

Skills Progression for Computing Overview

National Curriculum:

Purpose of study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims

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.

Pupils should be taught:

- 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 Units	Year 4 Units	Year 5 Units	Year 6 Units
E safety	<p>Children demonstrate the importance of having a secure password and not sharing this with anyone else. Children can start to explain the negative implications of failure to keep passwords safe and secure.</p> <p>They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such in Purple Mash.</p> <p>They know more than one way to report unacceptable content and contact.</p> <p>Pupils know they can communicate with others via the internet and what they can say to people online</p> <p>Start to understand the importance of what balance means and how this relates to being online.</p> <p>Begin to ask questions and discuss their ideas about different scenarios with peers.</p>	<p>Children build on the key concepts taught in year 3 and can explore key concepts relating to online safety using concept mapping. They are now able to offer support to help others to understand the importance of online safety.</p> <p>Children know a range of ways of reporting inappropriate content and contact.</p> <p>Understand that it is important to balance time online – being online for too long will limit other activities (and sleep!)</p> <p>Know what respectful means and how to be respectful to peers off and online and know that all messages received online may not be kind.</p>	<p>Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services.</p> <p>Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.</p> <p>Understand that users can portray themselves in a certain way due to filters and editing of impacts – develop an understanding of the positive and negative impacts that this can have on themselves and others.</p>	<p>Children demonstrate the safe and respectful use of a range of different technologies and online services.</p> <p>They identify more discreet inappropriate behaviours through developing critical thinking activities. They recognise the value in preserving their privacy when online for their own and other people’s safety.</p> <p>Pupils can explain and evaluate why being a super digital citizen on the internet will keep them safe, allowing them to draw on different strategies to keep themselves safe.</p> <p>Children know websites have a duty of care to protect private information and know when a website is safe.</p> <p>Pupils to understand, emphasise and explore how it would feel to be cyberbullied. Learn strategies to deal with cyberbullying if it arises.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Information literacy and digital citizenship</p>	<p>Use keyboard to enter text (index fingers left & right hand) and know when and how to use – RETURN/ENTER/CAPS LOCK/DELETE/BACKSPACE to correct text.</p> <p>Use software tools to insert, format and change text inside documents.</p> <p>Save a document</p>	<p>Understand how to make amendments to text and save changes.</p> <p>Amend text by highlighting & using SELECT/ DELETE & COPY/ PASTE</p> <p>Use a variety of font sizes, styles and colours.</p> <p>Look at their own work and assess its effectiveness.</p>	<p>Use excel to change cells by resize cells, adding colour, representing data in charts, use formulae to calculate totals, averages, maximum and minimum numbers and answer ‘what if’ questions.</p> <p>Align text left, right and centre.</p> <p>Create quality presentations that are appropriate and engaging for a known audience.</p> <p>Look at their own work and evaluate its effectiveness.</p>	<p>Use online software like Weebly or Google Classroom to create website pages that fulfil a purpose.</p> <p>Apply word processing understanding to create a new post, save it and then publish it once changes are made.</p> <p>Embed hyperlinks text and images into posts.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Multimedia</p>	<p>Y2 - Create a simple presentation incorporating sounds that children have captured.</p> <p>Begin to evaluate the use of media in order to improve communication.</p> <p>Manipulate an image on a range of software to convey a specific mood or meaning.</p>	<p>Create multimeadia software including e- books and PowerPoint aimed at a target audience.</p> <p>Add text, backgrounds, photos and hyperlinks Import recorded sound into software for purpose. Embed content such as maps or YouTube.</p> <p>Start to create presentations appropriatefora known audience.</p>	<p>Create a film or animation from images (Still or moving) that have been sourced or created.</p> <p>(Video) Storyboard and capture still images for a purpose. Identify images to keep and which to discard. Begin to explore how to trim and arrange these to convey meaning for their project. Add effects to their project to engage their audience such as titles, credits, slide transitions, special effects.</p> <p>Incorporate isolated sound.</p>	<p>Use software to resize, adjust colours, brightness and filters, add overlaying text and add layers to a picture or video.</p> <p>(Video- Imovie) Storyboard and capture videos for a multi-scene project for a purpose.</p> <p>Adjust the number of photographs taken and the playback rate to improve the quality of the animation.</p> <p>Can effectively use animation/special effects and transition.</p> <p>Export their video.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Data handling</p>	<p>Use a pre-set spreadsheet to insert data used in maths or science. Use this data to create a simple graph in excel.</p> <p>Contribute towards a database</p> <p>Record data in a variety of ways and present data to others.</p> <p>Use a software programme to log data and monitor any changes identified.</p>	<p>Use search engines or cross curricular links to fetch data</p> <p>Create a data collection sheet and use it to setup a straight forward database to answer questions and make predictions.</p> <p>Identify different types of data and be able to indentify data that is inaccurate.</p>	<p>Begin to explore simple formulae to help atomise data sheets and improve efficiency.</p> <p>Analyse information and question data, identifying poor quality data.</p> <p>Reflect on the effectiveness the layout.</p>	<p>Using maths or science data, children to decide on a relevant data handling system and generate, process, interpret, store, and present information collected – realising the need for accuracy and checking plausibility</p> <p>Introduce formulae to predict outcomes.</p> <p>Identify and present results Import data charts from excel for use in wider projects.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Programming</p>	<p>Start to read and follow simple everyday written sequences, identifying what an algorithm wants you to do.</p> <p>Observe a working program and decompose its elements as a class.</p> <p>Decide which parts of a project are most important or should be started first</p> <p>Create sequence of simple code that can be easily read. Develop understanding of how to create multiple sequences that run concurrently.</p> <p>Create a sequence where timing is important.</p> <p>identify where in the code or algorithm bug/ problem occur.</p>	<p>Write simple sequence algorithms using words.</p> <p>Recognise that one algorithm may be better by reading and creating count-controlled and forever loops.</p> <p>Pupil choose to adapt ideas that they have used to solve similar problems.</p> <p>Spot patterns in algorithm or code and continue the patterns.</p> <p>Add small non critical adaptations</p> <p>Create sequences of multiple sequences where timing is critical</p> <p>Observe a working program and decompose its elements as a class. Debug simple sequence errors independently</p>	<p>Read, follow and write algorithms with selection and repetition</p> <p>Adapt a given design for a new teacher given purpose and change an algorithm that may be better than another</p> <p>Use single simple condition and create selection within a loop</p> <p>Observe a working program and decompose its elements as an individual</p> <p>Debug simple repetition and selection errors independently</p>	<p>Be able to repurpose ideas for a pupil’s chosen purpose</p> <p>Use all knowledge taught previously to create variables within code which is used to hold number or word and reported.</p> <p>Create multiple non- connected variables in code.</p> <p>Evaluate more complex code that does the same thing and be able to adjust the code accordingly.</p> <p>Debug repetition, selection & variable errors independently</p>