Curriculum Intent - Computing

The aim of Computing is to enable students to understand how computers and computer systems work, how they are designed and programmed, how to apply computational thinking, and how to make best use of information technology. It aims to give pupils a broad education that encourages creativity and equips them with the knowledge and skills to understand and change the world. The Computing curriculum is made up of three distinct strands, each of which complement each other: Computer Science (CS), Information Technology (IT) and Digital Literacy (DL). Each component is essential in preparing pupils to thrive in an increasingly digital world.

Computer Science is the scientific and practical study of computation: what can be computed, how to compute it, and how computation may be applied to the solution of problems. The benefits of studying Computer Science go beyond working with electronic devices, the ability to decompose problems that can be addressed in an algorithmic way is beneficial in a range of fields. This can include an Application Analyst, a CAD Technician, Cyber Security Analyst, Data Analyst, Forensic Computer Analyst and Game Designer. Information Technology is concerned with how computers and telecommunications equipment work, and how they may be applied to the storage, retrieval, transmission and manipulation of data. By being able to understand how user interfaces function, students can utilise this skill to their advantage when required to communicate with the given device as an expert user. Digital Literacy is the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies. This also includes ethical, legal and cultural considerations when using technology to create or communicate, with a focus on the impact of one's own use of the internet and social media on one's day-to-day lives and experiences.

The aim of Key Stage 3 study is to model real-world problems such as computer security and use of hardware to support working practices, and to develop an understanding of the functionality of a computer system, with an introduction to processing, storage and input/output devices. Students also have the opportunity to learn coding in Python, supported by simple algorithmic thinking. They also have the opportunity to utilise BBC Micro:bit hardware to demonstrate results in programming.

The Key Stage 4 curriculum is split into two courses. Students can study either vocational (ICT) or academic (Computer Science) routes. The BTEC Digital Information Technologies is a vocational route that allows students to plan, design, create and evaluate user interfaces; analyse and test data; and project manage. Alongside this, students learn how information technology functions in the modern world, including cyber security and modern technologies. GCSE Computer Science requires students to know and understand the hardware and software functions of a computer, including the theoretical principles on which the physical architecture of a computer has been built (e.g. Von Neumann architecture); students are expected to understand how to apply algorithmic thinking to solving a wide range of problems, through abstraction and decomposition; they are also expected to know how to utilise different representations of data and their transmission. In both routes, students learn the importance of the impact of social media and the importance of legislative considerations on the use of computing and data, and how that should influence ethical ways of working.

Why is computational thinking so important? It allows us to solve problems, design systems, and understand the power and limits of human and machine intelligence. Computing skills can be applied and further developed across the curriculum. For example, students can create animations to support Geography, learning about online safety in PSHE and creating programs to simulate science experiments or solve mathematical problems.

Computing lessons are planned to challenge every learner, every lesson, every day. Clear goals of what we want and know students can achieve are set. Through doing this we are ensuring our students have the technological skills needed to succeed in the global digital economy.

All students study Computing at Key Stage 3, they complete regular home learning tasks to revise subject knowledge that will enable them to apply that knowledge. They also complete regular online quizzes to check subject knowledge and progress checks are completed to assess the application of that knowledge.

Students who study the Vocational Computing course at Key Stage 4 will complete two pieces of coursework. The coursework is split up into small assignments that have regular deadlines to ensure timely completion of tasks. Alongside coursework students will study theory topics; knowledge will be regularly checked through online quizzes that will feed into future lesson planning. Students who study GCSE Computer Science will prepare for two theory exams: The Principles of Computer Science and The Application of Computational Thinking. Also, within this course, students will complete a coding-based task on a given scenario. Students will be prepared for the exams through regular online quizzes, progress checks and summative assessments.

By studying Computing, we are equipping students with fresh ideas and practices, constantly updating their knowledge and ensuring that they do not just have skills but learn how to adapt to technological change and deal with its challenges and opportunities.