Module/Unit of Learning	Taught During	What will students learn?	How does this deepen understanding and enrich experience?	Links to other Subjects
1.1 Systems Architecture	September Year 10 and September Year 11	Students will learn about the purpose of a computer and how this is developed into a computer system is the building from Spring 1 students will know begin to research and learn a deeper understanding into system architecture. The component parts that fetch decode and execute instructions. They understand that instructions are converted into binary now we lead on to how they are decoded	This topic builds upon topics from KS3 but allows pupils to gain a more detailed understanding of the CPU and how it works with RAM	
1.2 Memory and storage	September Year 10 and September Year 11	Students will learn about the Primary memory (RAM and ROM) and secondary storage. Virtual memory is also looked at before moving onto data representation which includes binary, binary arithmetic, and how binary is used to represent text, images and sound data. Lossy and lossless compression is also studied.	Again, building on KS3 topics pupils will gain a great insight into how data can be represented and how the binary building blocks are physically stored.	Math – arithmetic and co-ordinates
1.3 Computer networks, connections and protocols	December Year 10 and October Year 11	Students will learn the characteristics of LANs and WANs including common examples of each, an understanding of different factors that can affect the performance of a network; The tasks performed by each piece of hardware. The concept of the Internet as a network of computer networks. The concept of servers providing services; the concept of clients requesting/using services from a server; the Cloud: remote service provision.	Students will utilise expert tuition from the CISCO website, providing students with industry level expertise and be challenged to Apply understanding of networks to a given scenario.	

1.4 Network security	January Year 10 and October Year 11	Students will learn that threats and hacks are a constant challenge for both corporate and small businesses and understand the nature of attacks, and how to identify and prevent.	Students will be exposed to various real-world examples from both common platforms (PlayStation, Xbox, Facebook etc..). They will also look at real world systems and methods to prevent these attacks.	
1.5 Systems software	January Year 10 and November Year 11	Students will learn about the operating system and why it is the most fundamental piece of system software. Learners will consider the interactions between software and hardware and the interface it provides between user and computer.	Pupils will use a variety of user interfaces and different operating systems looking at their similarities and differences.	
1.6 Ethical, legal, cultural and environment al impacts of digital technology	February Year 10 and November Year 11	Ethical issues such as the use of AI and social media are studied. Cultural issues such as differences between countries use of technology and the digital divide are looked at. Students will also learn about the main legislation that effects how people use computers and also the environmental impacts of technology.	A wide range of issues will be discussed and a variety of videos and news articles read to gain further insight into how these issues effect different people.	English – reading comprehen sion and extended writing tasks
2.1 Algorithms	March Year 10 and January Year 11	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. Sorting and Searching Algorithms and Trace tables will also be studied	During this unit of work students will be challenged to complete a series of Python challenges that link to the algorithms studied.	Maths - inequalities

2.2 Programming fundamentals	April/May Year 10 and January Year 11	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. String manipulation, 2D and 3D Arrays, SQL and File handling will also be studied.	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 - Algebra
2.3 Producing robust programs	May Year 10 and February Year 11	Students will gain and understanding of the issues a programmer should consider ensuring that a program caters for all likely input values. They will also understand how to deal with invalid data in a program and use authentication to confirm the identity of a user. Learners will understand syntax errors, logic errors as errors which produce unexpected output and ways to test data.	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.	PSHE - esafety
2.4 Boolean logic	June Year 10 and February Year 11	Students will learn about the main 3 logic gates and combine them to represent expressions and systems, as well as studying truth tables to represent and show all possible inputs and outs to a logic system.	Students are given the opportunity to explore logic gates beyond those listed in the specification and create and understand logic diagrams that have multiple gates and layers.	
2.5 Programming languages and Integrated Development Environments	July Year 10 and March Year 11	Students will learn the differences between high- and low-level programming languages, the need for translators and the differences, benefits and drawbacks of using a compiler or an interpreter. Students will also gain a knowledge of the tools	Students will be given the opportunity to solve significant problems using Python. Students may draw on some of the content in both	Maths (Boolean algebra, decision maths)

		that an IDE provides, how each of the tools and facilities listed can be used to help a programmer develop a program.	components when engaged in Practical Programming.	
General Programming	Throughout both years but for a prolonged period in November of year 10 and February/March of year 10 and December in year 11	As well as being taught and modelled programming techniques by their teachers, students will use a variety of resources including time2code, snakify, microbits, gocodeit and OCR Programming Challenges to learn, understand and embed their knowledge of programming.	Pupils are challenged to program solutions to increasingly difficult problems. There is also a dropdown day given over to programming a larger problem which has many aspects.	Maths – algebra A variety of other subjects depending on the program eg geography if a capital cities quiz is made
Revision	One lesson in January Year 10 (Unit 1) One lesson in July Year 10 (Unit 2) Two lessons in November year 11 (Unit 1) Two lessons in March year 11 (Unit 2) 14 -15 lessons before final GCSEs (Units 1 & 2)	Revision covering: 1.1 Systems architecture 1.2 Memory and storage 1.3 Computer networks, connections and protocols 1.4 Network security 1.5 Systems software 1.6 Ethical, legal, cultural and environmental impacts of digital technology 2.1 Algorithms 2.2 Programming fundamentals 2.3 Producing robust programs 2.4 Boolean logic 2.5 Programming languages and Integrated	Students will be given further instruction on all aspects of the specification. They will be challenged to always exceed their own expectations.	