# Year 7 Computer Science Scheme of Work – Taught in context

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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**Overview of the Year:**

| Module | Topic |
|---|---|
| 1 | E-safety, Security and Ethics |
| 2 | Understanding Computers |
| 3 | How data is represented in computers |
| 4 | Programming |
| 5 | Digital Creativity |
| 6 | Collaborative Project |

Module 2 is taken from www.teach-ict.com and is based on the Computers the Basics unit – I am unable to share the learning objectives here as the lesson plans are from a subscription service

Module 4 is a paid for resource and is available from http://pgonline.co.uk/ due to licensing and purchasing, I am unable to publish the Learning Objectives for these modules,

Module 5 is taken from www.teach-ict.com and is based on the Faking It unit – I am unable to share the learning objectives here as the lesson plans are from a subscription service

✓ indicates that an appropriate homework should be set from this lesson

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| Module | Theme | Calendar Events | Lesson/ week | Topic | Learning Objectives | Homework |
|---|---|---|---|---|---|---|
| **1** | E-safety, Security and Ethics | | | Issue books – labels and expectations<br>Logging on<br>Privacy Rules<br>https://www.commonsensemedia.org/educators/lesson/privacy-rules-3-5 | Students will be able to ...<br>• learn which information they should avoid sharing online because it is private.<br>• understand which kinds of websites have privacy policies, and why.<br>• practice checking websites they visit for privacy policies and privacy seals of approvals | ✓ |
| | | | | Cyberbullying: Be Upstanding<br>https://www.commonsensemedia.org/educators/lesson/cyberbullying-be-upstanding-6-8 | Students will be able to ...<br>• reflect on what it means to be brave and stand up for others offline and online.<br>• learn to show empathy for those who have been cyberbullied.<br>• generate multiple solutions for helping others when cyberbullying occurs. | |
| | | | | Trillion-Dollar Footprint<br>https://www.commonsensemedia.org/educators/lesson/trillion-dollar-footprint-6-8 | Students will be able to ...<br>• learn that they have a digital footprint and that information from it can be searched; copied and passed on; seen by a large, invisible audience, and can be persistent.<br>• recognize that people's online information can be helpful or harmful to their reputation and image.<br>• consider their own digital footprints and what they want those footprints to be like in the future. | ✓ |
| | | | | Private Today, Public Tomorrow<br>https://www.commonsensemedia.org/educators/lesson/private-today-public-tomorrow-9-12 | Students will be able to ...<br>• consider the possible benefits and risks of sharing information online.<br>• recognize the importance of context in posting or viewing online images.<br>• understand what choices they need to make to protect the privacy of others online. | |
| | | | | Copyrights and Wrongs<br>https://www.commonsensemedia.org/educators/lesson/copyrights-and-wrongs | Students will be able to ...<br>• identify the legal and ethical considerations involved in using the creative work of others.<br>• understand an individual's rights and responsibilities as a creator and consumer of content.<br>• practice critical thinking and ethical decision making about the use of creative works. | ✓ |

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|---|---|---|---|---|---|---|
| | | | | Assessment – formal topic test | | |
| | | | | Fix-it-Five | To respond to feedback on assessment | ✓ |
| | | | | Rework, Remix, Reuse https://www.commonsensemedia.org/educators/lesson/rework-reuse-remix-6-8 | Students will be able to ...<br>• identify the key points required for a creative work to fall under fair use.<br>• judge whether or not the two case studies can be called fair use.<br>• understand the value of fair use by reworking and remixing copyrighted material in a collage or video. | |
| | Half Term | | | | | |
| **2** | Understanding Computers | | | What is a Computer? | • To understand the function and purpose of a computer<br>• To understand that not every computer looks like a PC and that many everyday devices contain computers<br>• To explain what is meant by binary data and to understand why a computer uses binary data | |
| | | | | Electronic Computers – Colossus | • To be able to identify the first electronic computer<br>• To gain a basic understanding of the role of Colossus in World War II<br>• To gain a basic understanding of how Colossus made use of valves, rewiring and paper tape | ✓ |
| | | | | Moore's Law | • To explain the purpose and use of a transistor in computing terms<br>• To understand that computers are getting faster all the time (Moore's Law) | |
| | | | | | • To be able to identify the main component parts of a computer<br>• To be able to explain the role of the main components within a computer<br>• To be able to define the term 'software'<br>• To understand that software provides instructions for the computer<br>• To be able to identify different types of software<br>• To be able to distinguish between system software and application software | ✓ |
| | | | | | | |
| | | | | Fix-it-Five | To respond to feedback on assessment | ✓ |
| | | | | Seasonal lesson | | |
| | Christmas Break | | | | | |
| **3** | How data is represented in computers | | | | To define the terms bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte<br>To understand that data needs to be converted into a binary format to be processed by a computer. | ✓ |

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| | | | | | To be able to explain why data is represented in computer systems in binary form | |
| | | | | | Represent text as binary such as writing names in binary or decoding secret messages | ✓ |
| | | Assessment week | | | | |
| | | Data input on 3rd | | | To respond to feedback on assessment | ✓ |
| | | | | | Basic ASCII – work out denary value of your name<br>Decode secret message from binary – Decode Binary worksheet and message.<br>Write your name in Binary | |
| | Half Term | | | | | |
| **4** | Programming | | | Introduction to Python | • | |
| | | | | Numbers and Arithmetic | • | ✓ |
| | | | | Selection & Writing Algorithms | • | |
| | | | | While loops | • | ✓ |
| | | | | Assessment – Test a program | | |
| | Easter Break | | | | | |
| **5** | Digital Creativity (Faking It unit from www.teach-ict.com) | | | Fix-it-Five | To respond to feedback on assessment | ✓ |
| | | | | Airbrushing | • | |
| | | | | Photo Editing Techniques | • | ✓ |
| | | | | Image Manipulation | • | |
| | | | | Image Manipulation | • | ✓ |
| | | | | Applying image manipulation and photo editing techniques | • | |
| | Half Term | | | | | |

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|---|---|---|---|---|---|---|
| **6** | Collaborative Project | | | | • Give detailed information about the final product to be produced.<br>• To contribute effectively to the work of a group most of the time, to produce detailed planning documents e.g. mind map, brainstorm, thought-shower, showing the allocation of tasks.<br>• To list a range of appropriate success criteria will be given. | ✓ |
| | | | | | • describe the main features of three different types of search engine, giving at least one example of each.<br>• explain the appropriate use of at least three techniques when using search engines.<br>• compare the results of searches using these techniques in three different types of search engine | ✓ |
| | | | | | • identify a range of information required.<br>• carry out research using the internet and at least two non-internet sources.<br>• use effective internet search criteria.<br>• list sources and evaluate the suitability and reliability of most of them.<br>• comment on the copyright of most of the information found. | |
| | | | | | • create a document as per their allocated task set by the group.<br>• use information from at least four different sources, including at least one non-internet source.<br>• download graphics and text<br>• acknowledge their sources through appropriate captions or cross-references and in a bibliography. | ✓ |
| | | | | | | |
| | | | | | To respond to teacher feedback | |
| | | | | | | |