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Supporting the Professiona Learning of School Leaders and Teachers

Leaving Certificate Computer Science

Introduction to Micro:bit

Introducing Oide

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Supporting the Professional Learning of School Leaders and Teachers

Lárionad Ceannaireachta Scoile
CSL
Centre for School Leadership

An tSraith Shóisearach do Mhúinteoirí
JuniorCYCLE for teachers

NIPT
An Clár Náisiúnta Ionduchtaithe do Mhúinteoirí
The National Induction Programme for Teachers

PDST
Professional Development Service for Teachers | An tSeirbhís um Fhorbairt Ghairmiúil do Mhúinteoirí

Workshop Overview

Session 1 10:00 - 11:30	Getting started GAA scoreboard activity
Tea/Coffee 11:30 – 12:00	
Session 2 12:00 - 13:30	Branching out – Sensors, PRIMM, Conditionals Temperature Sensor Activity
Lunch 13:30 - 14:30	
Session 3 14:30 - 16:30	Working with LEDs Traffic Light Activity

Purpose for the Day

To upskill Phase 5 teachers of LCCS in the use of the micro:bit.

To explore Computer Science as a discipline and the implications of its introduction to teaching and the classroom dynamic, including the importance of group work in LCCS.

Key Messages

There are many ways to use the LCCS specification.

Group work and group dynamics are a key feature in the teaching, learning and assessment of LCCS.

Effective pedagogies can enhance teaching and learning, however, the emphasis for this workshop is on skills development.

There are multiple ways to solve problems (some are more efficient than others).

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Session 1

Getting started with the micro:bit

What is a micro:bit?

Affordable pocket-sized coding device

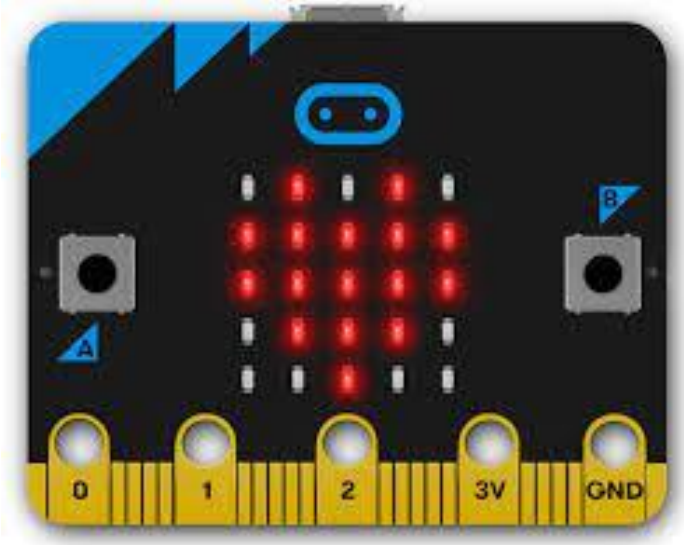
Developed by BBC & Microsoft

Microcontroller, LED display, sensors

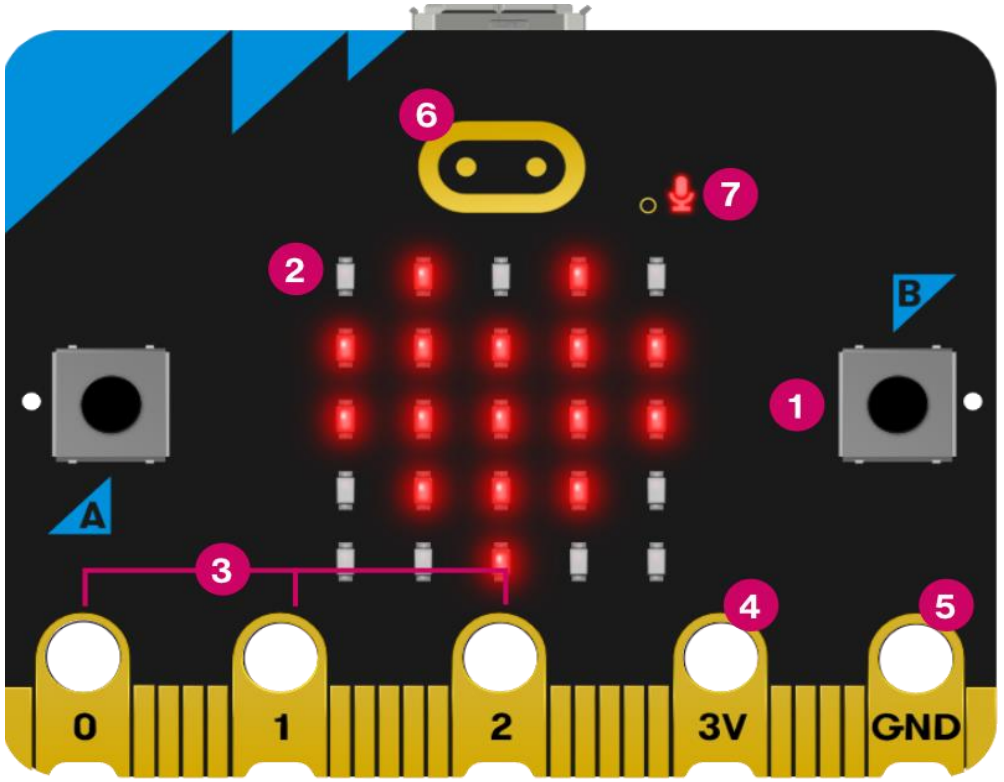
Ideal for beginners

Learn to program and experiment with hardware

Engaging and creative platform

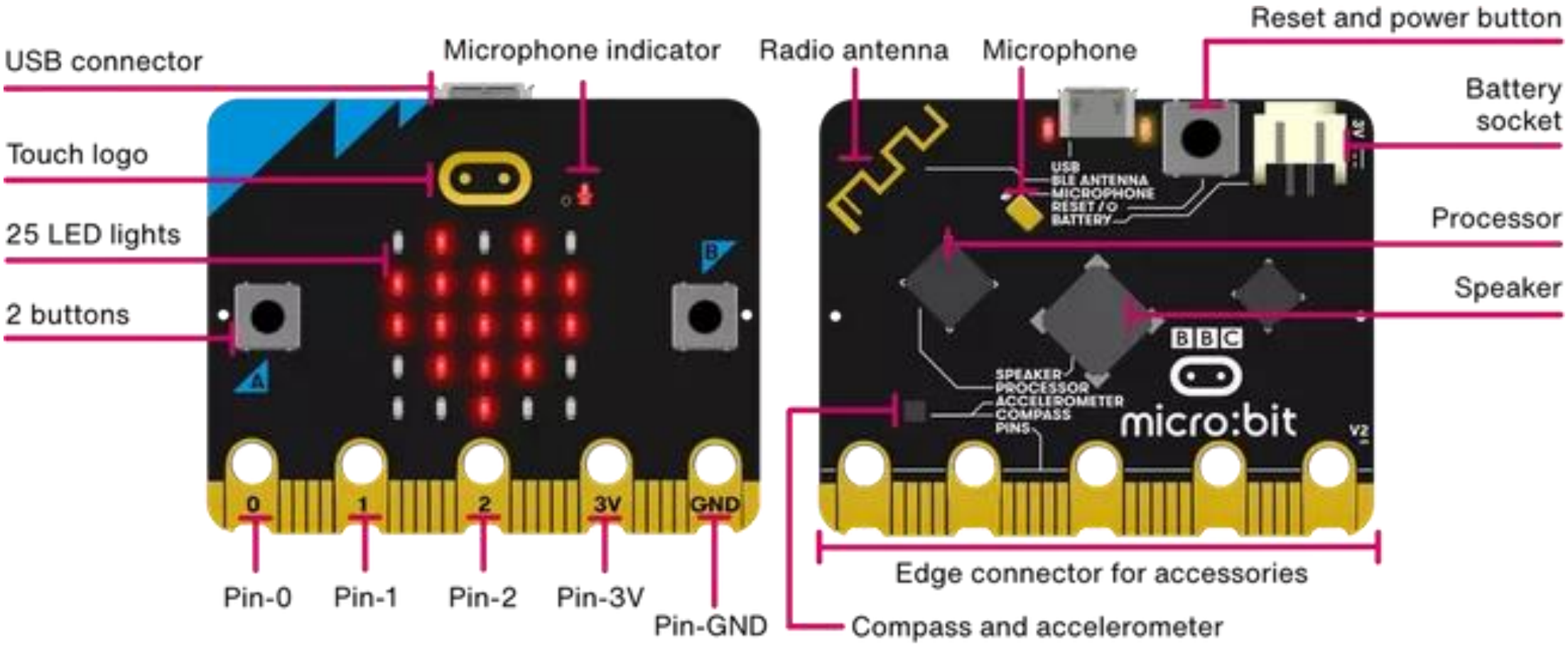


Overview of micro:bit



https://microbit.org/get-started/user-guide/overview/

Overview of micro:bit

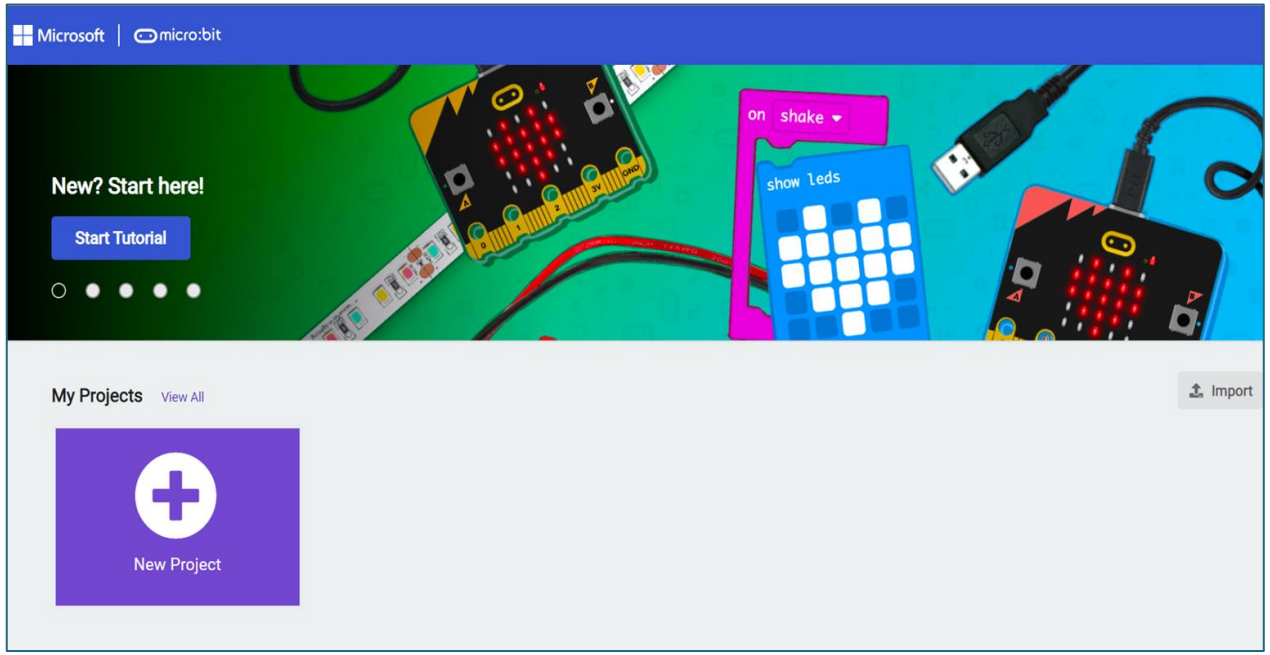


https://microbit.org/get-started/user-guide/overview/

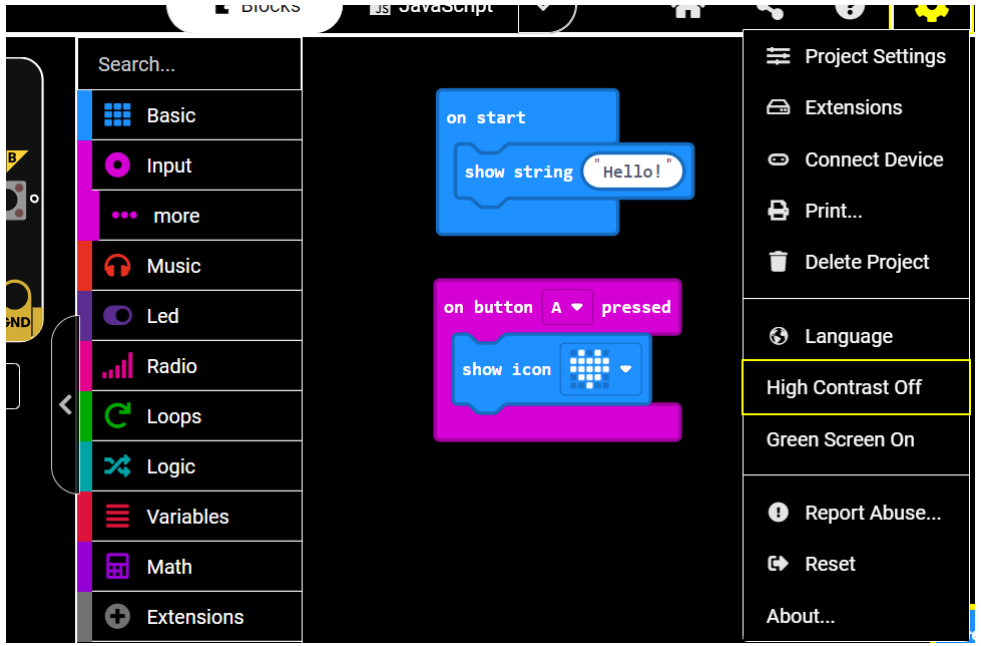
First steps with the micro:bit

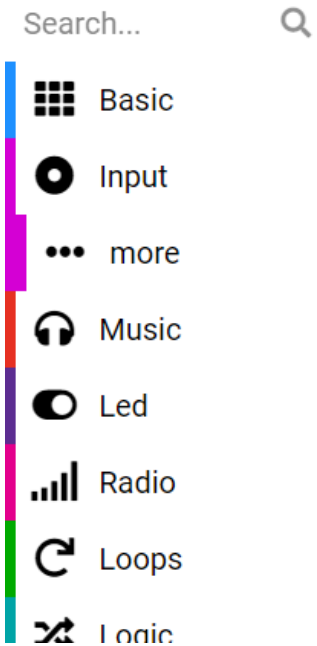
https://makecode.microbit.org/

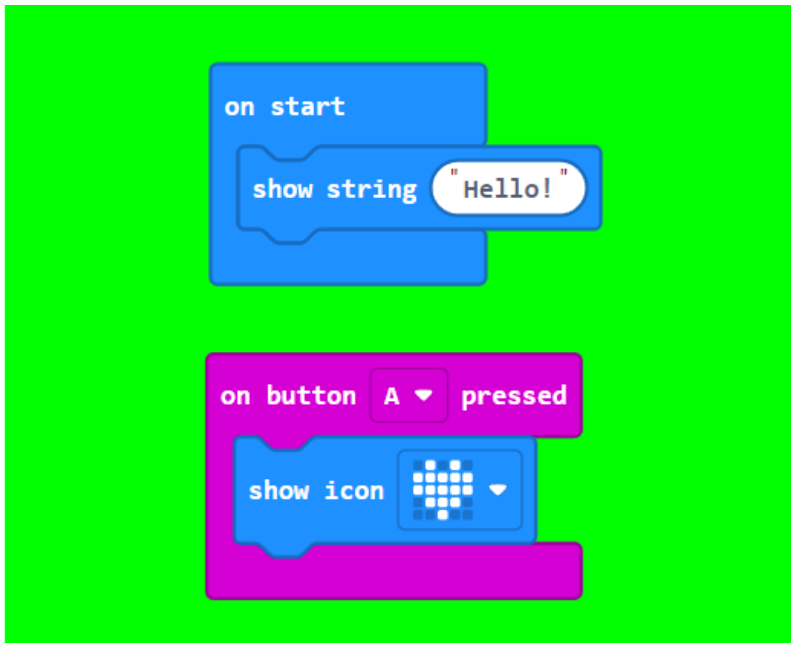
Click on “New Project”



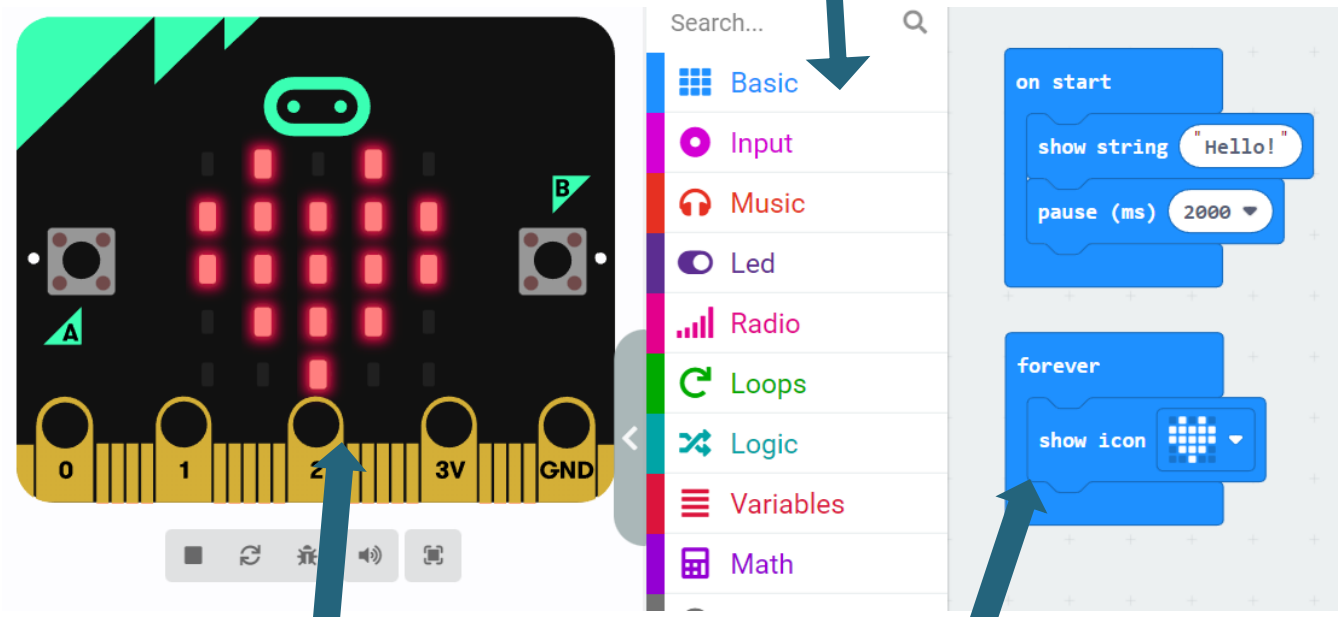
Background


Search...
Basic
Input
more
Music
Led
Radio
Loops
Logic
Variables
Math
Extensions
on start
show string "Hello!"
on button A pressed
show icon
Project Settings
Extensions
Connect Device
Print...
Delete Project
Language
High Contrast Off
Green Screen On
Report Abuse...
Reset
About...


Search...
Basic
Input
more
Music
Led
Radio
Loops
Logic


on start
show string "Hello!"
on button A pressed
show icon

To create your program, click on the menu in the middle and drag the blocks to the right-hand side.



Change the message on the micro:bit to something else…

Show a different image on the micro:bit…

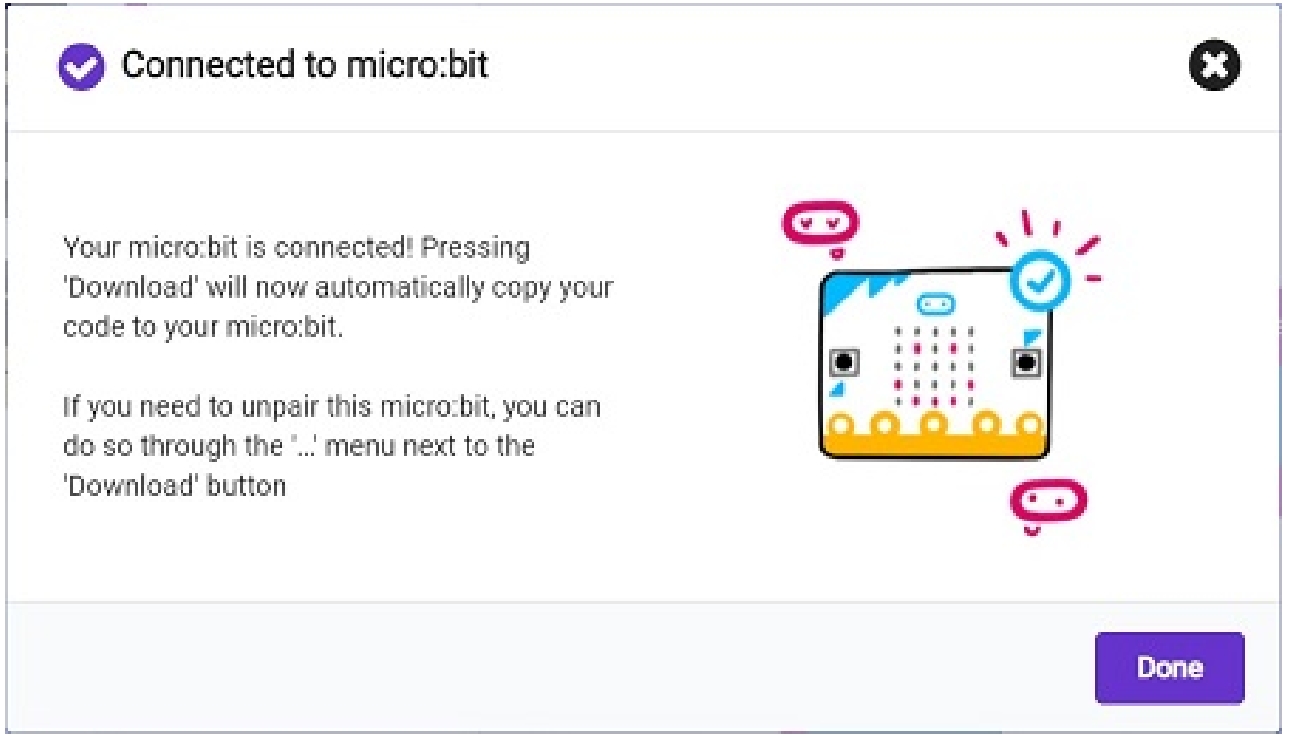
Click on the “virtual” micro:bit to see if your program works!

Drag the blocks in here, stick them together, and create your program!

Transfer your code onto the micro:bit

When your micro:bit is connected, you'll see the Connected to micro:bit message window. Click on Done and you're ready to go!

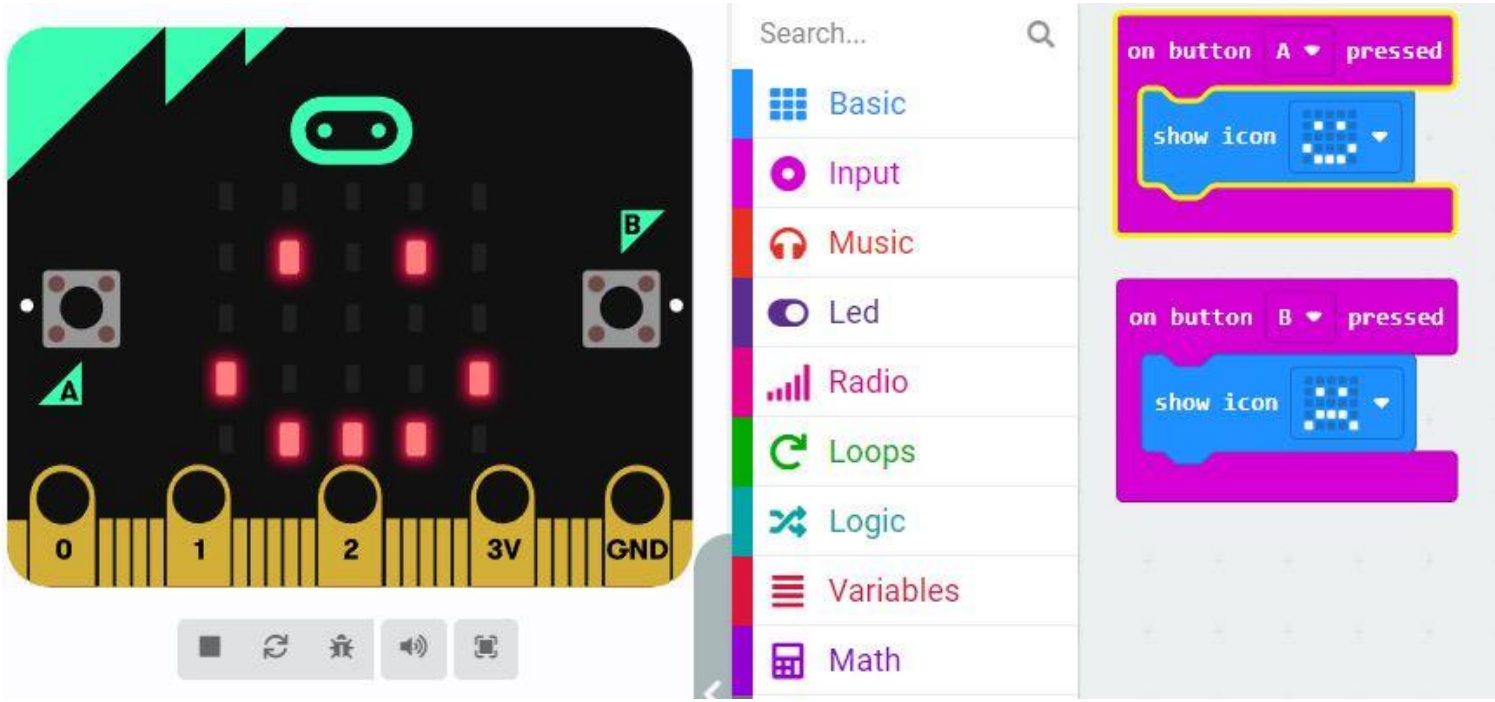
Can you download your program onto your micro:bit?



Events

When buttons A or B is pressed…

Modify your code so that when you press a button, a message will be displayed.



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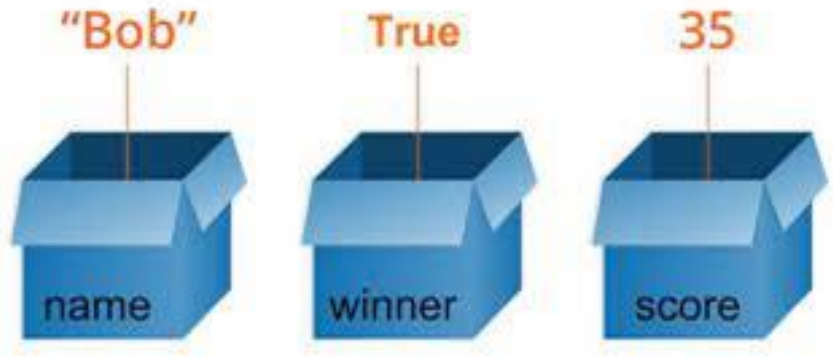
Introduction to Variables

GAA scoreboard activity

What is a variable?

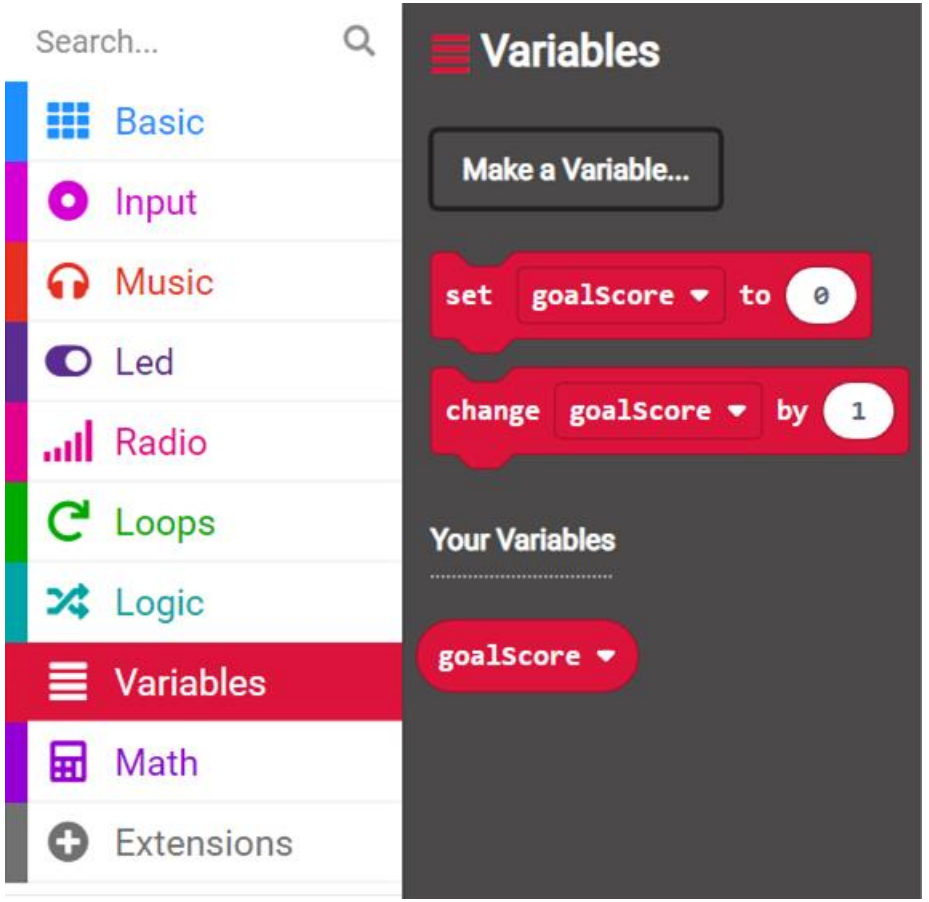
Variables are the names given to computer memory locations that are used to store values in a computer program.

Think of a variable as a container that can store information that is required for your program to run.



Creating a variable in makecode

Create two variables called “goalScore” and “pointScore”



Exercise #1 – Predict & Discuss

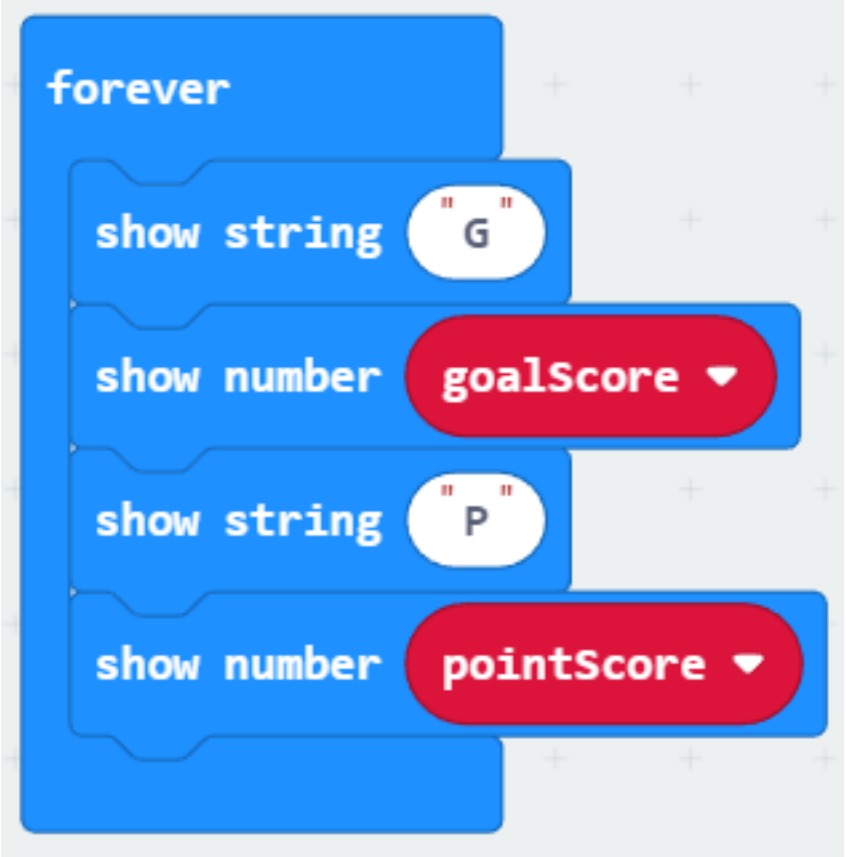
Exercise #2 – Recreate and Run

Create two Variables called **goalScore** and **pointScore**.

Recreate the code from exercise 1.

Run your code.

Does it run and does it do what you thought it would do?



Exercise #3 – Modify the code

Modify the code as follows:

when button A is pressed, **goalScore** is incremented by 1

when Button B is pressed, **pointScore** is incremented by 1

Exercise #4 – Extension

Add a feature which when button A + B is pressed, work out the **total number** of points (goals and points)

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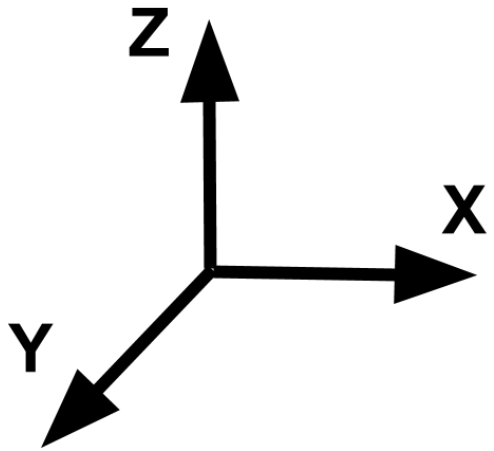
Session 2

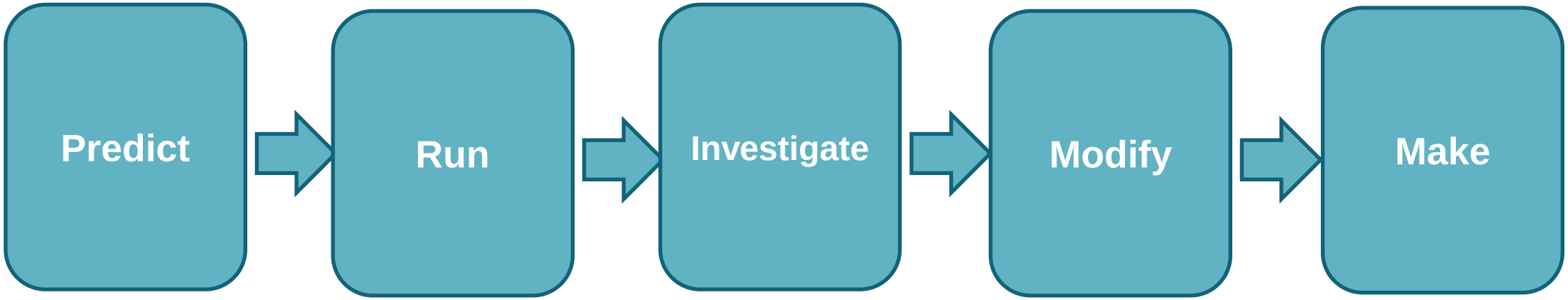
Branching out

Sensors

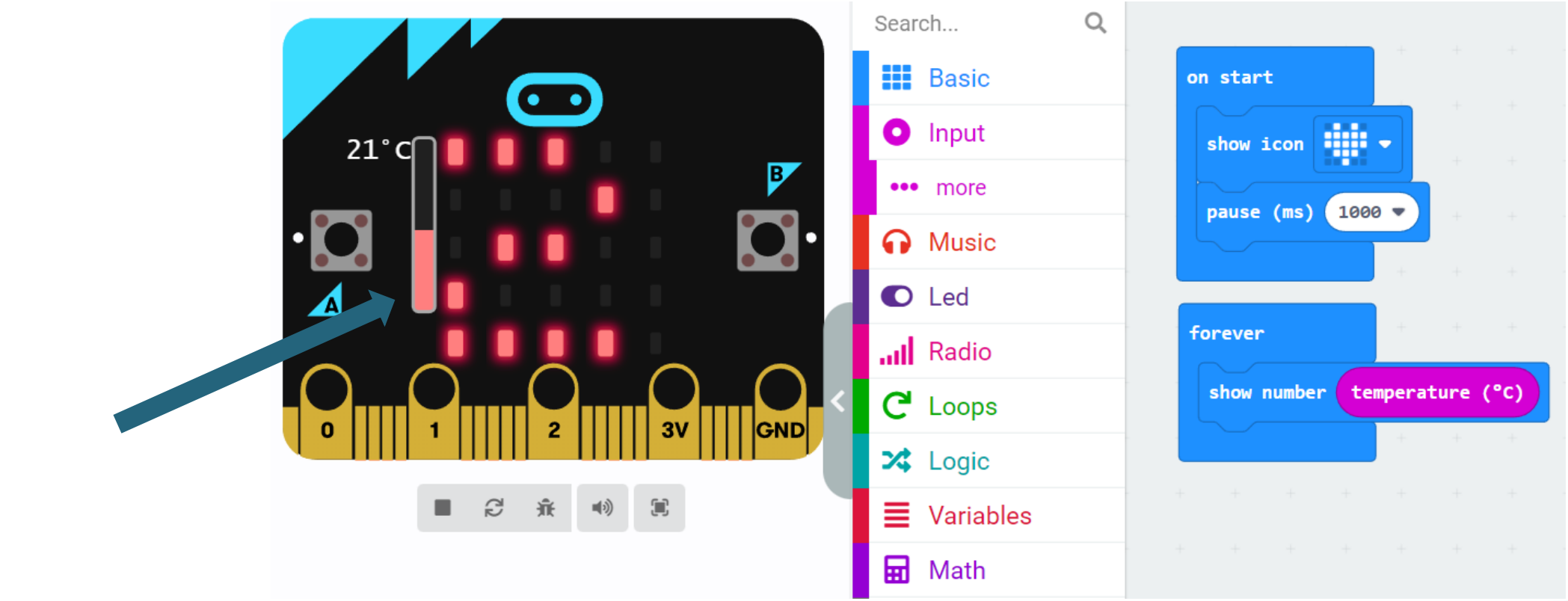
Today



PRIMM



Exercise 1 - Predict, Run, Investigate



Exercise 1 – Modify, Make

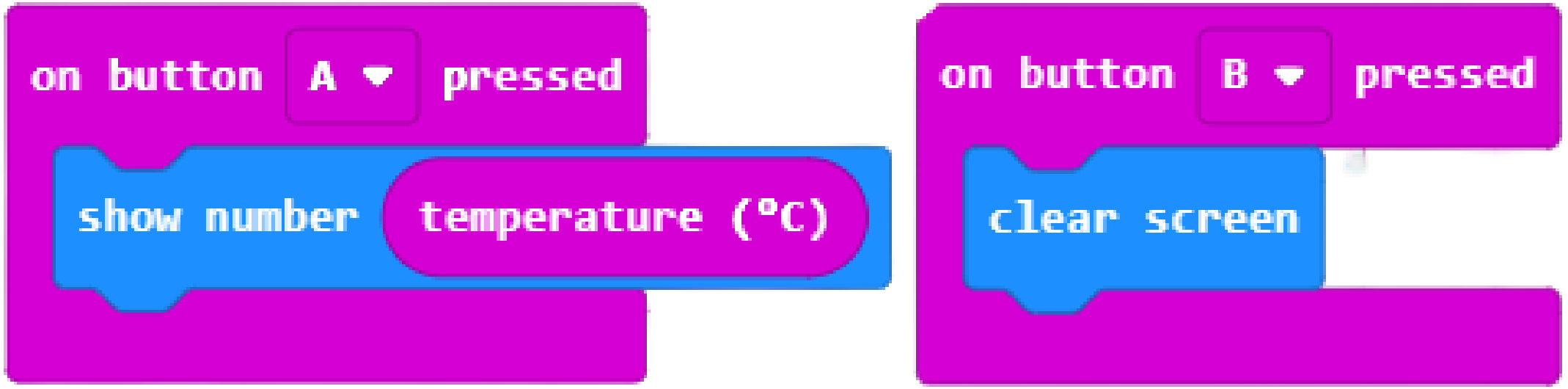
Modify your code so that

- the temperature is displayed when Button A is clicked
- the LED display area is cleared when Button B is clicked

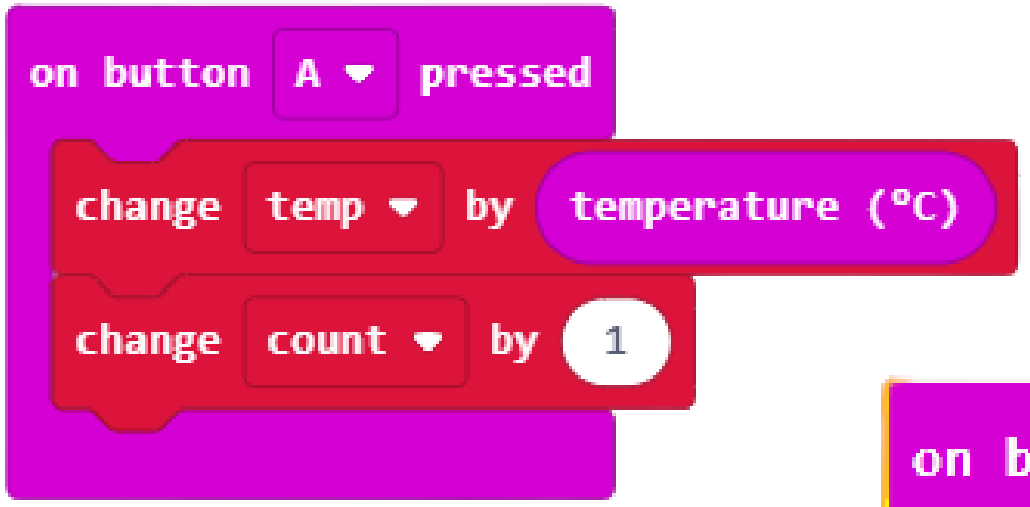
Extension task:

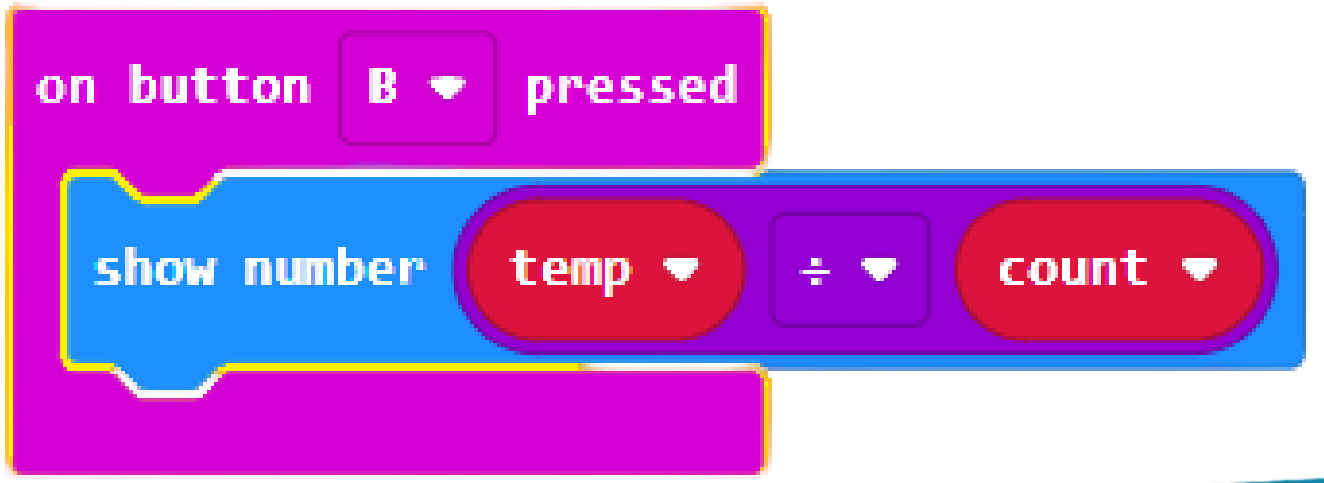
- Write code to work out the average temperature

Exercise 1 – Modify (sample solution)

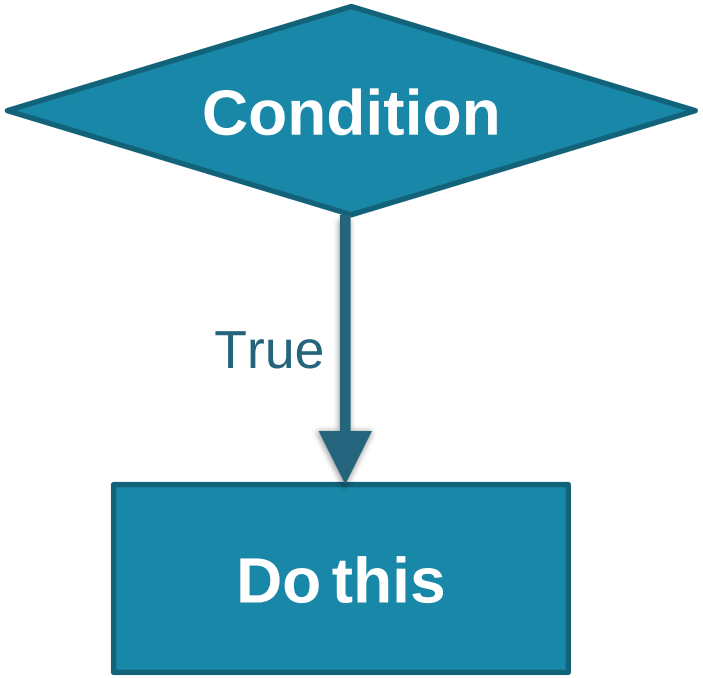


Exercise 1 – Make (sample solution)

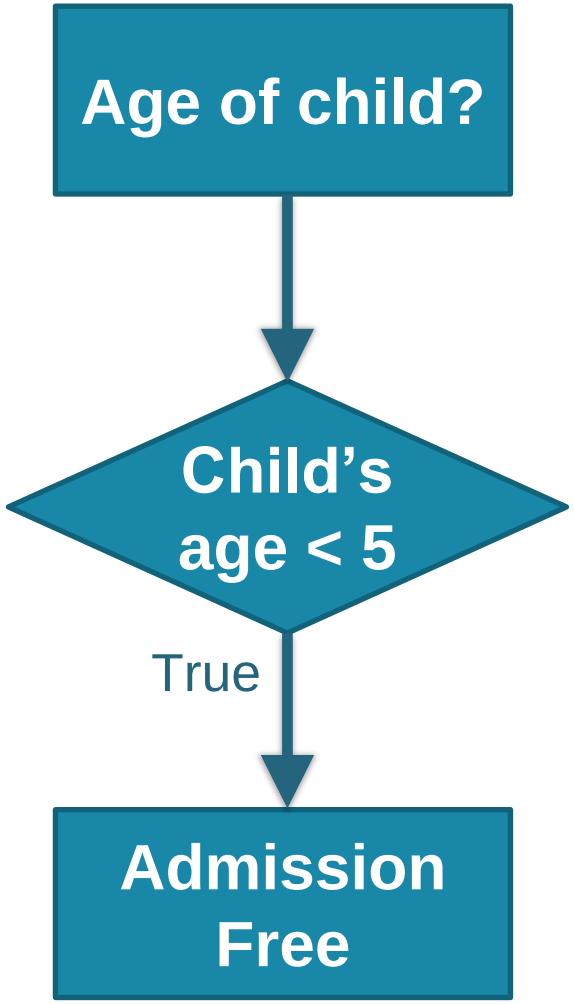


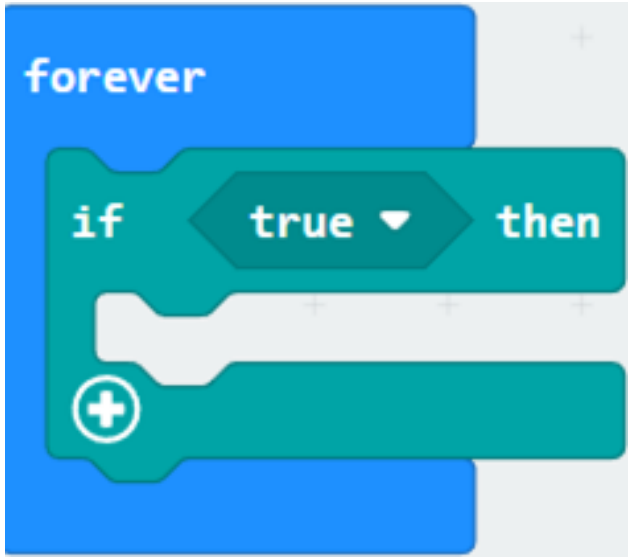


Conditional statements



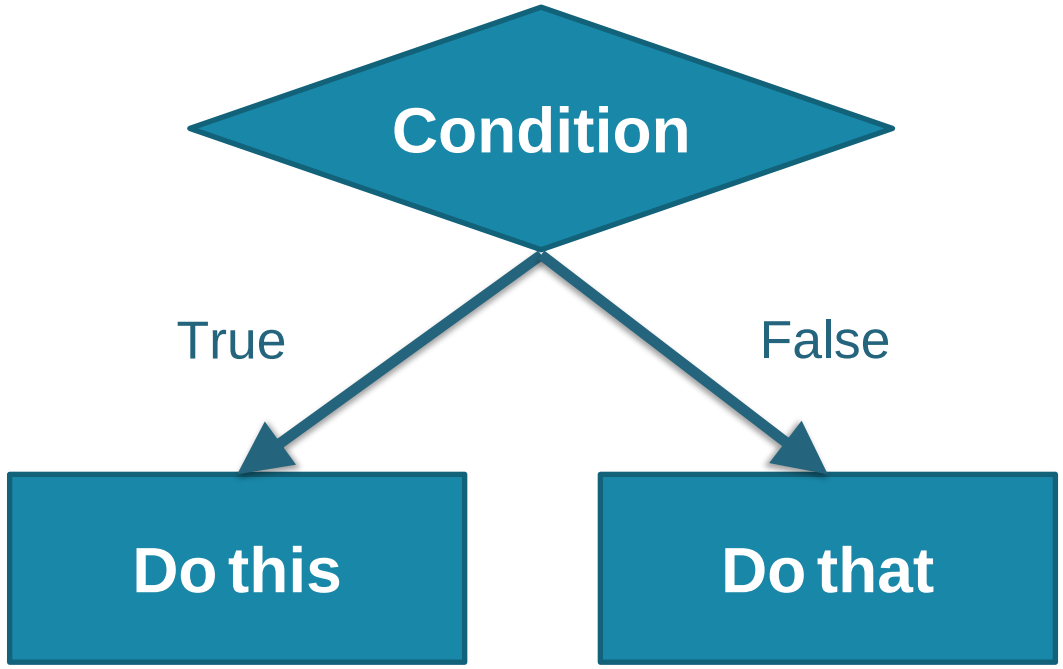
Conditional statements



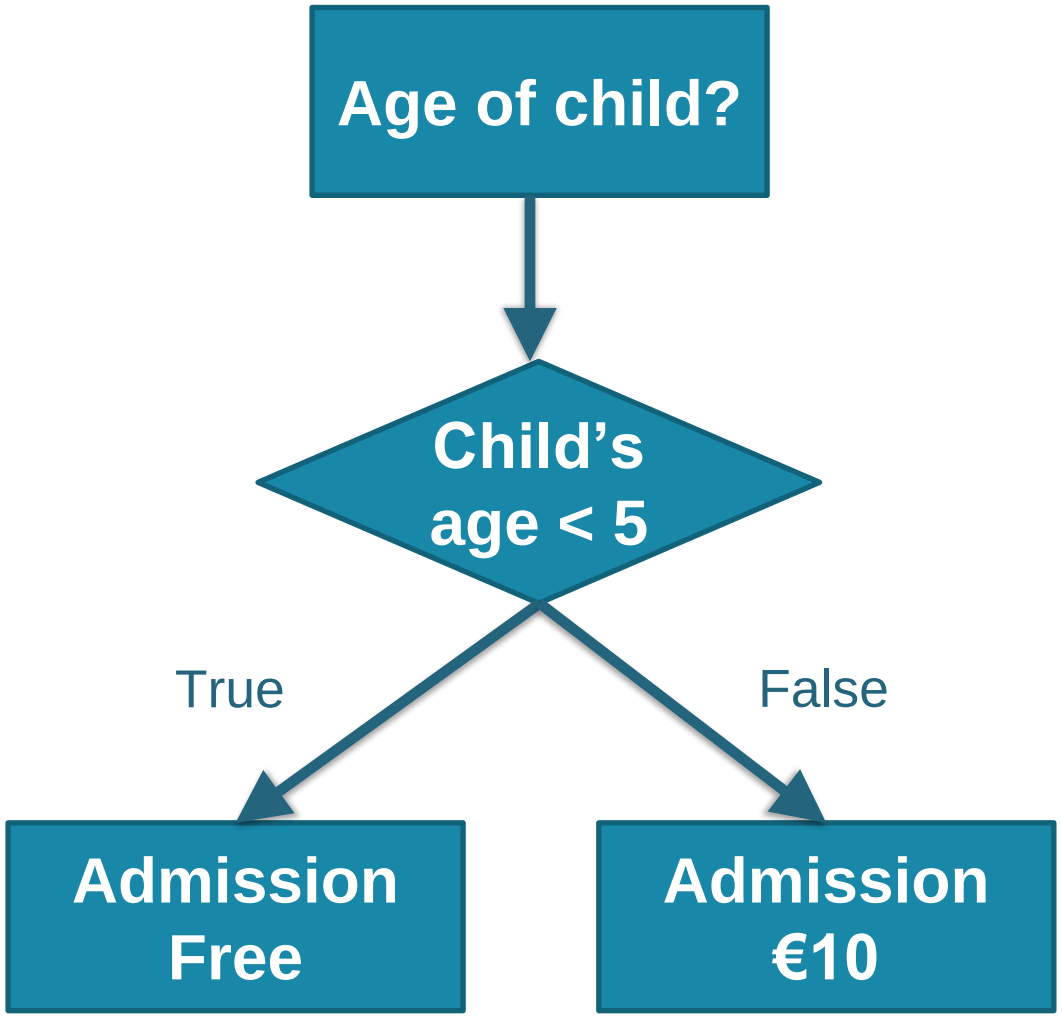


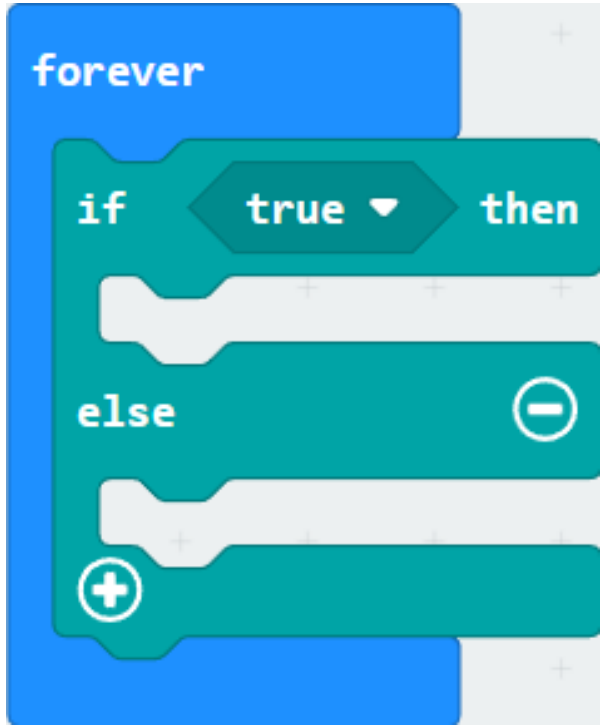
What block do you think the conditional block should sit inside?

Conditional statements



Conditional statements



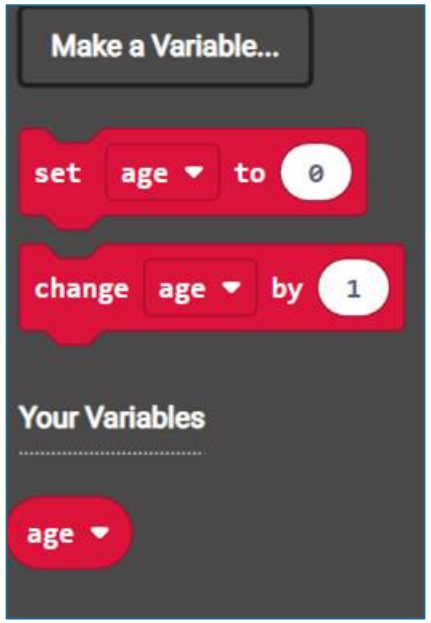


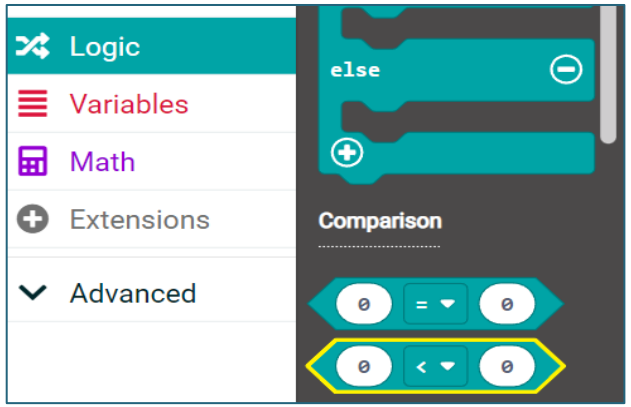
Challenge task

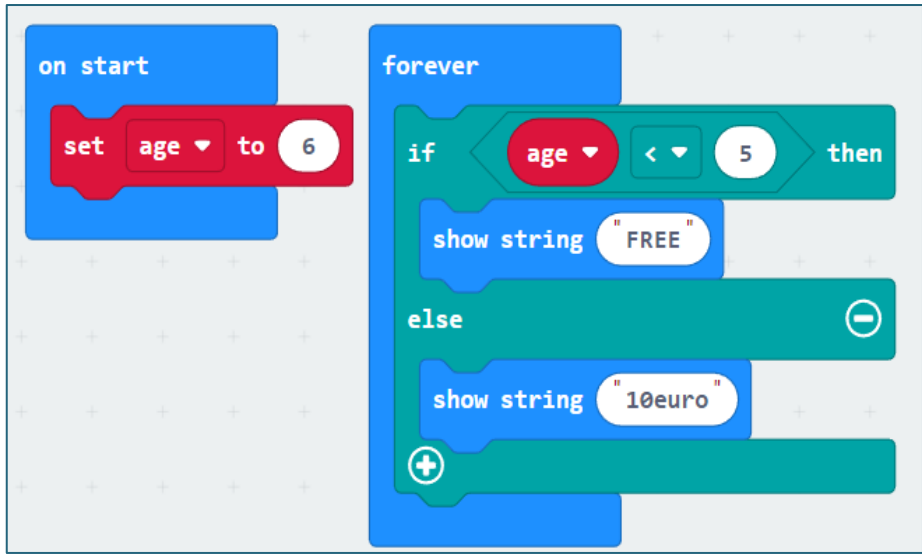
On start set age

If less than 5, display “F

Else, display “10euro”







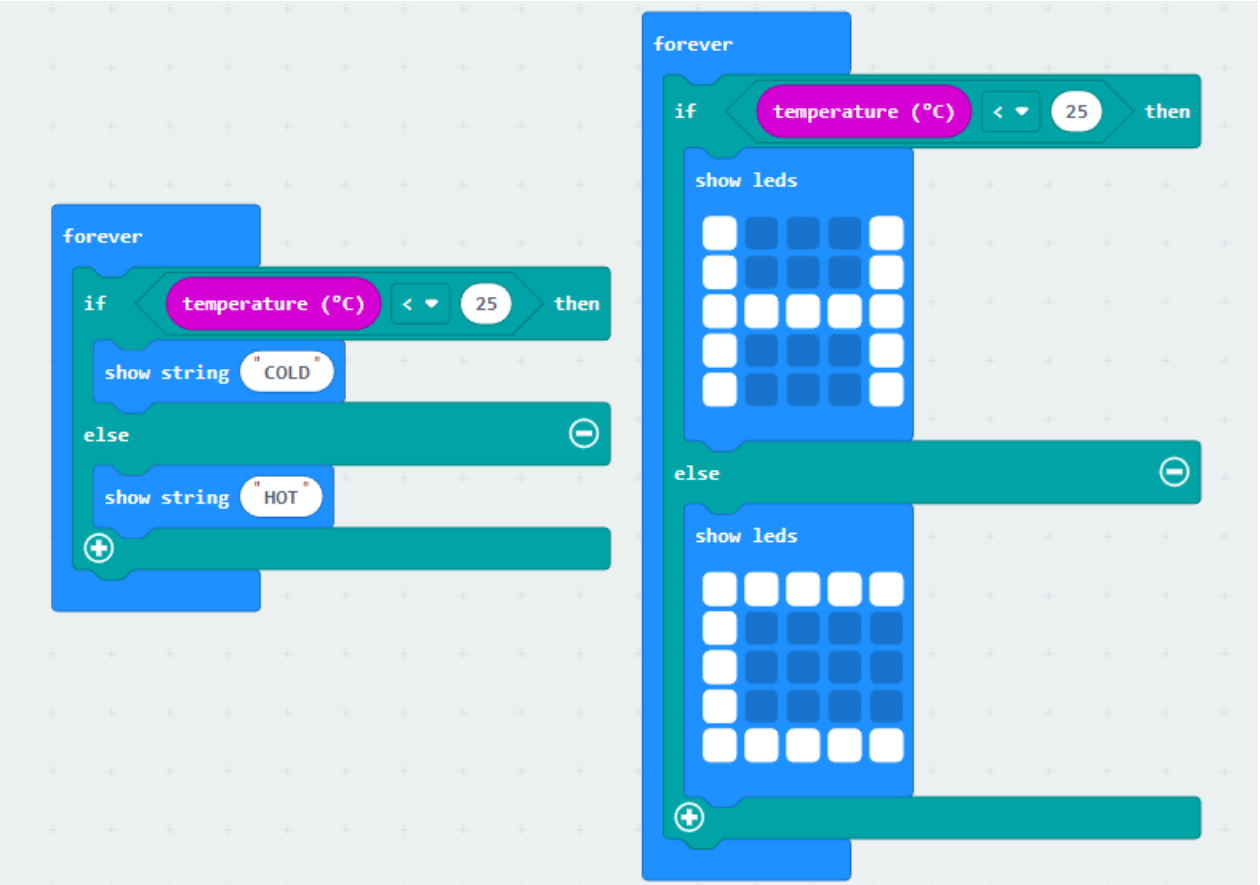
Extension: Can you set the age to be a random number?

Exercise 2

If the temperature is above a certain value

- micro:bit should indicate that the room is hot
- otherwise it should indicate that the room is cold

Exercise #2 – sample solution snippets



Feedback

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Session 3

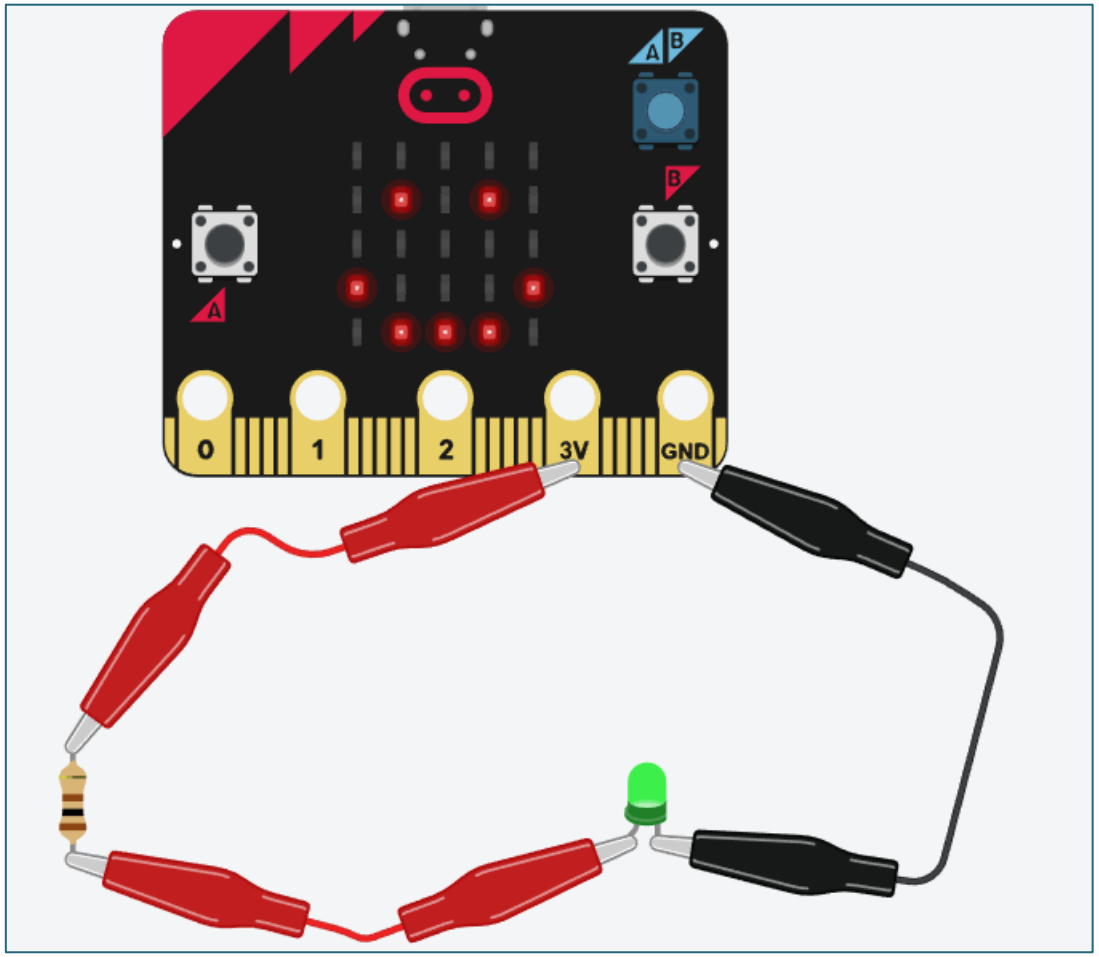
Traffic Lights

Building circuits with the micro:bit

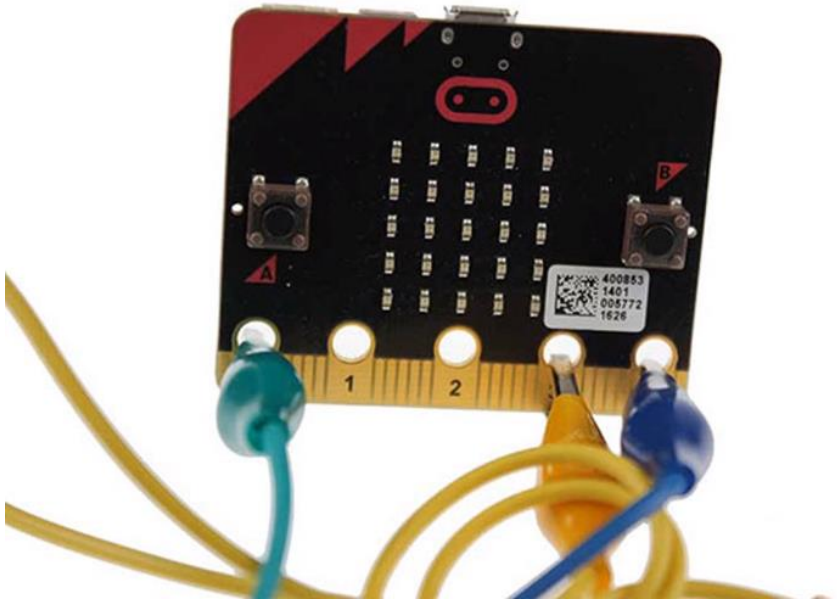
We will…

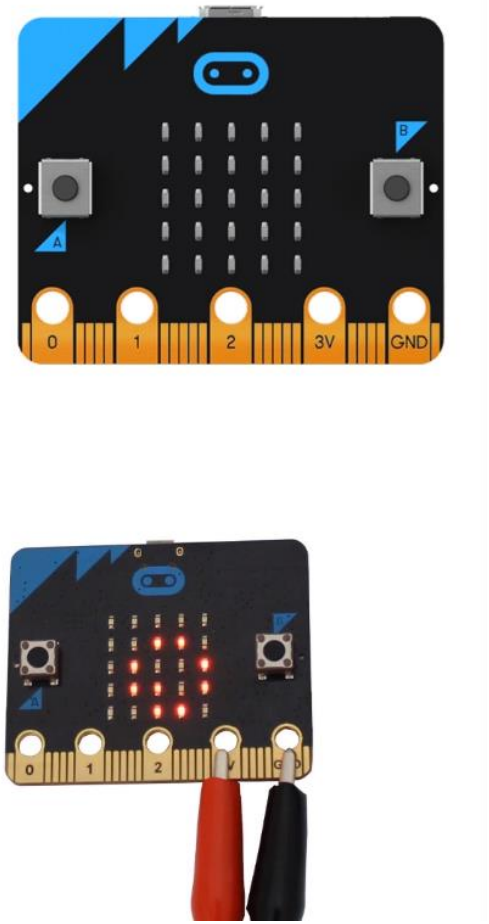
- Learn about simple circuits
- Learn how to control digital outputs on the micro:bit
- Learn how to wire up the digital outputs on the micro:bit

Connecting an LED



Connecting crocodile clips

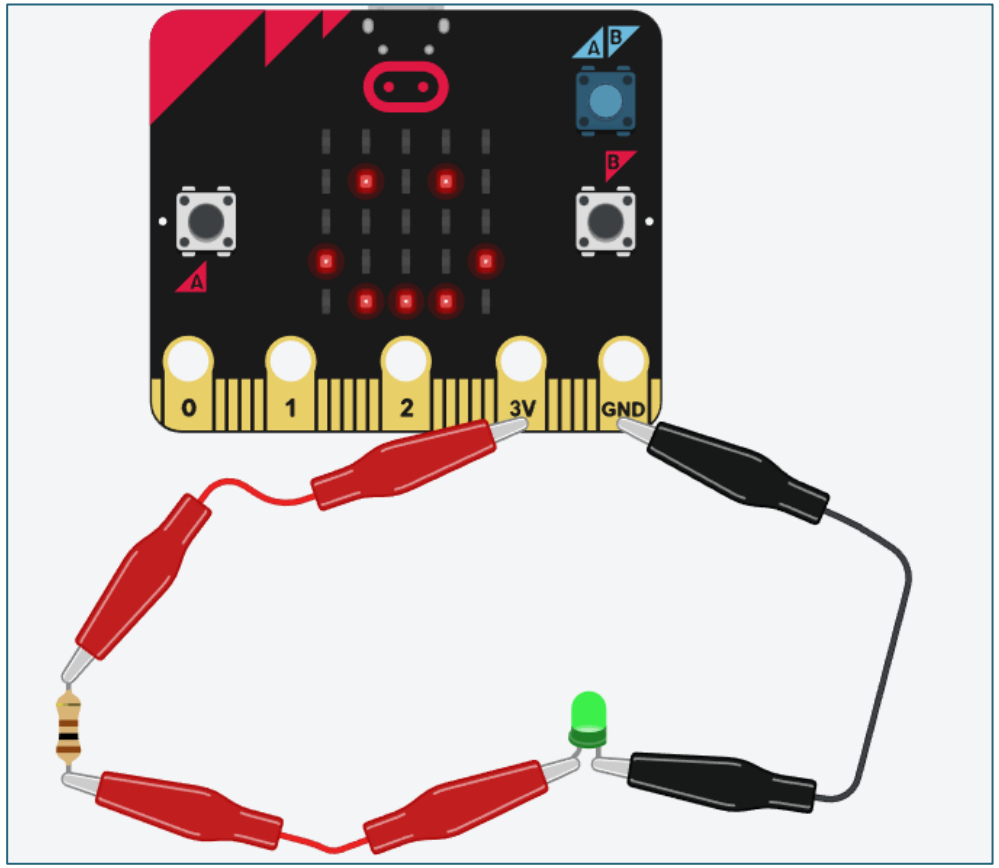




Build your circuit

You will need

- Micro:bit
- Crocodile clips
- LED
- Resistor

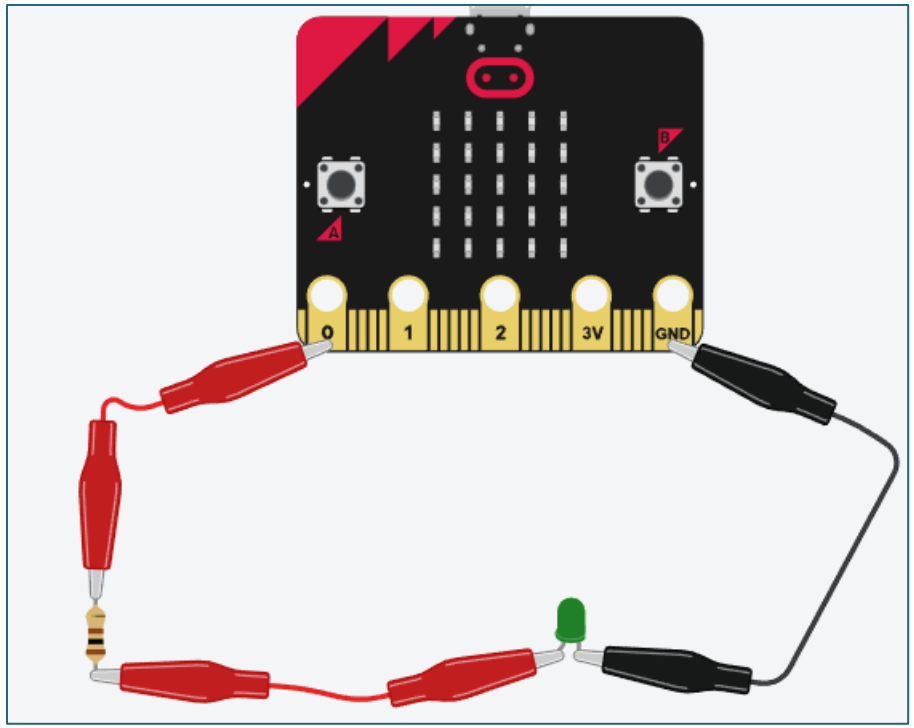


How can we turn the LED on and off?

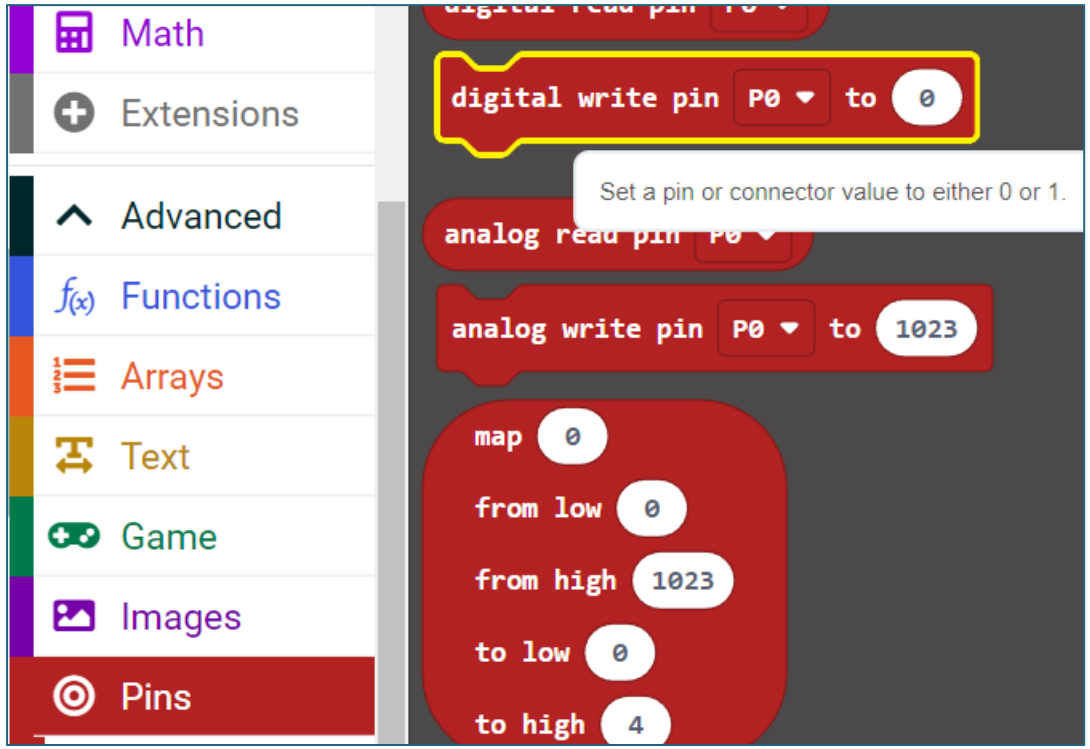
How can we CONTROL the LED?

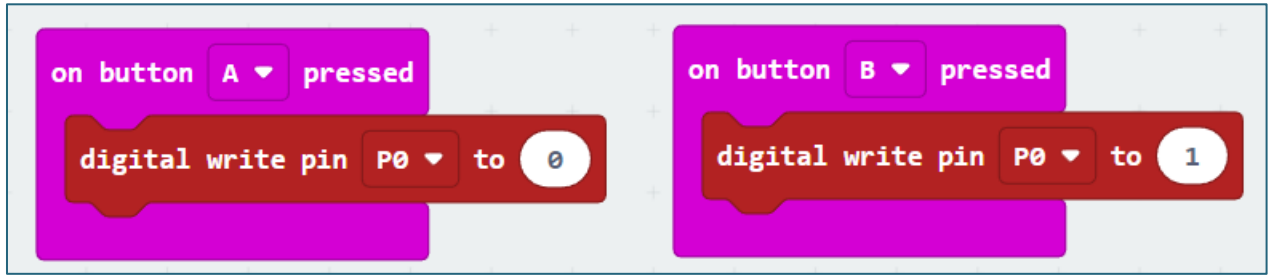
Controlling an LED

General Purpose Input Output (GPIO) pins
0, 1, 2



Write a program to control the LED





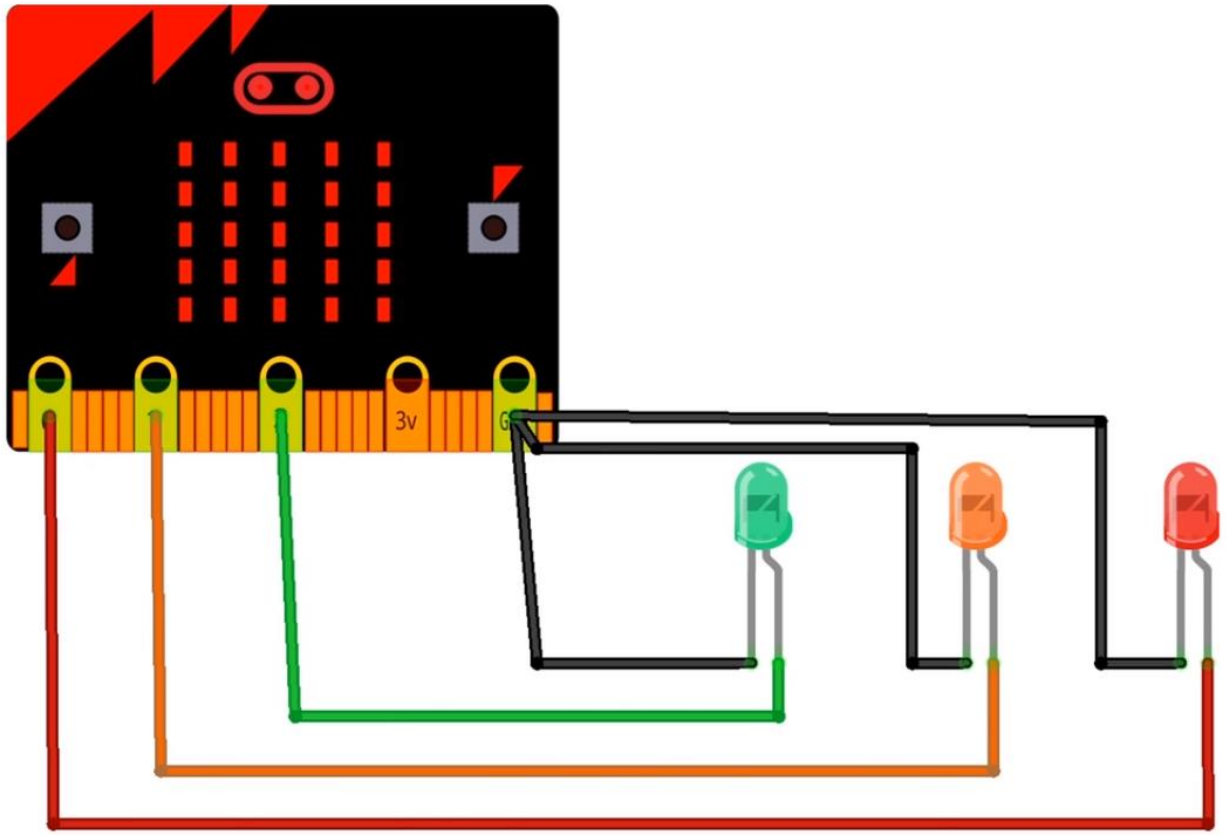
Traffic lights problem

How do the traffic lights at a pedestrian crossing work?

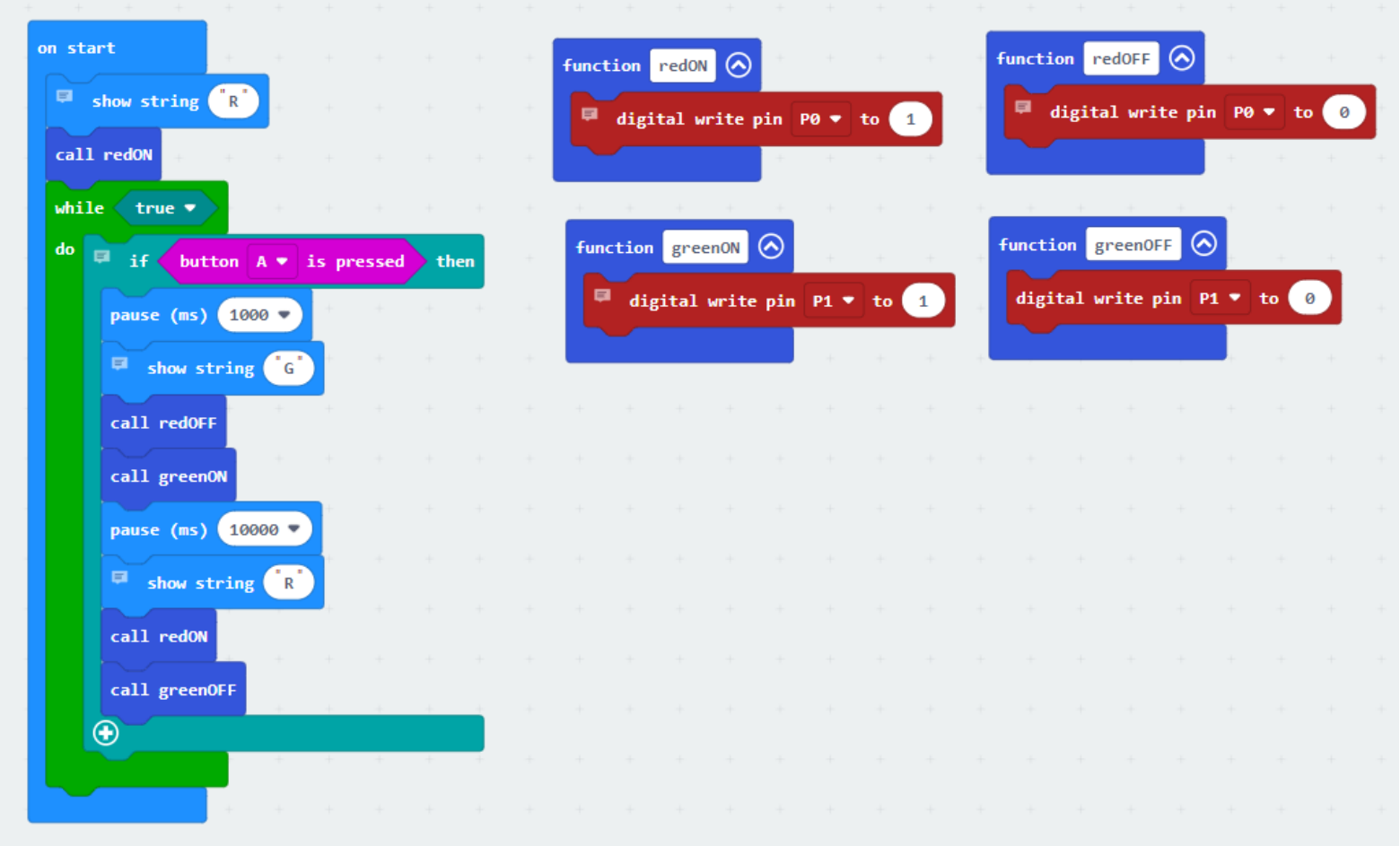
Explain the steps one by one

Any issues that might arise?

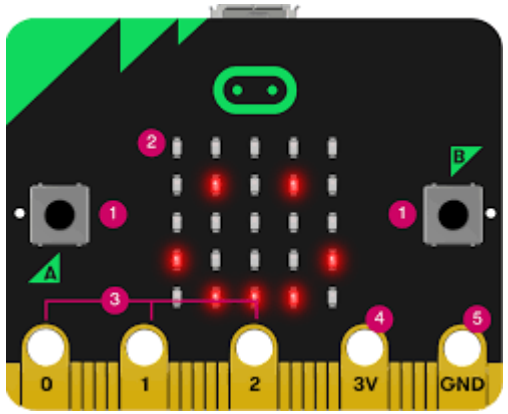
Traffic Lights



Suggested solution



Micro:bit kits



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Department of Education