

Intention of Computer Science

The Computer Science Curriculum at Melton Vale fosters a unique blend of creativity, innovation, logic and mathematical reasoning whilst building an understanding of the power and limitations of human and machine intelligence. It simultaneously develops student understanding of how computer systems work and their personal, technical and programming skills. Students are also taught the moral, ethical, legal and cultural opportunities and risks of digital technology within our society. This leads to much debate and appreciation of the wider world as creators and consumers within our digital age, as well as the global demand for the advancement of computer science that permeates all aspects of our professional and personal lives.

Our carefully sequenced curriculum builds on the fundamental principles introduced at KS4 by extending students' computational thinking to include abstraction, algorithms and data representation. Students will be taught how to think abstractly to solve problems, how to decompose them into manageable pieces and how to think logically. These skills form the bedrock for programming high level languages such as Python, SQL and JavaScript, Unity, C#. To engage, attract and in order inspire students about the history of computing or coding, we organise historical/museum visits.

Knowledge of data base design, Data Structures, exchanging data, Data Types, network infrastructure and modern web technologies are also deepened throughout the curriculum, as are mathematical skills including Boolean Algebra and algorithms such as Google's Page Rank and Dijkstra's shortest path and how to measure the efficiency of algorithms using Big O notation.

Independent thinking opportunities are planned routinely throughout the curriculum to enable students to confidently tackle quantitative and data centric problems, giving them the foundations on which to solve problems resulting in real world, social impact. The project-based aspect of the curriculum is deliberately flexible to allow our students to tailor their work to their strengths, weaknesses, passions, beliefs and moral purpose. Mobile app, software engineering are routes students may explore for their personal projects.

Cyber security, data protection and legislation underpin all key concepts within the curriculum, ensuring our students are aware of and know how to minimise and prevent threats and risks.

The Computer Science Curriculum combines invention and excitement as academic principles are applied to real world systems by our students who become independent, confident problem solvers and decision makers.