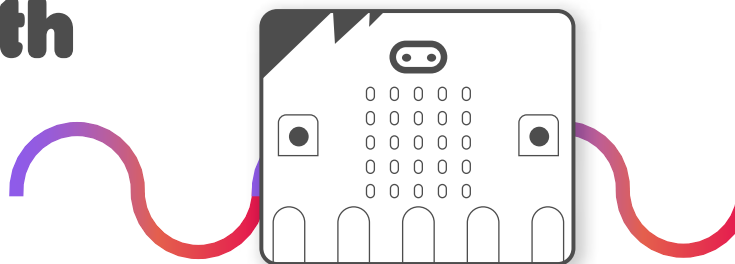


# Getting started with micro:bit



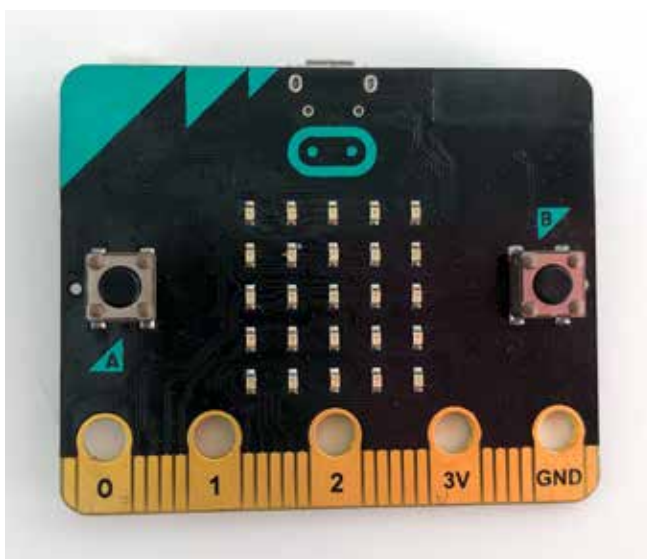
In this activity participants will learn how to use the micro:bit, a mini computer or “microcontroller” that can be easily programmed online. Participants will be able to create simple programs using a variety of inputs and outputs after completing this lesson.

## Material List:

- Computers with internet access
- Micro:bits and USB cables

## Facilitator Preparation:

Before the activity, facilitators should go introduce participants to the physical components of the micro:bit and make sure participants understand the functions and locations of parts of the micro:bit such as the LED array, buttons, pins, and accelerometer. Visit <https://microbit.org/guide/features/> for more in depth information about the micro:bit's features.



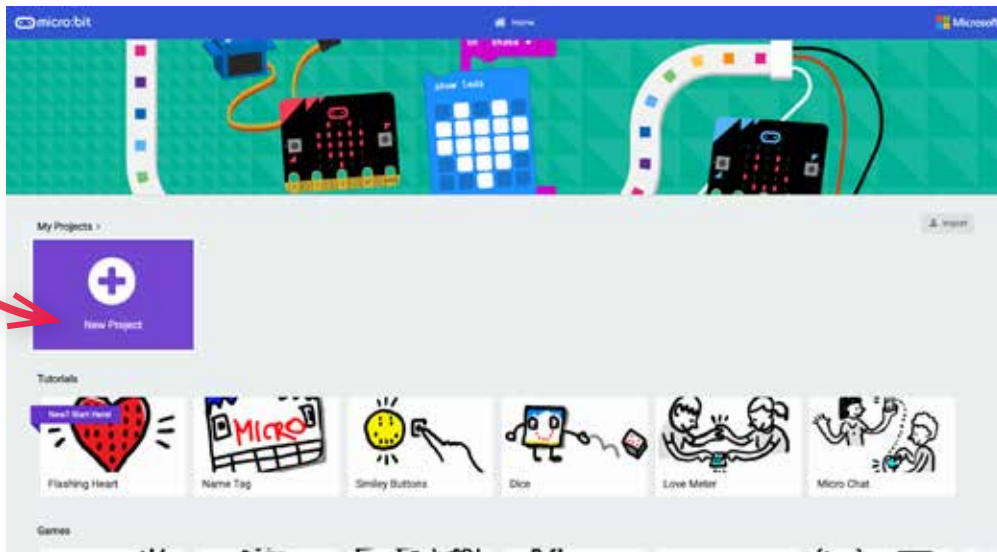
Front of micro:bit



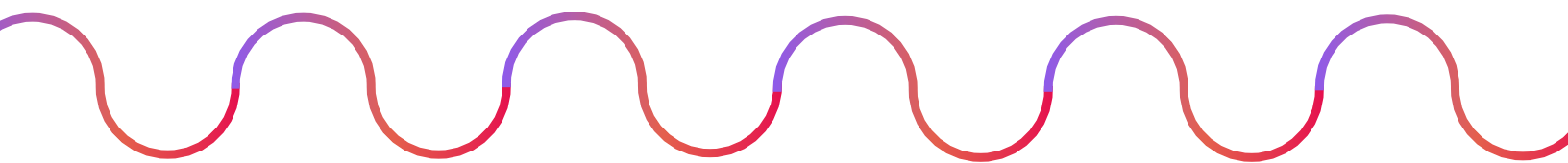
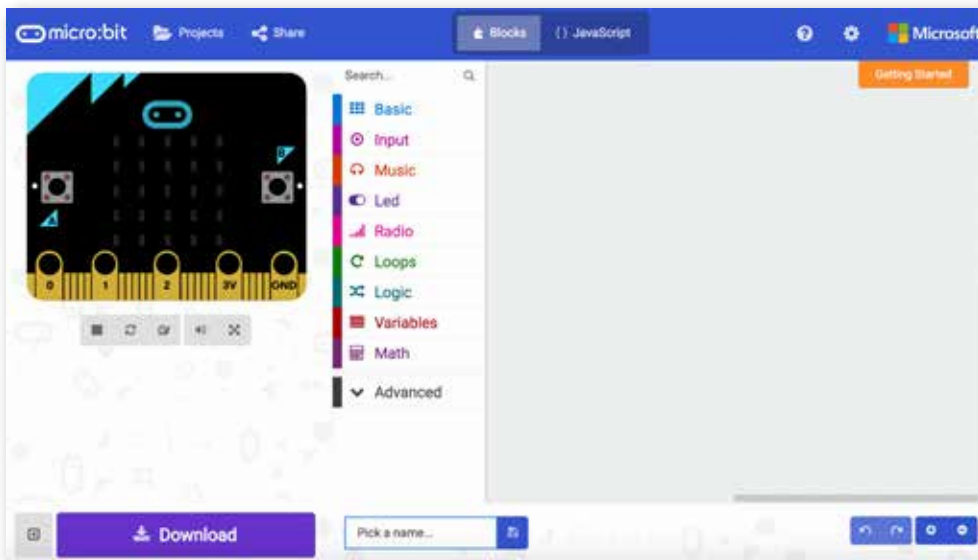
Back of micro:bit



Navigate to [makecode.microbit.org](https://makecode.microbit.org) and click on the purple box that says "New Project"



Your screen should now look like the screen below:



# 2

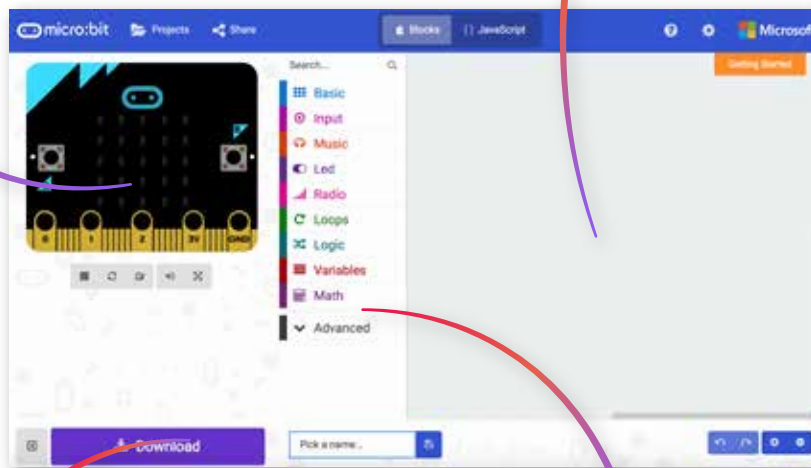
Explore the elements of the MakeCode environment. Consider printing off an image of the MakeCode environment and labeling the function of the different parts. Keep this image where the group can see it during this lesson.

### micro:bit Simulation

This interactive graphic show the effect that your program has on the micro:bit. The buttons below give more control over the simulation.

### Canvas or Editor

This is the area where programming takes place. Blocks are dragged out onto this screen from the toolbox to create programs if using the blocks mode. If using javascript mode, this is the area where code can be typed.



### Download Button

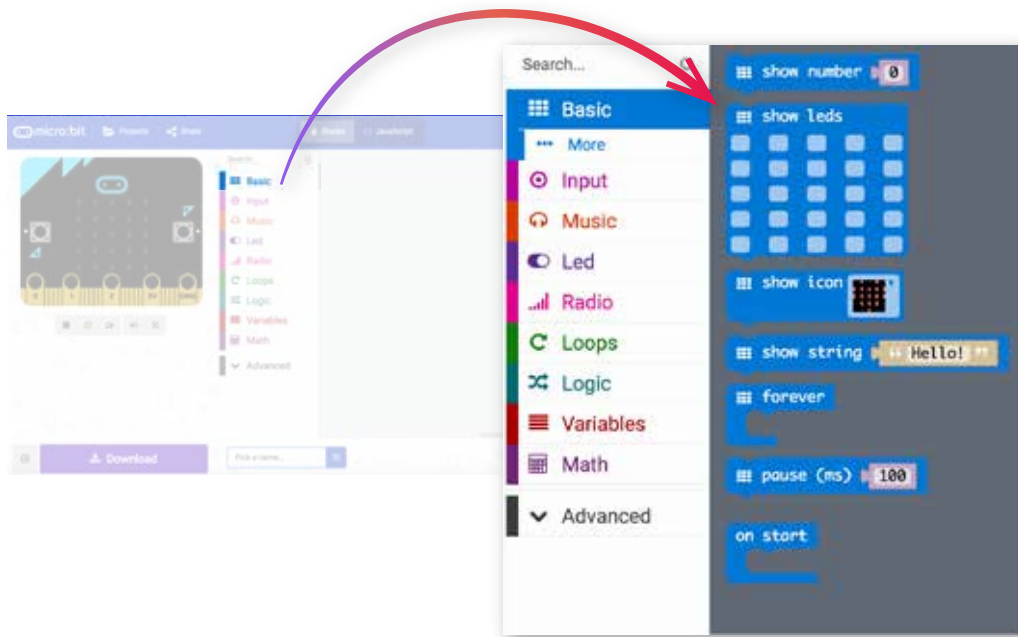
When programs are complete, they can be added to a usb connected micro:bit by pressing the download button.

### Toolbox

This is where all of the blocks used for programming can be found. Blocks are organized by types such as "input" or "logic".

# 3

Prompt participants to create a program that shows their name on the LED array of the micro:bit forever by using blocks found in the “basic” section.



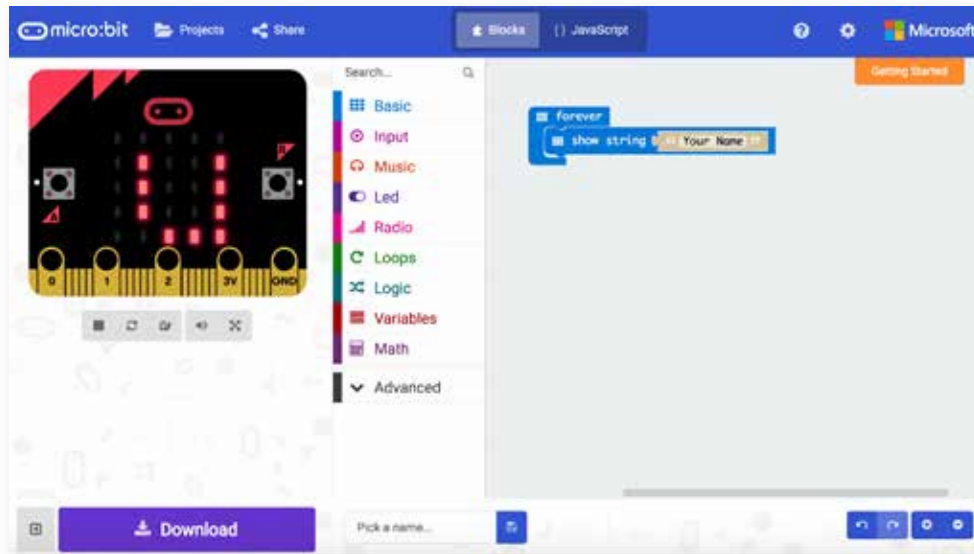
Explain to participants that the “show string” block is what we use to show text on the LED array of the micro:bit and that the text we want to show is called a string. Prompt participants to drag the “show string” block onto the canvas. Ask why they think the block is faded on the screen and cannot be interacted with. Explain that we need something to tell the micro:bit to show the message. Prompt participants to drag out the “on start” block and to connect it to the “show string” block. *Watch the simulation, what happens? try the “forever” block, how does that change what happens on the screen?*



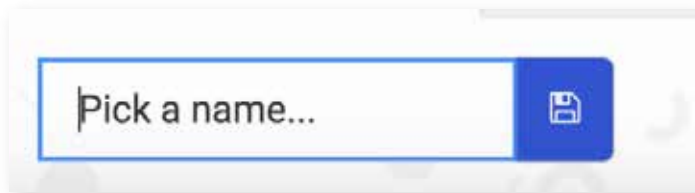
**Tip:** Holding the mouse over any of the blocks in the toolbox will cause a description to appear.

# 4

The final program should end up looking something like the image below.



Before saving the program to the micro:bit, give the program a name by typing a short, specific name into the field at the bottom of the screen.

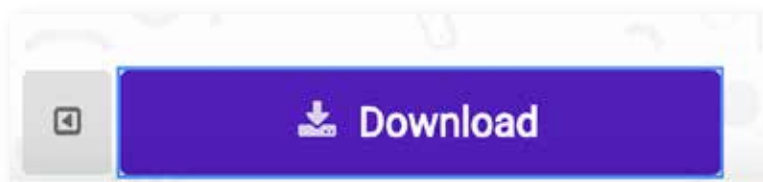


Before saving the program, make sure that your micro:bit is plugged into your computer.





When your micro:bit is plugged in, you're ready to save your code to the micro:bit. Click the download button at the bottom of your MakeCode window.



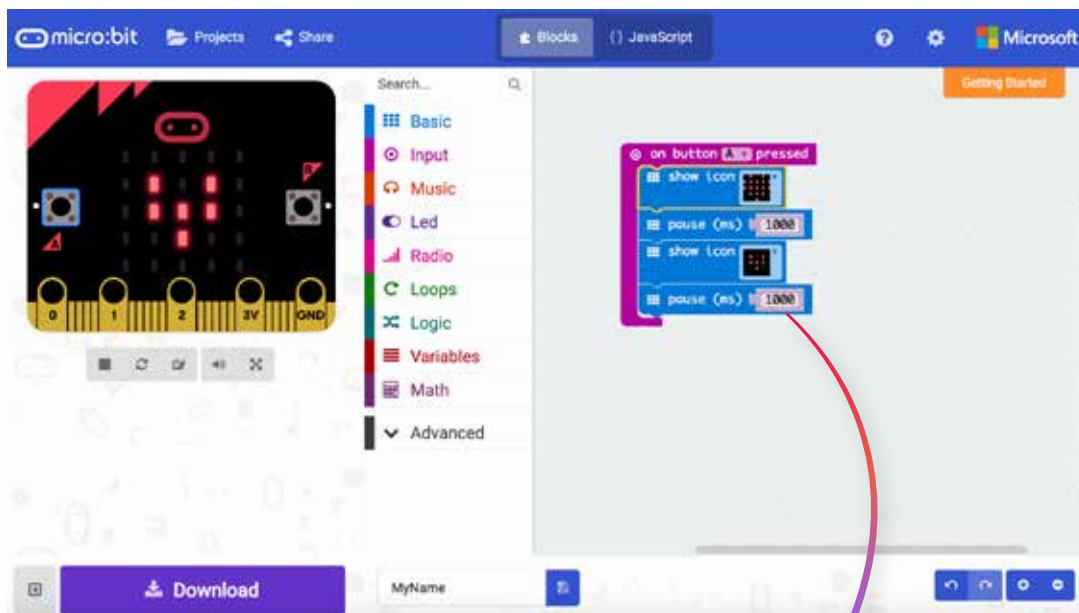
Download the file directly to your micro:bit or drag and drop the downloaded file onto the micro:bit. See <https://microbit.org/guide/quick/> for more information about how to upload files to the micro:bit for different devices and operating systems.

5

Prompt participants to try using a different input to control their programs that show their names. Select the input menu from the toolbox and experiment with replacing the “forever” block with one of the “input” blocks. Have participants download the program to the micro:bit and test their new programs.



Next, ask participants to create an animation controlled by one of the pink “input” blocks. Instead of using the “show string” block, prompt them to use the “show leds” or “show icon” blocks. Ask participants to brainstorm what blocks they will need to create an animation. Facilitation questions might include “What happens if you create a program that shows two icons in a row? How does that program change when you place a “pause” block in between the two icons? (See example below).



**Tip:**

Remind participants that time is measured in milliseconds in the MakeCode environment. Ask them to identify how many milliseconds are in a second, half a second, and two seconds.

# 6

**Challenge:** Prompt participants to explore some of the other block types such as the “logic” blocks. Ask participants to create a program that uses one or more blocks that are not “basic” or “input” blocks.

See below for an example of a program that combines “loop” and “logic” blocks to create a program that shows a different animation depending on which way the micro:bit is tilted.

Remember that participants can preview or simulate their programs by interacting with the micro:bit simulation on screen.

