Computer Science – Curricilum Intent Statement

To develop students' computational thinking and problem solving abilities, equipping them with the skills required to be successful in their future careers. We want students to build resilience and become creative, critical thinkers who can apply their skills to any challenging situation. Our broad and balanced curriculum is designed to equip students with the skills and understanding to live and work in a technological world. This includes being able to use a variety of ICT and coding software.

To develop students' knowledge, skills and understanding through exposure to key computational concepts. The Computing curriculum has been designed to ensure learners have sufficient knowledge to stay safe online, understanding how computers work and be confident when using them. Students develop into resilient learners who are able to effectively solve problems and recover from mistakes.

Implementation

The units of study at KS3 give a basis of knowledge, skills and understanding to allow students to progress onto the KS4 GCSE or BTEC course. We aim to develop all students into effective practitioners in the workplace who are prepared for the demands of Computing and ICT in the world today.

Starting in Year 7, students are introduced to the basic ICT skills they will need to support other subjects across the curriculum including an introduction to the computer systems used at St Paul's: the school network, Google Classroom, Office 365, Satchel One, and Go 4 Schools. The core constructs of programming are introduced when developing algorithms and the inner workings of a computer are explored when learning about internal and external components.

Throughout Year 8, students will continue to build upon the skills they developed in Year 7. Programming is taken to the next level with the introduction of textual languages, data storage and the binary number system are explored as well as how to stay safe online. This year is used to develop students' programming and computational thinking skills in preparation for choosing KS4 options.

GCSE Computer Science

At Key Stage 4, the course builds on the knowledge, understanding and skills established during years 7 and 8. There is a heavy focus on programming skills and students are given the opportunity to experiment with a variety of languages and activities. Students revisit theory already covered in the form of written and multiple-choice topic assessments. More theory units are introduced not only to allow for a solid basis of understanding, but also to engage learners and get them thinking about real world application. Theory units follow the OCR specification:

Component 1: Computer Systems:

- Systems architecture
- Memory and storage
- Computer networks, connections and protocols
- Network security
- System software
- Ethical, legal, cultural and environmental impacts of digital technology

Component 2: Computational thinking, algorithms and programming:

- Algorithms
- Programming fundamentals
- Producing robust programs
- Boolean logic

- Programming languages and Integrated
- Development Environments

During Year 11, students continue to study the exam board specification theory units and revisit theory already covered in the form of written and multiple-choice topic assessments. A programming project is undertaken which involves students analysing a programming problem, designing a solution and implementing their design. Completing the project gives students relevant experience they can relate to in the Component 2 exam.

BTEC Digital Information Technology

The DIT course consists of three components that give learners the opportunity to develop broad knowledge and understanding of the digital sector and specialist skills and techniques in project planning, designing user interfaces and manipulating and interpreting data. Students develop their technical skills in preparation for the coursework and exam units.

Component 1: Exploring User Interface Design Principles and Project Planning Techniques

- Learners will develop their understanding of what makes an effective user interface and how to effectively manage a project. They will use this understanding to plan, design and create a user interface.

Component 2: Collecting, Presenting and Interpreting Data

- Learners will understand the characteristics of data and information and how they help organisations in decision making. They will use data manipulation methods to create a dashboard to present and draw conclusions from information.

Component 3: Effective Digital Working Practices

- Learners will explore how organisations use digital systems and the wider implications associated with their use.

A Level Computer Science

The Key Stage 5 curriculum builds upon knowledge gained during KS4 and provides the technical knowledge and experience required to progress into higher education.

The aims of the A Level qualification are to enable learners to develop:

- an understanding of and ability to apply the fundamental principles and concepts of computer science including; abstraction, decomposition, logic, algorithms and data representation
- the ability to analyse problems in computational terms through practical experience of solving such problems including writing programs to do so
- the capacity for thinking creatively, innovatively, analytically, logically and critically
- the capacity to see relationships between different aspects of computer science
- mathematical skills
- the ability to articulate the individual (moral), social (ethical), legal and cultural opportunities and risks of digital technology

The curriculum intends that students should adopt high aspirations and that most should aim to progress onto university or higher-level apprenticeships.

Impact

The curriculum plan allows for the teaching of theory followed by application of the theory in the form of practical lessons and homework. The curriculum plan includes cross-curricular links for literacy in the form of key terms and subject specific vocabulary, which are included in lesson presentations. Spelling tests are added to Show My Homework to re-enforce learning from the lesson. As Computer Science has close ties to Mathematics, numeracy is also a fundamental part of activities. Lessons

contain differentiated activities for students to complete that are in line with the lesson SOLO Learning Objective and Success Criteria.

The impact of following these whole school protocols is that students enjoy a familiar learning experience and know what is expected of them in each lesson. Formative assessment is ongoing during projects and programming tasks, and summative assessment is used during end of topic assessments. This allows students to know what level they are working at, and provides them with the knowledge of how they can achieve their full potential.