

Module/Unit of Learning	Taught During	What will students learn?	How are students challenged to become experts?	Links to other Subjects
<b>Programming fundamentals and Boolean logic</b>	Autumn 1	Students will learn the foundations of computer programming using the Python language. This includes: the use of variables, constants, operators, inputs, outputs and assignments, Sequence, Selection and Iteration (count- and condition-controlled loops); the common arithmetic and Boolean operators; and the three main Boolean logic gates.	During this unit of work students will be challenged to complete a series of Python challenges using coding rooms to create, interpret, correct, complete, and refine algorithms using pseudocode, flowcharts, reference language and a high-level programming language, in this case Python.	Maths
<b>Programming</b>	Autumn 2	Students will extend their knowledge and skills in programming using the Python language. This will include: how to use sub programs (functions and procedures) to produce structured code, random number generation, nested selection statements.	Students will be given the opportunity to solve significant problems using Python. Students may draw on some of the content in both components when engaged in Practical Programming.	Maths English

<b>Secondary Storage and Data Storage Units.</b>	Spring 1	Students will learn about secondary storage types including: magnetic, optical and solid state. They will learn the advantages and disadvantages of the different storage media relating to the following characteristics: capacity, speed, portability, durability, reliability and cost. Students will learn the different data storage units. Students will learn about units of data and be able to calculate data capacity requirements.	Students will be challenged to justify choices of secondary storage for given scenarios based on characteristics. Students will be challenged to calculate document sizes and data capacities.	Maths
<b>Data Storage and Compression</b>	Spring 2	Students will learn how numbers, characters, images and sound are represented in binary. They will learn how to convert numbers to binary and hexadecimal and vice versa, the use of character sets, and how sound can be sampled and stored in digital form. Students will learn the relationship between the storage of data as binary and file sizes. The students will learn how to decrease the file sizes including the use of lossy and non-lossy compression.	Students will be challenged to convert data into a form that is suitable for processing. Students will be challenged to predict and justify the impact that changing the file sizes will have on the quality of the data.	Maths
<b>Additional Programming Techniques</b>	Summer 1	Students will learn additional skills of computer programming using the Python language. They will learn and use basic string manipulation. The students will learn the use of basic file handling operations including how to open, read, write and close files.	Students will be given the opportunity to solve significant problems using Python. Students may draw on some of the content in both components when engaged in Practical Programming.	Maths English

<b>Algorithms</b>	Summer 2	Students will learn how abstraction, decomposition and algorithmic thinking are components of computational thinking. Students will learn how to apply abstraction, decomposition and algorithmic thinking to problems. Follow iteration and subroutines within flowcharts. Students will learn how to write algorithms using pseudocode, flowcharts and the Python programming language	During this unit of work students will be challenged to complete a series of Python challenges using coding rooms.	Maths English
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Pride

Respect

Success