

Year 8 - Term 1 - Programming

Year group: 8	Subject: Computing
Introduction	The Year 8 Programming curriculum represents a critical pivot from visual, block-based instruction to Text based coding. The unit's rationale is built on taking the foundational algorithms and control structures learned in Year 7 (Sequencing, Variables, Selection, Iteration) and applying them independently within the strict logical structure of the Python language.
Rationale	1. Mastering Syntax and Logic: Students begin learning how to use code to solve problems, focusing on essential elements like Checking Syntax—a necessary skill in text-based environments. 2. Achieving Independence: The focus moves toward the Year 8 Developing level, where students must "Independently design and write programs that incorporate loops (iteration) and a combination of control structures to solve problems". 3. Building Complex Problem Solving: By introducing arithmetic operators, complex selection (using OR and AND), and data structures (Lists), students are prepared for More advanced programming and later skills like Decomposition.
Vocabulary:	1. Programming - Introduction to python: The specific language and focus of the Year 8 curriculum. 2. Text based coding: The type of coding used in Year 8, where students write instructions rather than putting blocks together. 3. Variables: Used in programs to store data. This skill is required for the Emerging level in Year 8. 4. Selection: The ability to make programs make decisions using 'if/else' statements based on conditions. 5. Iteration / Loops: The process of using loops. At the Developing level, students must independently design and write programs that incorporate loops (iteration).

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	6. Debugging: The skill of acting as a detective to debug any mistakes. The Year 8 Secure level requires students to use debugging techniques to identify and fix logical and syntax issues in their own and others' programs. 7. Checking Syntax: A necessary skill in Year 8, focusing on verifying that the structure and language rules of the code are correct. 8. Using functions: A key concept introduced in Year 8, which involves using functions to organize and structure code. 9. Advanced algorithms: A focus area for Year 8, requiring students to move beyond simple algorithms (step-by-step instructions) to more complex problem-solving structures. 10. Decomposition: The crucial process of breaking down complex programming problems into smaller, manageable sub-problems, a skill required for mastery in Year 9 but introduced as part of the progression
Cultural Capital:	The Year 8 Programming curriculum, characterized by the shift to Programming - Introduction to Python, delivers significant Cultural Capital by transitioning students from the visual support of Block based coding to the independence and rigour of Text based coding. This move requires students to develop meticulous attention to detail, specifically focusing on Checking Syntax. Mastering this environment requires the development of sophisticated debugging techniques, where students must test their code for errors and become detectives to fix logical and syntax issues in their own and others' programs. By achieving the Developing level, students are equipped to independently design and write programs that incorporate loops (iteration) and a combination of control structures to solve problems. This development of Advanced algorithms and independent application prepares students for higher-level computer science methodologies like Decomposition and Abstraction, which are essential for tackling complex real-world problems

Links to National Curriculum	The Year 8 Programming curriculum is designed to rapidly advance students' skills by shifting from visual, block-based coding to the rigorous environment of Text based coding using Programming - Introduction to python. This progression ensures direct alignment with the Key Stage 3 (KS3) National Curriculum objectives, focusing on independent application, sophisticated control structures, and robust debugging. Here is the detailed breakdown of the Year 8 Programming links to the KS3 National Curriculum, organized by the progression pathway: <table border="1" data-bbox="416 454 1630 1385"> <thead> <tr> <th data-bbox="416 454 1055 550">Year 8 Programming Curriculum Objective</th><th data-bbox="1055 454 1630 550">Supporting Concepts (Year 8 Focus)</th></tr> </thead> <tbody> <tr> <td data-bbox="416 550 1055 730">The student needs to use variables to store data, AND make their programs make decisions using 'if/else' statements based on conditions.</td><td data-bbox="1055 550 1630 730">This confirms mastery of Variables and Selection in the new Python environment.</td></tr> <tr> <td data-bbox="416 730 1055 954">The student needs to independently design and write programs that incorporate loops (iteration) and a combination of control structures to solve problems and create interactive projects.</td><td data-bbox="1055 730 1630 954">This emphasizes independent application of control structures and Iteration.</td></tr> <tr> <td data-bbox="416 954 1055 1145">The student needs to test my code for errors, using debugging techniques to identify and fix logical and syntax issues in my own and simple programs from others.</td><td data-bbox="1055 954 1630 1145">This requires a strong focus on Checking Syntax and advanced application of Debugging.</td></tr> <tr> <td data-bbox="416 1145 1055 1385">The student needs to decompose complex programming problems into smaller, manageable sub-problems, and begin to use abstraction to create more [efficient programs].</td><td data-bbox="1055 1145 1630 1385">This introduces high-level computational thinking skills like Decomposition and Abstraction. Year 8 also begins introducing Using functions and Advanced algorithms.</td></tr> </tbody> </table>	Year 8 Programming Curriculum Objective	Supporting Concepts (Year 8 Focus)	The student needs to use variables to store data , AND make their programs make decisions using 'if/else' statements based on conditions .	This confirms mastery of Variables and Selection in the new Python environment.	The student needs to independently design and write programs that incorporate loops (iteration) and a combination of control structures to solve problems and create interactive projects.	This emphasizes independent application of control structures and Iteration .	The student needs to test my code for errors, using debugging techniques to identify and fix logical and syntax issues in my own and simple programs from others.	This requires a strong focus on Checking Syntax and advanced application of Debugging .	The student needs to decompose complex programming problems into smaller, manageable sub-problems, and begin to use abstraction to create more [efficient programs].	This introduces high-level computational thinking skills like Decomposition and Abstraction . Year 8 also begins introducing Using functions and Advanced algorithms .
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