

Together, We Flourish

Kindness • Respect • Perseverance • Curiosity • Hope • Community



Year 4 Summer 1 - Computing Medium-Term Plan: Physical Computing 2

Enquiry question: How can we program a micro:bit to control sound and create a virtual band?

End-of-unit computing outcome:

Create a Virtual Band.

Schema focus: Think, Code & Control



What we already know, remember and can do:

Children have previously had prior experience with block-based coding through programs such as Scratch or ScratchJr. It would also be useful if they are familiar with using and navigating digital devices to access web-based programs.

Topic overview / rationale

Physical Computing 2 is designed to give children a basic understanding of the BBC micro:bit and how it can be used to create simple programs that interact with the physical world. During the unit, children will: navigate the MakeCode interface; learn how to display and animate an image on a micro:bit; learn about the importance of sequencing when programming; use Music blocks within simple programs; debug algorithms; use simple Loops blocks in programs; learn when to use selection in programming; use simple Logic blocks in programs; flash programs to the micro:bit. This is a Big Project unit and children will be working towards the following project: Create a Virtual Band. The sequence builds towards the unit Big Project and gives pupils repeated opportunities to apply, check and refine their skills.

Key vocabulary for this topic

block, MakeCode, micro:bit, debug, program, explore, predict, run, investigate, modify, make, hardware, software, algorithm, sequence, trigger, execute, loops

Christ Church values and spirituality links

Values: Curiosity, Perseverance, Hope, Community.

Spirituality: Children wonder at how ideas in Physical Computing 2 help people understand, create or shape the digital world. They reflect on the consequences of their choices, the importance of perseverance and the ways technology can connect or affect people. They respond by using computing with care, curiosity and responsibility.

Wonder: How does this technology or idea work? Reflection: What impact could our digital choices have? Response: How can we use computing so everyone can flourish?

Inclusion and adaptive teaching

Suggested inclusive practice: Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.

Lesson	Learning Intention / Activity	I know statements - what will be known and remembered	Revisited vocabulary	New vocabulary	Adaptations / Inclusion	Deeper thinking
1	Introduction to micro:bit and MakeCode LI: To know what is meant by physical computing. To know what the micro:bit is and explain some of its features. Activity: Within this step, the children will explore the names, functions and features of the BBC micro:bit. They will start to use the Microsoft MakeCode editor to run very simple programs, look at ways to modify them and create their own.	✓ I know what physical computing is. ✓ I know the features and uses of a micro:bit. ✓ I know that I can navigate around the MakeCode interface.	debug, program	block, MakeCode, micro:bit, explore, predict	✓ Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.	How do I code using the micro:bit?
2	Starting Programs with the micro:bit LI: To investigate ways to start simple programs for the micro:bit. Activity: Within this step, the children will recap the meaning of algorithm and the importance of sequence within programs. They will predict what a block of code will do before running it to check their prediction.	✓ I know different ways that a program can be started on a micro:bit. ✓ I know the importance of sequence when programming. ✓ I know that I can debug an algorithm.	algorithm, sequence, debug	trigger, execute	✓ Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.	Why is it important to order our coding blocks?

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3	Making Music with micro:bit LI: To create simple programs for the micro:bit including repetition. To be able to connect a micro:bit to a digital device and flash a program to it. Activity: Within this step, the children will recap the meaning of repetition and why it is used within programs. They will look at some of the Loops blocks in detail and some of the ways that they can be used.	✓ I know when to use repetition in a program. ✓ I know the different types of Music blocks in MakeCode. ✓ I know that I can use Music blocks within programs.	algorithm, sequence, debug	loops, repetition, compose, flashing	✓ Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.	Why is repetition important?
4	Selection with micro:bit LI: To create simple programs for the micro:bit using sequence, repetition and selection. Activity: Within this step, the children will learn about selection and how it can be used within programs. They will look in detail at the pick random and if [...] then Logic blocks.	✓ I know when to use selection within a program. ✓ I know that I can use the if [...] then Logic block within a program. ✓ I know that I can use the pick random Math block within a program.	trigger, execute, loops, repetition	random, selection, oval, hexagonal, conditional	✓ Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.	How can I use the pick random block?
5	The Big Project LI: To design and create a simple program for the micro:bit. Activity: Within this step, the children will recap their learning from the unit before designing, building and testing their program to create a virtual band.	✓ I know that I can plan out my project. ✓ I know that I can include two or more different inputs in my project. ✓ I know that I can include Music blocks in my project.	test	simulate, evaluate, design brief	✓ Model algorithms or code in short chunks and use unplugged rehearsal before moving to a device. Provide partially completed sequences, block cards, worked examples and paired debugging. Extend by increasing complexity, asking pupils to optimise a solution or justify why a program behaves as it does.	What does your program do?