| | Computing: Progression in Knowledge and Skills |
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| | Strands of Computing:<br><span style="color:red">Computer Science</span><br><span style="color:blue">Information Technology</span><br><span style="color:green">Digital Literacy</span> |

Key Stage 1 National Curriculum Objectives
Pupils should be taught to:
- ♣ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- ♣ create and debug simple programs
- ♣ use logical reasoning to predict the behaviour of simple programs
- ♣ use technology purposefully to create, organise, store, manipulate and retrieve digital content
- ♣ recognise common uses of information technology beyond school
♣ use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

| Year Group | Key Knowledge | Key Skills |
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| **Year 1** | Computer Science<br>• Identify a set of instructions (pre-cursor to an algorithm).<br>• Describe what a computer program is.<br>Information Technology<br>• Identify the difference between left and right click.<br>• Describe what different formatting tools are (font, colour, bold etc…)<br>• Explain why computers are useful in presenting information.<br>Digital Literacy<br>• Identify the potential uses and dangers of the internet.<br>• Describe what information is individual.<br>• Identify key organisations that will help and support children online.<br>• Explain rules for traveling safely on the Internet.<br>• Understand that they should never give out private information on the Internet. | Computer Science<br>• Write a simple set of instructions (an algorithm).<br>• Edit their instructions for mistakes (de-bug).<br>• Use different blocks to program physical and virtual characters.<br>Information Technology<br>• Type with two hands.<br>• Save work to a folder.<br>• Use keys such as space, shift and enter effectively.<br>• Record a sound.<br>• Format a piece of work with colours and fonts.<br>Digital Literacy<br>• Write an email.<br>• Learn how to search online by using the alphabet.<br>• Compare how staying safe online is similar to staying safe in the real world.<br>• Recognise the kind of information that is private.<br>• Discover that the Internet can be used to visit far-away places and learn new things.<br>• Learn to create effective usernames that protect their private information. |
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| **Year 2** | Computer Science<br>• Explain what an algorithm is.<br>• Describe what de-bugging is.<br>Information Technology<br>• Describe the uses of different programs on the computer (e.g. Word, PPT etc…)<br>• Explain what key terms are such as: text box; font; cursor<br>Digital Literacy<br>• Explain what makes a website safe and appropriate.<br>• Identify the 'digital trail' that an individual leaves.<br>• Describe what cyber-bullying is and what it can look like. | Computer Science<br>• Write more complex algorithms including repeat functions.<br>• Predict what an algorithm will result in for a virtual character.<br>• Combine blocks together from different parts of Scratch Jr.<br>• Begin to apply skills to new situations.<br>Information Technology<br>• Adding photos, text and sound.<br>• Insert objects, text boxes and images.<br>• Refine skills into a 'finished product'.<br>Digital Literacy<br>• Perform a keyword search to efficiently find information.<br>• Evaluate websites that are: safe and unsafe; appropriate and inappropriate. |

| Key Stage 2 National Curriculum Objectives |
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| ♣ design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts |
| ♣ 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 |
| ♣ understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration |
| ♣ use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content |
| ♣ 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 and presenting data and information |
| ♣ use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. |

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| **Year 3** | Computer Science<br>• Define key terms within coding such as: algorithm; de-bug; variable.<br>• Identify what key blocks in Scratch do.<br>• Describe what a character would do if a specific program was run.<br>Information Technology<br>• Describe what a hyperlink is.<br>• Identify key applications for specific tasks.<br>• Explain key formatting tools and their functions.<br>Digital Literacy<br>• Identify the principles of a safe password.<br>• Describe the key features of an online community. | Computer Science<br>• Write algorithms on more complex coding applications.<br>• Use repeat functions to create more efficient algorithms.<br>• Begin to de-bug incorrect code in block based algorithms.<br>• Begin to create and use variables within algorithms.<br>Information Technology<br>• Add hyperlinks to documents, websites and pictures.<br>• Complete basic keyboard shortcuts such as copy, paste, save etc…<br>• Insert videos to presentations.<br>• Alter the size and looks of characters.<br>• Record and add sound recordings.<br>Digital Literacy<br>• Write emails for different purposes. |
| **Year 4** | Computer Science<br>• Begin to understand the term decomposition.<br>• Explain what an algorithm does and some uses for an algorithm.<br>Information Technology<br>• Describe what SmartArt is.<br>• Explain what certain keyboard shortcuts do.<br>Digital Literacy<br>• Explain key principles of being a digital citizen.<br>• Identify key differences between personal and private information.<br>• Define the term plagiarism and explain it to others. | Computer Science<br>• Write more complex algorithms which complete tasks.<br>• Begin to use 'if… then' blocks to introduce selection to algorithms.<br>• Refine and use variables within algorithms.<br>• Begin to combine more large sections of code into a longer algorithm.<br>Information Technology<br>• Perform more complex keyboard shortcuts such as: changing text size; formatting shortcuts; undo/redo.<br>• Record and add sounds to a project.<br>• Choose appropriate formatting tools to purpose and audience.<br>Digital Literacy<br>• Refine the use of a keyword search to exclude unwanted results. |

| Year 5 | Computer Science | Computer Science |
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| | • Define and explain the term decomposition.<br>• Explain what a variable is and give examples of variables that would be useful in programs.<br>• Begin to describe the real-life uses of algorithms and uses across the curriculum.<br>Information Technology<br>• Explain why certain formatting features are used.<br>• Identify applications that could be more useful for certain tasks.<br>Digital Literacy<br>• Define and explain the term spam in a digital context.<br>• Explain strategies for dealing with spam.<br>• Explain what citing is and why it is important. | • Use 'if… then' blocks more efficiently.<br>• Combine variables, sequencing and selection in more complex algorithms.<br>• Develop algorithms that respond to variables.<br>• Begin to use operators in conjunctions with variables to construct programs that respond to inputs.<br>Information Technology<br>• Combine audio and video skills together.<br>• Add charts and tables.<br>• Apply skills to alternative programs (e.g. Prezi)<br>• Add transitions, animations and effects to presentations.<br>Digital Literacy<br>• Further refine the creation of passwords including creating a system of multiple passwords for multiple accounts and online services.<br>• Correctly cite their work in an approved way. |
| Year 6 | Computer Science | Computer Science |
| | • Confidently explain the difference between an algorithm, program as well as debugging and decomposition.<br>• Define sequencing, selection, variables and repetition and explain why they are needed in algorithms.<br>Information Technology<br>• Explain the pros and cons of applications to complete specific tasks.<br>• Identify what a spreadsheet is and the key components of it.<br>• Describe some uses for spreadsheets in a real life context.<br>Digital Literacy<br>• Describe strategies for dealing with and organisations that support cyber-bullying.<br>• Begin to understand how algorithms can have positive and negative effects on individuals' online experiences.<br>• Describe ways in which online privacy and identity can be protected. | • Combine the use of repetition, sequencing, variables and selection to create complex programs by writing more complex algorithms.<br>• Use a variety of inputs and outputs that interact together including some external outputs.<br>• Use logical reasoning to de-bug a range of both pre-created and self-created algorithms including to more **efficient** algorithms (e.g. better use of repetition etc…)<br>Information Technology<br>• Begin to use some formatting tools in Excel.<br>• Confidently use some formulas to analyse basic data.<br>• Apply and refine the variety of skills used in KS2 to create a finished presentation.<br>Digital Literacy<br>• Confidently use technology safely and efficiently across the curriculum.<br>• Use technology for a variety of purposes including e-mailing, blogging and searching |

| KS3 | • design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems |
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|  | • 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 2 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, reuse, revise and repurpose 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 |