

Computing Scheme of Work Year 7 2018/2019

Computational Thinking

Programming

Data Representation

Safety and Responsibility





Year 7 Computing Scheme of Work 2018/2019

Introduction:

The following scheme is created to enable class teachers to plan, prepare and assess pupil work according to an overall learning journey. The needs of the learner are paramount and differentiation of this scheme is expected. No doubt there will be further opportunities for students to be taught topics that will further enrich the current scheme. Therefore, it is expected that staff should collaborate and share best practise wherever possible so as to provide more learning opportunities for pupils to make progress in Computing at Alt Bridge. Staff are expected to use a range of assessment strategies and incorporate Assessment for Learning within their teaching style. Further guidance on marking and feedback can be found in the department marking and feedback policy. In addition, where appropriate staff should make pupils aware of links to literacy and numeracy. CLC sessions are available to book for in-class digital workshops. There is also a bank of 10 I Pads available in the main Computing Room.





Year 7 Computing Scheme of Work 2018/2019

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.



Year 7 Computing Scheme of Work 2018/2019

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]



Year 7 Computing Scheme of Work 2018/2019

Overview of the Year:

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

✓ Indicates that an appropriate homework could be set from this lesson.

Where suitable, CLC sessions are available to book for in-class digital workshops.

There is also a bank of 10 I Pads available in the main Computing Room.

A bank of 30 Micro Bits are available from the IT Technician's room to book out.

Year 7 Computing Scheme of Work 2018/2019



Year 7 Computing Scheme of Work 2018/2019



Module	Theme	Calendar Events	Week	Topic	Learning Outcomes	Homework
1	E-safety, Security and digital footprints. Knowsley CLC E Safety editable pupil journal available for pupils to edit and keep a log of their learning. Contact Gary at Knowsley CLC.		1	Cyberbullying and online safety	<p>Students will be able to ...</p> <ul style="list-style-type: none"> All students will: watch the videos and understand the effect that cyberbullying can have on a person Most students will: form clear opinions about the effect of cyberbullying and be able to offer suggestions to help the person being bullied Some students will: articulate strong opinions about the effect of cyberbullying. They will be able to offer solutions to help the person being bullied, a friend who wants to support the victim and also for the bully themselves. 	✓
			2	Online Grooming	<p>Students will be able to ...</p> <ul style="list-style-type: none"> All students will: Be able to give an example of online grooming Most students will: Be able to reflect on their own online behaviours Some students will: Have a comprehensive list of people and online resources where they can request help regarding online grooming 	
			3	Trillion-Dollar Footprint https://www.common sense media.org/educators/lesson/trillion-dollar-footprint-6-8	<p>Students will be able to ...</p> <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. 	✓
			4	Private Today, Public Tomorrow https://www.common sense media.org/educators/lesson/private-today-public-tomorrow-9-12	<p>Students will be able to ...</p> <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. 	



Year 7 Computing Scheme of Work 2018/2019

Module	Theme	Calendar Events	Week	Topic	Learning Outcomes	Homework
			5	Copyrights and Wrongs https://www.commonsensemedia.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. 	✓
		Assessment week	6	Assessment – formal topic test		
		Data Input	7	Fix-it-Five/Next-Steps	To respond to feedback on assessment	✓
			8	Rework, Remix, Reuse https://www.commonsensemedia.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. 	
Half Term						
2	Understanding Computers http://www.tech-ict.com/ks3/year7/computers/computers.htm		1	What is a Computer?	<ul style="list-style-type: none"> • To understand the function and purpose of a computer • To understand that not every computer looks like a PC and that many everyday devices contain computers • To explain what is meant by binary data and to understand why a computer uses binary data 	
			2	Electronic Computers – Colossus	<ul style="list-style-type: none"> • To be able to identify the first electronic computer • To gain a basic understanding of the role of Colossus in World War II • To gain a basic understanding of how Colossus made use of valves, rewiring and paper tape 	✓
			3	Moore's Law	<ul style="list-style-type: none"> • To explain the purpose and use of a transistor in computing terms • To understand that computers are getting faster all the time (Moore's Law) 	
			4		<ul style="list-style-type: none"> • To be able to identify the main component parts of a computer • To be able to explain the role of the main components within a computer • To be able to define the term 'software' • To understand that software provides instructions for the computer • To be able to identify different types of software • To be able to distinguish between system software and application software 	✓



Year 7 Computing Scheme of Work 2018/2019

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		Assessment week	5			
		Data Input	6	Fix-it-Five/Next-Steps	To respond to feedback on assessment	✓
			7	Seasonal lesson		
Christmas Break						
3	How data is represented in computers		1	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.	✓
			2	Data in Computer Systems	To be able to explain why data is represented in computer systems in binary form	
		Safer Internet Day	3	Data in Computer Systems	Represent text as binary such as writing names in binary or decoding secret messages	✓
		Assessment week	4	Assessment – formal topic test		
		Data input	5	Fix-it-Five/Next-Steps	To respond to feedback on assessment	✓
			6	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 Possible alternative programming is the use of Micro Bits from BBC. Bank of 30 available in Mr Jones' room.		1	Introduction to programming with Scratch or Scratch Junior on I Pads.	<ul style="list-style-type: none"> All students will: Create a simple script which will use an event to run a program, switch between costumes and incorporate 'speech' Most students will: Effectively use 'wait' commands to synchronise movement with text. Will include appropriate use of sound Some students will: Use what they have learned to independently write a script simulating a conversation between two sprites. 	
			2	Students will use a block based program to move a sprite around a maze. They will include collision detection and responsive messages to inform the user what is happening.	<ul style="list-style-type: none"> All students will: Import a new background and use simple coding blocks to move their sprites around the screen. Most students will: Use nested ifs and forever loops to move their sprites around the screen. They will use collision detection and responsive messages to stop the game and inform the user what has happened. They will gain a basic understanding of grid positions used within Scratch. Some students will: Have a comprehensive understanding of co-ordinates and grid positions within Scratch. They will improve their program by adding additional features such as sound, costume changes etc 	✓



Year 7 Computing Scheme of Work 2018/2019

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			3	Students will use a code block based program to create a simple shark and fish game. They will include multiple sprites, random movements, collision detection and a variable to keep track of the score.	<ul style="list-style-type: none"> All students will: include at least two different sprites in their game. One sprite will follow the mouse pointer when moving whilst the other will include some aspects of random movement. Most students will: Include multiple sprites which move randomly around the screen. They add collision detection so that the sprites hide when touched by another object. They include a variable to keep track of the score. Some students will: Independently write the code to include an enemy fish which, when touched, decreases the score. They will add sound effects which trigger when an action takes place. 	
			4	Students will write a basic plan for the game that they wish to develop. They will begin to develop their game based upon their design	<ul style="list-style-type: none"> All students will: Create a simple design plan for their game. They will include details about the background, sprites, aims of the game etc. They will begin to code their game, mostly following their plan. Most students will: Create a clear design plan with some examples of code blocks that they intend to use. Their game will make good use of the skills learned during the previous three lessons. They will use efficient code such as Forever loops, IF...Then conditions etc. They will use a limited number of techniques in their code e.g. collision detection, wait commands etc. Some students will: Create a detailed design plan which shows a clear understanding of their game concept. Sketches are detailed and well annotated and comprehensive examples of code blocks are included. They will use a wide range of techniques in their code e.g. collision detection, random numbers, good use of wait commands etc. 	✓
			5	Students will continue to program their games. They will take account of feedback provided in order to make future improvements.	<ul style="list-style-type: none"> All students will: Continue to develop their game. Peer assess another students' game and provide honest, critical feedback about the game playability and potential improvements. Most students will: Regularly check their code for errors and attempt to solve problems before requesting assistance. They will adapt and improve upon their game design throughout the lesson. Some students will: Problem solve with no assistance. They will add additional game features which were not taught during the skills lessons e.g. timer. 	



Year 7 Computing Scheme of Work 2018/2019

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		Assessment week	6	Students will write a detailed assessment of their programming code and finished game.	<ul style="list-style-type: none"> All students will: be able to assess their work against a given list of criteria Most students will: include screenshots of their code and provide some explanation as to how the code works Some students will: include screenshots of every aspect of their code and provide detailed and comprehensive explanations about how their code works 	
	Easter Break					
5	Digital Creativity (Stop Frame Animation)		1	Stop Frame Animation	<ul style="list-style-type: none"> All pupils will: work in a small group and take photographs that could be used to create a stop frame animation Most pupils will: Load their photographs into Monkeyjam and be able to view their animation Some pupils will: Investigate the effects of using different fps. 	✓
			2		<ul style="list-style-type: none"> All pupils will: work in a group and help towards the production of their stop frame animation Most pupils will: Design a storyboard which they will follow to create their animation Some pupils will: Come up with a set of criteria against which they can judge their project to be a success 	
			3		<ul style="list-style-type: none"> All pupils will: work in a group and help towards the production of their stop frame animation Most pupils will: Hold a group meeting and decide what they need to achieve this lesson. They will allocate a role within the group for each person e.g. camera, model positioning, director etc and will stick to these roles in order to make their project successful. Some pupils will: Begin looking for background sounds/music for their animation and find out how to add it to the software. 	✓
			4		<ul style="list-style-type: none"> All pupils will: work in a group and help towards the production of their stop frame animation Most pupils will: Take part in a group meeting to decide what they need to do this lesson in order to move their animation development forward. They will make positive contributions to their group. They will begin to look for sounds that can be used to enhance their animation. Some pupils will: Investigate how to use layers to add complexity to their animations 	

Year 7 Computing Scheme of Work 2018/2019



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			5		<ul style="list-style-type: none"> All pupils will: complete their self-assessment form even if they haven't completed their animation. Most pupils will: Complete their animation and be able to export it as an .avi file. They will upload their completed animation to the shared area/VLE. Some pupils will: Be use the set of criteria that they recorded at the start of the project in order to evaluate the success of their project. They will be able to state which criteria they met successfully and which they didn't manage to achieve, giving reasons why. 	✓
			6		<ul style="list-style-type: none"> Peer/Self-Assessment 	
Half Term						
6	Collaborative Project Suggested project: Appy Times CLC, Pupils to research and produce their own product and advertisement for wearable tech. Dragon's Den?		1	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. 	✓
			2	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 	✓
			3	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. 	
			4	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. 	✓
		Assessment week	5	Assessment		
		Data input	6	Fix-it-Five/Next-Steps	To respond to teacher feedback	

Year 7 Computing Scheme of Work 2018/2019



Module	Theme	Calendar Events	Week	Topic	Learning Outcomes	Homework
		Activities Week	7			