

Lessons overview – ages 11-16

Unit of work / design challenge	Computing topics covered	Other subjects covered	For students aged...	Number of one-hour lessons
Computing fundamentals 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
Health tech 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
Introduction to cryptography 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
Introduction to cyber security 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
Sensory classroom 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
Being active 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, physical education, SDGs.	11-14	3
Night safety 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, SDGs.	11-14	3
Energy awareness 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.	Algorithms, computer systems, data gathering and	Mathematics, sciences, SDGs.	11-16	6

	data representation. Programming.			
Healthy oceans 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.	Computational thinking, computer systems, networks.	Design and technology, SDGs.	11-16	2
Helping plants grow 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.	Computer systems, networks, prototyping, radio, sensors.	Design and technology, SDGs.	11-16	2