Instructor Guide

for teaching micro:bit to students in classes 6-8

Refer: Free Online Course on Micro:bit in Hindi for school students:
https://kalateetkaushal.in/courses/microbit-in-hindi/

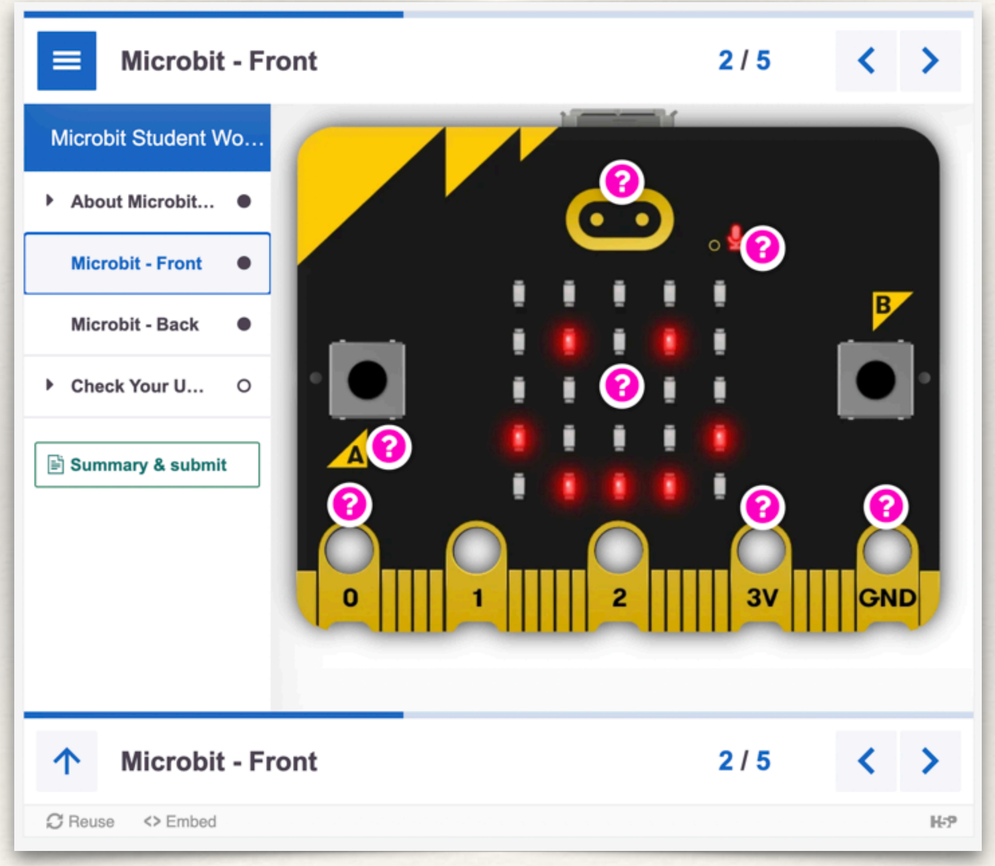
Timeless Lifeskills
FOUNDATION

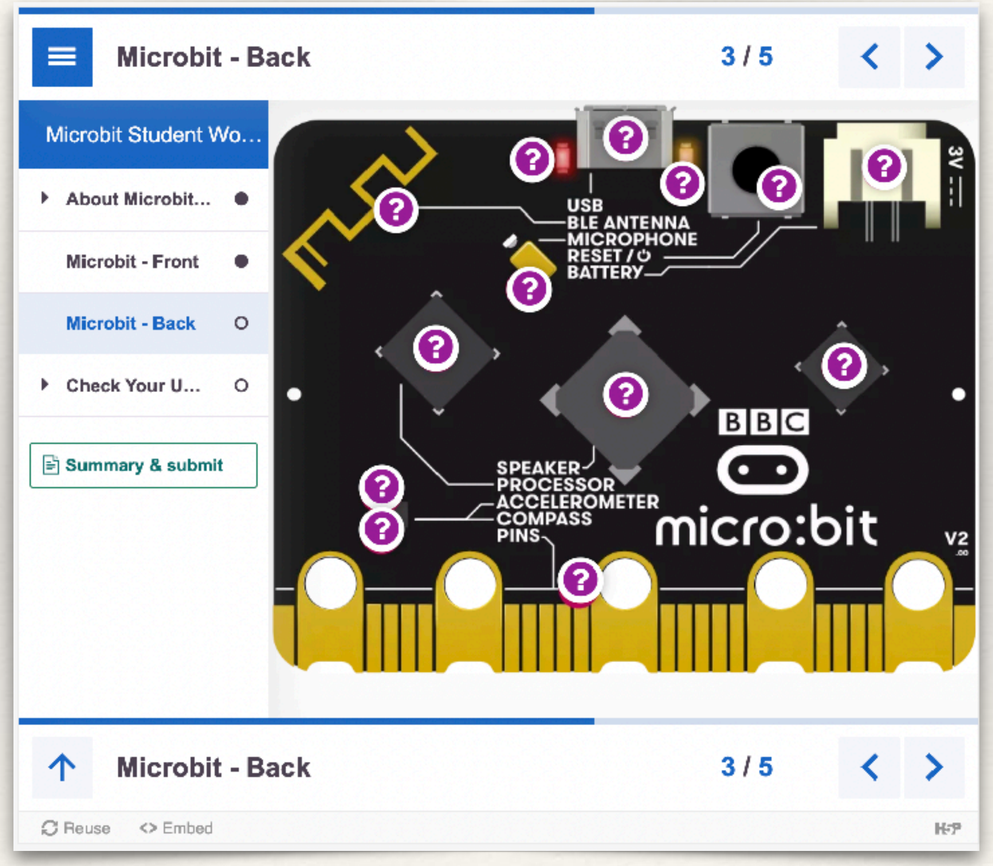
Introduce Micro:bit

- Help the students recall the key features of a normal computer - Input, Processor (CPU), Memory, Output
- Show how micro:bit is also a computer because it has all the above features
- It is a pocket computer because it fits in your pocket!
- Show how additional features of the micro:bit make it special - sensors, input-output pins, radio, bluetooth

Refer: https://kalateetkaushal.in/courses/microbit-in-hindi/lesson/student-workbook-for-section-1/

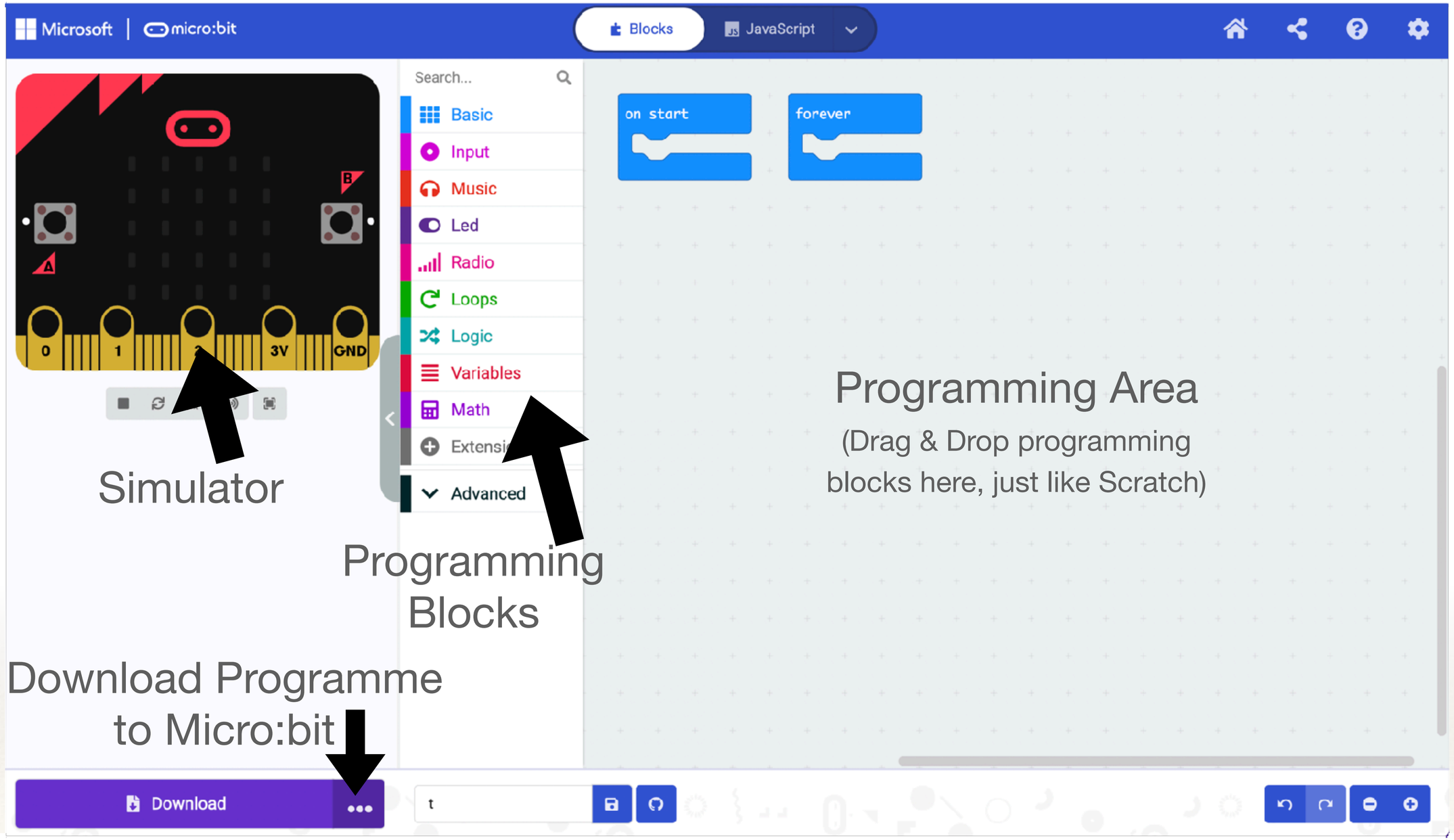
- Here are the key features of the micro:bit
- Refer: https://kalateetkaushal.in/courses/microbit-in-hindi/lesson/student-workbook-for-section-1/





Introduce Makecode for Micro:bit

- The instructor should introduce students to the basic layout of MakeCode for Micro:bit and explain the main sections - Simulator, Programming Blocks, Programming Area, Download button (see next page).
- If students are familiar with Scratch, comparison can be made with Scratch layout.


Microsoft
micro:bit
Blocks
JavaScript
Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Extensi
Advanced
on start
forever
0
1
2
3V
GND
Simulator
Programming Blocks
Programming Area
(Drag & Drop programming blocks here, just like Scratch)
Download Programme to Micro:bit
Download
t

Project-1

Name Badge

- **Objective:** to make students familiar with MakeCode interface and teach them how to transfer the code to the Micro:bit.
- **Problem:**
  - Write a programme to display your name on the microbit
  - Your name should continuously scroll on the microbit

- Steps to be taken by the students
  - Use Chrome browser
  - Go to https://makecode.microbit.org/
  - Click ‘New Project’
  - Give their project a name (name should be related with the project they are going to make, for example, Name, or Name Badge)
  - Write the programme (they need to use the Forever block and Show String block)
  - Transfer the programme to the microbit and test

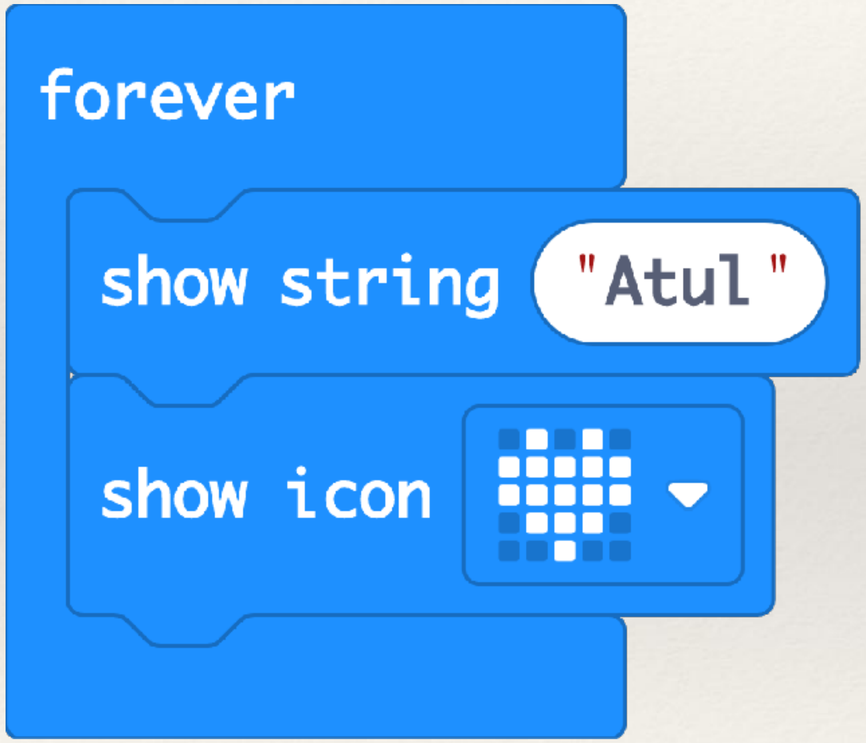
Create Your Name Badge

Project-2

Musical Name Badge

- **Objective:** to help students understand button-based user INPUT on the microbit (like Green Flag pressed in Scratch) and to introduce the Music blocks.
- **Problem:**
  - In the name badge created in the last project, ask the students to add a “Hello” sound when button-A is clicked
  - They can also add an icon to display after their name has been displayed
  - These should forever scroll on the microbit
  - Transfer the programme to the microbit and test

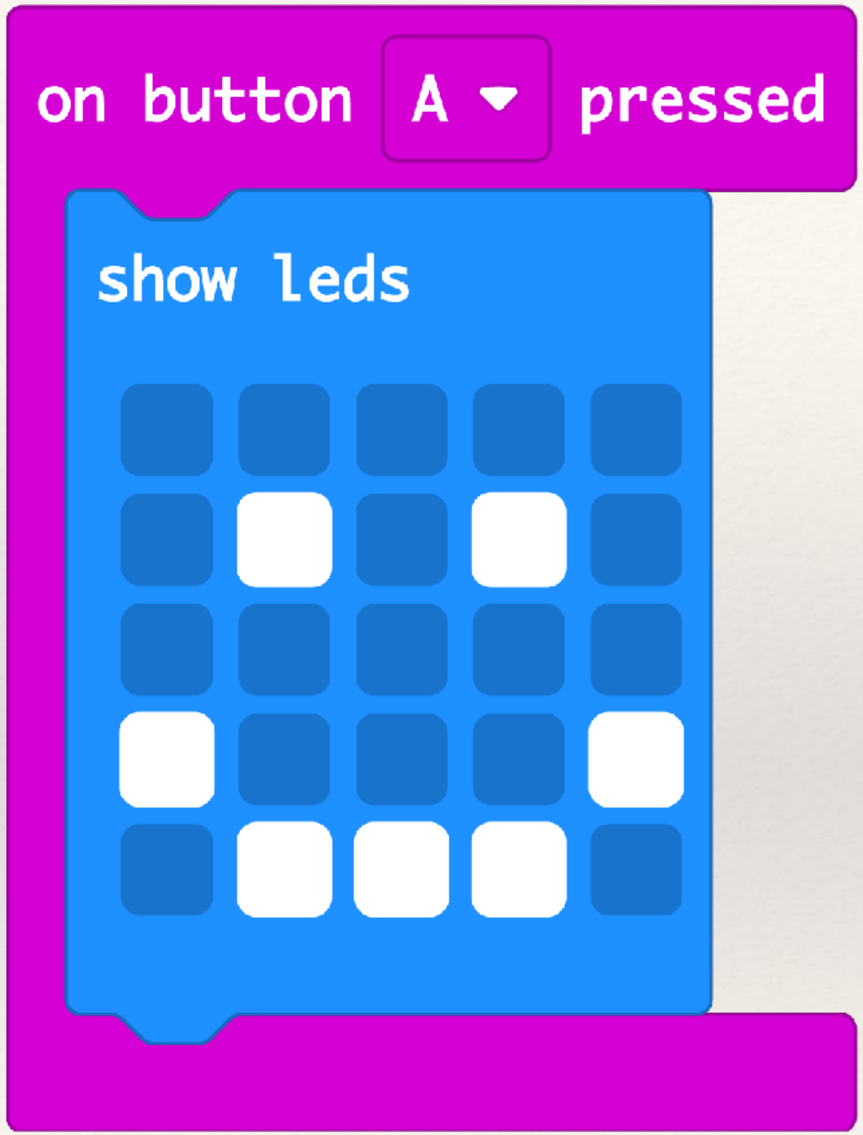
Musical Name Badge

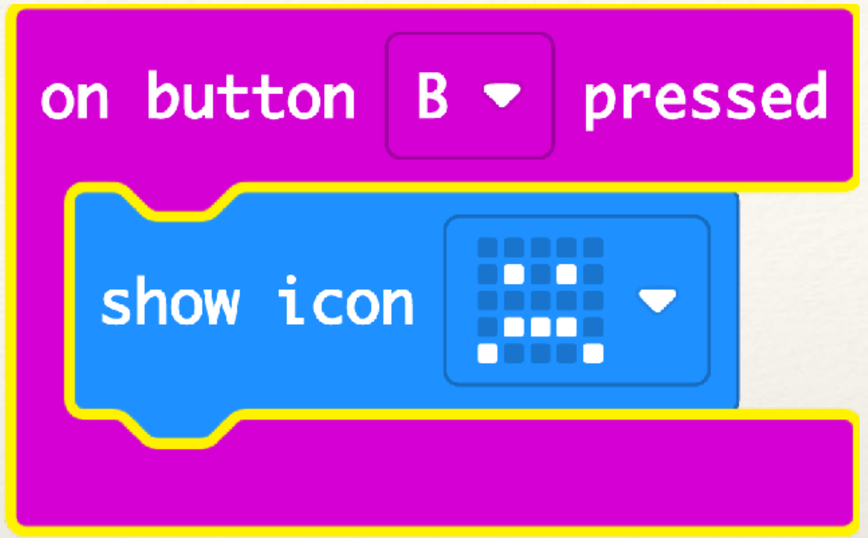


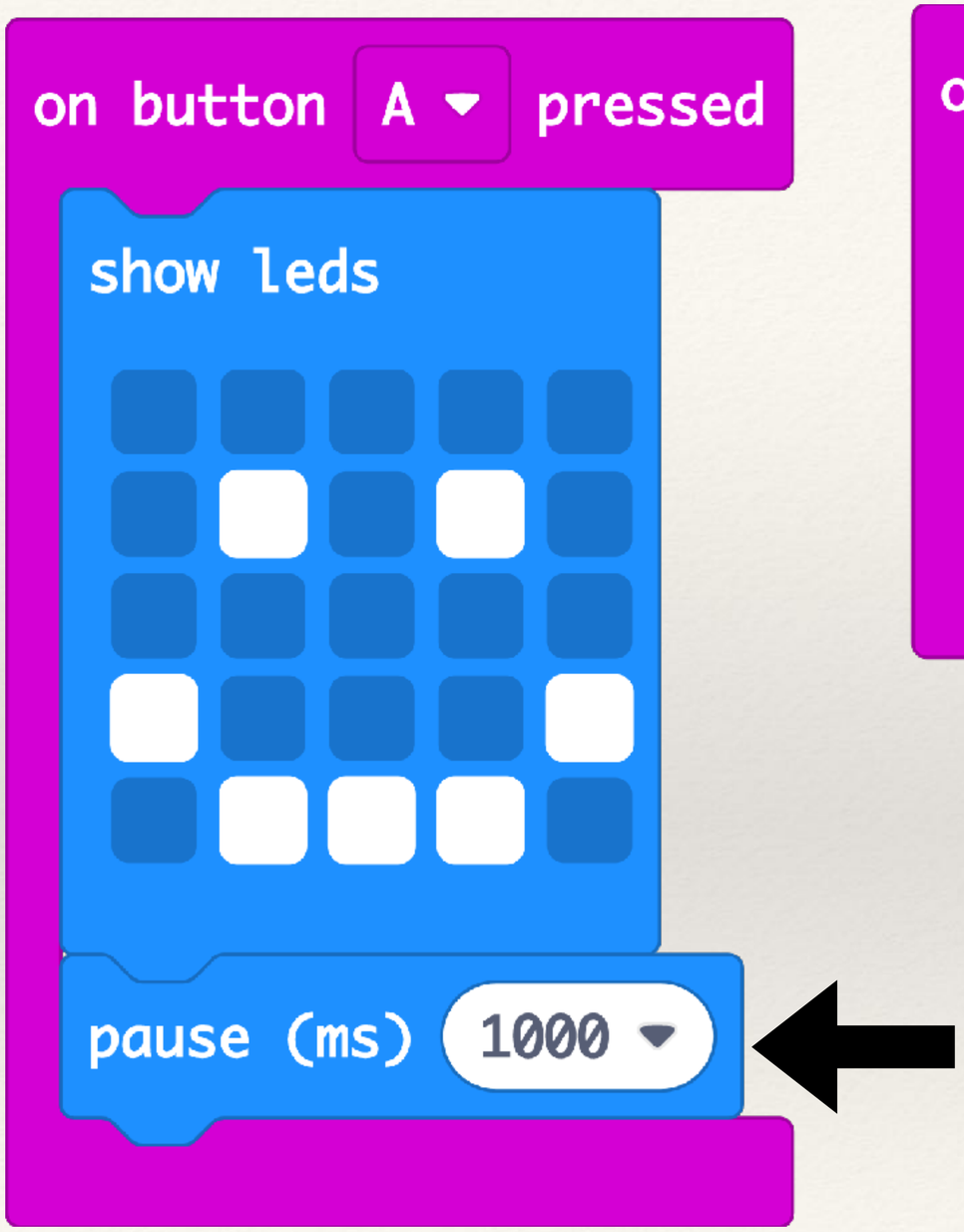
Project-3

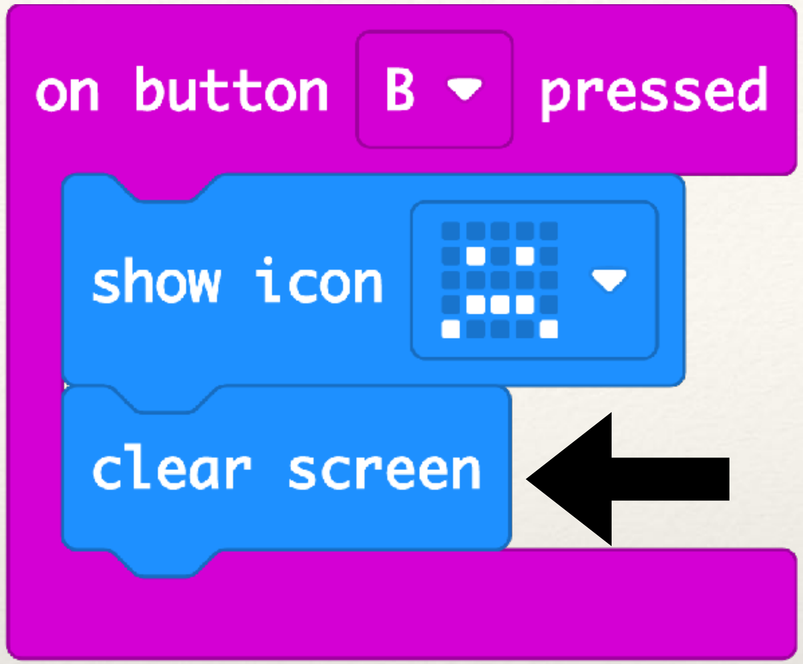
Smily :-) & Sad Face :-(

- **Objective:** to help students understand how to give multiple instructions to the microbit and introduce ‘Show LED’ and ‘Show Icon’ blocks
- **Problem:**
  - Write code such that when button-A is pressed a smily icon should display on the microbit and when button-B is pressed a sad icon should display
  - Students should make the smily icon by dragging Show LED block and by clicking the LEDs to light them up
  - Students should make the sad icon by dragging the Show Icon block and selecting the sad icon
  - Instructor can also explain ‘Pause’ and ‘Clear Screen’ blocks


on button A pressed
show leds


on button B pressed
show icon





Pause and Clear Screen Blocks

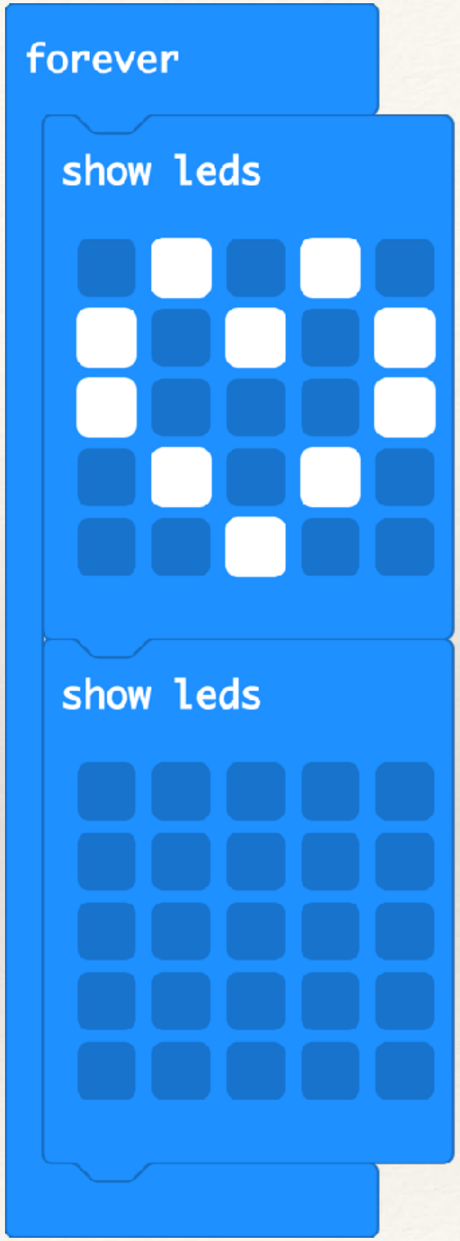
Project-4

Flashing Heart

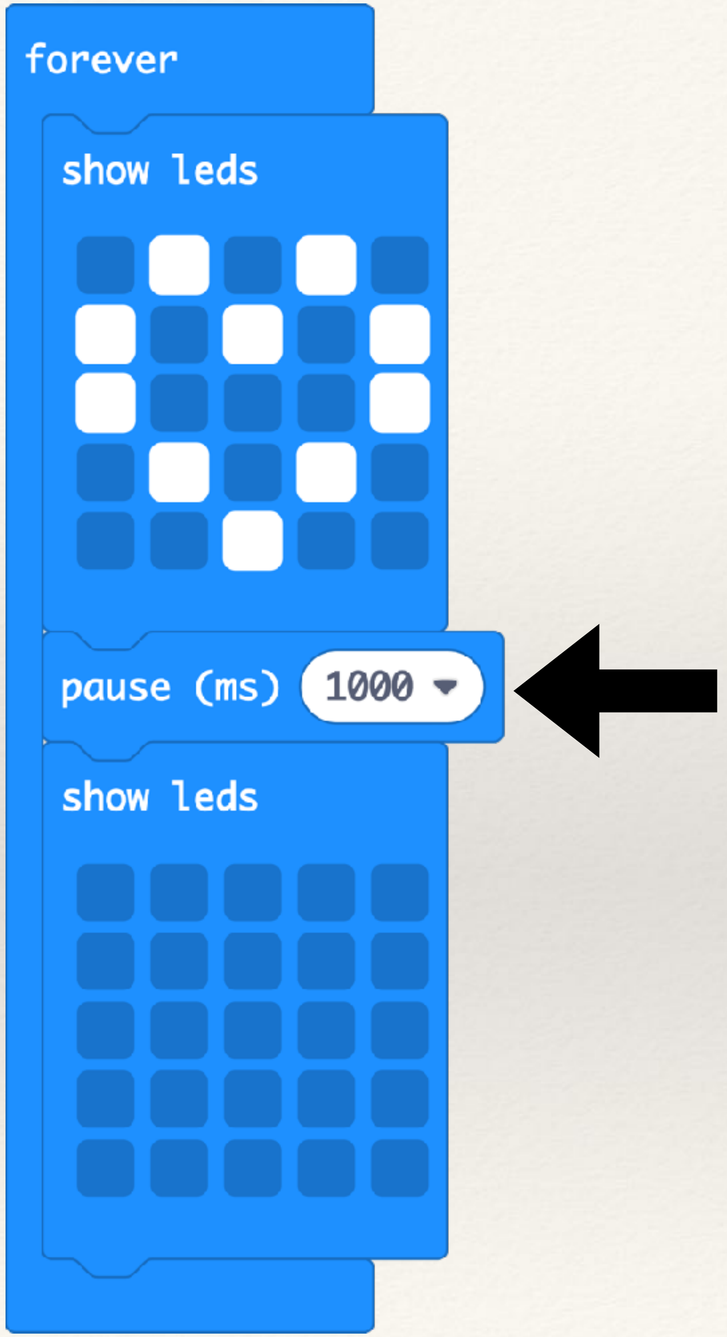
- **Objective:** to help students understand how create an ‘animation effect’ by not lighting up any LED.
- **Problem:**
  - Write code such that the Heart icon flashes on and off
  - Ask students to figure out how to control the timing of the flashing (by using Pause block)
  - Ask students to explore what happens if they put a Pause after the heart icon and after the blank LEDs and what happens if they change the number of seconds in the two pauses (see next page)
  - Challenge the students to make an animation of the heart become smaller and bigger and experiment more with size of the heart

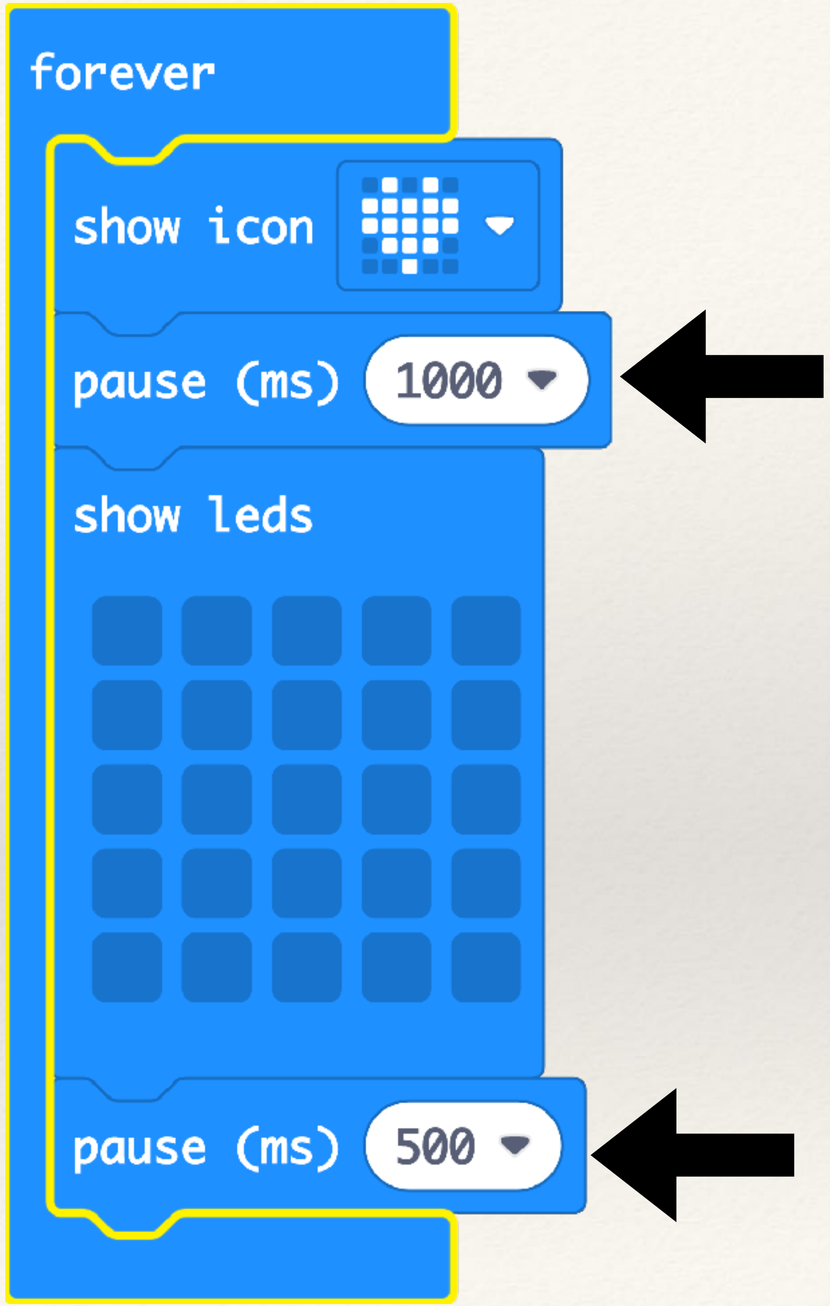
Flashing Heart Animation

Students can create their own heart icon or they can use the heart icon given in Show Icon block

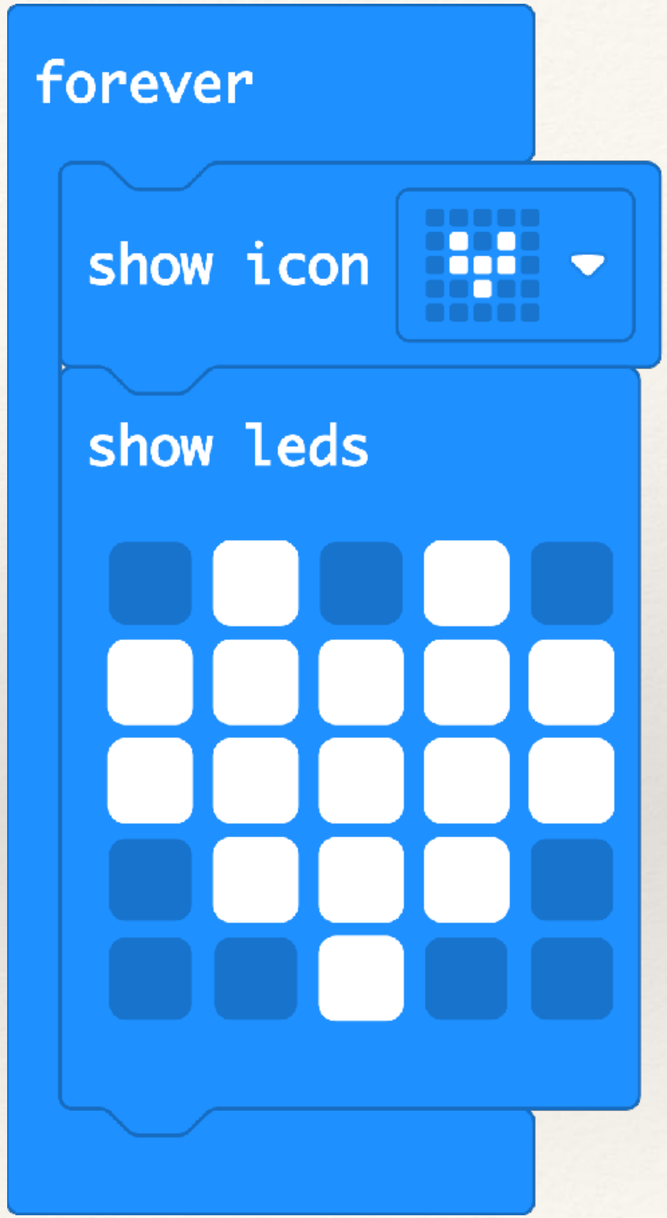


Controlling the timing of flashing





Animation of Small and Large Heart Flashing



Animation of a dot becoming a small heart then a big heart and then flashing in reverse

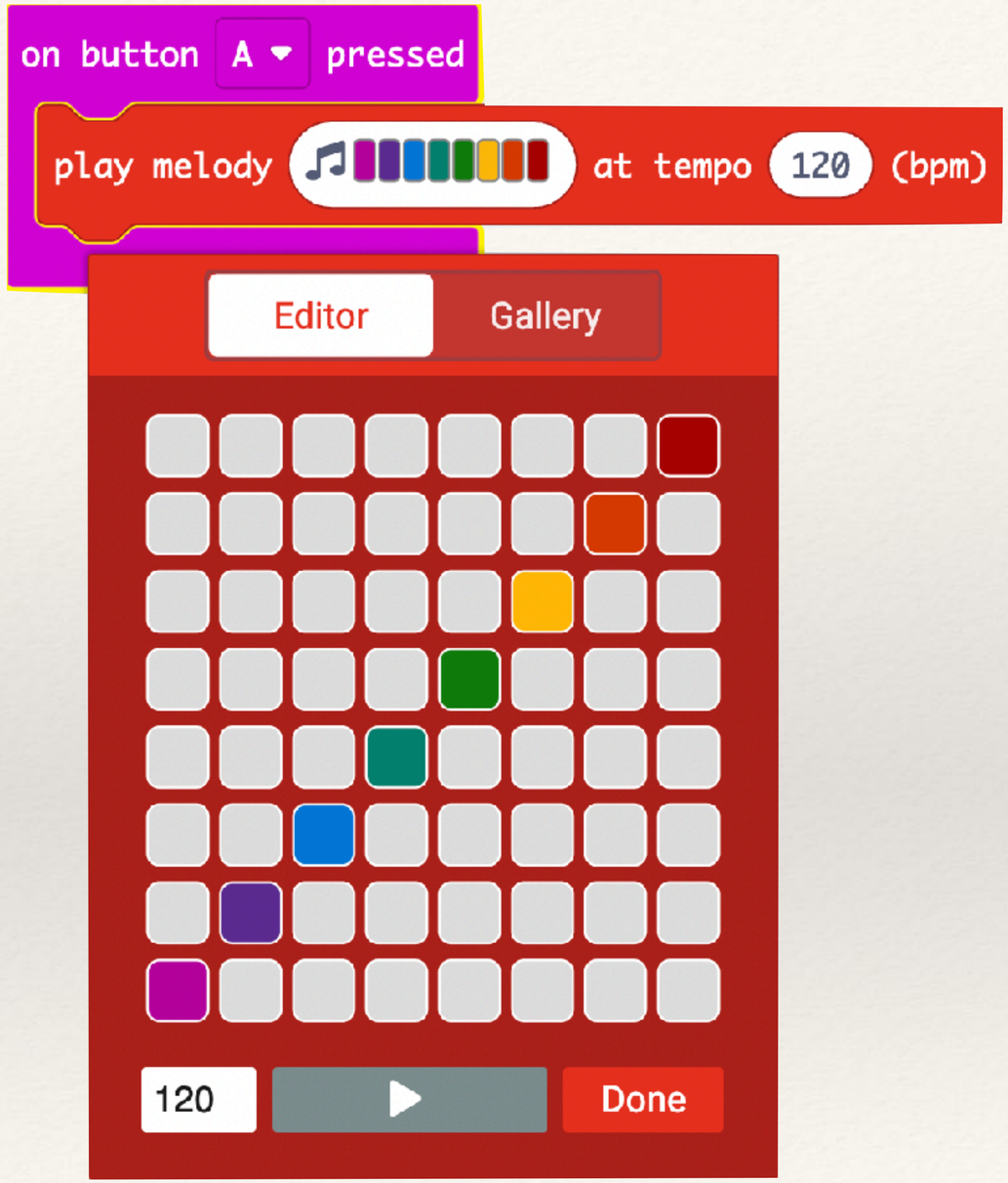
Students can add ‘Pause’ to control which icon displays for a longer duration

Project-5

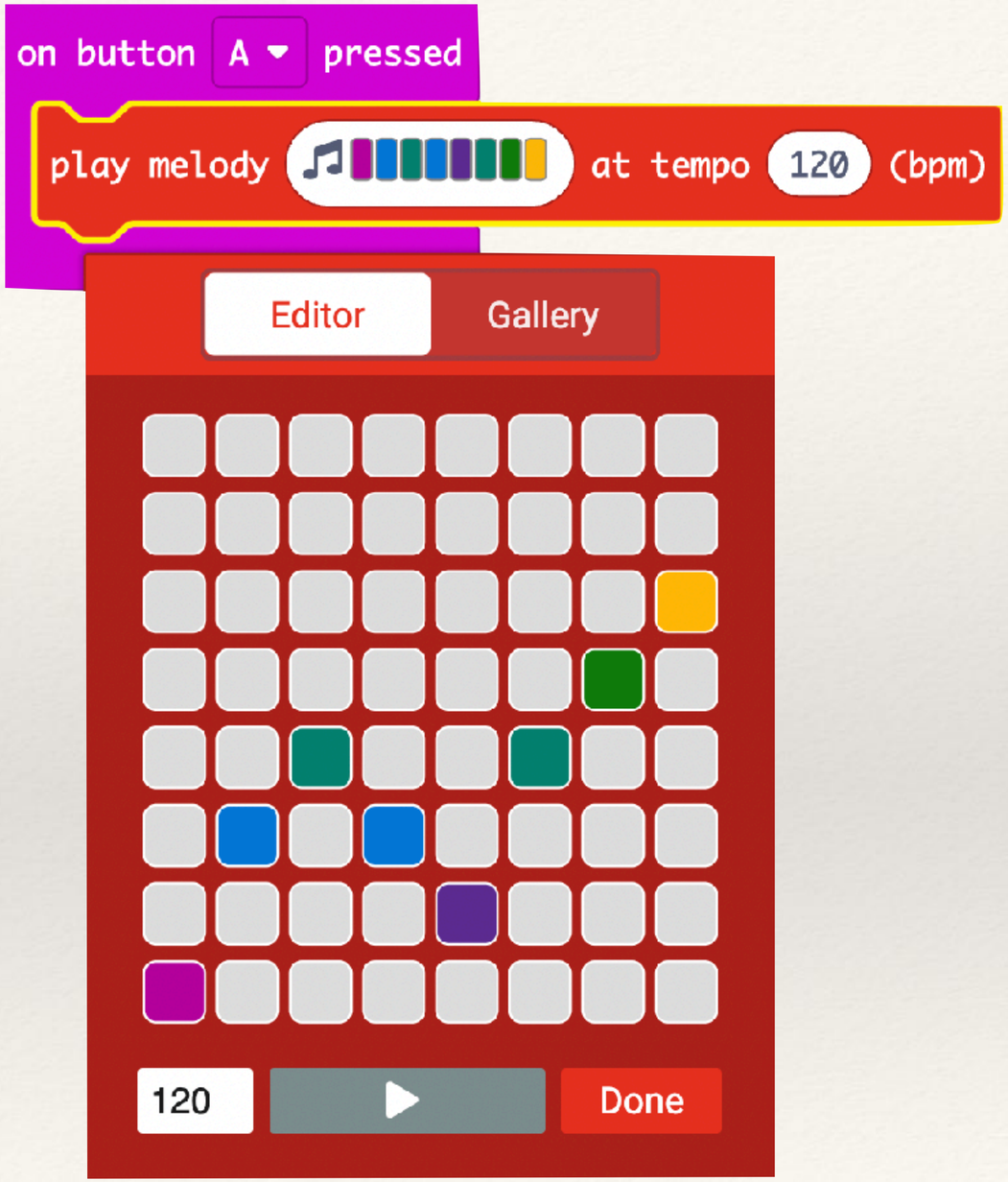
Music Composition

- **Objective:** Microbit offers a number of programming blocks create music and special effects for projects.
- **Problem:**
  - Explore different music related programming blocks
  - Go to google and search for piano notes for a nursery rhyme
  - Use these piano notes to make a nursery rhyme tune in microbit
  - Students can also add animation

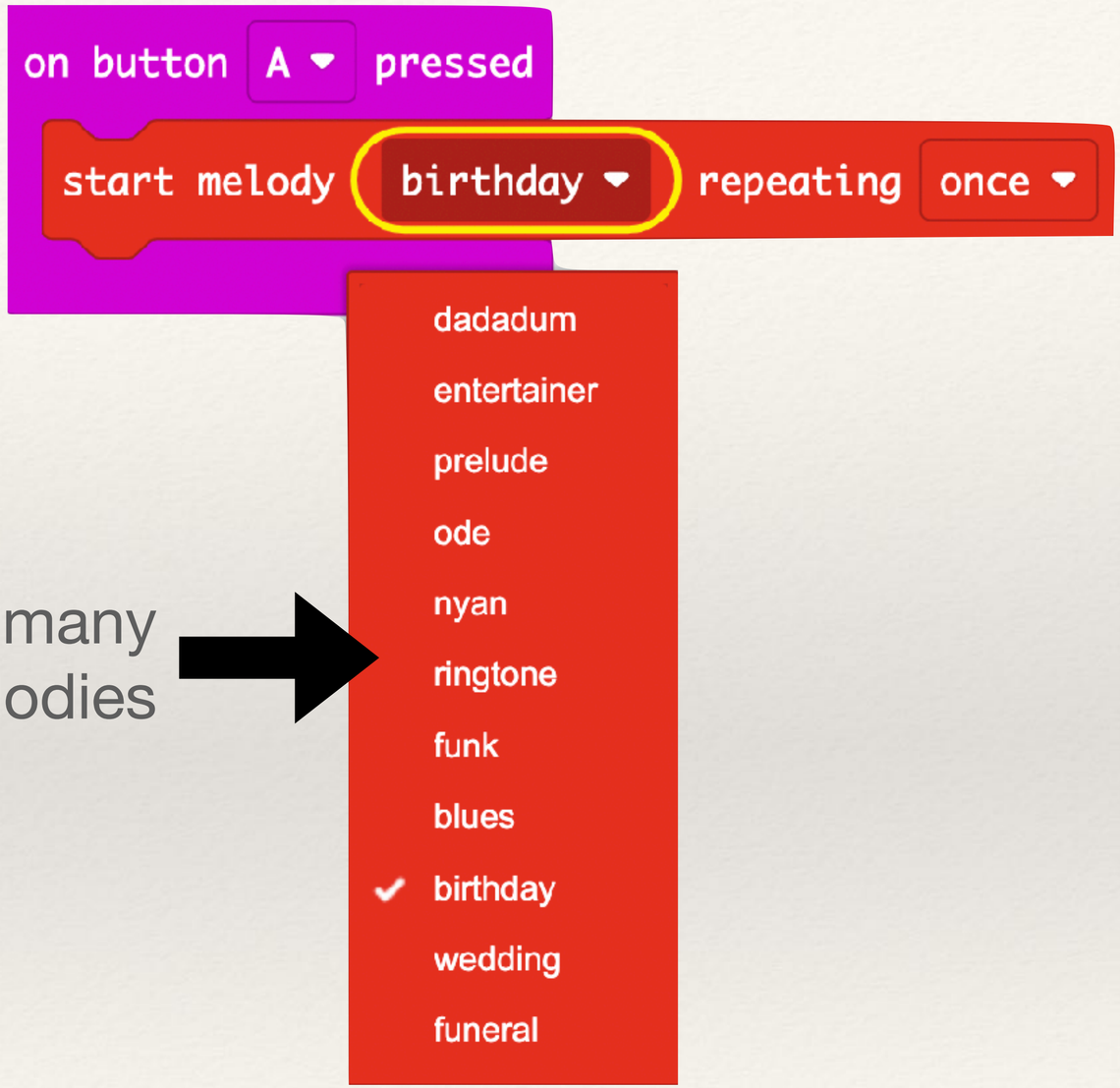
Play all the 7 Notes in the musical scale (Sa Re Ga Ma…)



Create Your Own Melody

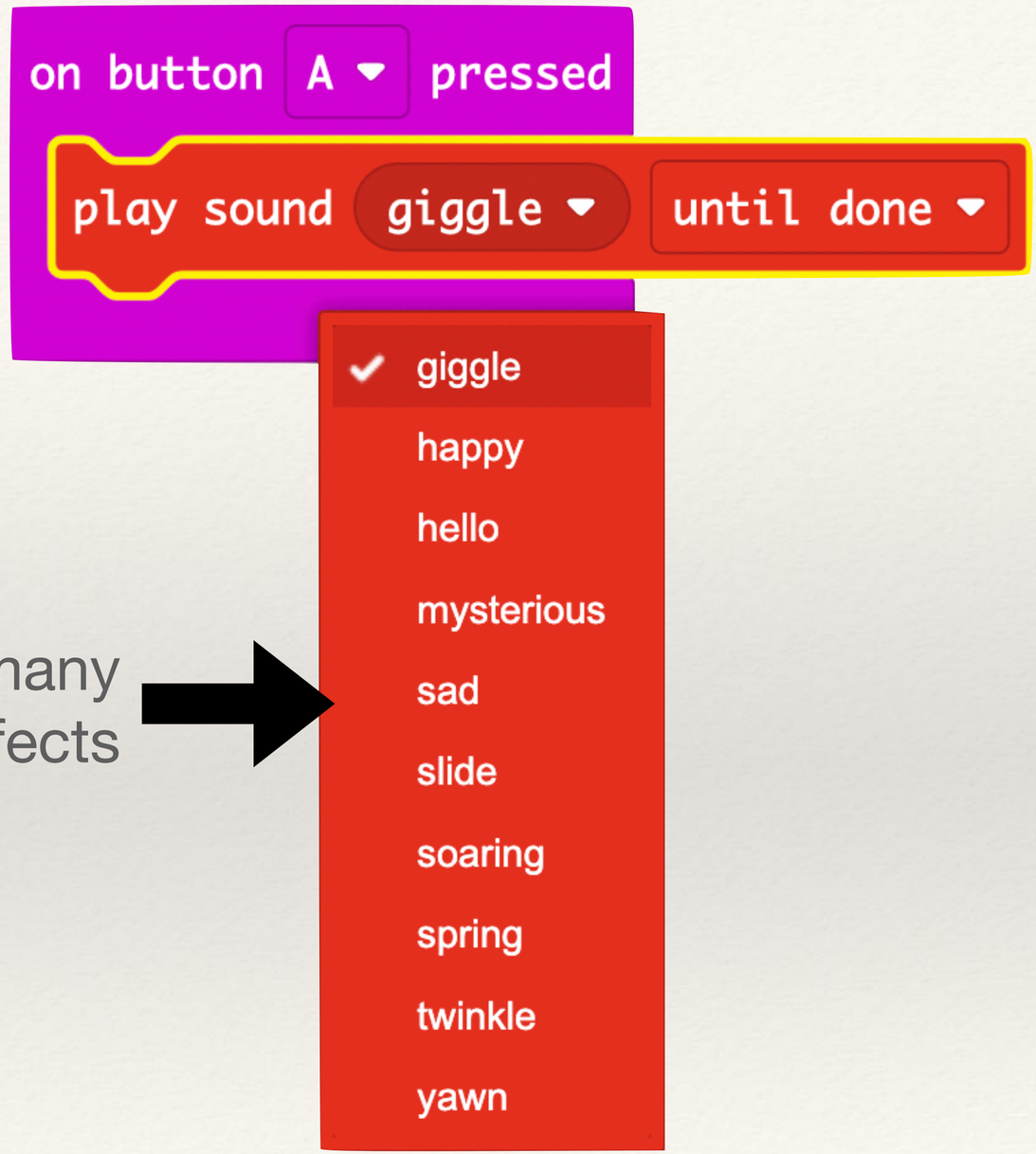


Play “Happy Birthday to You” Melody



Students can explore many more pre-made melodies

Play different Sound Effects



Students can explore many more pre-made sound effects

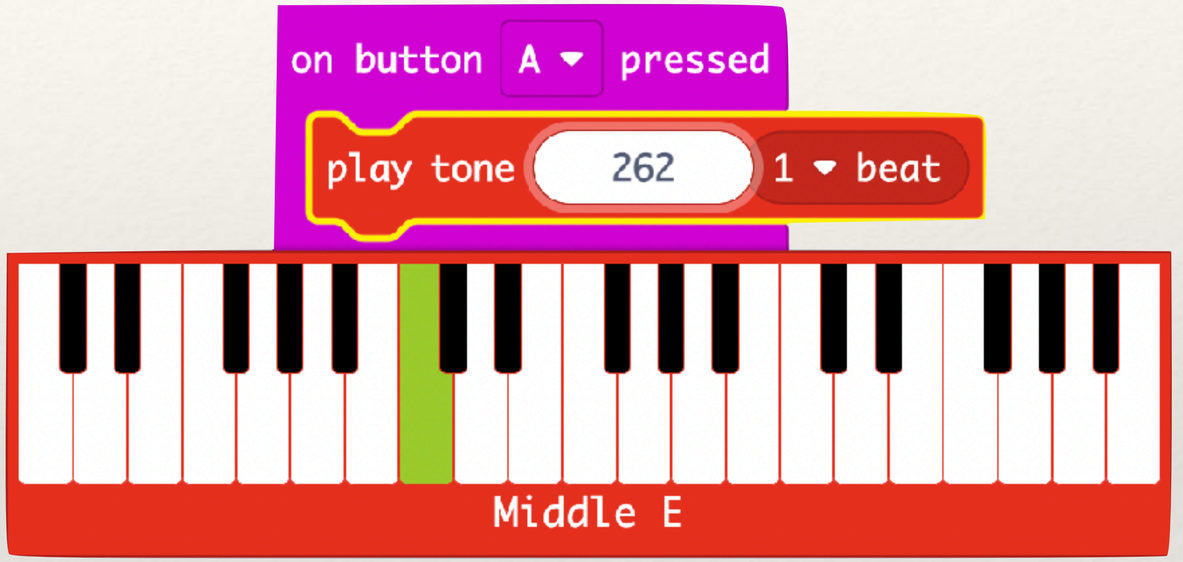
Write Own Melody for a Nursery Rhyme

Step-1: Search for “piano notes <name of nursery rhyme> on Google

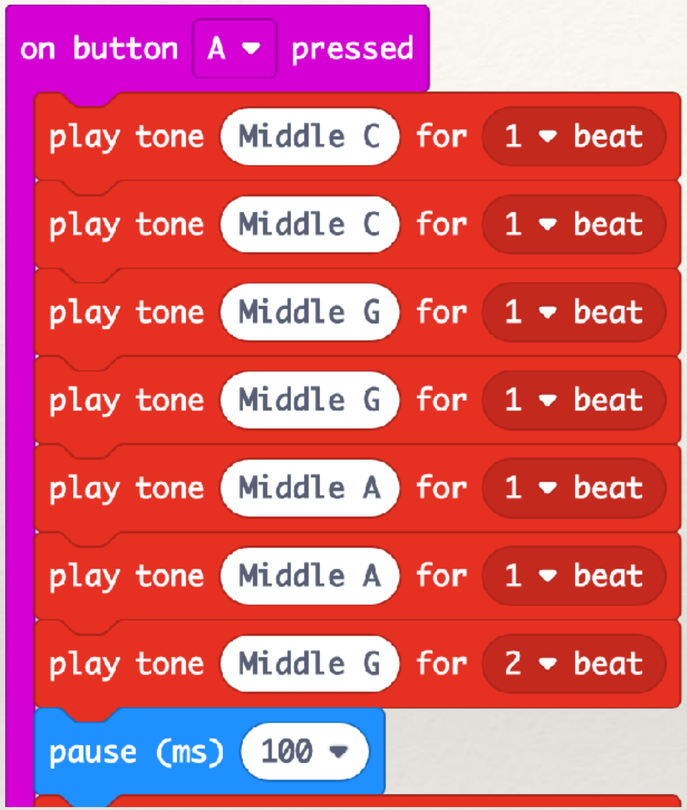
For example, “piano notes for ba ba black sheep” or “piano notes for Indian national anthem”

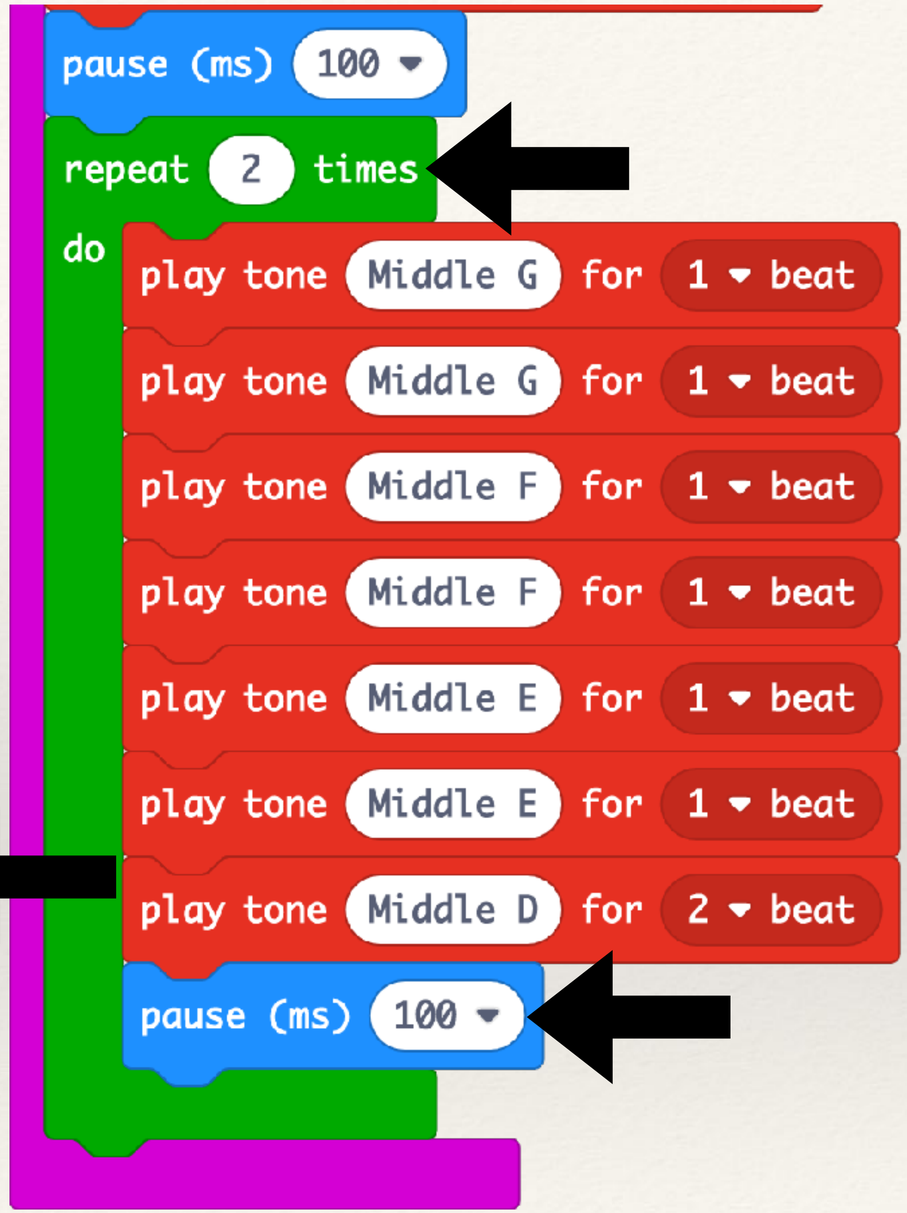
Step-2: Recreate the piano notes in MakeCode by using the ‘Play Tone’ programming block

You will need to use the ‘duplicate’ command to get all the notes



Notes for Twinkle Twinkle Little Star





Students will need to add pause, or change the beat to get the tune right. They can also use ‘Repeat’ loop for repeating notes.

Notes for Twinkle Twinkle Little Star with Music and Animation

Refer:

https://kalateetkaushal.in/courses/microbit-in-hindi/lesson/music-composition/

Get the Code:

https://kalateetkaushal.in/courses/microbit-in-hindi/lesson/music-composition-code/