Computing

Curriculum Intent

Key Stage 3

Key stage 3 lessons are designed to empower students and enable them to become confident individuals, effective contributors and successful learners.

Year 7 begins with computational thinking, flowchart design and implementation. This gives our pupils a solid foundation in the underlying principles used in computer programming. This then leads to using simple instructions being created from flowcharts and JAVA to move simple characters and objects. The pupils will learn the basics of linear scripting by writing simple constructs in the Python programming language. Pupils then learn about developing solutions for an intended audience by completing a mini creative project.

Year 8 begins with pupils developing an understanding of Object Oriented Programming. This provides them with greater confidence in handling modern complex languages such as JAVA. Students then undertake a set of linked tasks designed to give them a wider understanding of web development.

Year 9 begins with further widening their language base by learning to program in C#. Pupils learn how to use spreadsheets to give them useful skills across the curriculum and in industry. This prepares them for coding at GCSE level, and will give them the opportunity to see that many programming languages share a common base. They also gain an appreciation of modern developing industries and technologies such as the Internet Of Things and Artificial Intelligence.

Key Stage 4

Pupils in Year 10 start by developing their C# programming skills to further their understanding of program flow and this prepares them for their Computational thinking and programming skills examination in Year 11.

They develop the knowledge of Computing concepts in line with the AQA specification. Furthermore they complete assessment papers after each unit in preparation for the exams, highlighting weakness when needed.

Key Stage 5

Pupils in Key Stage 5 begin with an overview of programming concepts. They then start learning the theory behind hardware, software and networking to a secure level. This prepares them for higher education in any Computing field, giving them a clear advantage over any student who has not undertaken this course.

Curriculum Implementation

Key Stage 3

In KS3 pupils have two Computing lessons a fortnight.

Year 7	Year 8	Year 9
• Logical reasoning • Oxford computational thinking challenge • Flowcharts and basic algorithms • Introduction to java • Graphics & Logo design • Python • Intro to Cyber Security • Introduction to Artificial Intelligence	• Data Representation • Cyber theory • Mid level Object Oriented Programming • Oxford computational thinking challenge • Modern games and application design • HTML/ CSS • HTML 'Escape Room' project • Understanding the risks of Artificial Intelligence and the importance of using it safely	• Intro to Visual Studio • Computational thinking • C# coding. • Cyber theory • Spreadsheets • Data types • Databases • Risk Awareness • Coding Challenges • Understanding how to use Artificial Intelligence effectively and evaluate its outcomes

Key Stage 4: GCSE (AQA)

Pupils will begin working with real-world programming and provide a good understanding of the fundamental principles of computing.

Year 10	Year 11
• Fundamentals of algorithms • C# Programming • Fundamentals of data representation • Computer systems • Fundamentals of computer networks	• C# Programming - advanced • Fundamentals of cyber security • Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy • Aspects of software development

Key Stage 5: A Level (AQA)

At A Level the pupils will undertake the following components:

Year 12 & Year 13

1. At A Level the pupils will undertake the following components:

- Fundamentals of programming
- Fundamentals of data structures
- Systematic approach to problem solving
- Theory of computation
- Fundamentals of data representation
- Fundamentals of computer systems
- Fundamentals of computer organisation and architecture
- Consequences of the uses of Computing
- Fundamentals of communication and networking
- In the third term of year 12, the pupils choose a programming project, which teaches them skills in planning and iterative implementation and testing.
- Alongside this, pupils develop their coding abilities in C#.

Impact

Key Stage 3

Students are preparing to both program and understand the role of Computing in the wider world.

In year 7, pupils will understand how computers work, and how they can be programmed at a fundamental level.

In year 8, pupils will have built upon their knowledge in the previous year. They will have gained a wider understanding of how to program in an Object Oriented Environment. They will also have gained a wider understanding of how web pages and websites work, both in a technical aspect, and in terms of commerce.

In year 9, pupils will have developed a thorough understanding of programming concepts in preparation for further study at GCSE. They will have gained an understanding of spreadsheets and databases, and their use in the wider world.

Key Stage 4

At Key stage 4, pupils will have become conversant in programming in C#. They will have gained a general understanding of the operations of computers and networks. They will understand the basic mathematics that underpins Computer Science. They will have gained an appreciation of the role computers play in the wider society.

Key Stage 5

At Key stage 5, pupils will have a deep understanding of programming in C#. They will have gained a significant understanding of both the hardware and software used in computers and Computing networks. They will be able to undertake in-depth projects, and be able to plan build and test systems.