Coding for Climate Action Mapping (Primary)

Overview & Mapping – Programme of Study (Computing)

Lesson	Lesson Objectives	Programme of Study for Computing statements
1	Identify similarities and differences between natural hazards Identify the relationship between heat and evaporation Describe how Early Warning Systems can be used to mitigate the effect of natural hazards	2.1, 2.6
2	Describe the differences between the parts of a system and the functions of those parts Research and identify the part and functions of three different existing technologies Explain the part and functions of three existing technologies	2.1, 2.6
3	Identify the differences between hardware and software Identify input, output, and repetition in code Modify and complete code that uses input, output, repetition, and variables	2.1, 2.2, 2.3, 2.6
4	Identify the sensors on a micro:bit Design and modify programs using sensors Modify and complete code that uses input, output, count-controlled loops, and variables	2.1, 2.2, 2.3, 2.6
5	Describe how a simple electrical circuit works Describe how a circuit can be controlled by a physical device Use selection in a program to produce an intended outcome	2.1, 2.2, 2.3, 2.6
6	Describe that micro:bits can send data to one another using radio signals Interpret the code that is used to send data between micro:bits Implement if/else statements in my code to produce one of two intended outcomes	2.1, 2.2, 2.3, 2.4, 2.6
7	Identify core programming constructs, including input, output, variables, repetition, and selection Design and implement code to achieve a specific outcome Interpret and predict the outcomes of code	2.1, 2.2, 2.3, 2.4, 2.6

Overview & Mapping

Label	Year 5 Teach Computing Programming Units	Covered in Coding for Climate Action
	Programming A – Selection in physical computing	
CS	Create a simple circuit and connect to a computer	Lesson 5
CS	Program a microcontroller to make an LED switch on	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
CS	Connect more than one output component to a microcontroller	Lesson 5, Lesson 7
CS	Program a microcontroller to respond to an input	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
PG	Explain what an infinite loop does	Lesson 3, Lesson 5, Lesson 6, Lesson 7
PG	Design sequences that use count-controlled loops	Lesson 4
PG	Design a conditional loop	Not covered
PG	Explain that a condition is either true or false	Lesson 5, Lesson 6, Lesson 7
PG	Use selection (an ' if…then..' statement) to direct the flow of a program	Lesson 5, Lesson 6, Lesson 7
PG	Use selection to produce an intended outcome	Lesson 5, Lesson 6, Lesson 7
DD	Describe what my project will do	Lesson 7
DD	Test and debug my project	Lesson 4, Lesson 5, Lesson 6, Lesson 7
	Programming B – Selection in quizzes	
AL	Identify conditions in a program	Lesson 4, Lesson 5, Lesson 6, Lesson 7
AL	Identify the condition and outcomes in an 'if… then… else...' statement	Lesson 5, Lesson 6, Lesson 7
AL	Explain that program flow can branch according to a condition	Lesson 5, Lesson 6, Lesson 7
PG	Modify a condition in a program	Lesson 4, Lesson 5, Lesson 6, Lesson 7
PG	Use selection in an infinite loop to check a condition	Lesson 5, Lesson 6, Lesson 7
PG	Show that a condition can direct program flow in one of two ways	Lesson 5, Lesson 6, Lesson 7
PG	Identify the outcome of user input in an algorithm	Lesson 3, Lesson 4, Lesson 5, Lesson 6
DD	Outline a given task	Lesson 7
DD	Test my program	Lesson 4, Lesson 5, Lesson 6, Lesson 7
DD	Identify ways the program could be improved	Lesson 3, Lesson 4

Label	Year 6 Teach Computing Programming Units	Covered in Coding for Climate Action
Programming A – Variables in games		
PG	Identify examples of information that is variable	Lesson 3
PG	Explain that a variable has a name and a value	Lesson 3
PG	Recognise that the value of a variable can be changed	Lesson 3, Lesson 4, Lesson 5, Lesson 6
PG	Decide where in a program to change a variable	Lesson 4, Lesson 5, Lesson 6
PG	Make use of an event in a program to set a variable	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
PG	Recognise that the value of a variable can be used by a program	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
PG	Create algorithms for my project	Lesson 7
DD	Test the code that I have written	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
DD	Identify ways that my game could be improved	Lesson 3, Lesson 4
Programming B - Sensing movement		
CS	Transfer my program to a controllable device	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
CS	Experiment with different physical inputs	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7
PG	Use a variable in an if, then, else statement to select the flow of a program	Lesson 5, Lesson 6, Lesson 7
PG	Use a condition to change a variable	Lesson 5, Lesson 6, Lesson 7
PG	Use an operand (e.g. <>=) in an if, then statement	Lesson 5, Lesson 6, Lesson 7
DD	Design the program flow for my project	Lesson 7
DD	Use a range of approaches to find and fix bugs	Lesson 3, Lesson 4, Lesson 5, Lesson 6, Lesson 7

DD= Design and Development, CS = Computing Systems, PG = Programming, AL = Algorithms

Overview & Mapping – Programme of Study (Science)

Lesson	Lesson Objectives	Programme of Study for Science statements	Notes on implementation.
1	**1.1** Identify similarities and difference between natural hazards **(Slides 1-8)** **1.2** Identify the relationship between heat and evaporation **(Slides 9-17)**	1.1.1 Working Scientifically(WS) (Identifying and classifying and identifying differences, similarities or changes related to simple scientific ideas and processes) 1.1.2 Year 1: Plants (identify and name a variety of common wild and garden plants, including deciduous and evergreen trees) 1.1.3 Year 2: Animals including humans (find out about and describe the basic needs of animals, including humans, for survival (water, food and air) 1.1.4 Year 3: Plants (explore the requirements of plants for life and growth [air, light, water, nutrients from soil, and room to grow] and how they vary from plant to plant 1.1.5 Year 4: Living things and their habitats (recognise that environments can change and that this can sometimes pose dangers to living things) 1.2.1 Working Scientifically (1. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions 2. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 3. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions)	1.1.1 In KS1, children will be asking questions about the similarities and differences between things, which is a great opportunity to promote 'talk for learning' and encourage children to share their ideas. This type of enquiry lends itself to going outside to explore the world around them at all times of the year. In KS2 children should continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, as well as developing higher order skills in reasoning and justification when explaining how they have chosen to group things. KS2 pupils will be expected to design simple tests to help them classify materials, as well as independently using a range of secondary sources to support them in identifying a range of living things. https://www.ogdentrust.com/wp-content/uploads/2021/10/WS-identifying-and-classifying.pdf 1.2.1 If able to utilise the humidity activity as a practical experiment you can address these WS statements.

	1.3 Describe how Early Warning Systems can be used to mitigate the effect of natural hazards **(Slides 18-22)**	1.2.2 Year 3: Plants (explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant) 1.2.3 Year 4: States of matter (observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius [°C]) 1.2.4 Year 4: States of matter (identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature) 1.3.1 Working Scientifically (reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations) 1.3.2 Working Scientifically. Pupils have the opportunity to recognise and discuss how scientific ideas change and develop over time	1.2.4 This is the only place in the primary science curriculum where evaporation is mentioned, so it is a great opportunity to address this NC statement within a related context. 1.3.1 Research enquiries are a great opportunity to use science lessons to practise reading and listening skills developed in English; children get to use a range of secondary sources to help them find the answers to their 'big questions'
2	**2.1** Describe the differences between the parts of a system and the functions of those parts **(Slides 1-6)** **2.2** Research and identify the part and functions of three different	2.1.1 Working Scientifically (planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary) 2.1.2 STEM Careers Opportunity **2.1.3 Structure and function (notes & non-statutory)** 2.2.1 **Geography curriculum** KS2 locational knowledge (locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries, and major cities) 2.2.2 Year 3 Rocks (notes & guidance non-statutory)	2.1.3 Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do (They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction). 2.2.2 Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.

	existing technologies **(Slides 7-11)** **2.3** Explain the part and functions of three existing technologies **(Slides 8-17)**	2.2.3 Year 5 Forces (explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object). 2.3.1 Working Scientifically (reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations)	2.3.1 Opportunity to analyse the bar chart and explain the current pattern in data. Students could also make predictions on what might happen in the future.
3	**3.1** Identify the differences between hardware and software **(Slides 1-11)** **3.2** Identify input, output and repetition in code **(Slides 12-14)** **3.3** Modify and complete code that utilises input, output and repetition and variables **(Slides 15-22)**	3.1.1 STEM Careers Opportunity *This particular lesson is clearly dominated by the Micro:bit and how to operate this. There are therefore very limited cross-curricular opportunities.*	
4	**4.1** Identify the sensors on	**4.1.1 Working Scientifically (They should learn how to use new equipment, such as data loggers, appropriately**. They should collect data from their own observations and measurements, using notes,	

	a Micro:bit **(Slides 1-3)** **4.2** Design and modify programs using sensors **(Slides 4-9)** **4.3** Modify and complete code that utilises input, output, count controlled loops and and variables **(Slides 10-15)**	simple tables and standard units, and help to make decisions about how to record and analyse this data) 4.1.2 Year 1 Animals including humans (identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense) 4.1.3 Year 6 Evolution and inheritance (identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution) 4.1.4 Year 3 Light (recognise that they need light in order to see things and that dark is the absence of light) 4.1.5 Year 6 Light (use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye) 4.1.6 Year 5 Forces (notes & guidance non-statutory) 4.1.7 Year 4 States of matter (notes & guidance non-statutory) 4.2.1 Working Scientifically (planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary) 4.3.1 Working Scientifically (reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentation) 4.3.2 (taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate)	4.1.3 Potential to consider how our (human) senses are adapted to our environment. There is a working scientifically opportunity to identify and classify other animals with similar/different senses. E.g. Birds of prey and their enhanced eyesight. 4.1.4 opportunity to link the current learning to previous learning e.g. Humans need [visible] light to see and that the eye is the human sensor of light 4.1.7 Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream. An opportunity to link the learning around how to measure temperature changes to the new Micro:bit context. Given the temperature range (-5C - 50C) of the Micro:bit a good probing question might be, would the Micro:bit be a good scientific tool to measure the temperature at which water freezes/boils. Why? 4.3.2 The Micro:bit can be viewed as a piece of scientific equipment

5	**5.1** Describe how a simple electrical circuit works **(Slides 1-14)** **5.2** Describe how a circuit can be controlled by a physical device **(Slide 15)** **5.3** Implement selection in a program to produce and intended outcome **(Slides 16-27)**	5.1.1 Year 4 Electricity (recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit) 5.1.2 Year 6 Electricity (use recognised symbols when representing a simple circuit in a diagram) 5.1.3 Year 6 Electricity (Notes and guidance (non-statutory) Building on their work in year 4, pupils should construct simple series circuits) 5.1.4 Year 4 Electricity (recognise some common conductors and insulators, and associate metals with being good conductors) 5.3.1 Year 4 Electricity (recognise some common conductors and insulators, and associate metals with being good conductors)	5.1.1 Pupils will have come across the concept of circuit components in Year 4, including the role of a switch to open and close a circuit 5.1.3 A prime opportunity to link the Micro:bit circuits to simple series [single, closed loop] circuits. A great way to reinforce the key scientific vocabulary. 5.1.4 A great example to dispel the myth that only metals are constructors of "electricity". The same goes for materials like graphite in pencils. The pupils may have interacted with Squishy Circuits (https://squishycircuits.com/) in which cases, they may recall the presence of salt in the dough makes it an electrical conductor.
6	**6.1** Understand that Micro:bits can send data to one another using radio signals **(Slides 1-8)** **6.2** Interpret the code that is used to send data between	6.1.1 Year 6 Light (recognise that light appears to travel in straight lines) 6.1.2 Year 6 Light (Notes and guidance (non-statutory) They could extend their experience of light by looking at a range of phenomena including rainbows..	6.1.1 and 6.1.2 Potential to extend the Primary Science curriculum to make the link between visible light, and other "types" of light, such as Radio waves. **Warning**! Electromagnetic waves/spectrum is not formally covered until GCSE science

	Micro:bits **(Slides 9-12)** **6.3** Implement if/else statements in my code to produce one of two intended outcomes **(Slides 13-17)**		
7	**7.1** Identify core programming constructs input, output, variables, repetition and selection. **7.2** Interpret and predict the outcomes of code **7.3** Design and Implement code to achieve a specific outcome.		