

Powerful Knowledge

Powerful knowledge in Computing is the understanding that digital technology is designed and created by people and that computer systems work according to a set of logical rules and instructions. Students develop the knowledge needed not only to use technology effectively, but also to understand how and why it works, how digital systems communicate and process information, and how technology can be used to solve real-world problems.

In **Year 7**, students begin by developing the core digital skills required to work effectively and safely within the school's computing environment. E-Safety is introduced early and reinforced throughout the curriculum, helping students understand their responsibilities when communicating, sharing information and using online services. Students are introduced to **computational thinking**, learning how problems can be broken down, patterns identified and algorithms developed. They then apply these ideas through visual programming using **Kodu** and **MakeCode**, developing their understanding of sequence, selection, iteration and events while designing and testing their own programs.

In **Year 8**, students build their confidence as users and creators of digital technology. Through **spreadsheets**, students learn how data can be organised, processed and analysed using formulas, functions and appropriate formatting. Their study of **computer hardware** develops an understanding of the components that make up computer systems and how these work together. Programming is developed further using the **BBC micro:bit**, providing opportunities to design, create, test and refine programs for a physical device. Students also explore **web design**, considering how websites are structured, designed and developed for particular audiences and purposes.

In **Year 9**, students apply their knowledge with greater independence and begin to encounter concepts that provide a foundation for GCSE Computer Science and other digital qualifications. **Mobile app development** allows students to design solutions for particular users and purposes. Through **cybersecurity**, students investigate digital threats, vulnerabilities and methods used to protect individuals, data and computer systems. Students progress to **text-based programming using Python**, developing their understanding of variables, data types, input and output, selection, iteration and problem solving. A **Data Science** unit introduces students to the collection, analysis, interpretation and presentation of data and demonstrates how computing can be used to identify patterns and inform decisions. Students also undertake the **iDEA Challenge**, developing wider digital, enterprise and employability skills.

Throughout Years 7–9, the key thread is the development of students from **users of technology into confident and responsible creators of technology**. Students

repeatedly apply computational thinking, problem solving, digital literacy and programming skills in increasingly challenging contexts.

Literacy

Computing introduces students to a wide range of technical vocabulary which they are expected to understand and use accurately when explaining computer systems and evaluating their own work.

Key terminology includes:

Algorithm · Abstraction · Decomposition · Pattern Recognition · Sequence · Selection · Iteration · Variable · Data Type · Input · Output · Program · Debugging · Hardware · Software · CPU · Memory · Storage · Data · Formula · Function · Spreadsheet · Cybersecurity · Malware · Phishing · Password · Authentication · Network · Website · HTML · Python · Data Science

Students are encouraged to use subject-specific vocabulary when describing processes, explaining solutions and evaluating digital products.

School Context

The Computing curriculum reflects the increasingly digital world in which our students live, study and will eventually work. Students are encouraged to make connections between the topics studied in lessons and the technology they encounter in school, at home and in the wider community.

Online safety and responsible use of technology are embedded throughout the curriculum rather than being treated solely as a standalone topic. Students consider issues such as **privacy, security, digital footprints, appropriate online behaviour and the responsible use of data.**

Where appropriate, students investigate current and emerging technologies and consider their impact on individuals, organisations and society. Practical activities give students opportunities to create digital products for realistic purposes and audiences, helping them understand how the knowledge and skills developed in Computing can be applied beyond the classroom.

The curriculum also prepares students for further study at Key Stage 4 by developing the computational thinking, programming, digital literacy and problem-solving skills required for **Computer Science and digital technology qualifications.**

Assessment

Assessment takes place throughout each unit and includes both practical and theoretical activities.

Students' understanding is assessed through questioning, retrieval activities, quizzes, written work, practical tasks and programming challenges. Students are regularly required to apply their knowledge rather than simply recall facts, particularly through problem-solving, programming and digital-product development.

Formal assessment and revision activities are included at appropriate points during the year, including preparation for **AP3 assessments**. Assessment outcomes are used to identify misconceptions and areas requiring further development.

Where appropriate, students also evaluate their own digital products and programs, identifying strengths and suggesting improvements.

Careers

Careers education is embedded within the Computing curriculum by highlighting how the knowledge and skills students develop are used in the workplace. Students are encouraged to recognise that Computing is relevant not only to specialist technology careers but to almost every modern industry.

Programming, cybersecurity, data analysis, web development, digital design and problem solving provide opportunities to introduce students to a wide range of careers. The Year 9 curriculum in particular provides links between the skills developed at KS3 and possible future study and employment.

Careers explored may include:

- **Software Developer / Software Engineer**
- **Games Developer**
- **Web Developer**
- **App Developer**
- **Cybersecurity Analyst**
- **Ethical Hacker / Penetration Tester**
- **Data Analyst**
- **Data Scientist**
- **Network Engineer**
- **IT Support Technician**
- **Computer Hardware Engineer**
- **Cloud Engineer**
- **Digital Designer**

- **AI / Machine Learning Engineer**
- **Database Administrator**

Students are also encouraged to understand the importance of broader transferable skills developed through Computing, including **logical thinking, problem solving, creativity, resilience, collaboration and the ability to analyse and interpret data.**