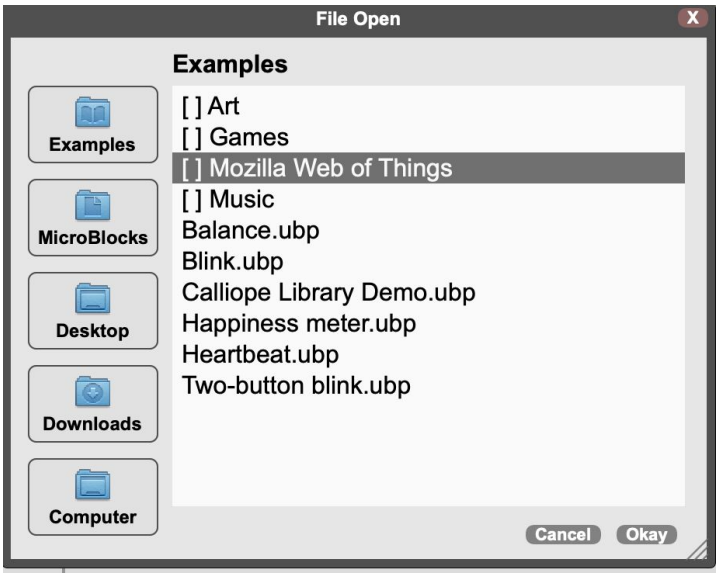


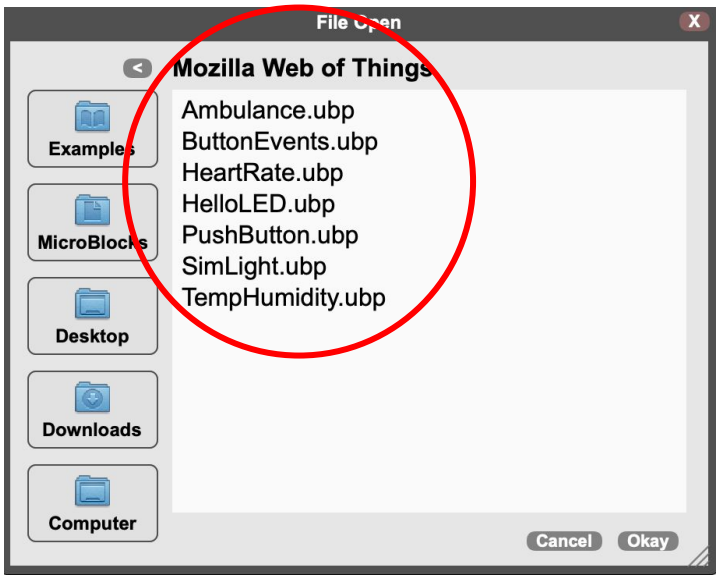


More about web things

See other examples under “Mozilla Web of Things”. After loading an example, connect the board to the WebThings Gateway via USB or Wi-Fi.

Find and open other “web thing” examples.





Turn any regular MicroBlocks program into a web thing, by minimally adding a “define thing” block, and at least one “property” or “event”.

Attach data to variables assigned to properties, or broadcast strings and assign them to events.