Year 7 Computing/ICT Scheme of Work

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

In Key stage 3

Pupils should be taught to:

- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

Computing programmes of study: Key stages 3 and 4, National curriculum in England, DFE-00191-2013
[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239067/SECONDARY_national_curriculum_-_Computing.pdf]

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Topics

Computing

How Computers Work – Students learn about what is inside a computer, covering aspects such as CPU, RAM and Storage. Learn about software and hardware including Operating systems.
Data Representation – Students learn how Binary is used to represent data and control systems. How data is processed to create information.
Networked Systems – Students learn how computer systems can be interconnected and assess appropriate methods for application.
Programming – Students use visual based programming tools to create applications or games.

Digital Citizenship (E-Safety)

Students learn that they need to be responsible when using social networks, technology and other online tools. Understand the possible dangers they may face online. Understand the impact ICT has on the world around them. Setting up a database to store, query and report information. Using spreadsheets to analyse costs for everyday use.

Digital Creativity

Students learn to consider audience and purpose when designing and creating digital products. Learn how to effectively edit, repurpose and combine digital elements. Learn the importance of self and peer evaluation.

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Overview of the Year:

Term	Topic
Autumn 1	Pupil Profiles Digital Citizenship - E-Safety – Smart Rules (2x lesons) Computing – How computers work
Autumn 2	Computing – How computers work Digital Creativity
Spring 1	Pupil Profiles Digital Citizenship - E-Safety – Digital Footprint (2x lessons) Computing – Data representation
Spring 2	Computing – Data representation Computing – Networked systems
Summer 1	Pupil Profiles Digital Citizenship - E-Safety – Cyberbullying (2x lessons) Digital Creativity
Summer 2	Digital Citizenship – Spreadsheets Computing - Programming

NB. E-Safety is also addressed by class teachers throughout the year during meeting time.