python in pieces

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Python in Pieces and the curriculum

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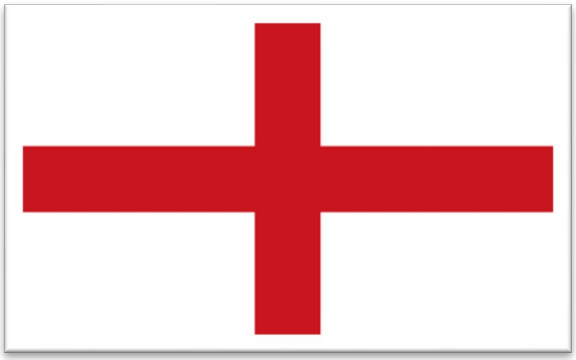
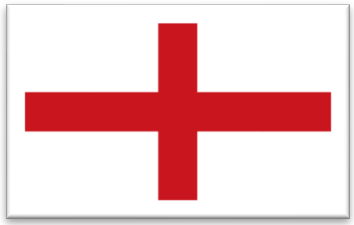


England KS2 Curriculum

		Free code	Micro:bit	Level 1 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While
CS	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	✓	✓	✓	✓	✓	✓	✓	✓
CS	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	✓	✓	✓	✓	✓	✓	✓	✓
CS	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	✓	✓	✓	✓	✓	✓	✓	✓
CS	Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration								
IT	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content								
IT	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	✓	✓	✓	✓	✓	✓	✓	✓
DL	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact								



England KS3 Curriculum

		Free code	Micro:bit	Level 1 Lesson Resources						Level 2 Lesson Resources						Level 3 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While	**Lesson 1** While Loops	**Lesson 2** And, Or	**Lesson 3** Loops in Action	**Lesson 4** Loops and Selection	**Lesson 5** Functions	**Lesson 6** Using Sound in a Game	**Lesson 1** Using Lists	**Lesson 2** Nested Selection	**Lesson 3** Password Generator	**Lesson 4** Binary and Decimal	**Lesson5** Morse Code	**Lesson 6** Linear Search
Comp Sci 1	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comp Sci 2	Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comp Sci 3	Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comp Sci 4	Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal].	✓	✓						✓	✓	✓				✓				✓		
Comp Sci 5	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.		✓																		
Comp Sci 6	Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.	✓	✓																✓	✓	
ICT 1	Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users.	✓	✓																		
ICT2	Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.	✓					✓	✓		✓	✓	✓		✓	✓		✓		✓		
DL	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns.	✓															✓	✓		✓	

 Scotland CfE- S2 Curriculum- Computer Science		Free code	Micro:bit	Level 1 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While
Understanding the world through computational thinking	I understand the operation of a process and its outcome. I can structure related items of information.	✓	✓	✓	✓	✓	✓	✓	✓
Understanding and analysing computing technology	I can explain core programming language concepts in appropriate technical language.	✓	✓	✓	✓	✓	✓	✓	✓
	I understand how information is stored and how key components of computing technology connect and interact through networks.	✓	✓						
Designing, building and testing computing solutions	I can create, develop and evaluate computing solutions in response to a design challenge	✓	✓	✓	✓	✓	✓	✓	✓

Scotland CfE- S3 Curriculum- Computer Science		Free code	Micro:bit	Level 1 Lesson Resources						Level 2 Lesson Resources						Level 3 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While	**Lesson 1** While Loops	**Lesson 2** And, Or	**Lesson 3** Loops in Action	**Lesson 4** Loops and Selection	**Lesson 5** Functions	**Lesson 6** Using Sound in a Game	**Lesson 1** Using Lists	**Lesson 2** Nested Selection	**Lesson 3** Password Generator	**Lesson 4** Binary and Decimal	**Lesson5** Morse Code	**Lesson 6** Linear Search
Understanding the world through computational thinking	I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	I am developing my understanding of information and can use an information model to describe particular aspects of a real-world system.	✓	✓															✓		✓	
Understanding and analysing computing technology	I understand language constructs for representing structured information.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	I can describe the structure and operation of computing systems which have multiple software and hardware levels that interact with each other.	✓	✓																		
Designing, building and testing computing solutions	I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements.	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Wales DCF 2008 KS3- Year 7- Computer Science

		Free code	Micro:bit	Level 1 Lesson Resources						Level 2 Lesson Resources						Level 3 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While	**Lesson 1** While Loops	**Lesson 2** And, Or	**Lesson 3** Loops in Action	**Lesson 4** Loops and Selection	**Lesson 5** Functions	**Lesson 6** Using Sound in a Game	**Lesson 1** Using Lists	**Lesson 2** Nested Selection	**Lesson 3** Password Generator	**Lesson 4** Binary and Decimal	**Lesson5** Morse Code	**Lesson 6** Linear Search
Problem-solving and modelling	Identify different parts of a process, e.g. variables, loops, case statements and comments	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Predict process outcome after modifying inputs, e.g. predicting the effect of changing/editing a set of instructions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Modify a given flow chart to change the variables of an algorithm, e.g. add a process or a counter to it that would increment or decrement values																				
Data and information literacy	Create a data capture form, capture data, search data and create a database or spreadsheet with appropriate data input method																				

Wales DCF 2008 KS3- Year 8- Computer Science

		Free code	Micro:bit	Level 1 Lesson Resources						Level 2 Lesson Resources						Level 3 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While	**Lesson 1** While Loops	**Lesson 2** And, Or	**Lesson 3** Loops in Action	**Lesson 4** Loops and Selection	**Lesson 5** Functions	**Lesson 6** Using Sound in a Game	**Lesson 1** Using Lists	**Lesson 2** Nested Selection	**Lesson 3** Password Generator	**Lesson 4** Binary and Decimal	**Lesson5** Morse Code	**Lesson 6** Linear Search
Problem-solving and modelling	Identify patterns and opportunities for re-using code (instructions), e.g. parts of a method or instruction list that can be used to solve similar problems in different situations and/or systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Apply logical reasoning to a problem to formulate a solution, e.g. explain and justify how and why a solution to a problem is suitable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Modify a given flow chart to change rules of an algorithm, e.g. adjust conditions of actions in a flow chart, for instance changing the boundaries of a counter in a loop to change how the program functions																				
	Change an algorithm and predict the outcome	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data and information literacy	Construct frequency tables for sets of data, grouped where appropriate, and perform simple analysis on data sets.																				

Wales DCF 2008 KS3- Year 9- Computer Science

		Free code	Micro:bit	Level 1 Lesson Resources						Level 2 Lesson Resources						Level 3 Lesson Resources					
				Lesson 1 Text Output	**Lesson 2** Numbers and Calculations	**Lesson 3** Repeat Loops	**Lesson 4** Moving Sprites	**Lesson 5** Variables and User Input	**Lesson 6** Repeat While	**Lesson 1** While Loops	**Lesson 2** And, Or	**Lesson 3** Loops in Action	**Lesson 4** Loops and Selection	**Lesson 5** Functions	**Lesson 6** Using Sound in a Game	**Lesson 1** Using Lists	**Lesson 2** Nested Selection	**Lesson 3** Password Generator	**Lesson 4** Binary and Decimal	**Lesson5** Morse Code	**Lesson 6** Linear Search
Problem-solving and modelling	Decompose complex processes and determine the actions of individual parts, e.g. multiple WHILE, FOR and IF in either text-based or block-based programming environments	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Follow given written instructions or flow charts to determine the function or output of a process	✓	✓																		
	Recognise that algorithms are language agnostic.	✓																			
	Follow and develop logical solutions, e.g. demonstrate how a problem could be solved selecting a suitable method to illustrate.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Detect and correct simple errors in algorithms, e.g. can identify and correct where a syntax error will occur, for instance missing equal signs, variable names spelled incorrectly.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data and information	Search through large data sets and identify trends where appropriate.	✓														✓					✓