

# Long Term Plan KS3 Computing - Year 8

| Half term                                 | Unit title               | Key knowledge/<br>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                                                                                                                                                                                                                                                                                                                                     |
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| HT1<br>05.09.22 - 21.10.22<br><br>7 weeks | Introducing Spreadsheets | <p>Understand how to write basic formulae in a spreadsheet</p> <p>Understand the concept of replication and the uses of relative and absolute cell referencing</p> <p>Understand how to name cells and ranges within a spreadsheet</p> <p>Understand how to write a range of basic functions, including SUM, AVERAGE, MAX, MIN, COUNT and IF</p> <p>Understand how to use conditional formatting</p> <p>Understand how to use data in spreadsheets to create graphs and charts</p> | <p>Use a range of basic formulae to manipulate data</p> <p>Use conditional formatting</p> <p>Create graphs and charts to represent different types of information</p> <p>Identify the most appropriate functions to use when developing spreadsheets for a particular purpose</p> <p>Identify the most appropriate chart of graph to display different types of information</p> | <p>Solving mathematical problems using IT</p> <p>Analytical skills</p> <p>Data representation</p> <p>Modelling outcomes</p> <p>Trial and error</p> <p>Resilient learners</p> | <p>The different operators used / * (different from maths).</p> <p>Selecting relevant data for charts and labelling these appropriately.</p> <p>Why different formulas and functions are used.</p> | <p>Students will need to understand basic arithmetic; addition, subtraction, multiplication and division</p> <p>KS2 NC Link: Select, use and combine a variety of software (including internet services) on a range of digital systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p> | <p>KS4 NC outcome: Develop and apply their analytic, problem-solving, design and computational thinking skills</p> <p>Links to both the IT and Computing curriculums at KS4 and 5.</p> | <p>Challenge tasks will be built into all lessons, but specific functions and skills will be targeted for challenge work from the Y8 spreadsheet unit. For example Elself_state ments</p> | <p>Mutual respect for each other - peer reviewing and support is encouraged.</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>Rule of Law is taught through lesson themes as</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' examples</p> | <p>Career links:</p> <p>Data controller</p> <p>Analysts</p> <p>Financial jobs such as accountants.</p> <p>Business roles, e.g. management</p> <p>NC Link:</p> <p>Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p>Undertake creative projects that</p> |

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|                                           |                                    |                                                                                                                                                                                                                                                                                                                                         | <p>Become proficient in the use of spreadsheets to handle data in a variety of situations</p> <p>Interpret data from spreadsheets</p>                                                                                                                                  |                                                                                                                                                                   |                                                                                                       |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                     |                                                                                                                                                                      | well with school rules also being adhered to and considered at all times.                                                                                                                                                                           |                                                                                                                                                                                               | 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                                                              |
| HT2<br>31.10.22 - 16.12.22<br><br>7 weeks | Computing past, present and future | <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 presenting information and have an awareness of factors that can inhibit this</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 grammar has been checked</p> <p>Select appropriate text and images for use in</p> | <p>Users are responsible, competent, confident and creative users of information and communication technology</p> <p>Formatting skills</p> <p>Research skills</p> | <p>Rules of formatting work well - presentation skills, e.g. range of fonts, colours, layout etc.</p> | <p>Students will be creating documents 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 vector-style graphics which will have been covered in the first half-term in "Getting</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 of environmental impacts is taught through lesson themes.</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' examples</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 selecting, using, and combining multiple applications, preferably across a range of devices, to</p> |

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|  |  |  | <p>presentations</p> <p>Design presentations to convey information effectively</p> <p>Use word processing and presentation software to present information effectively.</p> |  |  | started". |  |  | <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 with the school ethos. Students will know their rights as individuals and will know both what to</p> | <p>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 trustworthines s, design and usability</p> |
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|  |  |  |  |  |  |  |  |  | <p>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> |  |  |
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| HT3<br>04.1.2<br>3 -<br>10.02.<br>23 | Computing<br>components | Know about and understand the function of a range of input and output devices<br><br>Know about and understand different types of memory and storage and their use | Identify the correct input and output devices to use in a range of different situations. | Evaluation skills<br><br>Analysis skills<br><br>Literacy skills<br><br>Presentation skills<br><br>Technical knowledge | Devices that are 'all in one' and how these can be classified.<br><br>Storage sizes and calculations of these. | There is no requirement for students to have had any prior learning about computer components. However, they will need basic arithmetic to convert between different storage units and basic spreadsheet skills to create a graph. | Links to KS4 IT and Computing curriculums. | Challenge work will be built into all lessons - refer to MTP.<br><br>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. | 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.<br><br>Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times.<br><br>Individual Liberty – It is important to have students understand their freedoms as well as | We encourage students to read newspapers<br><br>We encourage students to watch the news<br><br>Current affairs are incorporated into lessons<br><br>Make links to 'real life' examples | Career links:<br><br>Computer technicians<br><br>Network managers<br><br>NC Links:<br><br>understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems<br><br>Understand how instructions are stored and executed within a computer system<br><br>Understand a range of ways to use technology safely, respectfully and responsibly, including protecting their online identity and privacy |
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6 weeks

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|                                                |         |                                                                |                                                                                                                                                  |                                                                                                                     |                                                                                                                                                           |                                                                                                                                                         |                                                                                                                                              |                                                                                                                                                               | <p>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> <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<br/>20.02.23 - 31.03.23<br/>6 weeks</p> | Scratch | Understand the concepts of sequencing, selection and iteration | <p>Develop working programs in Scratch</p> <p>Analyse the requirements of a program</p> <p>Identify the processes needed to solve a problem,</p> | <p>Logical reasoning</p> <p>Computational thinking</p> <p>can analyse problems in computational terms, and have</p> | <p>Misconceptions alongside what different blocks of code are used for and the difference between different angles when making shapes and things such</p> | <p>There is no requirement for students to have used Scratch before, although prior knowledge of Scratch may be useful. Students will be performing</p> | <p>Programming links to the KS4 computing curriculum.</p> <p>NC outcomes: develop and apply their analytic, problem-solving, design, and</p> | <p>Challenge tasks will be built into lessons - refer to MTP,</p> <p>In this unit, students will be encouraged to show additional skills when the develop</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</p>                                                                                                                                                                                                                 | <p>We encourage students to read newspapers</p> <p>We encourage students to watch the news</p> <p>Current affairs are</p> | <p>Career links:</p> <p>Software developer roles</p> <p>Programmers</p> <p>Mathematicians</p> <p>NC Links: use two or</p> |

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|  |  |  | <p>Design programs in Scratch to solve specific problems</p> <p>Use Scratch confidently to solve a range of problems.</p> | <p>repeated practical experience of writing computer programs in order to solve such problems</p> | <p>as forever and repeat loops.</p> | <p>calculations in scratch to an understanding of basic arithmetic operators (addition, subtraction, multiplication and division is needed).</p> <p>KS2: use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>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>computational thinking skills</p> <p>develop their capability, creativity and knowledge in computer science, digital media and information technology</p> | <p>their code.</p> | <p>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> <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</p> | <p>incorporated into lessons</p> <p>Make links to 'real life' examples</p> | <p>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</p> <p>Design, use and evaluate computational abstractions that model the state and behaviour or real-world problems and physical systems</p> |
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| HT5<br>17.04.23 - 26.05.23<br><br>6 weeks | Programming in Python: Sequence | Understand a range of basic programming constructs in Python<br><br>Know how to print to the screen, perform calculations, take inputs and store them in suitably named variables | <b>Develop</b> working programs in Python to solve specific problems.<br><br><b>Analyse</b> the requirements of a program<br><br><b>Identify</b> the processes needed to solve a problem<br><br><b>Design</b> programs in Python to solve specific problems<br><br><b>Use</b> Python to confidently write simple programs | Logical reasoning<br><br>Computational thinking<br><br>can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems | Syntax and logical errors<br><br>Students should be encouraged to 'find' errors in their work and test regularly | There is no requirement for students to have used Python before, although prior knowledge of code may be useful.<br><br>Students will be performing calculations in Python so an understanding of basic arithmetic operators (addition, subtraction, multiplication and division is needed).<br><br>In Y7 the students will have used scratch (block based coding)<br><br>KS2: use sequence, selection, and repetition in programs; work with | Programming links to the KS4 computing curriculum.<br><br>NC outcomes: develop and apply their analytic, problem-solving, design, and computational thinking skills<br><br>develop their capability, creativity and knowledge in computer science, digital media and information technology | Challenge tasks will be built into lessons - refer to MTP,<br><br>In this unit, students will be encouraged to show additional skills when they develop their code. | Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times.<br><br>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.<br><br>Mutual respect for tolerance of those with different | We encourage students to read newspapers<br><br>We encourage students to watch the news<br><br>Current affairs are incorporated into lessons<br><br>Make links to 'real life' examples | Computer programmer<br><br>NC Link<br><br>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems.<br><br>Make appropriate use of data structures (for example, lists, tables or arrays) |



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|                                                     |                                                         |                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                  | <p>variables and various forms of input and output</p> <p>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>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>HT6</p> <p>5.06.23 - 21.07.23</p> <p>7 weeks</p> | <p>Internet safety, cyber protection and encryption</p> | <p>By the end of this module, students should be able to:</p> <p><b>Know and understand</b> 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><b>Apply</b> 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</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</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/u</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</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</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, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and</p> |

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|  |  | Know about a range of ciphers | technologies<br>Use computer systems safely and confidently | engagement through a passion for learning and a level of challenge.<br><br>Students are happy and demonstrate a hunger for learning and courage to attempt new tasks and complete current ones.<br><br>Misconceptions are corrected and challenged at an appropriate level. |  | nacceptable behaviour; identify a range of ways to report concerns about content and contact | new to both year groups. |  | themes.<br><br>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.<br><br>Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times.<br><br>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 |  | conduct and know how to report concerns. |
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|  |  |  |  |  |  |  |  |  | <p>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> |  |  |
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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.