

Year 8 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	Computing in the wider context
2	Understanding Computers
3	How data is represented in computers
4	Programming
5	Digital Creativity
6	Collaborative Project

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	Week	Topic	Learning Objectives	Homework	
1	Computing in the wider context			Issue books – labels and expectations Logging on Setting up emails on mobile devices Privacy and Digital footprint. https://www.commonsemedia.org/educators/lesson/trillion-dollar-footprint-6-8	Students will be able to ... <ul style="list-style-type: none"> 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. recognize that people’s online information can be helpful or harmful to their reputation and image. consider their own digital footprints and what they want those footprints to be like in the future. 	✓	
				Private today Public tomorrow https://www.commonsemedia.org/educators/lesson/private-today-public-tomorrow-9-12	Students will be able to ... <ul style="list-style-type: none"> consider the possible benefits and risks of sharing information online. recognize the importance of context in posting or viewing online images. understand what choices they need to make to protect the privacy of others online 		
				Explore the risk and consequences of sharing personal information https://www.commonsemedia.org/educators/lesson/privacy-rules-3-5	Students will be able to ... <ul style="list-style-type: none"> learn which information they should avoid sharing online because it is private. understand which kinds of websites have privacy policies, and why. practice checking websites they visit for privacy policies and privacy seals of approvals. 	✓	
				Copyright and piracy https://www.commonsemedia.org/educators/lesson/copyrights-and-wrongs	Students will be able to ... <ul style="list-style-type: none"> identify the legal and ethical considerations involved in using the creative work of others. understand an individual’s rights and responsibilities as a creator and consumer of content. practice critical thinking and ethical decision making about the use of creative works. 		
				Rework, Reuse, Remix https://www.commonsemedia.org/educators/lesson/rework-reuse-remix-6-8	Students will be able to ... <ul style="list-style-type: none"> identify the key points required for a creative work to fall under fair use. judge whether or not the two case studies can be called fair use. understand the value of fair use by reworking and remixing copyrighted material in a collage or video. 	✓	
				Assessment – formal topic test			
				Fix-it-Five	To respond to feedback on assessment		✓

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				The Reality of Digital Drama https://www.commonsensemedia.org/educators/lesson/the-reality-of-digital-drama-6-8	Students will be able to: <ul style="list-style-type: none"> reflect on their own impressions of digital drama. compare underlying messages about drama on reality TV with “real world” digital drama among young teens. think critically about the gender stereotypes associated with drama. 	
Half Term						
2	Understanding Computers			Input, Process & Output	Describe a computer System - Input Process Output	
				The CPU	Explain the function of the CPU – in the context of the fetch execution cycle.	✓
				Components of a Computers System	Identify and describe the main internal and external components of a computer system	
				Input and Output Devices	Classify components as input, process, output or storage device. Compare different input and output devices	✓
				Assessment – formal topic test		
				Fix-it-Five	To respond to feedback on assessment	✓
Christmas Break						
3	How data is represented in computers			Data in Computer Systems	To define the terms bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte To understand that data needs to be converted into a binary format to be processed by a computer.	✓
				Data in Computer Systems	To be able to explain why data is represented in computer systems in binary form	
				Data in Computer Systems	Represent text as binary such as writing names in binary or decoding secret messages	✓
				Assessment – formal topic test		
				Fix-it-Five	To respond to feedback on assessment	✓
				Data in Computer Systems	Basic ASCII – work out denary value of your name Decode secret message from binary – Decode Binary worksheet and message. Write your name in Binary	
Half Term						
4	Programming			Introduction to Python	•	
				Numbers and Arithmetic	•	✓
				Selection & Writing Algorithms	•	

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				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					
6	Collaborative Project		01/06/2015	Plan a project as part of a group	<ul style="list-style-type: none"> • Give detailed information about the final product to be produced. • 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. • To list a range of appropriate success criteria will be given. 	✓
			08/06/2015	Investigate how search engines work	<ul style="list-style-type: none"> • describe the main features of three different types of search engine, giving at least one example of each. • explain the appropriate use of at least three techniques when using search engines. • compare the results of searches using these techniques in three different types of search engine 	✓
			15/06/2015	Carry out research for the group project	<ul style="list-style-type: none"> • identify a range of information required. • carry out research using the internet and at least two non-internet sources. • use effective internet search criteria. • list sources and evaluate the suitability and reliability of most of them. • comment on the copyright of most of the information found. 	

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			22/06/2015	Create the allocated part of the group task containing information from a range of sources	<ul style="list-style-type: none"> • create a document as per their allocated task set by the group. • use information from at least four different sources, including at least one non-internet source. • download graphics and text • acknowledge their sources through appropriate captions or cross-references and in a bibliography. 	✓
			29/06/2015	Assessment		
			06/07/2015	Fix-it-Five	To respond to teacher feedback	
			13/07/2015			

