KESTEVEN AND SLEAFORD HIGH SCHOOL

Computing Scheme of Learning

Year 9 – Topic 4 – Programming

Intent – Rationale

Topic Intent: Build on students' prior coding experience (sequence, selection, iteration) and introduce the concepts of modularity, nested selections and iterations

Curriculum Intent: Developing an understanding of some of the underlying principles of Computer Science, with a focus on … programming, in preparation for future study of the subject

KS3 PoS: use two or more programming languages… to solve a variety of computational problems; make appropriate use of data … design and develop modular programs that use procedures or functions

Sequencing – what prior learning does this topic build upon?	**Sequencing – what subsequent learning does this topic feed into?**
• Y7 Topic 3B • Y8 Topic 3B	• OCR GCSE Computer Science (2.1 & 2.2) • OCR GCE Computer Science (2.2 & AO3) • Further/Higher Education and Related Careers
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Mathematics (decisions)	• GB4e & GB4h
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
Directly linked to topic ○ https://www.w3schools.com/Python/default.asp Wider Reading/Interest: ○ https://www.codecademy.com/learn/learn-python	• BODMAS • Conditional Operators (<, <=, ==, >, >==, !=) • Modulus and Quotient

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?	
Know • Understand how to use Input and Process to generate Output • Understand Python's basic syntax rules and a how to use range of basic functions (input, print, if… elif, for loops, while loops, mathematical operators +-/*%^**) • Understand how to iteratively develop and test basic command-line driven programs using a modular approach • Understand the different types of errors that can occur: Syntax, Logic and Runtime **Apply** • Develop a range of basic CLI programs using taught knowledge, including: a quiz, a text-based adventure game and simple graphics **Extend** • Understand how to use sub-routines and decomposition to simplify a complex task into simpler component parts	
What subject specific language will be used and developed in this topic?	**What opportunities are available for assessing the progress of students?**
• ***Algorithm****: a process or set of rules to be followed in calculations or other problem-solving operations* • ***Iteration:*** *Repeating a block of code* • ***Selection:*** *Using conditions to decide which line/block of code to run next* • ***Decomposition:*** *breaking a complex problem or system into smaller parts that are easier to solve* • ***Modularity:*** *subdividing a computer program into separate sub-programs* • ***Sub-Routine:*** *a sequence of program instructions packaged as a unit to achieve modularity*	• In-lesson observation and feedback • Moodle onscreen assessment (during assessment week)

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
1 History of Programming, the role of women and Python's print and input instructions	Develop a fake chatbot using input/print	Introduce basic selection statements to vary response	
2 Using sequential selection	Develop a multiple-choice quiz	Include custom feedback based on answers and results	
3-4 Introduction to modular programming	Students design and develop a simple text-based adventure game	Include an inventory/reward system	
5 Randomness & Binary Searching	Students develop a higher/lower guessing game and learn how to search ordered data efficiently	Accurately apply a binary search on a very large data set	
6 Iteration and basic graphics	Students draw patterns/objects using efficient iterative code	Use nested iteration to improve efficiency/complexity	
7 Assessment			http://moodle.kshs.uk