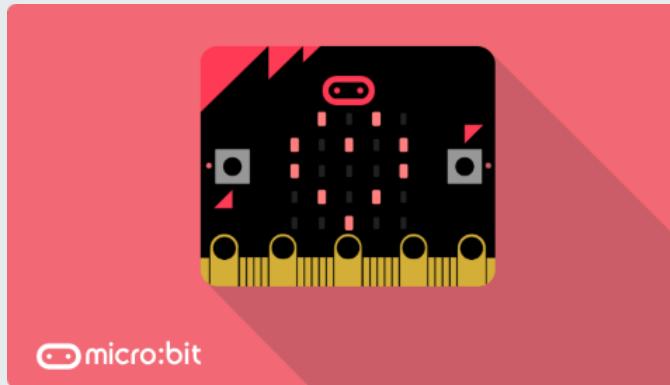




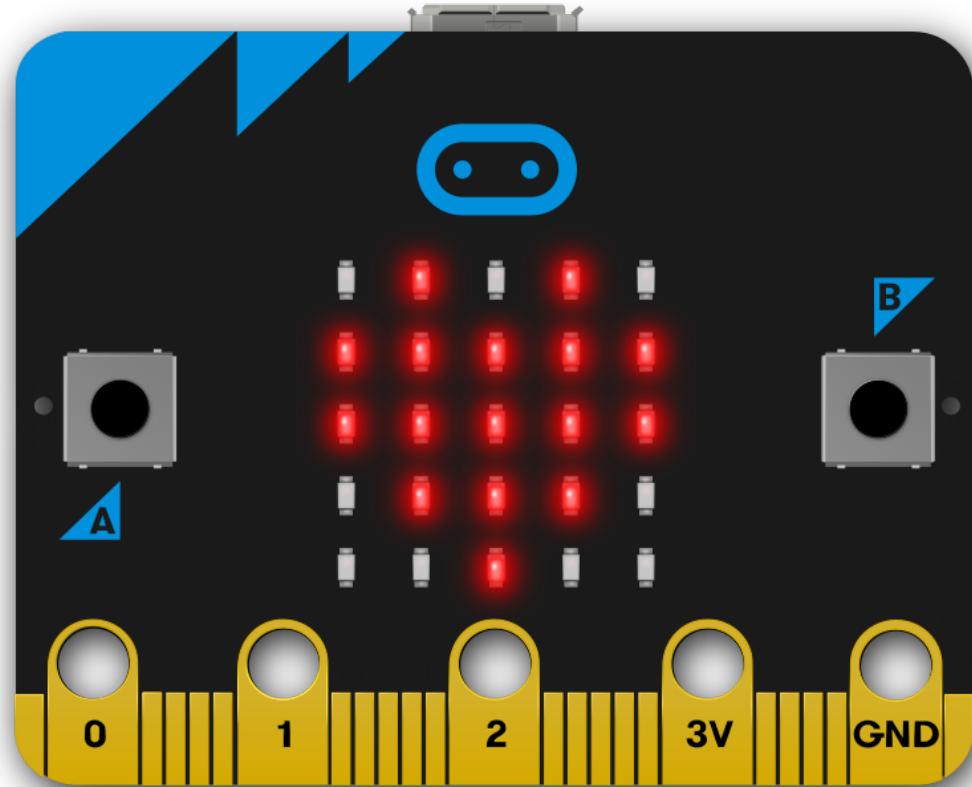
# Build a Friend Detector with BBC micro:bit

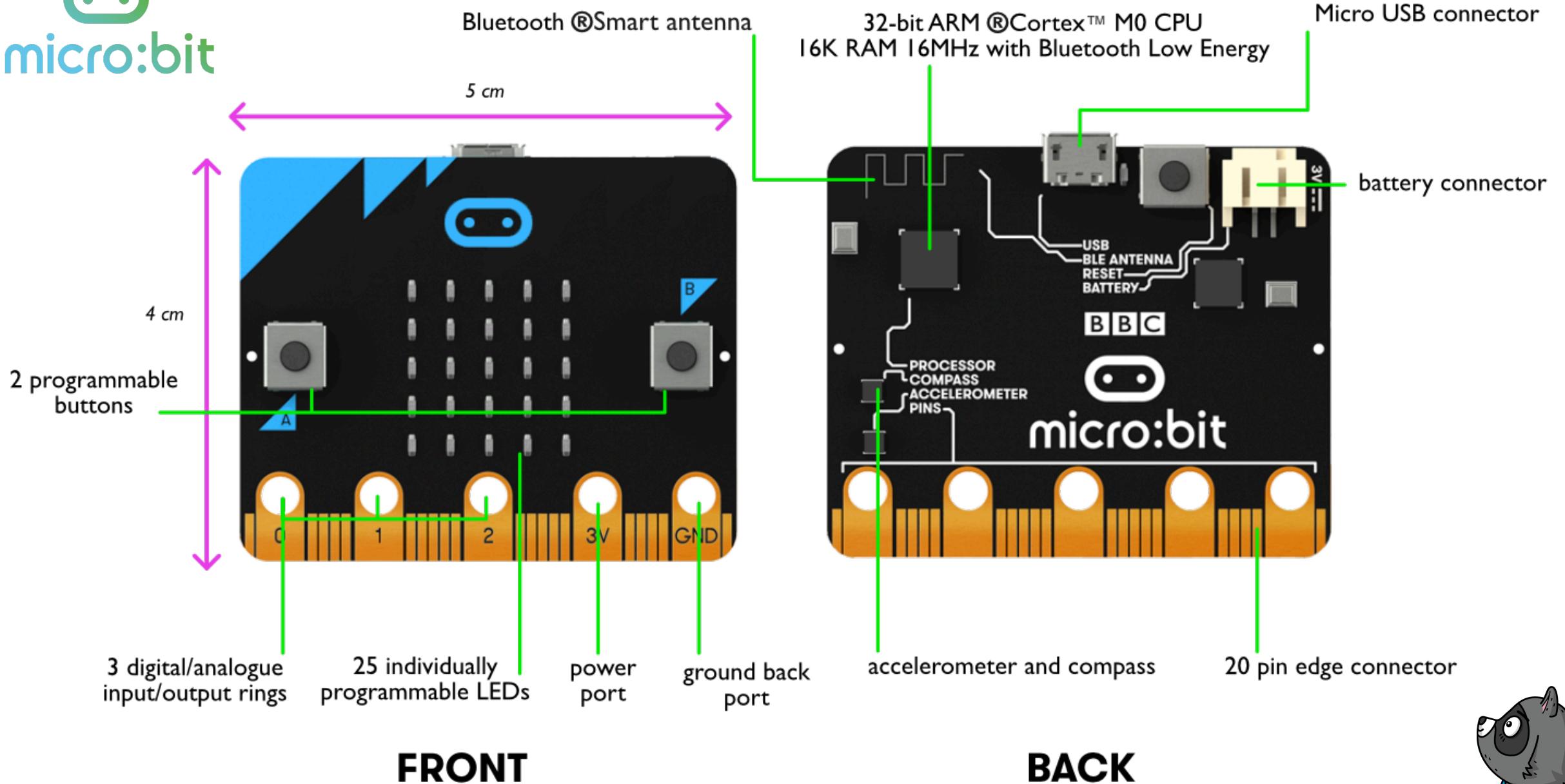


Jim Bennett  
@JimBobBennett  
[aka.ms/FriendDetector](http://aka.ms/FriendDetector)

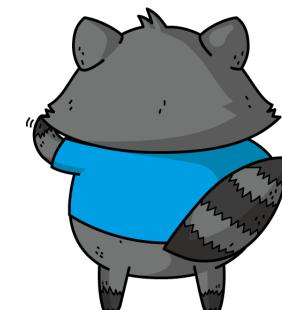


# The BBC micro:bit

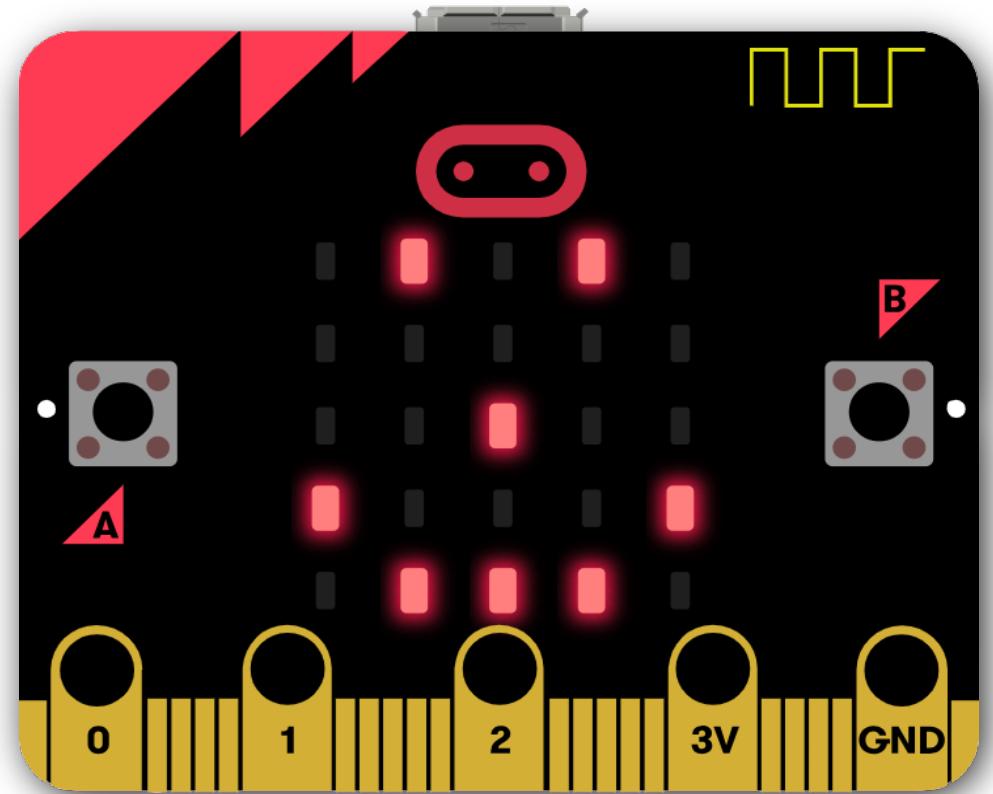




# The Friend Detector



# The radio



# The algorithm

When the secret code is detected, set a counter to 5

Every second:

- Send the secret code to others

- If the counter is more than 0

  - Show a smiley face

  - Decrease the counter

- Otherwise

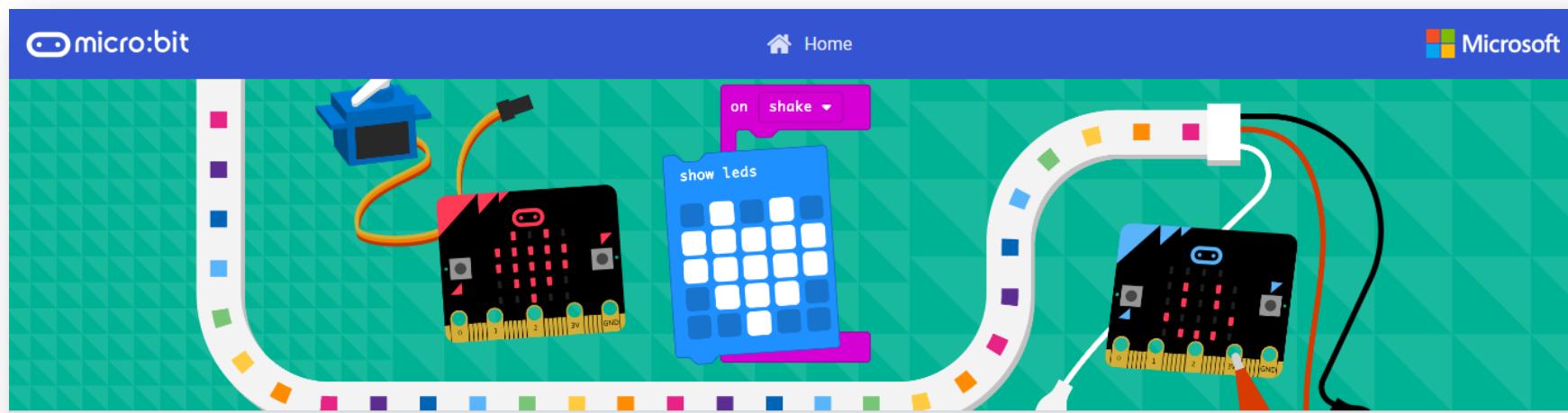
  - Show an X



# Lets code!

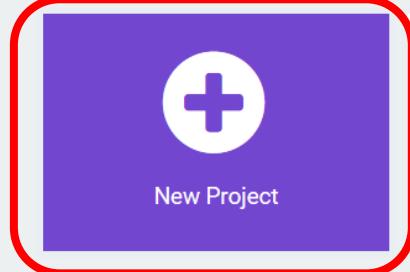


# MakeCode for the micro:bit



Import program files (.hex)  
or shared project URL's

## My Projects



Magic 8ball

a few seconds ago



WristCuffRadio

a few seconds ago



Serial Data

3 hours ago

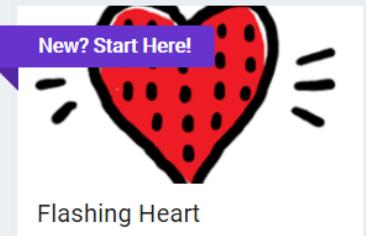


Microbit



Recent projects

## Tutorials



New? Start Here!

Flashing Heart



Name Tag



Smiley Buttons



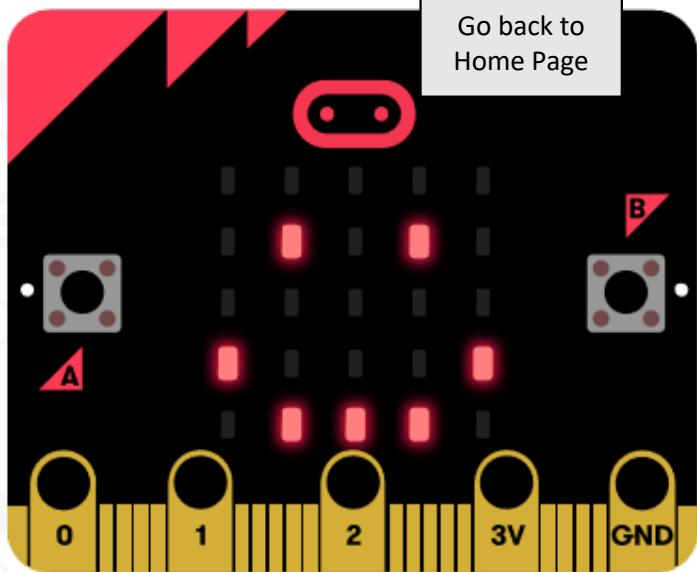
Dice



Love Meter

Step-by-step Tutorials,  
Sample Projects,  
Curriculum, Videos





Go back to Home Page

Simulator shows what your program will look like running on a micro:bit

Simulator Toolbar



Download your Project to the micro:bit

Download

Search...



Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Advanced

Program in either Blocks or JavaScript

on start

forever

show icon

Block Toolbox

Programming Workspace where you will build your program

Smiley



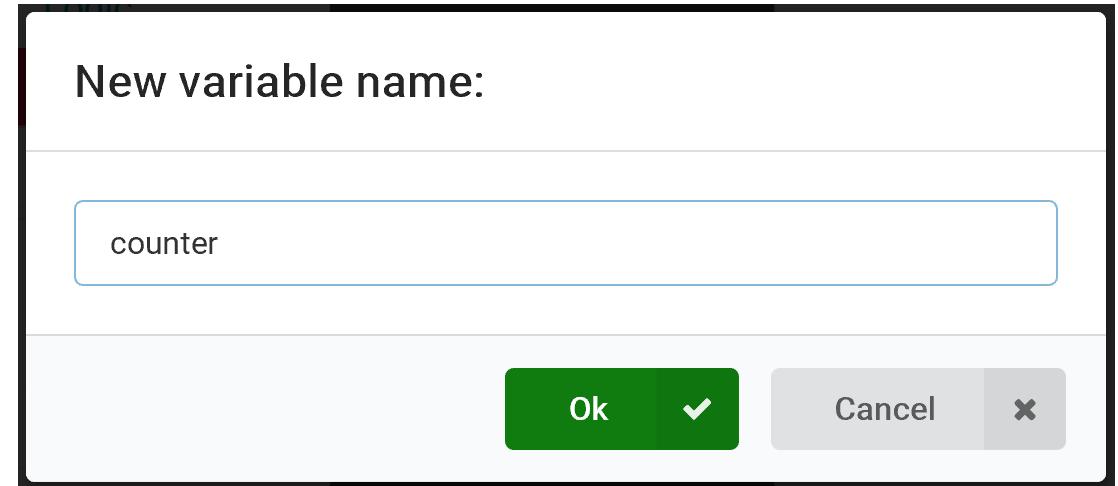
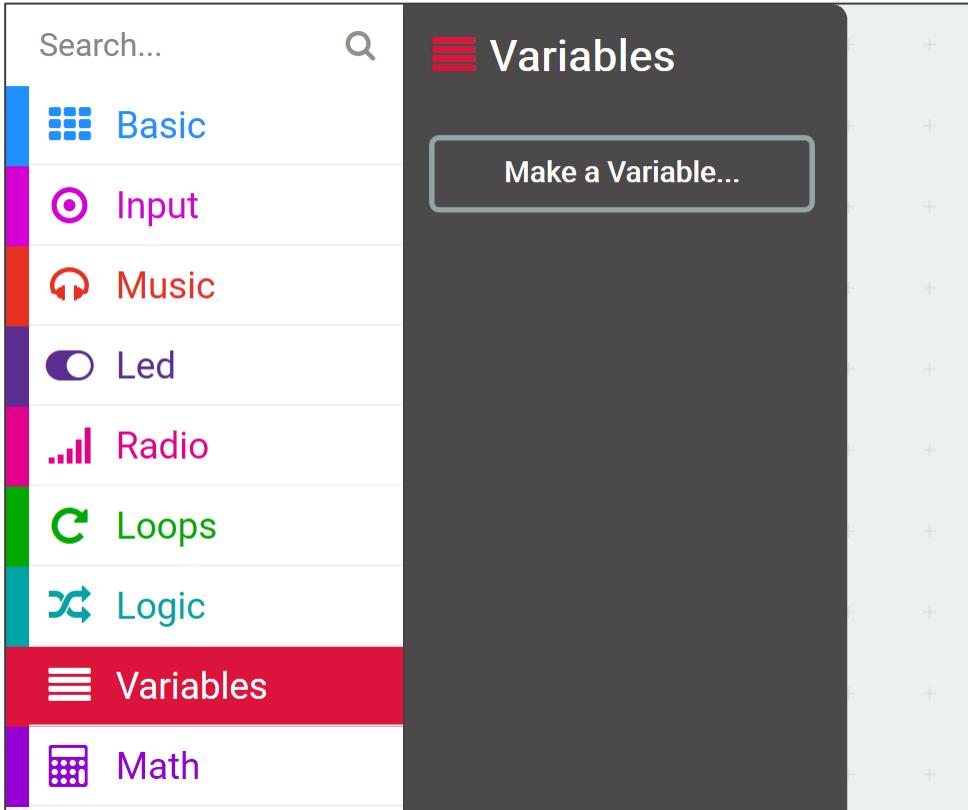
Undo/Redo and Zoom Workspace

Name your Project and Save it on your computer



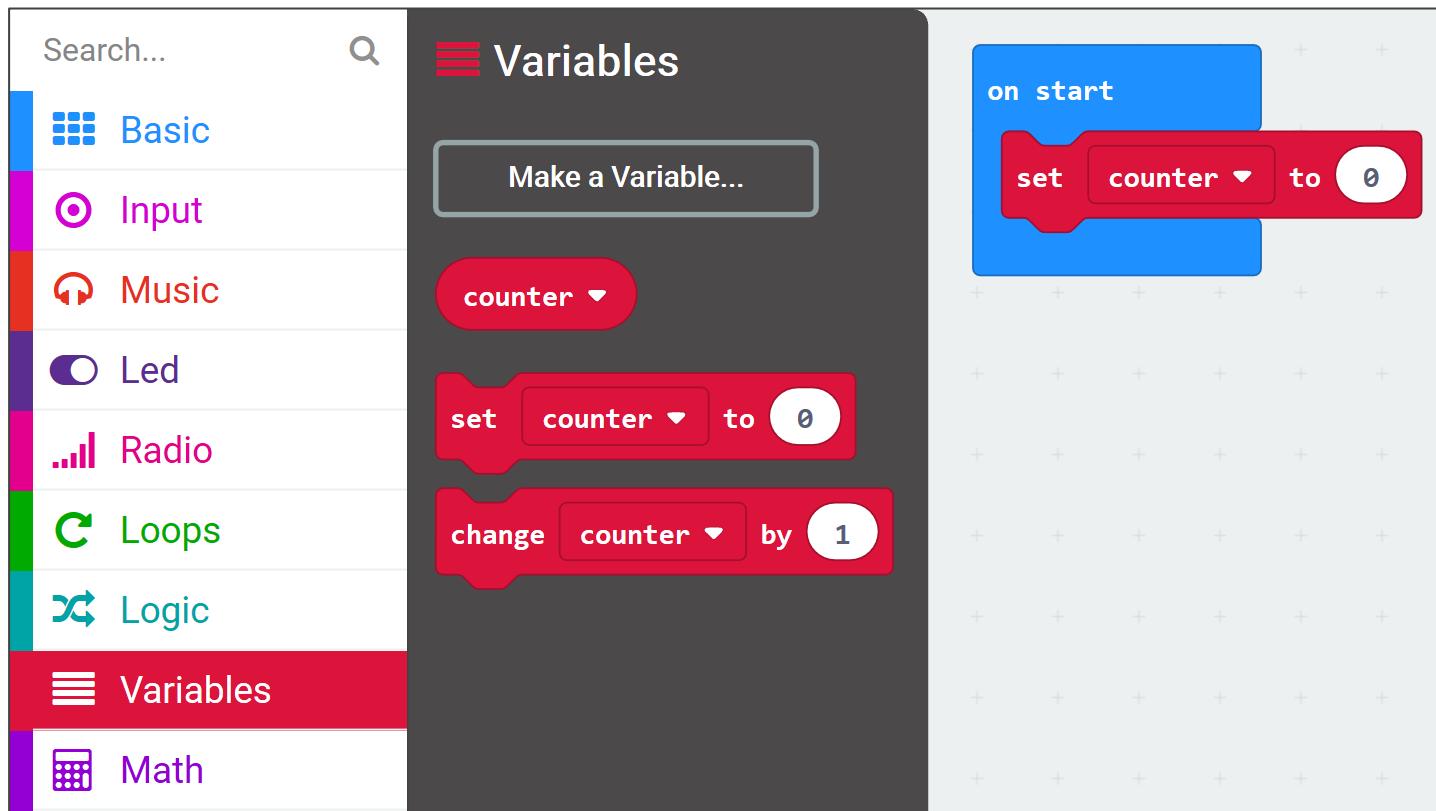
# Add a variable

- Open the **Variable** Toolbox drawer
- Select **Make a Variable...**
- Name the variable **counter**
- Select **OK**



# Set the variable on start

- Open the **Variable** Toolbox drawer
- Drag a **Set Counter to 0** block into the **On Start** block



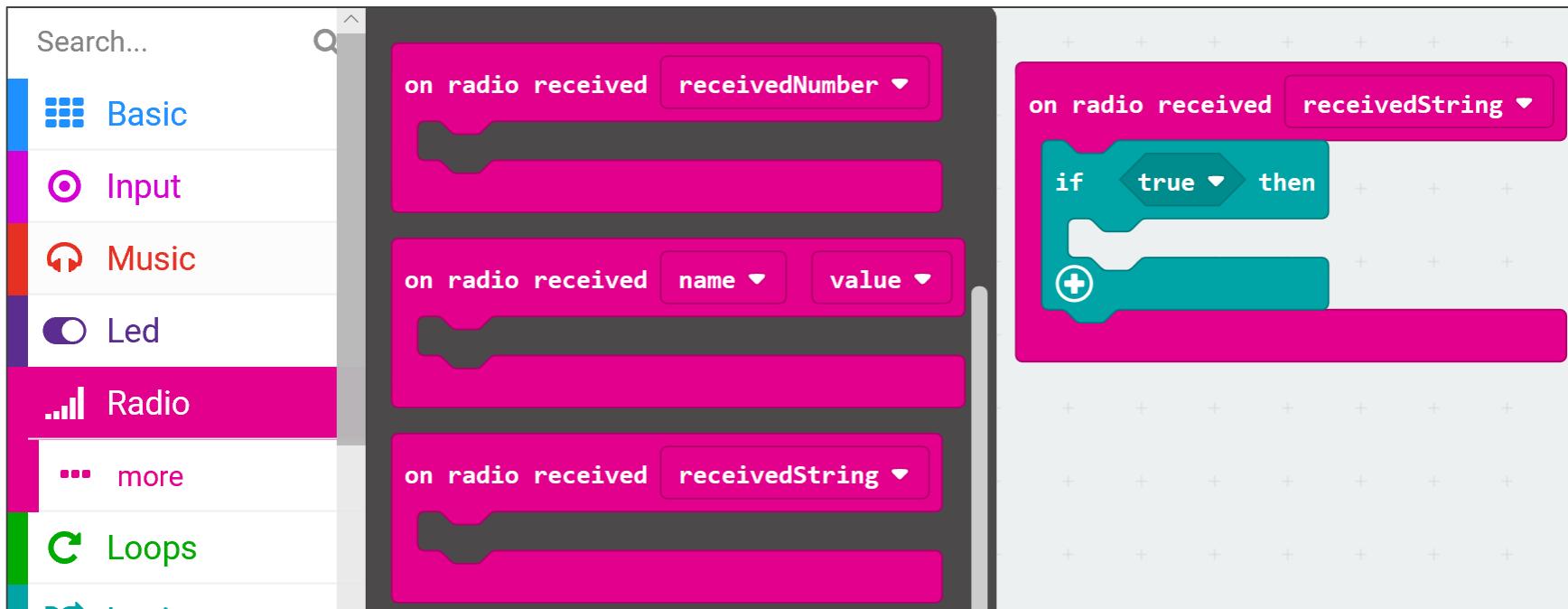
# Set the radio group on start

- Open the **Radio** Toolbox drawer
- Drag a **radio set group 1** block into the **On Start** block



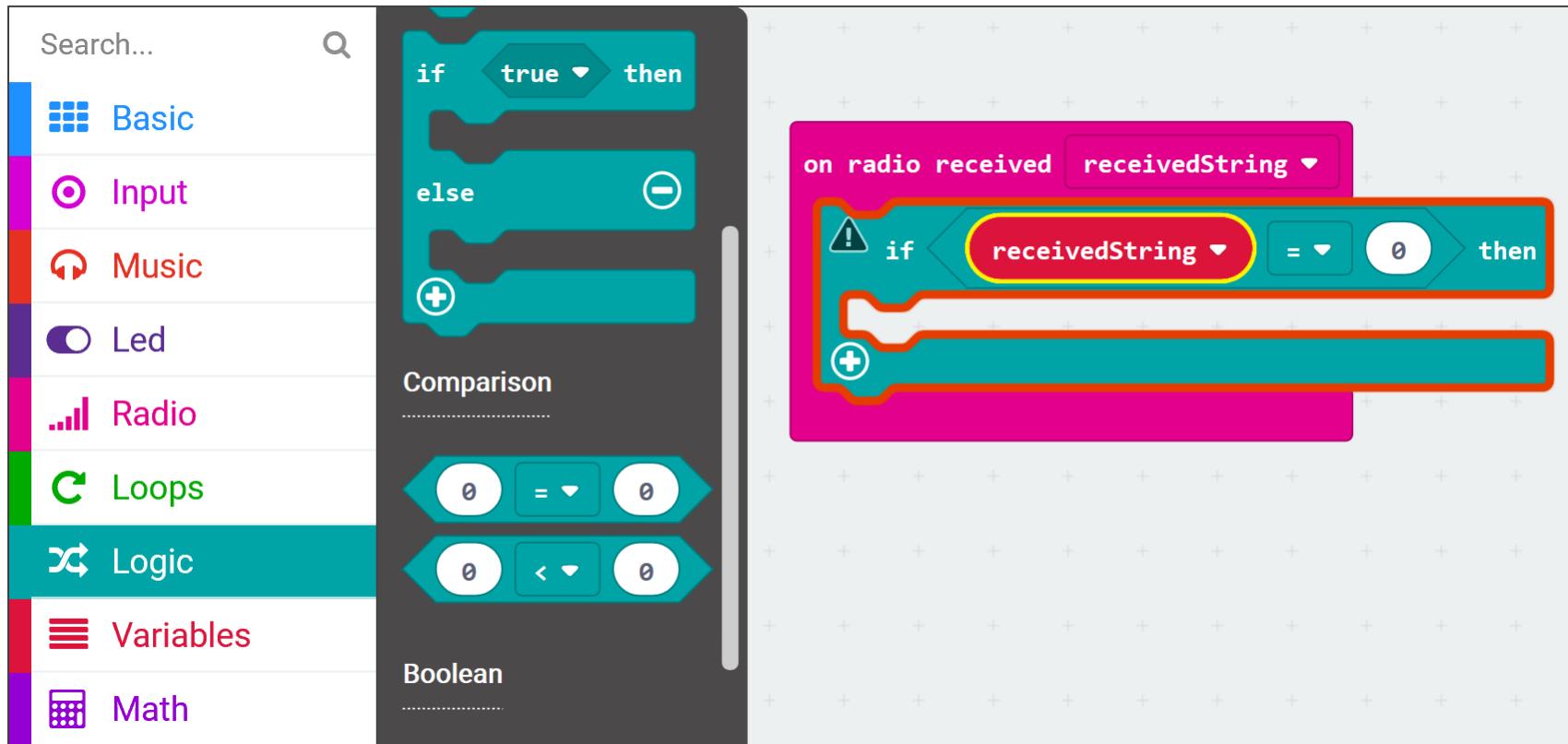
# Set the variable to 5 when a radio message is received

- Open the **Radio** Toolbox drawer
- Drag an **On Radio Received receivedString** block onto the workspace
- Open then **Logic** Toolbox drawer
- Drag an **If true then** block into the **On Radio Received receivedString** block



# Set the variable to 5 when a radio message is received

- Open then **Logic** Toolbox drawer
- Drag a **0 = 0** comparison block into the **true** part of the **if** block
- Open the **Variable** Toolbox drawer
- Drag the **receivedString** variable into the first part of the comparison



# Set the variable to 5 when a radio message is received

- Open then **Text** Toolbox drawer in the **Advanced** section
- Drag a “ ” block into the second part of the comparison
- Select the “ ” block and enter a secret code!

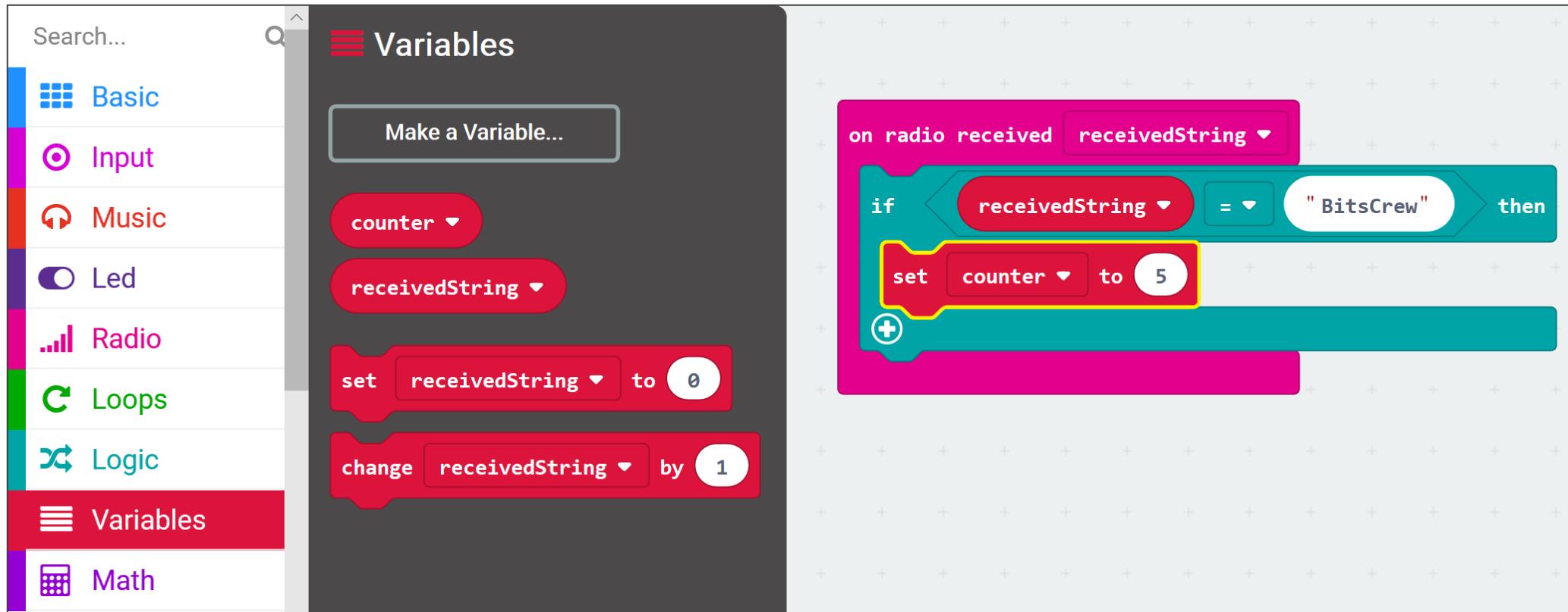


The image shows the Scratch interface with the following components:

- Toolbox Drawer:** On the left, under the **Advanced** tab, the **Text** category is selected. It contains blocks for creating, reading, and manipulating text.
- Script Area:** On the right, a script is being built for the **on radio received [receivedString v]** event. The script uses an **if** block with the condition **receivedString = "BitsCrew"**. The **then** branch of the **if** block contains a **set [variable] to (5)** block.

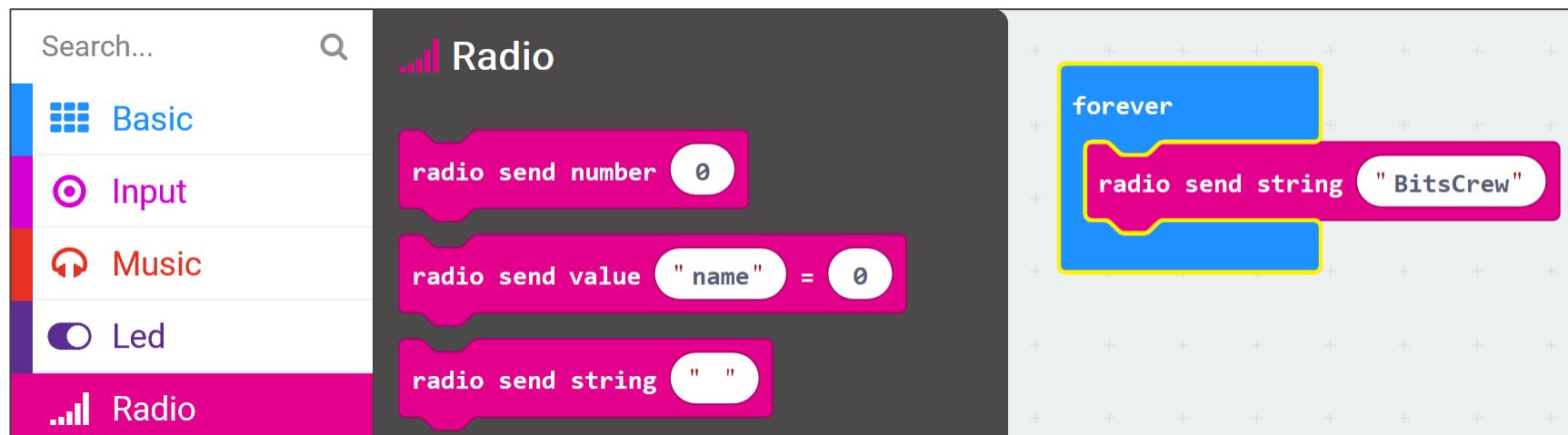
# Set the variable to 5 when a radio message is received

- Open the **Variable** Toolbox drawer
- Drag a **Set ... to 0** block into the **If then** block
- Change the variable to **counter** if necessary
- Select the **0** and set it to **5**



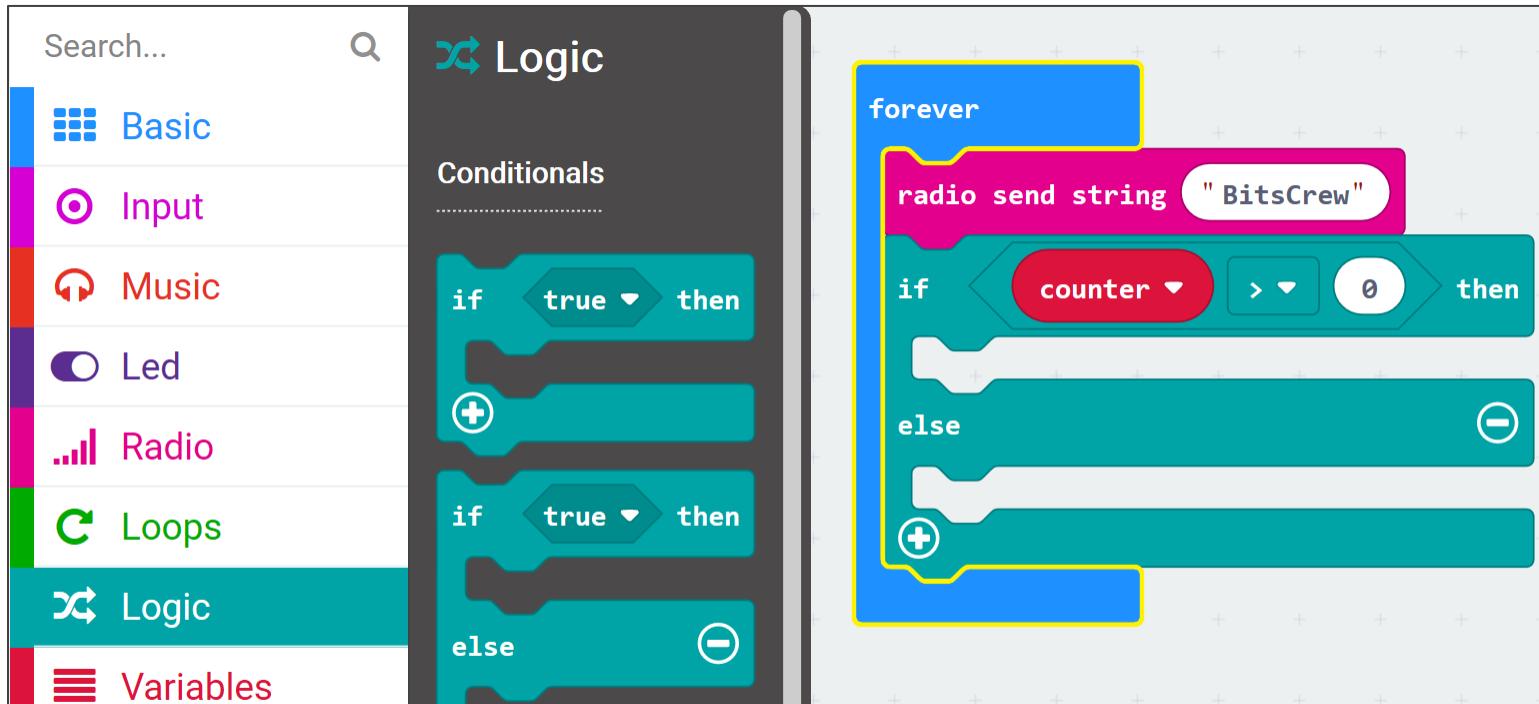
# Send the secret code

- Open the **Radio** Toolbox drawer
- Drag a **Radio Send String** block into the **Forever** block on the workspace
- Select the “ ” and set it to your secret code



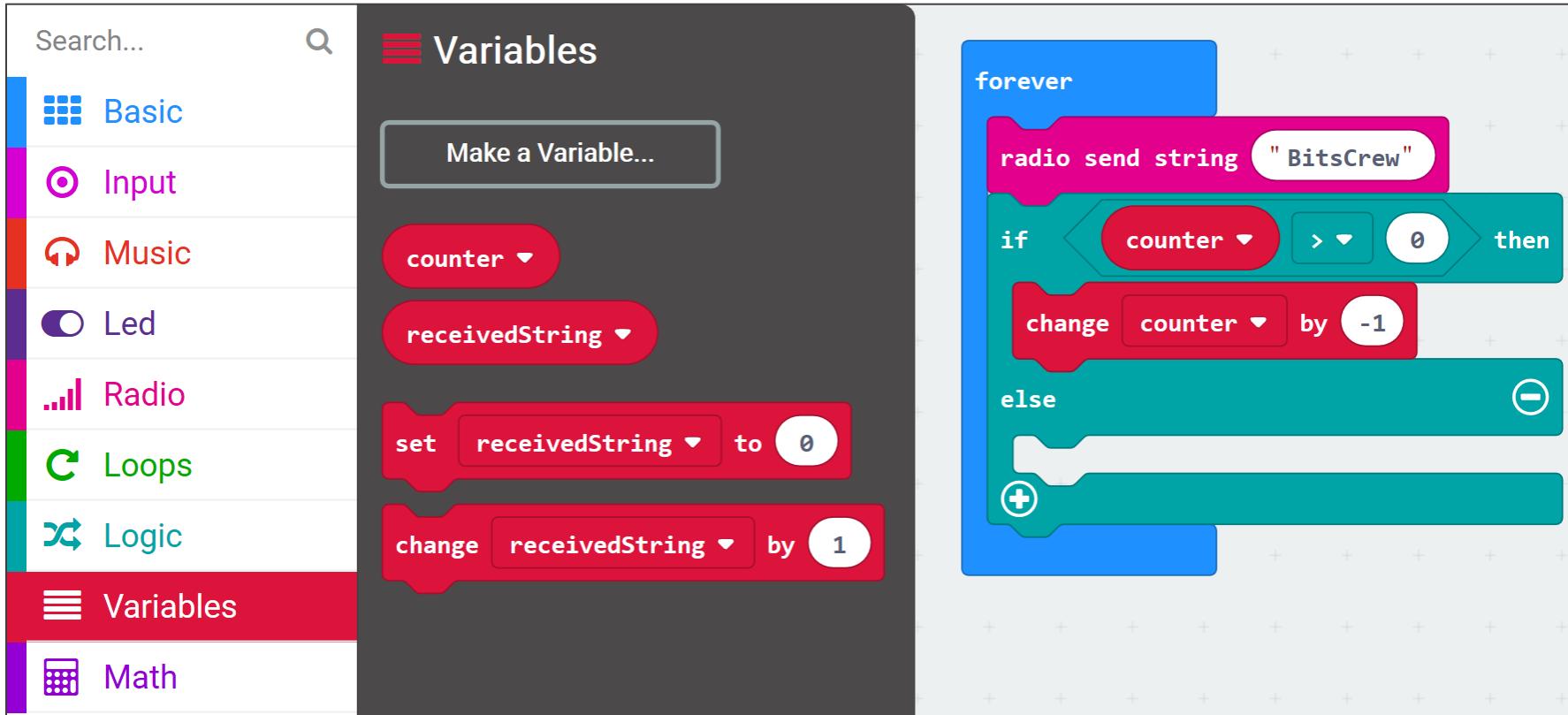
# Tick down the counter every second

- Open then **Logic** Toolbox drawer
- Drag an **If true then ... else** block onto the **Forever** block
- Drag a **0 = 0** comparison block into the **true** part of the **if** block
- Change the comparison from **=** to **>**
- Open the **Variable** Toolbox drawer
- Drag the **counter** variable into the first part of the comparison



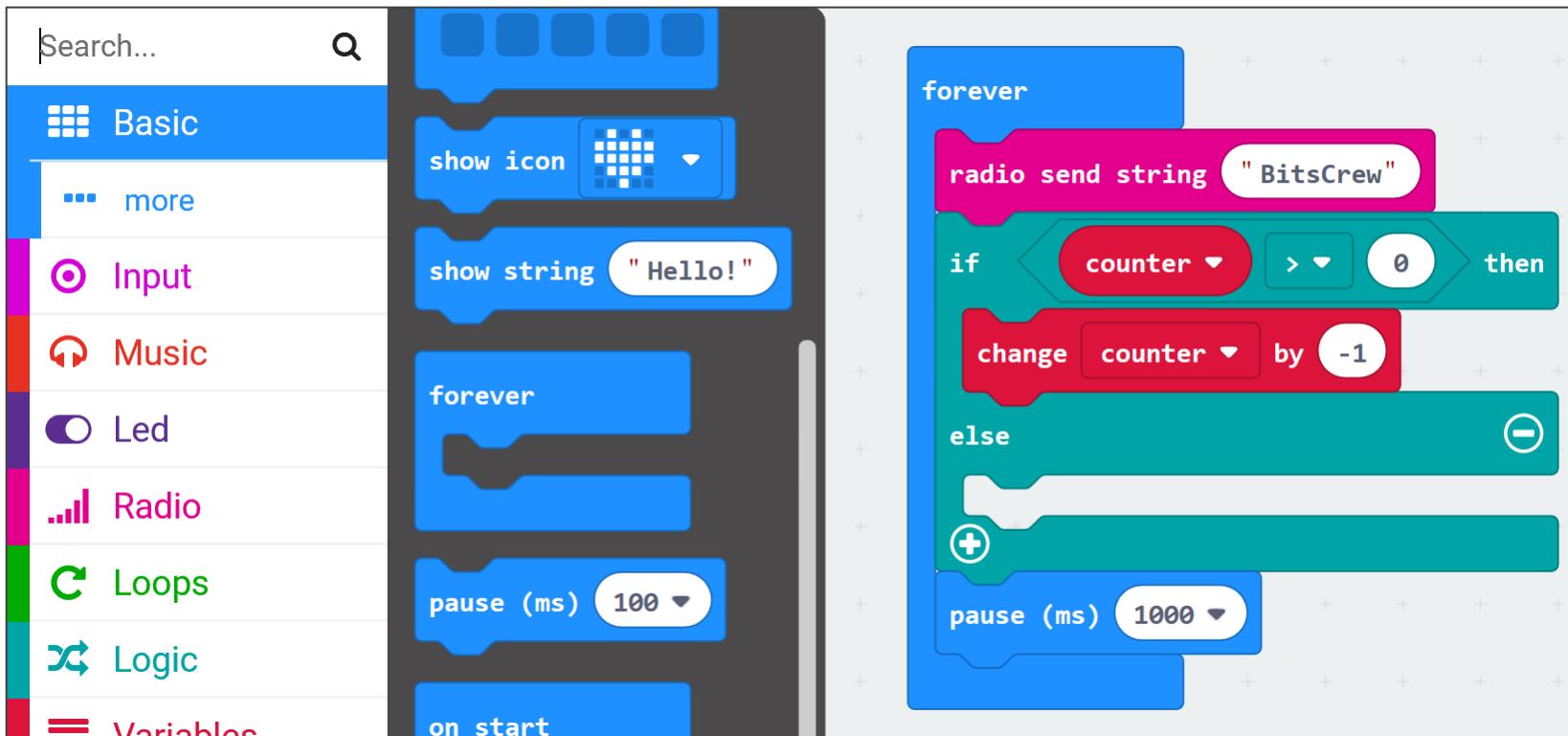
# Tick down the counter every second

- Open the **Variable** Toolbox drawer
- Drag a **change ... by 1** block into the **if ... then** part of the conditional
- Change the variable to **counter** if necessary
- Select the **1** and change it to **-1**



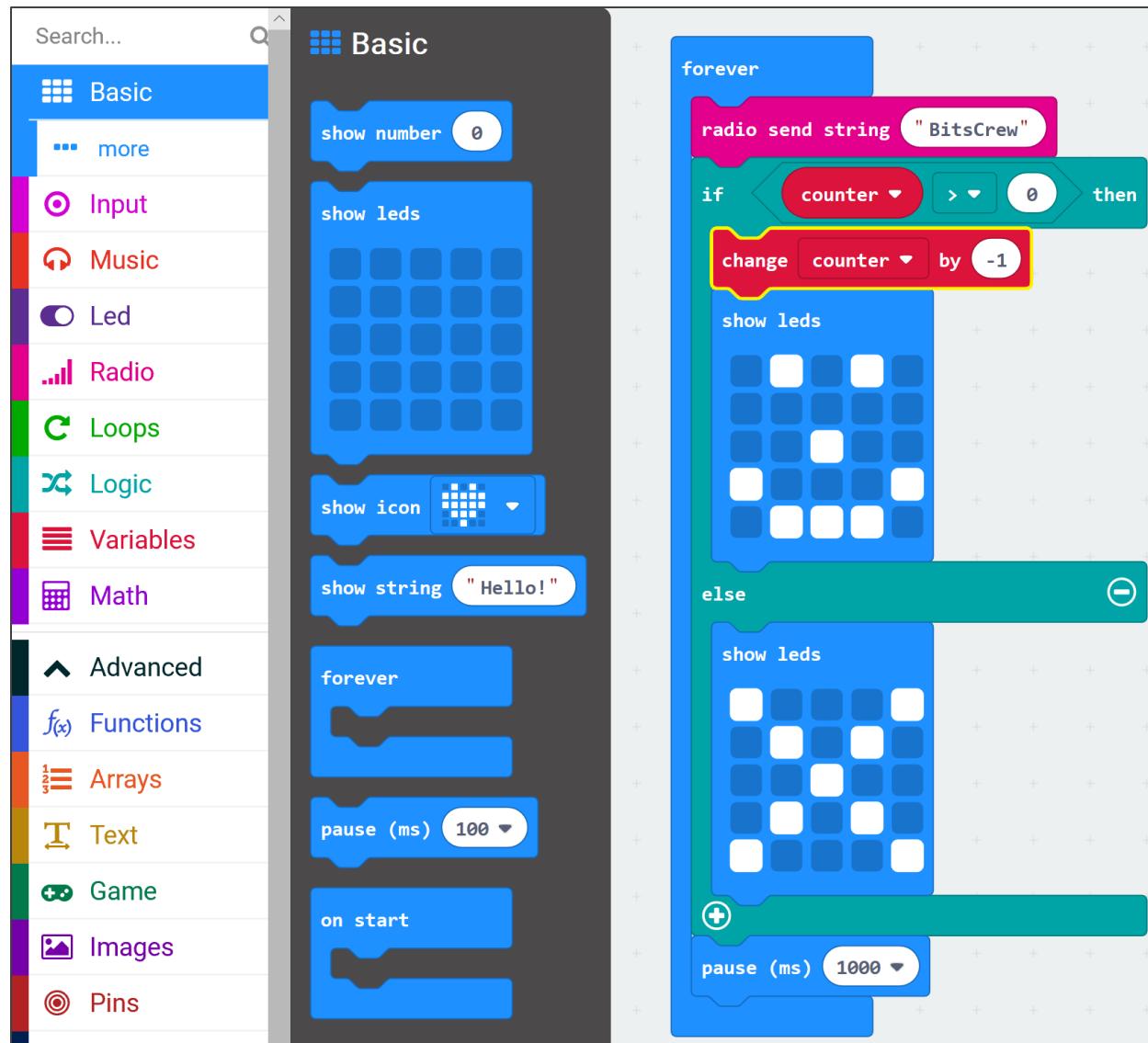
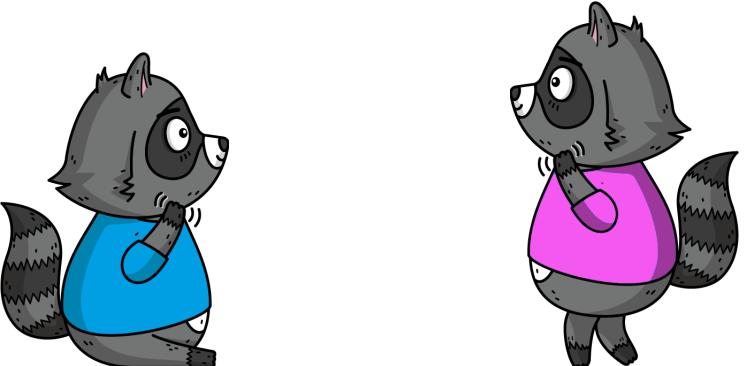
# Tick down the counter every second

- Open the **Basic** Toolbox drawer
- Drag a **Pause (ms) 100** block into the **Forever** block below the **If Then Else** block
- Change the time to **1 second**

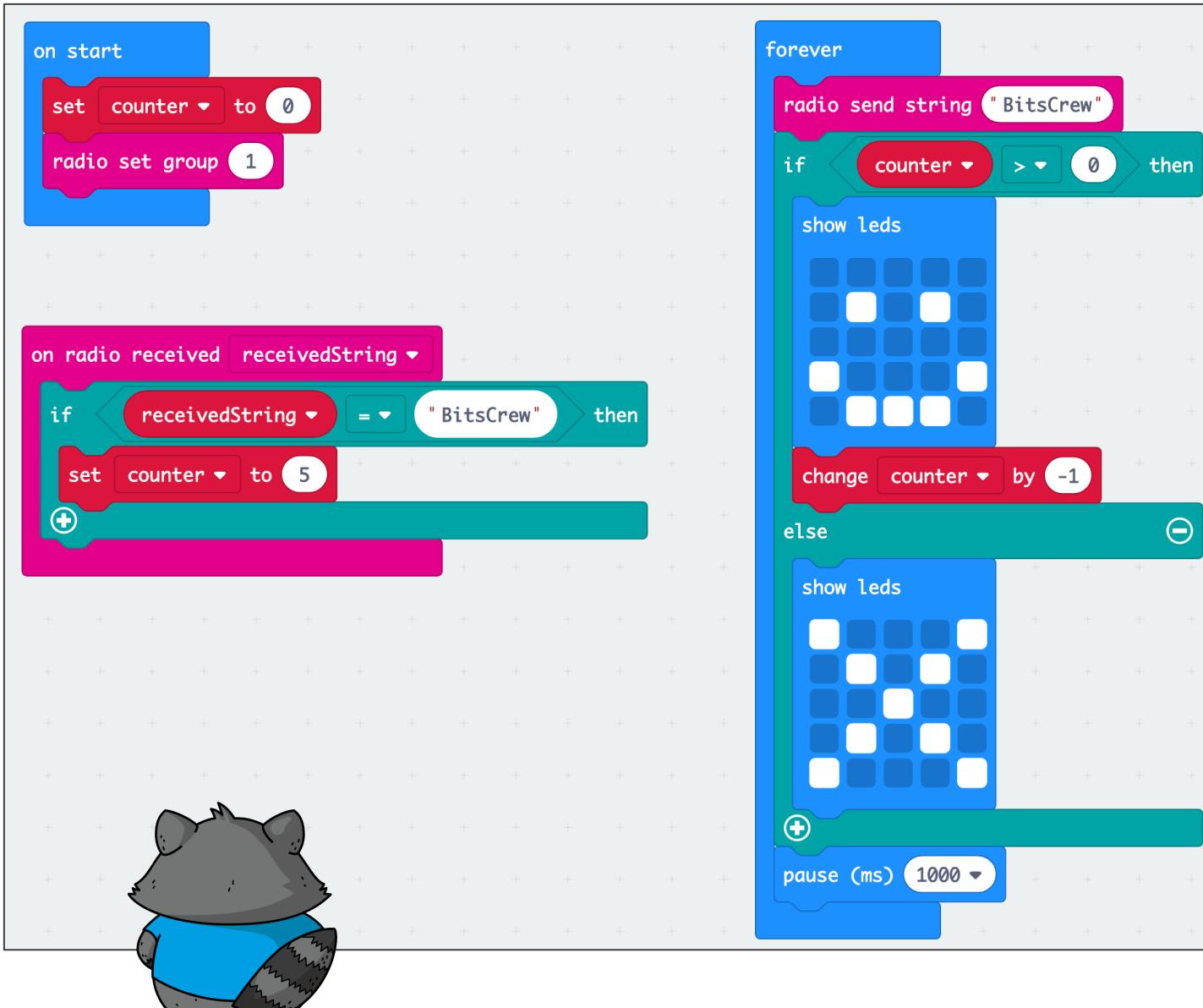


# Light up when a friend is near

- Open the **Basic** Toolbox drawer
- Drag two **Show LEDs** blocks into the **Forever** block – one into the **If Then** block, the other into the **Else** block
- Draw a smiley face in the **Show LEDs** block **If Then** block, and an X in the **Show LEDs** block in the **Else** block



# Complete Code



# Download your program to the micro:bit

1. Make sure your micro:bit is plugged into the computer
2. Click Download Button 

The Yellow light on the back of your micro:bit will flash while your program is downloading



# Lets make!

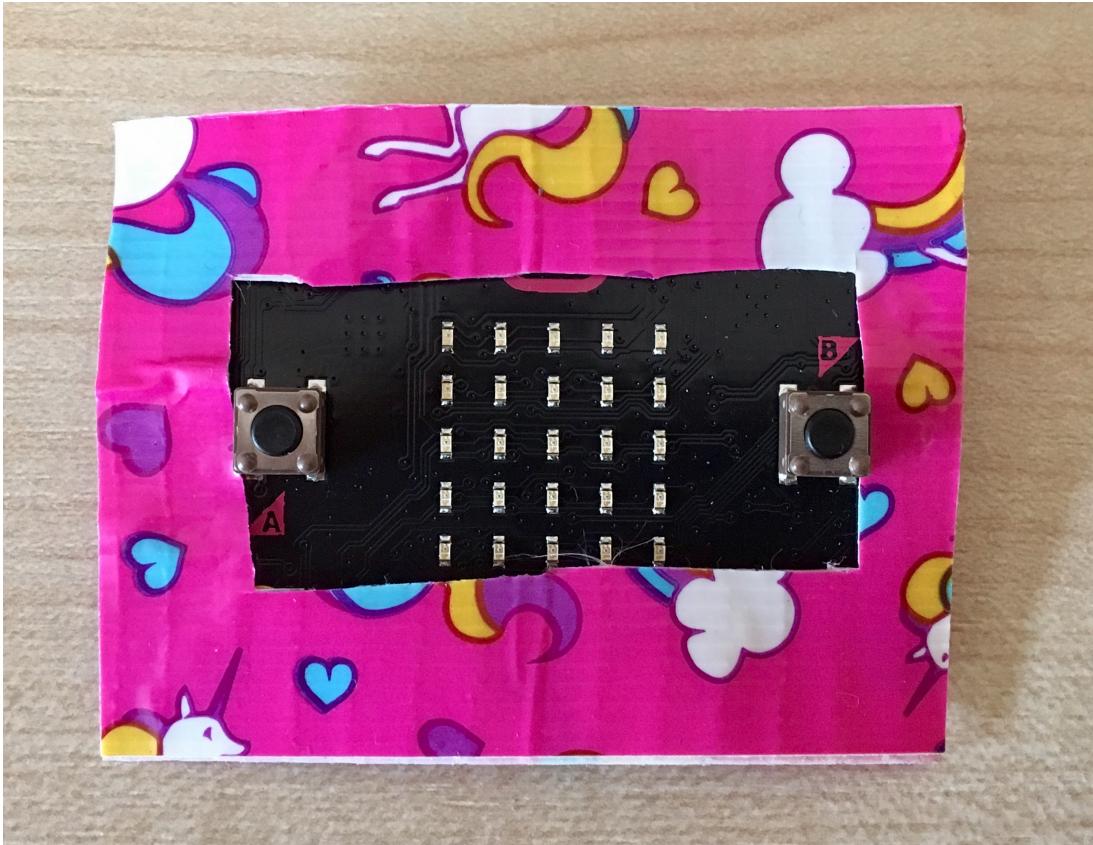


# Parts needed

- micro:bit
- Battery pack
- Wrist strap
- micro:bit holder
- Battery pack holder
- 2 Velcro strips
- Duct tape

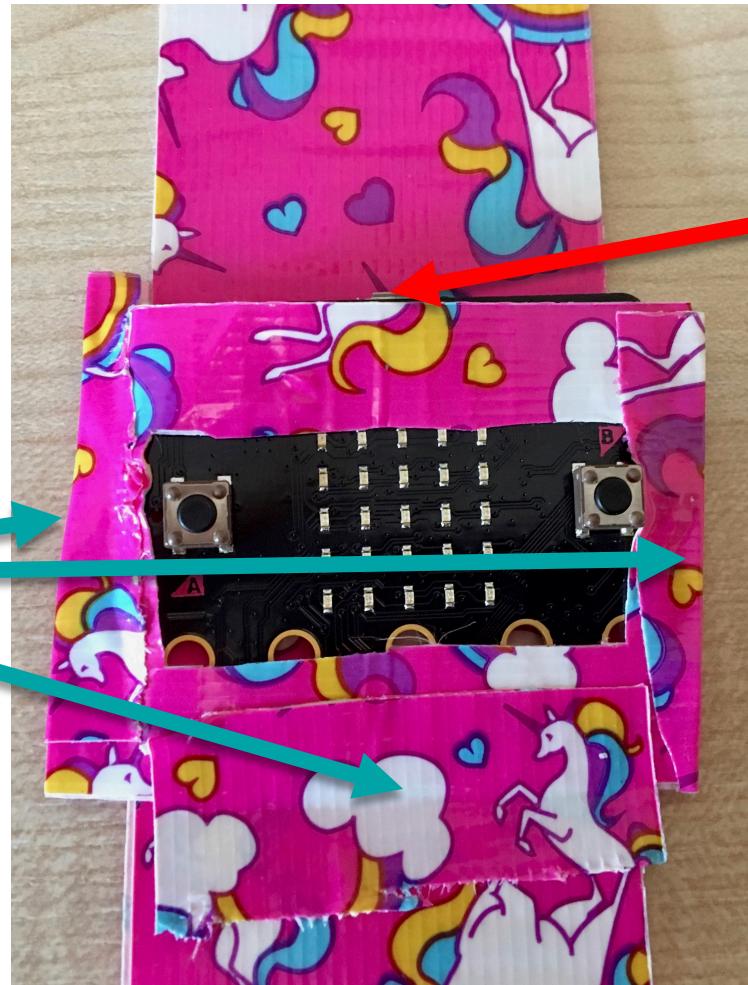


# Put the micro:bit into the holder



Fix the holder to the wrist strap with tape. Put one piece on each side, and one at the bottom.  
Leave the top open!

Tape these  
3 sides



Leave the  
top open



Put the battery pack into the holder and tighten it by unsticking the end and re-sticking. Make sure the switch is uncovered



Fix the battery pack to the wrist strap above the micro:bit using a strip of Velcro. Plug the battery pack into the micro:bit.



Attach one side of a piece of sticky Velcro to the wrist strap. Wrap around your wrist and attach the other side



Turn the battery pack on. Once another micro:bit with the same secret code is detected, you should see a smiley face!



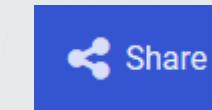
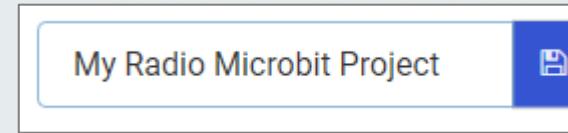
# Lets play!





# Share your Code

- Give your program a name
- Click the Share button in the top left
- Click the Publish Project button
- Copy the URL somewhere (or take a picture)



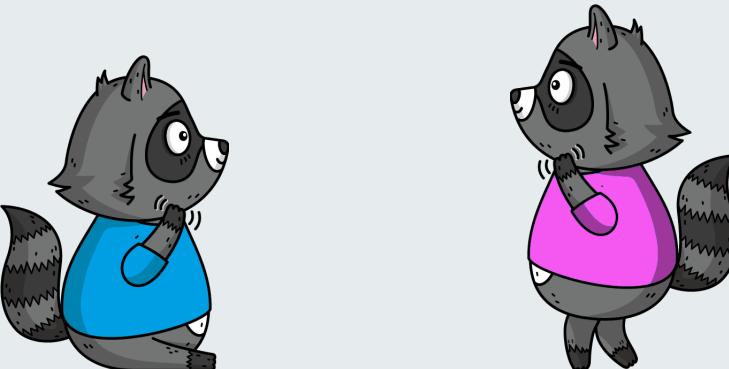
Share Project ×

Your project is ready! Use the address below to share your projects.

[https://makecode.microbit.org/\\_Lx4XcPfjYF0p](https://makecode.microbit.org/_Lx4XcPfjYF0p)

[Copy](#)

[Embed](#)





# MakeCode for the micro:bit

More about MakeCode – [makecode.com](https://makecode.com)

More about micro:bit – [microbit.org](https://microbit.org)

These instructions – [aka.ms/FriendDetector](https://aka.ms/FriendDetector)

