Computer Science – Year 7

Curriculum Intent

In Year 7, Computer Science introduces students to the fundamental principles of how computer systems work, how data is represented, and how problems can be solved computationally. Building on prior experience of block-based programming at Key Stage 2, students develop a foundational understanding of computer hardware, networks, data representation and algorithms. The curriculum is designed to establish clear conceptual understanding alongside practical skills, preparing students to think logically, work systematically and develop confidence in using computational thinking.

What Students Will Study Across the Year

Across the year, students explore the core components of computer systems, beginning with an introduction to what a computer system is and how different types of systems are used in everyday life. They examine the differences between general purpose and embedded systems and identify key hardware components such as the CPU, memory, storage and input and output devices. This develops students' understanding of how software and hardware work together within a system.

Students then study computer networks, learning how devices communicate and share data. They explore different types of networks, including local area networks, wide area networks and wireless personal area networks, and identify the hardware used within networks such as servers, switches, routers and wireless access points. Alongside this, students learn about common security threats, including unauthorised access and malware, and examine methods used to protect systems and data, such as passwords, firewalls and encryption.

The curriculum introduces data representation, focusing on how computers store and process information using binary. Students learn how to convert between binary and denary numbers and explore how images are represented digitally, including an understanding of bitmap images and how they differ from vector graphics. This builds a clear foundation for understanding how data is stored, processed and transmitted within computer systems.

Students also develop their understanding of computational thinking and algorithms. They explore the key stages of problem solving, including decomposition, abstraction, pattern recognition and algorithm design. Students learn how algorithms can be represented using flowcharts and investigate how searching algorithms, such as linear and binary search, are used to locate data efficiently.

Programming skills are developed through practical work using block-based programming environments, including Micro:bits. Students apply key programming constructs such as variables, sequence, selection and iteration to create simple programs. This reinforces logical thinking and allows students to apply theoretical knowledge in practical contexts.

Assessment and Progression

Students are assessed through two formal assessments across the year, alongside regular classroom activities that check understanding and application of knowledge. Assessment focuses on students' ability to explain key concepts, apply computational thinking, interpret data representation and create simple programs using correct structures. By the end of Year 7, students have a secure understanding of core computer science concepts and the skills needed to progress to more advanced study of programming, data and systems in Year 8.