Year 7 Computer Science	**Curriculum Intent:** Computing consists of three stands: Computational Thinking, Computer Science and Digital Literacy. Within the Computer Science and Computational Thinking streams we will develop the student's knowledge and understanding of what a computer is using the Input/Process/storage/output model of computing. In term one exploring the fundamentals of the model. We will examine the logic behind instructions and how they are processed. We de-mystify a computer by explaining what software is and how it is created, providing opportunities for students to develop their own software using a text-based programming language.		
	Term 1 **Understanding Computers, Data Representation and Software**	**Term 2** **Block-based programming and AI/Machine Learning**	**Term 3** **Computational Thinking, Boolean Logic and Text-based Programming**
Topic Titles (in order of delivery)	**Understanding Computers** • Elements of a computer • The CPU • Understanding Binary • Binary Arithmetic/ Addition • Storage Devices • Convergence and new technologies **Data Representation and Software** • Character sets • Images as binary • Sound as binary • What is a software? • Difference between Utility and Application software • Peripheral Devices	**Fundamentals of programming (Block Based)** • What is programming? • Programming essentials • Sequencing • Selection • Operators • Variables • Iterations **AI and Machine Learning** • What is AI • What is machine learning and what are the uses of machine learning • Ethics of AI. How Bias can be introduced into AI and machine learning. • How are images stored as binary data • How intelligence is measured in humans and computer. • What is a Turing test and how it works	**Computational Thinking** • Understand a problem. • Solve a problem. • Cornerstones of computational thinking • Decomposition • Abstraction • Pattern Recognition • Algorithms **Boolean Logic** • Logic Gates / Truth tables • Boolean Operators • Arithmetic Operators **Introduction to text-based programming (Python) using Hour of code** • Basic programming constructs • Sequence • Selection • Iteration
Key knowledge / Retrieval topics	• The computer as Input / Process. Output model • What input devices are • What output devices are • Components of a computer • FDE Cycle • Processor Speed • RAM vs ROM	• Understand the origin and uses of AI • Understand how rules are used in AI decision making • Understand the difference between facts and rules • Describe uses of machine learning	• What is computational think? • Solving a problem • Why is computational thinking important? • Breaks down problem. • Focuses on relevant details. • Develop solutions.

	• Define Bit, Byte, KB, MB and GB • Binary Conversions • Character Representation using ASCII • Binary Addition • Data Units • Storage Units • Optical Media • Timeline of communication • Effects of changing technologies • Emerging technologies • RFID • Assistive technologies • How the CPU works (FDE) • Different types of memory (RAM / ROM) • What software is • Operating system Software • Utility Software • Anti-virus • Back-up • System management • File management • Application Software	• Use training data to create rules that solve problems of categorising data • Discuss the strengths and weaknesses of machine learning • Understand how jobs can be affected by AI and automation • Understand how bias can be introduced into AI algorithms and machine learning • Understand issues that make facial recognition difficult • Understand how images are stored as binary data • Describe a technique for detecting patterns in a grid of pixels • Review program code and adapt it to detect given shapes • Understand how intelligence can be measured in humans and computers • Know what the Turing test is and how it works • Understand why interpreting patterns is not as useful a skill as 'thinking' • Program a chatbot • Sequencing in programming • Why is sequencing important in programming. • Variables in programming • What are variables? • Operators in programming • Why are different types of operators in programming? • Selection in programming • What is selection in programming? Why is selection important in programming. • Iteration in programming • What is iteration in programming? • Introduction to binary numbers • Identify correct units of data. • Binary conversions	• Who can understand solutions? • Humans • Computers • Both humans and computers

		• Denary to binary. Binary to denary • Identify a range of application software and use • image processing • Word Processing • Spreadsheet • Web browsers • Presentation • Database • IDE	
Understanding / Sequence of delivery	• (Input / process / output / storage) • Binary to denary • Denary to binary • Binary additions • How computers process data using switches • Bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte • 127 chars (7-bit ASCII) • Sound and Image can representation as binary • Internal components (CPU, Motherboard/RAM/BI • Difference between types of software • Input / Output storage devices • Operating Systems and Character sets	• Introduction to programming • Understand the following in programming using block based (Scratch) • Sequnce • Variable • Operators • Selection • Iteration AI and Machine Learning • What is AI • Machine Learning • Ethics of AI • Image Recognition • Turing Tests and Chatbot • Rate my Review	• Introduction to python. • Basic programming concepts in python • Sequence • Selection • Iteration • Hour of code to understand and create python-based programs.
	• Assessment on the above content	• Assessment on the above content	• Assessment on the above content