

## Lessons overview – ages 7-11

Unit of work / design challenge	Computing topics and skills covered	Other subjects covered	For students aged...	Number of one-hour lessons
<a href="#">Digital flashcards</a> Design sequenced algorithms for flashcards and develop an understanding of computational thinking. Write programs to create digital flashcards using the micro:bit and follow a process to test and evaluate work.	Abstraction, algorithms, debugging, evaluating, patterns. Unplugged and programming activities in MakeCode.	Languages	7-8	5
<a href="#">Nature art</a> Create nature representations, firstly by using art materials and then introduce abstract representations and working with inputs and outputs when programming the LEDs on the micro:bit.	Abstraction, algorithms, logical reasoning, inputs and outputs, data representation. Includes programming activities in MakeCode.	Digital arts	7-8	4
<a href="#">Barefoot meets micro:bit - wildlife animations</a> Create icons and animations by programming the micro:bit's LED display. Introduce working with loops/repetition when using the forever block and count-controlled loops.	Abstraction, algorithms, loops/repetition. Evaluating. Includes programming activities in MakeCode.	Sciences, digital arts	7-9	2
<a href="#">Electrical conductors</a> Develop an understanding of flowchart algorithms, selection, and inputs and outputs by using electrical circuits and the micro:bit to test the conductivity of materials.	Algorithms, inputs and outputs, decomposition and evaluating. Unplugged and programming activities in MakeCode.	Design and technology	8-9	5
<a href="#">Volcano animations</a> Develop an understanding of decomposition, flowchart algorithms and loops/repetition. Write, program and test an animation showing a volcanic eruption.	Abstraction, Algorithms, loops/repetition, inputs and outputs. Unplugged and programming activities in MakeCode.	Design and technology, geography	8-9	5
<a href="#">Data handling</a> Write algorithms and programs using selection and loops/repetition to make a temperature recorder, an automatic warning system and a digital assistant.	Algorithms, data representation, loops/repetition, selection.	Mathematics	9-10	5

	Includes programming activities in MakeCode.			
<a href="#">Musical micro:bit</a> Compose musical phrases and write algorithms to play them on instruments. Then program the micro:bit to play/output the phrases when events are triggered using inputs.	Algorithms, evaluating, inputs and outputs. Includes programming activities in MakeCode.	Music	9-10	5
<a href="#">Barefoot meets micro:bit – litter hunt</a> Use buttons and sensors on the micro:bit to make images display on the LED output. Then create a device that uses variables to record details of litter in the local area that can be recycled.	Algorithms, inputs and outputs, variables, representing data. Includes programming activities in MakeCode.	Sciences	9-11	2
<a href="#">Getting active</a> Develop an understanding of variables through unplugged and programming activities. Design a star-jump and step counter, and a family activity selector.	Algorithms, variables, evaluating. Unplugged and programming activities in MakeCode.	Sciences	10-11	5
<a href="#">NCCE – programming B sensing</a> Develop an understanding of sequence, loops/repetition, selection and variables by building a fortune-teller program, a navigational device and a step counter.	Algorithms, selection, variables, loops/repetition. Includes programming activities in MakeCode.	Design and technology	10-11	6
<a href="#">Protecting animals on land</a> Two simple activities using the micro:bit's buttons and radio function that explore how technology is used to design prototypes that can protect biodiversity.	Algorithms, inputs and outputs, computer systems, networks. Includes programming activities in MakeCode.	Design and technology, Global Goals	7-11	2
<a href="#">Saving sea creatures</a> Projects to learn about the threats faced by fish and sea turtles and how prototyping with technology can help design products to care for and promote biodiversity.	Algorithms, inputs and outputs, computer systems. Includes programming activities in MakeCode.	Global Goals	7-11	2

## Lessons overview – ages 11-16

Unit of work / design challenge	Computing topics covered	Other subjects covered	For students aged...	Number of one-hour lessons
<a href="#">Computing fundamentals</a> Learn about computational thinking, programming and computer systems through unplugged activities and experimenting with the micro:bit.	Algorithms, computer systems debugging, iteration, prototyping, selection,	None	11-12	6
<a href="#">Health tech</a> Develop and apply your knowledge and understanding of computational thinking and problem-solving to create a prototype health tech innovation.	Computational thinking, problem solving, preparing presentations, prototyping	Design and technology, sciences	11-14	5
<a href="#">Introduction to cryptography</a> Write algorithms for a Caesar cipher and write Caesar ciphers in text-based programming.	Algorithms, Javascript, logical reasoning, problem solving, Python	History	11-14	3
<a href="#">Introduction to cyber security</a> Gain an understanding of the importance of cyber security before writing algorithms and programs to create a 'strong password generator'.	Algorithms, evaluating, programming, safety and security	None	11-14	3
<a href="#">Sensory classroom</a> Evaluate existing aids for learners who are sensitive to sensory stimulus and then use this understanding to devise an aid using the micro:bit.	Algorithms, computer systems, evaluating, programming,	None	11-14	4
<a href="#">Being active</a> Projects to learn about the importance of being active to help prevent heart disease, and to create wearable devices to encourage people to be more active.	Algorithms, computer systems, evaluating, programming	Design and technology, Global Goals, physical education	11-14	3
<a href="#">Night safety</a> Create a gadget that reminds users when it is time to "Be Safe: Be Seen!". Then design a flashing wheel light for a wheelchair user and a light-up school bag.	Algorithms, computational thinking, computer systems, evaluating, programming	Design and technology, Global Goals	11-14	3

<p><a href="#">Energy awareness</a> Gather data about energy use using the micro:bit as a simple data logger, then process and analyse the data to make decisions about reducing energy usage.</p>	Computer systems, programming	Global Goals, mathematics, sciences	11-16	6
<p><a href="#">Healthy oceans</a> Make prototypes of wireless sensors to monitor the environment at sea, design an algorithm to clean an area of sea, and create a vehicle that mops up oil spills.</p>	Computational thinking, computer systems, networks	Design and technology, Global Goals	11-16	2
<p><a href="#">Helping plants grow</a> Create a prototype sensor to send alerts when trees are being illegally cut down. Then make moisture sensors and a prototype of an automated farming system.</p>	Computer systems, networks, prototyping, radio, sensors	Design and technology, Global Goals	11-16	2