

	Working Towards	Expected Standard	Greater Depth
	By the end of Year 9 a student should be able to:	By the end of Year 9 a student should be able to:	By the end of Year 9 a student should be able to:
A U T U M N	<p>Understand the terms decomposition and abstraction and use them in real world examples</p> <p>Able to use standard algorithms - bubble sort, merge sort, linear search and binary search</p> <p>Write algorithms that use arithmetic operators</p> <p>Identify the structural components of the programming language Python</p> <p>Understand the terms, selection, sequence and iteration in programming</p> <p>Identify appropriate uses of primitive data types</p> <p>Identify simple syntax errors in code</p>	<p>Understand the benefit of using decomposition and abstraction to model aspects of the real world and analyse, understand and solve problems.</p> <p>Understand how standard algorithms (bubble sort, merge sort, linear search, binary search) work</p> <p>Determine the correct output of an algorithm for a given set of data</p> <p>Follow and write algorithms (flowcharts, pseudocode*, program code) that use sequence, selection or repetition</p> <p>Differentiate between types of error in programs</p> <p>Write programs that make appropriate use of primitive data types</p> <p>Use structural components of the programming language Python</p>	<p>Analyse, understand and solve problems using decomposition and abstraction</p> <p>Analyse the standard algorithms used in CS - bubble sort, merge sort, linear search and binary search</p> <p>Produce pseudocode that uses selection, sequence and iteration correctly</p> <p>Write programs that make appropriate use of integer, and one/two-dimensional structured data types</p> <p>Use techniques to make programs easier to read, understand and maintain</p>

S P R I N G	<p>Use local variables within coding</p> <p>Understand what relational operators are within programming</p> <p>Identify the logical operators within programming</p> <p>Use the terms sequence, selection and iteration when talking about programming</p> <p>Be able to read, and write simple programs in a high-level programming language.</p> <p>Understand the difference between low level and high level programming language</p>	<p>Use local and global variables within coding</p> <p>Understand the need for and be able to follow and write algorithms that use arithmetic operators</p> <p>Use relational operators within programming</p> <p>Use logical operators AND, OR and NOT</p> <p>Write programs that make appropriate use of sequencing, selection, repetition</p> <p>Identify both high- and low-level programming languages</p> <p>Able to read, write and refine programs written in a high-level programming language.</p> <p>Understand the characteristics and purposes of low-level and high-level programming languages</p>	<p>Understand the need for and be able to follow and write algorithms that use modulus, integer division, exponential (Use count-controlled, condition-controlled loops), iteration and single entry/exit points from code blocks and subprograms</p> <p>identify when high- and low-level languages would be used</p> <p>Able to analyse programs written in a high-level programming language.</p> <p>Analyse how an interpreter differs from a compiler in the way it translates high-level code into machine code</p>
S U M M E R	<p>Understand the threat to digital systems posed by malware</p> <p>Identify methods of protecting digital systems and data</p> <p>Identify ethical and legal issues</p> <p>Identify methods of intellectual property protection for computer systems and software</p> <p>Understand that computers represent data in binary</p> <p>Understand how to convert binary into base 10</p> <p>Understand how to manipulate binary</p>	<p>Understand the threat to digital systems posed by malware and how hackers exploit technical vulnerabilities</p> <p>Explain a range of different methods of protecting digital systems and data</p> <p>Able to explain the ethical and legal issues associated with the use of artificial intelligence, machine learning and robotics</p> <p>Understand methods of intellectual property protection for computer systems and software</p>	<p>Analyse the use of social engineering to carry out cyberattacks</p> <p>Analyse a range of different methods of protecting digital systems and data</p> <p>Analyse a range of ethical and legal issues</p> <p>Able to analyse the ethical and legal issues associated with the use of artificial intelligence, machine learning and robotics</p> <p>Analyse a range of methods of intellectual property protection for computer systems and software</p>

numbers using addition,  
Understand how computers represent  
images and sound

Understand how computers represent  
data in binary  
Understand how to convert binary into  
other number system – base 10 and base  
16  
Understand how to manipulate binary  
numbers using addition, subtraction and  
multiplication  
Understand how computers represent  
images and sound including calculations  
of file size

Understand how to use two's  
complement, including how to deal  
with an overflow error  
Explain how computers change  
analogue sounds into a digital version  
for use and storage including  
compression  
Explain how computers store images  
Carry out complex calculations in  
order to work out the size of a file  
once converted