

# Computing

## Preparing students for tomorrow, bit by bit

The Computing department will help to create, share, and apply knowledge in all branches of Computer Science and ICT. We will educate students to be successful, ethical, and effective problem-solvers with a passion to innovate and create, rather than just being passive consumers and users of technology. We will develop an understanding and appreciation of all aspects of digital products, from how they work to how they look. We will foster curiosity and encourage exploration to create students who can contribute positively to the well-being of our society and who are prepared to tackle the complex 21st Century challenges facing the world.

Summary focus areas:

- Innovate, create, develop
- Solving 21st Century problems
- Active developers not passive consumers

Autumn			Spring		Summer
Using ICT systems	Presenting Information	E-Safety Binary & Logic	Spreadsheets, modelling and simulations	Introduction to programming	Digital animation

Homework for Computing is set with half-termly themes that cover a range of concepts and topics to extend and supplement the curriculum delivered in lessons. Students are offered a menu of activities to choose between, with each activity being worth a number of ‘points’ based on its size, complexity or difficulty. Each half-term students will be expected to hand in any combination of activities they choose that add up to the required target number of points. By giving the students flexibility to choose their homework tasks and when they complete them across the half-term, this helps to develop independence, resilience and time-management skills. Activity choices could include tasks such as:

- Research and presentation of findings
- Creative use of video, animation and sound to present understanding
- Visual representations of concepts and theories
- Literacy-based activities, such as poetry or song lyrics for a topic
- Comprehension-based quizzes

Completed activities will be collected and marked at the end of each half-term block, but students are free to hand in completed work throughout the period to help them balance and manage their workload.

Unit	Duration (lessons)	Learning Objectives/Outcomes
Using ICT systems	4	<ul style="list-style-type: none"> <li>• Logging on and network security</li> <li>• File management</li> <li>• Use of the VLE and email</li> </ul>
Presenting Information	6	<ul style="list-style-type: none"> <li>• Formatting text and images to produce professional documents</li> <li>• Fast and accurate data entry</li> <li>• Health and Safety when using computers</li> <li>• Presenting information for a given audience/purpose</li> </ul>
E-Safety and presenting information effectively	8	<ul style="list-style-type: none"> <li>• Sensible and safe online behaviour</li> <li>• The dangers and impact of cyber-bullying and social media</li> <li>• Presenting information in creative ways</li> <li>• Digital design choices – e.g. font, colour, layout</li> <li>• Creating effective information campaigns</li> </ul>
Binary and logic	8	<ul style="list-style-type: none"> <li>• Counting in binary</li> <li>• Converting text into binary</li> <li>• Understanding and evaluating Boolean logic</li> <li>• Logic diagrams and truth tables</li> </ul>
Spreadsheets, modelling and simulations	14	<ul style="list-style-type: none"> <li>• Spreadsheet terminology</li> <li>• Storing basic data electronically</li> <li>• Formatting</li> <li>• Basic formulas and functions</li> <li>• Graphs and charts</li> <li>• Nature and purpose of simulations and models</li> <li>• Examples of real-world simulations</li> <li>• Using a simulation to try ideas and test hypotheses</li> <li>• Conducting, analysing and using market research</li> </ul>
Introduction to programming	20	<ul style="list-style-type: none"> <li>• Text-based and block-based programming languages</li> <li>• Common programming constructs</li> <li>• Solving problems with code</li> <li>• Code efficiency</li> <li>• Procedures</li> <li>• Variables &amp; data structures</li> <li>• Sorting algorithms</li> <li>• Commenting and documenting code</li> </ul>
Digital animation	10	<ul style="list-style-type: none"> <li>• Types of digital animation</li> <li>• Animation techniques</li> <li>• Telling a story through animation</li> </ul>