KS5 Computer Science Curriculum

	Autumn	Spring	Summer
Year 12	,Programming, Arrays, Tuples, Records Queues, Lists, Stacks, Hash tables Graphs, Trees Computational thinking, Algorithms	Project work and Architecture of the CPU Memory, Storage, Systems Analysis Assembly Language Networks HTML, CSS, JavaScript	Project Work and SQL, Search Engine Indexing Database normalisation
	Programming and Programming Project		
Year 13	Project Work and Data types: 2s compliment, floating point numbers Boolean logic algebra, logic gates ,Legislation	Recap on Spring and Summer Terms	Exam and Revision Technique
	Programming, Revision and Exam Technique		

How will you be assessed?

- **Knowledge** of topics and programming ability
- **Understanding** of the topics throughout the curriculum and the ability to analyse, decompose and write algorithms
- **Application** of knowledge and understanding to interpret, analyse and evaluate programming problems providing effective solutions

Intent		What new knowledge/content do we introduce?	

By the end of KS5 students are able to…		Year 12	Year 13	Choices	How does this curriculum incorporate the National Curriculum and go beyond? How does going beyond the NC ensure challenge?
• understand the key topics to the curriculum and be able to not only articulate answers to exam questions, but to talk fluently in a variety of ways about them as well as how they inter-link to other topics • develop high level programs that reflect their understanding of the topics as well as the fundamentals of all programming languages • be able to understand more complex theoretical and abstract concepts that underpin the ways in which computers, networks and the internet works	Autumn	Heavy focus on programming and software development aspects of the course to establish the skills required to start project work.	How different data types are represented including floating point numbers. Boolean algebra and simplification of circuits, and adding circuits, D-Type flip flops. Legal, environmental, cultural aspects of computing. Complete and hand in Project	Within year 12, the programming project allows the student to program a project based on specific stages that utilise as many of the topic that they will have come across at that point. They are given free choice as to what project they can undertake. Within year 13, we further develop the ways in which students understand the topics that they would have been given in the year. Each student is given a specific topic to research of the current technology and thinking around that topic. They will then provide a presentation to other students on this topic	We utilise our own in school IT department to support topics, where applicable, to give a real-life practical understanding of how computers work in real businesses. Students have the chance to see how topics specific to KS5 work within the school environment.
	Spring	Project work begins this runs in parallel to the following theory work How computers are structured, memory and storage types.Operating Systems, CPU types and hardware writing assembly language.	Revision topics. Based on Year 13 mocks bespoke revision/feedback work followed by students taking past papers under exam conditions and subsequent bespoke feedback. Also focus on how to effectively answer 9/12 mark long questions.		
	Summer	What ways are data sent through networks? What are the theoretical underpinnings to these concepts?	Students continue taking past papers under exam conditions and subsequent bespoke feedback. Also focus on how to effectively answer 9/12 mark long questions.		
	Rationale for this sequence	We take start with ensuring the students are capable of understanding the key concepts that they typically did at KS4. These begin with the architecture of the CPU and ways in which different devices interact with it. We deal more closely at this point with how a computer is maintained for maximum efficiency As the year progresses, others topics are developed based around the programming that the students begin to go through. So we based their programming with an introduction to assembly language, system analysis, database and SQL. This provides some higher level thinking that they can take advantage of within the project. Programming is taught throughout the year to ensure that students are prepared for completing the project as well as capable of writing the more complex algorithm questions within the paper. The programming project is an assessed piece of work which combines a variety of skills from across the topic base and therefore supplements the work that students do. We ensure that practical programming topics visited during the year are used to define and demonstrate their understanding within the project.	We begin year 12 by looking at the more complex topics that students typically struggle to understand. These involve topics such as search engine indexing, Karnaugh maps and adders. We then revisit topics from year 12, ensuring that students understand the topics thoroughly. At this point students have a full understanding of the topic over the entire curriculum and therefore we can now support each topic with its relevant and interactivity with other similar topics. Students also become more aware of how questions around these topics will be worded within the exam. Each topic is set up with different questions that We continue programming skills but focus on decomposing problems that might occur in the exam. Students are tasks with constant challenge in these areas to ensure that are capable understanding how these questions are developed within the exam, how mark schemes are focused and how to ensure the maximum marks can be achieved for these typically higher scoring questions.		
	How does the KS5 Curriculum build on previous learning at KS4?	We develop the topics that were learnt in KS4 to a much deeper level. Students may have developed questions at KS4 that we are not able to visit within lesson time and these are used to support the introduction to each topic that we teach in KS5. We still ensure that students create their own theoretical understanding of a topic, to develop their own skills in deeper thinking, before the topic is gone through based on the OCR curriculum.			