COMPUTER SCIENCES CURRICULUM OVERVIEW

Key Stage 3		Key Stage 4	Key Stage 5
Transition Stage	Foundation Stage	Examination Stage	Advanced Stage

The guiding principles underpinning Computer Science during the Transition and Foundation stages is to develop students who are confident users of ICT and able to be critical thinkers, who understand the digitally connected world. As students join us from primary school, they are taught to become familiar with the school network and there is a continuous focus on ensuring that students understand the implications of using ICT safely. This is taught first to make sure students understand the need for e-Safety and can use the IT systems we provide.	Students build on their knowledge from the transition stage by learning about more specific content by being taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. The curriculum is matched closely to the National curriculum in England for Computer Science with a key focus on the pathway students will follow in key stage 4.	The GCSE Computer Science qualification enables students to learn how computers work, as well as learning about other theoretical aspects of computing such as networks and applications. The aim of this course is to understand and apply the fundamental principles and concepts of Computer Science to solve a wide range of problems. The course also prepares students for A Level Computing and BTEC Level 3 IT, covering many of the core topics	At A Level Computer Science, students understand the core academic principles of computer science. These include computation and algorithms, computer programming, machine data representation, computer systems (hardware and software), computer organisation and architecture, communications and networking, databases and the consequences of using computing.
Computer Hardware/Software: Important for students to understand the components of a computer system and their functions	During year 8, students learn how to plan, develop, code and test programs using a range of programming techniques and coding languages. Seeing the common programming structures across a range of languages reinforces the principles. In addition, students learn about data representation and designing and creating websites using HTML and CSS.	During this course, students learn and develop further knowledge of topics such as: computational thinking including abstraction, decomposition, logic, algorithms, and data representation. Students also analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs. This allows students to think creatively, innovatively, analytically, logically and critically.	Classroom learning is transferred into creating real-world systems through the creation of an independent programming project. Students will develop technical understanding and their ability to analyse and solve problems using computational thinking. Students will develop further skills of thinking creatively, innovatively, analytically, logically and critically as well as developing the capacity to see relationships between different aspects of computer science.
Students are also introduced to computer programming through developing their own computer game. This helps them develop problem solving skills & logical reasoning invaluable in Computing and across the curriculum. The transition stage ensures that students become digitally literate – able to use, and express themselves and develop their ideas through information and communication technology.	During year 9, several key knowledge strands will be embedded so as to allow for deep learning and preparation for continuation to the Examination stage. Topics include: computational thinking including decomposition and abstraction, creating algorithms, program development with Python, hardware and software of computer systems.	Students develop knowledge of the components that make up digital and computer systems, and how they communicate with one another and with other systems. Students learn the legal and ethical issues of using computers where they discuss and analyse the impacts of digital technology to the individual and to wider society.	
	By the end of Key Stage 3 students will be able to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation and they will be able to analyse problems in computational terms. Students will have repeated practical experience of writing computer programs in order to solve such problems. Students will be able to evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. Students will become safe and responsible, competent, confident and creative users of information and communication technology.		