

Curriculum Summary

Subject: Computer Science

Year 7	Year 8	Year 9	Year 10	Year 11
		<p style="text-align: center;">Computational Thinking:</p> <p>Students will learn about decomposition and abstraction using different strategies to analyse problems. They will understand what an algorithm is and how they are used in both computing and everyday life.</p>	<p style="text-align: center;">Networking:</p> <p>Students will develop a thorough understanding of the LAN/WAN networks and how the internet works. They will learn how networks can be connected and how different types of connections and environmental factors affect speed and reliability.</p> <p>Students will also learn about network security and how to minimise risk.</p>	<p style="text-align: center;">Issues and Impact:</p> <p>Students will explore environmental impact on digital devices, including the disposal of technology.</p> <p>They will also explore the ethical and legal issues relating to the collection and use of personal data. They will attempt to answer important questions such as: Is it ethical for computers to make critical decisions which could influence safety and welfare? What is the future of AI?</p> <p>Students will also understand the laws regarding ideas and inventions, including digital art and software.</p>
		<p style="text-align: center;">Data Representation:</p> <p>Students will explore the use of binary to represent data and program instructions and will convert binary numbers to hexadecimal and vice versa. They will use 7-bit ASCII, bitmaps and analogue sound as binary, and consider the issues of large binary numbers.</p>	<p style="text-align: center;">Constructs:</p> <p>Students will understand and identify the structural components of programs and recognise main programming constructs in code. They will write programs that make use of sequencing, selection, repetition, iteration and single entry/exit points.</p>	
		<p>Data storage and compression: Students will understand that data storage is measured in binary multiples and be able to construct expressions to calculate file sizes and data capacity requirements. They will also explore the need for data compression.</p>	<p style="text-align: center;">Programming:</p> <p>Students will further develop their programming skills, creating programs independently and developing debugging skills.</p>	<p style="text-align: center;">Problem Solving Skills:</p> <p>Students will apply their knowledge of decomposition and abstraction in the form of both flowcharts and pseudocode. They will</p> <p style="text-align: center;">be able to independently create a flowchart or pseudo code which shows a solution to a problem using standard notation.</p>
		<p>Computers: Students will learn about hardware and software and different programming languages, recognising high-level code languages such as Python and lower-level languages such as machine code. They will also understand the two different ways higher level code can be converted into a binary string.</p>	<p style="text-align: center;">Data Types and Structures:</p> <p>Students will write programs that make use of primitive data types and one and two-dimensional structured data types. They will use variables and constants, use and manipulate strings and be able to write programs that accept and respond to user input.</p>	<p>Students will use test tables to check codes inputs and outputs, and identify valid, extreme and invalid data.</p>
		<p>Python Programming: Students will explore programming constructions of sequence, selection and iteration. They will understand why the order of instructions is important and be able to use ifs in programming.</p>	<p style="text-align: center;">Data Representation:</p> <p>Students will be able to describe, in detail, the process that a computer uses to convert a file into binary code for storage, then how it deciphers the code to display it.</p>	