Lesson 1 - Getting to know the micro:bit
As an introduction, explain what the micro:bit is and why it was invented. Perhaps introduce the Internet of Things as a wider context. **Safety first !** Read the safety advice in the teacher's background information. For lesson 1, keep your explanation of the micro:bit simple. The children only need to know how to take care of the micro:bit, about the two buttons (A and B), the 5 x 5 LED display and how to use the **MakeCode editor**. Allowing children to learn by experimenting or 'playing' is a very effective way of enabling them to understand the micro:bit and what it is capable of. Have a good play yourself and use the links below to find out more. Meet micro:bit (micro:bit website) - https://microbit.org/guide/ Micro:bit resources for teachers - https://microbit.org/teach/ Click here for the Quick Start guide
Learning objectives - the children will
- know what a micro:bit is and why it was invented   - learn how to use the MakeCode editor   - be able to test code using the simulator
Resources
The resources are referenced with Lesson (L), Activity (A) and Resource (R). One micro:bit between two children. The MakeCode editor displayed on a screen (https://makecode.microbit.org/) A PC laptop, desktop or chromebook with internet access for each pair of children. Micro:bit worksheet and pencil, one per child (click this link). Duck Duck Go script (L1A3R1) as a printout or via the website displayed on a screen.
Prior learning
No prior learning is required, but it does help if the children are already familiar with a block coding environment such as Scratch.
Introduction
Hand out the micro:bits explaining that they are delicate electronic devices and need to be handled with care. Use this link to show the children a short video to introduce the micro:bit. https://youtu.be/oNLf6aFYVoU Explain that the micro:bit is a credit card sized computer that was created to help children to learn to program and to design and create physical computing projects such as the control systems found on the internet of things. Take them through the layout of the micro:bit and explain that it is a single circuit board. To keep it small it does not have a keyboard and screen so we use a separate computer to write the code and in the next lesson they will learn how to download code to the micro:bit once it has been tested and debugged using a

simulator.

Teach the children where to find the following and explain their functions.
- Button A - a push button to act as a **digital input**.
- Button B - a push button to act as a **digital input**.
- The 5 x 5 LED display - this is used to **output** information to the user.

Activity 1

On the microbit worksheet, ask the children to add their name then identify and label the parts of the micro:bit as explained in the introduction (***Button A, Button B, 5x5 LED display***).

Activity 2

Ask the children to use Google to search for **makecode**.
Then click on the link to **Microsoft Makecode for micro:bit**.

When they access the Makecode website, tell the children to click on the big purple **New Project** button.

When the editor loads, explain that it is good practice to give each new project a name that will remind them what it is designed to do. They could name this, their first project, *'project1'*.

Explain that they are using a **block editor** (similar to Scratch) and that code is created by dragging blocks of code from the colour coded pallets in the centre of the editor screen. The blocks are clicked together to create a program script. Dragging and dropping scripts back onto the palettes will recycle them.

Show the children how scripts can be tested using the **simulator**. This is a good example of computer aided design and testing.

Allow the children at least ten minutes or more to explore the MakeCode interface.

Suggest some simple experiments that the children might try such as:
- display their name as a **string** of text when button A is pressed
- show a picture of a smiley face when button B is pressed
- get the LEDs to display a flashing heart forever
- create a little animation
- make the display count from 1 to 5

Adventurous children will quickly explore and master other features of the micro:bit. The more time you can give them to do so the better. Some will want to try all of the different types of blocks, including **Advanced**. Use those children with a quick grasp of the editor as helpers to show less confident children what to do.

Activity 3

Hacking a script

Project the **Duck Duck Go** script for Activity 3 on the screen (L1A3R1).

Ask the children to read the script and explain what they think it will do (code reading is an important skill for the programmer).

Instruct the children to recreate the script and then click on the green arrow button (Start the simulator), under the simulator, to run their script.

Set them the task of **hacking** the script to repurpose it so that it does something different or use some of the ideas in the script to make something of their own.
Explain that there is nothing at all wrong with hacking so long as you have the permission of the original author of the code, hacking is a perfectly legitimate activity commonly carried out by programmers.

Key concepts in the DuckDuckGo script are:
- the script automatically runs when the micro:bit is switched on
- a **repeat** script is used to display the duck then the square icon 2 times with a 1 second pause in between each image
- the **text string** 'Go' is displayed

Some hacks you could suggest for the children to experiment with:
- change the number of repeats
- add more icons to the repeat loop to make a longer animation
- change the icons to something different
- change the text string displayed at the end
- Change the pause time to make it longer or shorter.

Assessment

As this is a short awareness raising course and the children are just beginning their adventures with the micro:bit my advice is not to be too focussed on assessment. The lessons are aimed to teach skills and if the children can complete the activities they have succeeded. So lesson by lesson, base your assessment on the outcome of the children's activities.

There is a summative assessment task which can be used for more formal assessment purposes.

Summary

Tell the children that they now know what a micro:bit is, why it was created and how to use it to code, test simple code and debug code. In the lesson 2 you will learn how to create a simple application and run it on the actual micro:bit.
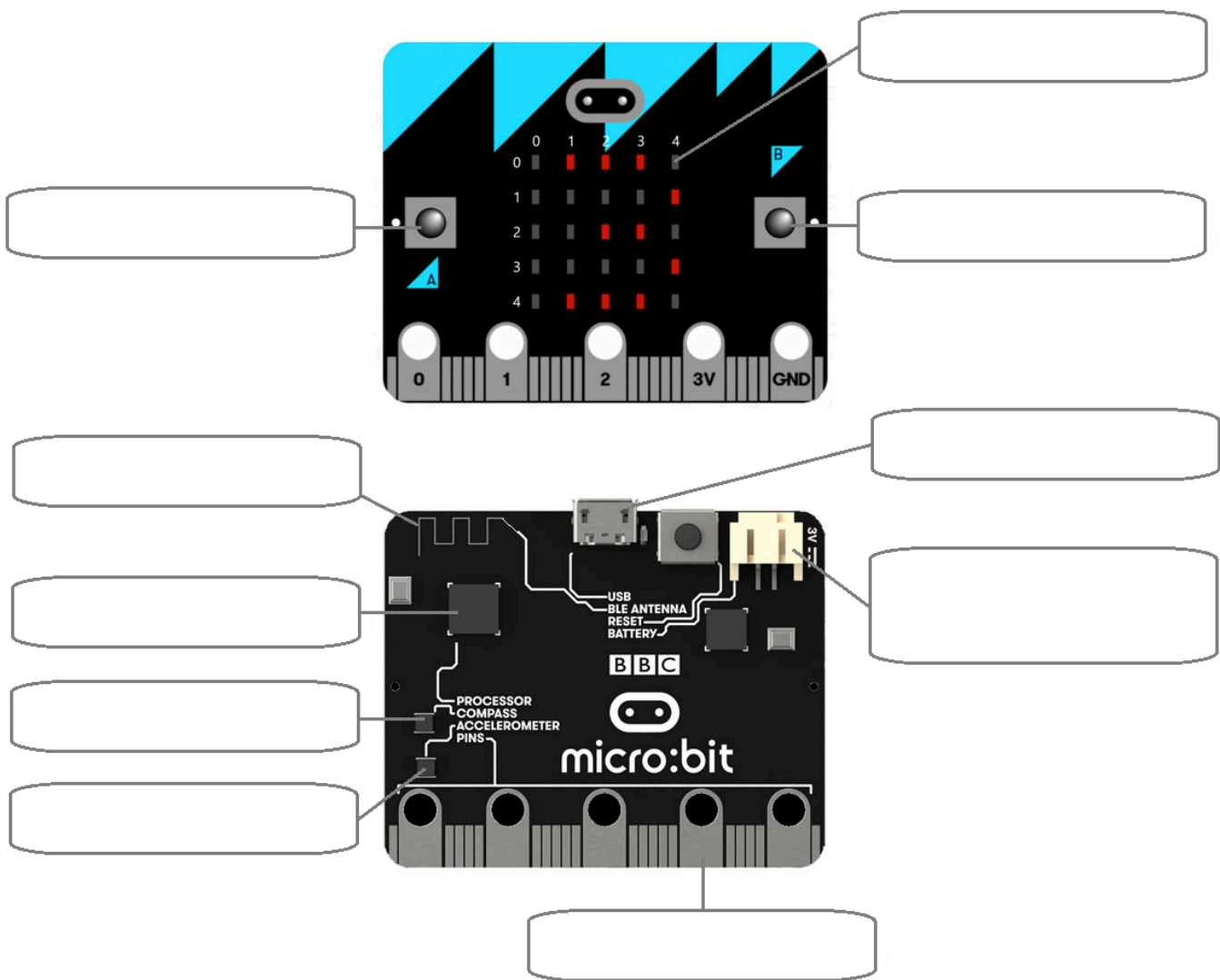
L1A3R1 - Duck Duck Go script
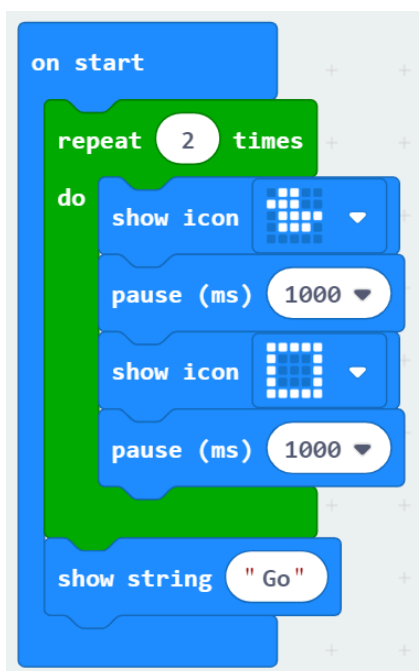
BBC micro:bit

Name: _____

The top image shows the front of the micro:bit

The bottom image shows the back of the micro:bit.

The micro:bit is a delicate electronic device so it must be used carefully and treated gently.

As you learn the names of the parts of the micro:bit,
add the names to the boxes above.