

Long Term Plan KS3 Computing - Year 9

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Link to subject ethos and driver	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
HT1 05.09.22 - 21.10.22 7 weeks	Internet safety, cyber protection and encryption	<p>By the end of this module, students should be able to:</p> <p>Know and understand the key concepts and principles of Computing:</p> <p>Understand a range of malware and the effects they have</p> <p>Know what precautions to take to maintain safety online</p> <p>Understand the role of encryption in maintaining safety online</p> <p>Know about a range of ciphers</p>	<p>Apply knowledge and understanding of the key concepts and principles of Computing:</p> <p>Demonstrate safe practices when using the Internet</p> <p>Use a range of ciphers to encrypt and decrypt text</p> <p>Develop confident and responsible use of modern information technologies</p> <p>Use computer systems safely and confidently</p>	<p>Students show respect towards each other, their teacher and the wider community.</p> <p>Students exhibit wisdom when they know what they have done in a context of where that will lead to, with high levels of engagement through a passion for learning and a level of challenge.</p>	<p>Rights as a data subject.</p> <p>The value of personal data to companies.</p> <p>Possible consequences of security breaches.</p> <p>The difference between firewalls and anti-virus software.</p> <p>Ethics - e.g. different hat hackers.</p>	<p>KS2 – The Internet</p> <p>Communication</p> <p>Students have also covered Privacy and security briefly in Y7/8.</p> <p>KS2 outcome - use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about</p>	<p>KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices</p> <p>KS4 computing curriculum.</p> <p>*Note - this is also currently taught in Y8, but as the students are using Boost now this is new to both year groups.</p>	<p>Further research and understanding of the laws surrounding privacy and security.</p>	<p>From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes.</p> <p>Democracy is something students will learn about and will know how to treat</p>	<p>We encourage students to read newspapers</p> <p>We encourage students to watch the news</p> <p>Current affairs are incorporated into lessons</p> <p>Make links to 'real life'</p>	<p>Link to careers in cybersecurity.</p> <p>NC link:</p> <p>understand a range of ways to use technology safely, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.</p>

				<p>Students are happy and demonstrate a hunger for learning and courage to attempt new tasks and complete current ones.</p> <p>Misconceptions are corrected and challenged at an appropriate level.</p>		content and contact			<p>others fairly and how to make things work for the whole class as well as the individual.</p> <p>Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times.</p> <p>Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in with the school ethos. Students will know their rights as individuals and will know both what to expect and what is expected of them.</p>		
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									<p>Mutual respect for tolerance of those with different faiths and beliefs, and for those without faith is important</p> <p>Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.</p>		
<p>HT2 31.10.22 - 16.12.22</p> <p>7 weeks</p>	<p>Computing past, present and future</p>	<p>Know about important figures in the development of computing</p> <p>Understand Moore's Law and how computer technology has developed and changed over time</p> <p>Know how to format documents</p> <p>Understand the importance of aesthetics when</p>	<p>Present knowledge about computing using word processing and presentation software</p> <p>Use formatting appropriately</p> <p>Ensure that work has been proofread and spelling and</p>	<p>Users are responsible, competent, confident and creative users of information and communication technology</p> <p>Formatting skills</p>	<p>Rules of formatting work well - presentation skills, e.g. range of fonts, colours, layout etc.</p>	<p>Students will be creating document and presentation files so will need basic file handling skills in order to save and retrieve their work. Students will also benefit from experience creating</p>	<p>Links to KS4/5 IT and computing.</p> <p>KS4 outcome:</p> <p>develop their capability, creativity and knowledge in computer science, digital media and information technology</p>	<p>Challenge tasks will be built into lessons - refer to MTP, In this unit specific additional formatting skills and delving into the topic deeper will be used.</p>	<p>From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be recycled, reused and have extended lives. The understanding</p>	<p>We encourage students to read newspapers</p> <p>We encourage students to watch the news</p> <p>Current affairs are incorporated into lessons</p>	<p>Career links</p> <p>Many job roles will require students to be able to format and present work well.</p> <p>NC links:</p> <p>undertake creative projects that involve</p>

		<p>presenting information and have an awareness of factors that can inhibit this</p>	<p>grammar has been checked</p> <p>Select appropriate text and images for use in presentations</p> <p>Design presentations to convey information effectively</p> <p>Use word processing and presentation software to present information effectively.</p>	<p>Research skills</p>		<p>vector-style graphics which will have been covered in the first half-term in "Getting started".</p>			<p>g of environmental impacts is taught through lesson themes.</p> <p>Democracy is something students will learn about and will know how to treat others fairly and how to make things work for the whole class as well as the individual.</p> <p>Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times.</p> <p>Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in</p>	<p>Make links to 'real life' examples</p>	<p>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</p> <p>create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</p>
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									<p>with the school ethos. Students will know their rights as individuals and will know both what to expect and what is expected of them.</p> <p>Mutual respect for tolerance of those with different faiths and beliefs, and for those without faith is important</p> <p>Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.</p>		
HT3 04.1.2 3 - 10.02. 23	Computing components	Know about and understand the function of a range of input and output devices	Identify the correct input and output devices to use in a range of	Evaluation skills Analysis skills	Devices that are 'all in one' and how these can be classified.	There is no requirement for students to have had any prior	Links to KS4 IT and Computing curriculums.	Challenge work will be built into all lessons - refer to MTP.	From an environmental standpoint students are encouraged	We encourage students to read newspapers	Career links: Computer technicians

6 weeks		Know about and understand different types of memory and storage and their use	different situations.	Literacy skills Presentation skills Technical knowledge	Storage sizes and calculations of these.	learning about computer components. However, they will need basic arithmetic to convert between different storage units and basic spreadsheet skills to create a graph.		In particular students may start to look in more depth at what devices are used for and how technology is emerging so devices are often a mixture of input and output.	to understand the ways that computer systems and parts can be recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes. Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times. Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in with the school ethos. Students will	We encourage students to watch the news Current affairs are incorporated into lessons Make links to 'real life' examples	Network managers NC Links: 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 a range of ways to use technology safely, respectfully and responsibly, including protecting their online identity and privacy
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									<p>know their rights as individuals and will know both what to expect and what is expected of them.</p> <p>Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.</p>		
<p>HT4 20.02. 23 - 31.03. 23</p> <p>6 weeks</p>	Python	<p>Using the print function Variables Inputs Selection Finding and fixing errors</p>	<p>Problem solving</p> <p>Writing programs</p> <p>Trial and error</p> <p>Computational thinking - logic - predicting, analysing</p> <p>Mathematical operators</p>	<p>Creating students who can solve problems and think outside the box to create solutions</p>	<p>Capital letters</p> <p>Spelling (Syntax errors)</p> <p>Logical errors</p> <p>Naming variables</p>	<p>KS2 outcomes: design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p>	<p>In GCSE Computer science students need to use programming languages such as Python.</p> <p>We are not using the Hodder materials is Y9 as these are spread over 3 terms and the students</p>	<p>All lessons will include challenge tasks in them, specific examples include writing own code unguided and also creating 'How to' guides.</p>	<p>Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.</p> <p>Mutual</p>	<p>We encourage students to read newspapers</p> <p>We encourage students to watch the news</p> <p>Current affairs are incorporated into lessons</p> <p>Make links to</p>	<p>In the first lesson students need to research IT jobs, specifically a software developer.</p> <p>Teacher to discuss range of IT options pre KS3 with students at this point.</p>

						Students will have had experience with block based programming both at primary school and in Y8. *Note - currently the same content, but condensed as Y8's will cover - 9's did not cover this in Y8.	need to cover this in less time.		respect for tolerance of those with different levels of understanding and knowledge - peer support.	'real life'	
HT5 17.04. 23 - 26.05. 23 6 weeks	Advanced spreadsheets	<ul style="list-style-type: none"> - Recap on Basic spreadsheet skills from Y7. - Understand the structure and use of a range of more advanced functions - Understand how to use validation to create dropdown lists - Know how to sort data and 	<p>Use a range of more advanced functions within spreadsheets.</p> <p>Use validation within spreadsheets to minimise user error.</p> <p>Develop and use macros to automate aspects of spreadsheets.</p> <p>Identify the most appropriate functions to use when</p>	<p>Progress in computing key topics - application software</p> <p>Progress in computing key topics - data</p> <p>Analyse problems in computational terms</p> <p>Apply K&U of the key concepts and principles of computing</p>	<p>Basic recap will be needed, e.g. formulas start with =, * is multiply etc.</p> <p>Students may need help removing filters once applied.</p> <p>Graphs/charts - titles.</p>	<p>KS2 outcome: select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating</p>	<p>In Y9 students will further develop their spreadsheet skills in the Encryption unit. .</p> <p>This will be built on further at KS4 should they choose IT as an option.</p>	<p>Explaining and analysing.</p> <p>Evaluation</p> <p>Alternative solutions</p>	<p>Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.</p> <p>Mutual respect for tolerance of those with different levels of</p>	<p>We encourage students to read newspapers</p> <p>We encourage students to watch the news</p> <p>Current affairs are incorporated into lessons</p> <p>Make links to 'real life'</p>	<p>Link to business and how businesses might use spreadsheets .</p> <p>*Map to NC outcomes</p> <p>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p>undertake</p>

		<p>run simple queries</p> <p>- Understand the use of macros to automate processes and know how to record, edit and assign macros.</p>	<p>developing a spreadsheet for a particular purpose.</p> <p>Design spreadsheets for a range of purposes making use of a range of more advanced functions.</p> <p>Use spreadsheets to handle data in a variety of situations proficiently.</p> <p>Interpret data from spreadsheets.</p> <p>Problem solving</p> <p>Manipulating data independently</p> <p>Trial and error</p> <p>Computational thinking - logic - predicting, analysing</p> <p>Mathematical operators</p> <p>Resilience</p>	<p>Develop confident and responsible use of modern information technologies</p>		<p>and presenting data and information</p> <p>In Y7 students will have learnt basic formulas, cell referencing, and the SUM, MIN , MAX, AVERAGE, COUNT and IF Functions.</p> <p>They will also have created charts.</p>			<p>understanding and knowledge - peer support.</p>		<p>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</p> <p>Understand simple Boolean logic (for example, AND, OR and NOT) and some of its uses in circuits and programming</p> <p>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems. Make</p>
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											appropriate use of data structures (for example, lists, tables or arrays).
HT6 5.06.23 - 21.07.23 7 weeks	Algorithms	Understand the concepts of abstraction, decomposition, pattern recognition and algorithms Know how to read and develop flow diagrams	Use the principles of abstraction and decomposition to produce algorithms to solve a range of problems Write flow diagrams to sequence the steps involved in completing a task Analyse different approaches to solving problems Design algorithms to solve a range of computational problems	Progress in computing key topics Algorithms Analyse problems in computational terms Data Plan creative solutions to problems Apply K&U of the key concepts and principles of computing Develop confident and responsible use of modern information technologies Logical	Flowchart shapes Mathematical skills - e.g. patterns	KS2 outcomes: use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Links to the KS4/5 IT and Computing curriculums	Challenge work will be built into lessons. Students will attempt more complex tasks and may design more detailed flow diagrams	Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result. Mutual respect for those with different levels of understanding and knowledge - peer support. From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be	We encourage students to read newspapers We encourage students to watch the news Current affairs are incorporated into lessons Make links to 'real life'	Roles within computing and mathematics *NC statements 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 Design and

				<p>reasoning</p> <p>Computational thinking</p> <p>can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems</p>					<p>recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes.</p>		<p>develop modular programs that use procedures or functions</p>
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Skills developed throughout the programme

Cognitive skills

- Non-routine problem solving – expert thinking, metacognition, creativity.
- Systems thinking – decision making and reasoning.
- Critical thinking – definitions of critical thinking are broad and usually involve general cognitive skills such as analysing, synthesising and reasoning skills.
- ICT literacy – access, manage, integrate, evaluate, construct and communicate.

Interpersonal skills

- Communication – active listening, oral communication, written communication, assertive communication and non-verbal communication.
- Relationship-building skills – teamwork, trust, intercultural sensitivity, service orientation, self-presentation, social influence, conflict resolution and negotiation.
- Collaborative problem solving – establishing and maintaining shared understanding, taking appropriate action, establishing and maintaining team organisation.

Intrapersonal skills

- Adaptability – ability and willingness to cope with the uncertain, handling work stress, adapting to different personalities, communication styles and cultures, and physical adaptability to various indoor and outdoor work environments.
- Self-management and self-development – ability to work remotely in virtual teams, work autonomously, be self-motivating and self-monitoring, willing and able to acquire new information and skills related to work.