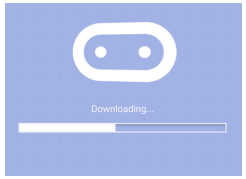
Year 5/6 Summer 1- Short term plan - Introducing Microbits	
Unit Rationale	
This unit introduces pupils to the idea of physical computing. This enables pupils to use their computers to interact with sensors, LEDs, robotics, buttons etc on a microcontroller such as the BBC Microbit, rather than just on the computer itself (screen, keyboard, touchpad etc). Pupils are shown a variety of real-world applications and encouraged to use knowledge gained to start building their own projects.	
National Curriculum Objectives:	**Cross Curricular Links:**
• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output	
Trips/Visits:	**Modern Day Links:**
Prior Learning:	**Substantive Knowledge:**
Y1/Y2 - Algorithms & programs Y3 - Creating an animation (Scratch) Y4 - Programming and debugging (Scratch)	facts. what is an algorithm?

Big ideas/Disciplinary Knowledge	What next?
thinking like a computer scientist	Y5 - Designing an adventure game (Scratch) Y6 - Advanced programming including simulations, debugging and action games Y6 - Controlling cars and lights with a Microbit (To be written)

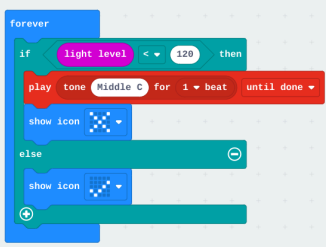
Lesson	WALT	What should the children remember?	Lesson plan and outcome	Key Vocabulary	Key Questions
1	**E-Safety**		See separate e-safety plans		
Lesson 2	**Plug in and switch on a microbit**	When designing a piece of software or creating a digital artefact, users are limited in how they interact with your product, for example by using a keyboard or touchscreen. Physical computing is different in that users can interact with and get feedback from your creation more widely in the real world: LEDs can light up, robotic arms can move, buttons can be pressed, sensors can detect the change and so on.	**Quiz** **Share WALT** **Introduce concept of physical computing** Physical computing involves programming digital devices to sense and interact with the world - rather than a screen only activity. **Introduce microbits and what they can be used for** Watch video (2 min) https://www.youtube.com/watch?v=u2u7UJSRuko **Microbits can** 1) Sense, measure and log light, temperature, sound, movement and magnetism 2) Use buttons, LEDs, radio, networks 3) Have their code changed **Looking after microbits** TTYP: How should we look after the microbits? **Activity** Teacher to model first - under visualiser.	**physical computing microbits download**	**Can they explain what physical computing is?** **Can they plug in a microbit?** **Do they know how to take care of microbits?**

			Pupils to unwrap microbits Plug in battery packs Test them out with the default meet the microbit program - What happens when you shake it? - Press button A, B or A+B - Hold the touch sensor and speak into it **NOTE: You may need to download the default program if it has been changed (visit: https://makecode.microbit.org/#pub:_6xL3kzM2D36y)**		
Lesson 3	**Write, download and test programs on a microbit**	Pupils should know how to find the microbit webpage and the makecode editor. They should begin to understand how they can write a program and download it to the microbit.	NOTE: While children get used to the Microbits you may want to use them in pairs (1 computer 1 Microbit per pair) to reduce possible tech issues. **Quiz** **Share WALT** **Teaching** - Introduce pupils to the microbit.org website https://microbit.org/ - Explain that there are lots of projects, videos and tutorials on there to help - Show them the Make code editor - Click Let's code and Go to Makecode editor (https://makecode.microbit.org/) - Explain that this is where we write our code for the microbits (it's similar to Scratch) - We are going to start with the Name badge project **Name badge project** - Pupils to plug in their microbits to their computers - Watch the two videos on the project page	**physical computing microbits download**	**Can they plug in a microbit?** **Do they know how to take care of microbits?** **Can they write code and download it to a microbit?**

			https://microbit.org/projects/make-it-code-it/name-badge/ - Pupils to try making the code to display their name. Test it on the Simulator first, then download it to the microbit. - Click Download - Click Next and then Pair - Choose it in the pop up block and click connect - Click Download again (Screen should show this)  - Once download has finished look at Microbit display to check that it shows correct name. - If activity is done in pairs, change the program to show the other partner's name and download it. **Name badge extension** - If time, watch the Name badge extension video that shows pupils how to change the code to display different names for each button. - Pupils can change the code and re-download it to the microbit.		
Lesson 4	**Write, download and test programs on a microbit**	Pupils should be able to follow the project sheets or pages from the Microbit webpage to create, download and test programs on a	NOTE: You may wish to print copies of the project sheets for children who find it tricky to switch between tabs. These include 5 different projects for them to try. **Quiz** **Share WALT**	**physical computing microbits download debug**	**Can children code and download projects from the microbit**

		Microbit.	**Teaching** - Remind pupils of the microbit.org website https://microbit.org/ - Show them the Make code editor - Click Let's code and Go to Makecode editor (https://makecode.microbit.org/) - Remind them that this is where we write our code for the microbits - Explain that pupils will get to try out some different projects today from the website. **Activities** - Pupils to plug in microbits to computers - Teacher to share projects page https://microbit.org/projects/make-it-code-it/ - Filter it to beginner projects - T. to model creating a project and downloading it to their microbit - so the class sees the entire process again. - Pupils to choose a project to try out on their Microbit - Teacher could print out projects pages and place them for pupils to choose or just let them look via the website (note: you may need to show them how to switch between tabs) **Plenary** - Children to explore what others have done. Partner 1 to move around while partner 2 stays to show their project. Then switch. - What was their favourite project?		**website?** **Can they debug code?** **Can they improve the projects?**
Lesson 5	**Write, download and test programs on a microbit**		Repeat previous lesson - giving children the chance to find and try out a variety of beginner level programs on the microbits. You might want to up the ratio to 1:1, so each child has their own		

			chromebook and microbit to explore. NOTE: You may wish to print out some additional projects for those who find it harder to switch between tabs.		
Lesson 6	**Write, test and debug your own microbit programs**	Pupils should be able to use the skills learned to create their own Microbit programs - downloading, testing and debugging them.	**Quiz** **Share WALT** **Teaching** - Remind pupils of the microbit.org website https://microbit.org/ - Show them the Make code editor - Click Let's code and Go to Makecode editor (https://makecode.microbit.org/) - Remind them that this is where we write our code for the microbits - Explain that pupils will try to create **their own projects** today **Teaching** - Teacher to explain process of creating your own program 1. What do you want it to do? 2. What is the algorithm? 3. What code do you need? 4. Test it and debug 5. Improve it - Watch video for an example - Suggestions: Display emojis for different buttons Quiz - button A for question, button B gives answer	**algorithm code debug**	**Can children create their own projects, test, debug and improve them?**

			Shadow alarm - Display X and make beeping sound if a shadow passes over the sensor (use light level <120)  **Activities** - Pupils to plug in microbits to computers - **Plenary** - Children to explore what others have done. Partner 1 to move around while partner 2 stays to show their project. Then switch. - What was their favourite project?		