

COMPUTER SCIENCE



YEAR 10

Autumn 1	<h3 data-bbox="943 384 1435 432">Computer Hardware</h3> <p data-bbox="353 443 1995 512">Students will learn about a range of different types of computer systems including embedded systems. From there they will study the stored program concept, and the role of memory, the CPU and buses in the fetch-decode-execute cycle.</p> <p data-bbox="353 547 1771 579">They will also examine the role of secondary storage and learn how data is stored on different types of media.</p>
Autumn 2	<h3 data-bbox="819 683 1554 730">Programming and Algorithms 1</h3> <p data-bbox="353 742 1977 842">Students will be introduced to the basic concepts of programming including variables and datatypes, selection and repetition. They will write code using Python taking advantage of inbuilt subprograms for input, output and strings. They will learn how to use Boolean Operators and how to create associated truth tables.</p>
Spring 1	<h3 data-bbox="1133 981 1240 1029">Data</h3> <p data-bbox="353 1040 2016 1141">Students will learn why computers use binary. They will practice converting between unsigned and signed denary and 8-bit binary numbers, adding and shifting binary numbers, and converting between hexadecimal and binary. At this point they will also consider why hexadecimal is used in computer science.</p> <p data-bbox="353 1176 2002 1238">Students will also explore how binary can represent text, images and sound. They will construct expressions to calculate file sizes establish data capacity requirements. Students will also consider the need for and different methods of data compression.</p>



Spring 2	Programming and Algorithms 2
	Students will practice using Python subprograms related to lists and will explore the various ways to iterate through data structures using for loops.
	Students will learn how to create their own subprograms and learn the difference between functions and procedures. They will also consider their first key programming algorithm – linear search.
Summer 1	Networks
	Students will learn what a network is and the reasons for connecting computers in a network. They will examine different types of networks, common network topologies and the characteristics of wired and wireless connectivity. Students will practice constructing expressions involving file size, time, and transmission rate measured in bits per second. They will learn what the internet is and how it is structured. They will study network protocols and the TCP/IP stack before considering the importance of network security, and ways of identifying vulnerabilities and protecting networks.
Summer 2	Programming and Algorithms 3
	Students will build on their programming skills by learning how to write programs that access data from other files. Reading from and writing to files will allow them to solve more complex problems.
	Students will examine their second key algorithm – merge sort. Students will also use the Turtle subprograms to write programs that create graphics. They will combine their learning from across the year to create complex graphics programs.