

**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.

**Foundation Stage**

Pupils should be taught to:

- Safely recognise that a range of technology is used in places such as homes and schools.
- Select and use technology for particular purposes.

**Key Stage 1**

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.

**Key Stage 2**

Pupils should be taught to:

- 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.

	Nursery Computer User	Reception Computer User	Year 1 Computer User	Year 2 Computer User
	<p><b>(30-50 months)</b></p> <p><b>Children:</b></p> <ul style="list-style-type: none"> <li>• Know how to operate simple equipment, e.g. turn on CD player and use remote control.</li> <li>• Show an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</li> <li>• Show skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.</li> <li>• Know that information can be retrieved from computers.</li> </ul>	<p><b>(40-60 months)</b></p> <p><b>Children:</b></p> <ul style="list-style-type: none"> <li>• Complete a simple program on a computer.</li> <li>• Use ICT hardware to interact with age-appropriate computer software.</li> <li>• Recognise that a range of technology is used in places such as homes and schools.</li> <li>• Select and use technology for particular purposes</li> </ul>	<p><b>Computer science</b></p> <ul style="list-style-type: none"> <li>• Know what an algorithm is.</li> <li>• Know that an algorithm written for a computer is called a program.</li> <li>• Know what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash</li> <li>• Write my own simple algorithm, e.g. Colouring in a Bird activity.</li> <li>• Make logical attempts to debug a program, e.g. Bubbles activity in 2Code.</li> <li>• Read a code and predict what a program may do e.g. interpret where the turtle in 2Go challenges will end up at the end of the program.</li> </ul>	<p><b>Computer science</b></p> <ul style="list-style-type: none"> <li>• Know that an algorithm is a set of instructions to complete a task.</li> <li>• Know that I need to be precise with algorithms so that they can be successfully converted into code.</li> <li>• Create and debug a simple program that achieves a specific purpose e.g. Debug Challenges: Chimp.</li> <li>• Show a growing awareness of the need for logical, programmable steps.</li> <li>• Write a cause and effect sentence of what will happen in a program.</li> </ul>

	Nursery Computer User	Reception Computer User	Year 1 Computer User	Year 2 Computer User
Progression and Assessment Criteria	<p><b>Adults:</b></p> <ul style="list-style-type: none"> <li>Support and extend the skills children develop as they become familiar with simple equipment, such as twisting or turning a knob.</li> <li>Draw young children's attention to pieces of ICT apparatus they see or that they use with adult supervision.</li> </ul> <p><b>Environments:</b></p> <ul style="list-style-type: none"> <li>When out in the locality, ask children to help to press the button at the pelican crossing, or speak into an intercom to tell somebody you have come back.</li> </ul> <p><i>In nursery children will be using enquiry skills in their everyday play within their local environment throughout the year.</i></p>	<p><b>Adults:</b></p> <ul style="list-style-type: none"> <li>Encourage children to speculate on the reasons why things happen or how things work.</li> <li>Support children to coordinate actions to use technology, for example, call a telephone number.</li> <li>Teach and encourage children to click on different icons to cause things to happen in a computer program.</li> </ul> <p><b>Environments:</b></p> <ul style="list-style-type: none"> <li>Provide a range of materials and objects to play with that work in different ways for different purposes, for example, egg whisk, torch, other household implements, pulleys, construction kits and tape recorders.</li> <li>Provide a range of programmable toys, as well as equipment involving ICT, such as computers.</li> </ul> <p><i>In reception children will be using enquiry skills in their everyday play within their local environment throughout the year.</i></p>	<p><b>Information technology</b></p> <ul style="list-style-type: none"> <li>Sort and collate digital content e.g. use Purple Mash 2Quiz example (sorting shapes)</li> <li>Edit and store digital content e.g. 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count.</li> </ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"> <li>Know what is meant by technology and can identify a variety of examples both in and out of school.</li> <li>Make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.</li> <li>Understand the importance of keeping information private.</li> <li>Take ownership of my work and save this in my own private space such as My Work folder on Purple Mash.</li> </ul>	<p><b>Information technology</b></p> <ul style="list-style-type: none"> <li>Organise data using a database such as 2Investigate.</li> <li>Retrieve specific data for conducting simple searches.</li> <li>Edit more complex digital data such as music compositions within 2Sequence.</li> <li>Confidently create, name, save and retrieve content.</li> <li>Use a range of media in my digital content including photos, text and sound.</li> </ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"> <li>Retrieve relevant, purposeful digital content using a search engine.</li> <li>Apply my learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template.</li> <li>Make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs.</li> <li>Know the implications of inappropriate online searches.</li> <li>Understand how things are shared electronically such as posting work to the Purple Mash display board.</li> <li>Develop an understanding of using email safely by using 2Respond</li> <li>Know ways of reporting inappropriate behaviours and content to a trusted adult.</li> </ul>
	Nursery and Reception Safe Computer User		Year 1 and Year 2 Safe Computer User	
Progression and Assessment Criteria	<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>Understand some of the risks to using the internet</li> <li>Understand what personal information is and that it must be kept safe</li> <li>Know that websites sometimes include pop-ups that take me away from the main site.</li> <li>Have begun to evaluate websites and know that everything on the internet is not true.</li> <li>Know that it is not always possible to copy some text and pictures from the internet.</li> <li>Know that personal information should not be shared online.</li> <li>Know I must tell a trusted adult immediately if anyone tries to meet me via the internet.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>Follow the school's safer internet rules.</li> <li>Understand the importance of asking for help from an adult when on the internet.</li> <li>Use the search engines agreed by the school.</li> <li>Know what to do if I find something inappropriate online or something I am unsure of.</li> <li>Use the internet for learning and communicating with others, making choices when navigating through sites.</li> <li>Recognise advertising on websites and learn to ignore it.</li> <li>Use a password to access the secure network.</li> </ul>		<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>Understand the different methods of communication (e.g. email, online forums etc).</li> <li>Know you should only open email from a known source.</li> <li>Know the difference between email and communication systems such as blogs and wikis.</li> <li>Know that websites sometimes include pop-ups that take me away from the main site.</li> <li>Know that bookmarking is a way to find safe sites again quickly.</li> <li>Have begun to evaluate websites and know that everything on the internet is not true.</li> <li>Know that it is not always possible to copy some text and pictures from the internet.</li> <li>Know that personal information should not be shared online.</li> <li>Know I must tell a trusted adult immediately if anyone tries to meet me via the internet.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>Follow the school's safer internet rules.</li> <li>Use the search engines agreed by the school.</li> <li>Know what to do if I find something inappropriate online or something I am unsure of (including identifying people who can help; minimising screen; online reporting using school system etc.).</li> <li>Use the internet for learning and communicating with others, making choices when navigating through sites.</li> <li>Send and receive email as a class.</li> <li>Recognise advertising on websites and learn to ignore it.</li> <li>Use a password to access the secure network.</li> </ul>	

	Year 3 Computer User	Year 4 Computer User	Year 5 Computer User	Year 6 Computer User	
Progression and Assessment Criteria	<p><b>Computer science</b></p> <ul style="list-style-type: none"><li>• Turn a simple real-life situation into an algorithm for a program showing how this translates into code.</li><li>• Identify an error within my program and then fix it.</li><li>• Design a program that follows a simple sequence.</li><li>• Beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects.</li><li>• Understand how variables can be used to store information while a program is executing.</li><li>• Think of the structure of a program in logical, achievable steps.</li><li>• Make good attempts to ‘step through’ more complex code in order to identify errors in algorithms and correct this. e.g. traffic light algorithm in 2Code.</li><li>• Read programs with several steps and predict the outcome accurately e.g. Logo</li><li>• List a range of ways that the internet can be used to provide different methods of communication and use some of these e.g. being able to open, respond to and attach files to emails using 2Email.</li><li>• Describe appropriate email conventions when communicating in this way.</li></ul> <p><b>Information technology</b></p> <ul style="list-style-type: none"><li>• Carry out simple searches to retrieve digital content using a search engine such as Purple Mash search or internet-wide search engines.</li><li>• Collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database (2Question), 2Graph.</li><li>• Know what software is most appropriate for a given task.</li><li>• Create purposeful content to attach to emails, e.g. 2Respond</li></ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"><li>• Know the importance of having a secure password and not sharing this with anyone else.</li><li>• Explain the negative implications of failure to keep passwords safe and secure.</li><li>• Understand the importance of staying safe and the importance of my conduct when online.</li><li>• Know more than one way to report unacceptable content and contact.</li></ul>	<p><b>Computer science</b></p> <ul style="list-style-type: none"><li>• Turn a real-life situation into an algorithm, using coding structures for selection and repetition.</li><li>• Make more intuitive attempts to debug programs.</li><li>• Use timers to achieve repetition effects in a more logical and integrated way.</li><li>• Understand ‘if statements’ for selection and attempt to combine these with other coding structures.</li><li>• Understand how variables can be used to store information while a program is executing.</li><li>• Make use of user inputs and outputs such as ‘print to screen’. e.g. 2Code.</li><li>• Think of the structure of a program in logical steps absorbing some new knowledge of coding structures e.g. ‘if’ statements, repetition and variables.</li><li>• Trace code and use step-through methods to identify errors in code and make logical attempts to correct this. e.g. traffic light algorithm in 2Code.</li><li>• Read programs with several steps and predict the outcome accurately e.g. Logo</li><li>• Recognise the main component parts of hardware which allow computers to join and form a network.</li><li>• Understand the online safety implications associated with the ways the internet can be used.</li></ul> <p><b>Information technology</b></p> <ul style="list-style-type: none"><li>• Understand the function, features and layout of a search engine.</li><li>• Appraise selected webpages for credibility and information at a basic level.</li><li>• Make improvements to digital solutions based on feedback.</li><li>• Make informed software choices when presenting information and data.</li><li>• Create linked content using a range of software such as 2Connect and 2Publish+. Share digital content within my community, i.e. using Virtual Display Boards.</li></ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"><li>• Explore key concepts relating to online safety using concept mapping such as 2Connect.</li><li>• Help others to understand the importance of online safety.</li><li>• Know a range of ways of reporting inappropriate content and contact.</li></ul>	<p><b>Computer science</b></p> <ul style="list-style-type: none"><li>• Attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts.</li><li>• Test and debug my programs as they go and can use logical methods.</li><li>• Translate algorithms that include sequence, selection and repetition into code with increasing ease.</li><li>• Combine sequence, selection and repetition with other coding structures.</li><li>• Beginning to think about my code structure in terms of the ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of variables.</li><li>• Understand the value of computer networks but am also aware of the main dangers.</li><li>• Recognise what personal information is and can explain how this can be kept safe.</li><li>• Select the most appropriate form of online communications considering audience and digital content, e.g. 2Blog, 2Email, Display Boards.</li></ul> <p><b>Information technology</b></p> <ul style="list-style-type: none"><li>• Search with greater complexity for digital content when using a search engine.</li><li>• Explain in some detail how credible a webpage is and the information it contains.</li><li>• Make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution e.g. creating a program to meet a design brief in 2Code.</li><li>• Objectively review solutions from others.</li><li>• Collaboratively create content and solutions using digital features within software.</li><li>• Know how to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email.</li></ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"><li>• Know common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services.</li><li>• Relate appropriate online behaviour to my right to personal privacy and mental wellbeing and that of others.</li></ul>	<p><b>Computer science</b></p> <ul style="list-style-type: none"><li>• Turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decompose them in a logical way.</li><li>• Test and debug my program as I go and use logical and systematic methods to identify the cause of bugs.</li><li>• Translate algorithms that include sequence, selection and repetition into code, including nesting structures.</li><li>• Understand variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions.</li><li>• Interpret a program in parts and I can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.</li><li>• Understand and can explain the difference between the internet and the World Wide Web.</li><li>• Know what a WAN and LAN are and can describe how I access the internet in school.</li></ul> <p><b>Information technology</b></p> <ul style="list-style-type: none"><li>• Apply filters when searching for digital content.</li><li>• Explain in detail how credible a webpage is and the information it contains.</li><li>• Compare a range of digital content sources and rate them in terms of content quality and accuracy.</li><li>• Use critical thinking skills in everyday use of online communication.</li><li>• Make clear connections to the audience when designing and creating digital content.</li><li>• Design and create my own blogs to become a content creator on the internet, e.g. 2Blog.</li><li>• Use criteria to evaluate the quality of digital solutions and identify improvements, making some refinements.</li></ul> <p><b>Digital literacy</b></p> <ul style="list-style-type: none"><li>• Demonstrate a safe and respectful use of a range of different technologies and online services.</li><li>• Identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities.</li><li>• Recognise the value in preserving my privacy when online for my own and other people’s safety</li></ul>	

	Year 3 and Year 4 Safe Computer User	Year 5 and Year 6 Safe Computer User
Progression and Assessment Criteria	<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand the need for rules to keep me safe when exchanging learning and ideas online.</li> <li>• Recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion.</li> <li>• Understand that the internet contains fact, fiction and opinion and begin to distinguish between them.</li> <li>• Use strategies to verify information, e.g. cross-checking.</li> <li>• Understand the need for caution when using an internet search for images and what to do if I find an unsuitable image.</li> <li>• Understand that copyright exists on most digital images, video and recorded music.</li> <li>• Understand the need to keep personal information and passwords private.</li> <li>• Understand that if I make personal information available online it may be seen and used by others.</li> <li>• Know how to respond if asked for personal information or feel unsafe about content of a message.</li> <li>• Recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy.</li> <li>• Know how to report an incident of cyber bullying.</li> <li>• Know the difference between online communication tools used in school and those used at home.</li> <li>• Understand the need to develop an alias for some public online use.</li> <li>• Understand that the outcome of internet searches at home may be different than at school.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Follow the school's safer internet rules.</li> <li>• Recognise the difference between the work of others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new.</li> <li>• Identify when emails should not be opened and when an attachment may not be safe.</li> <li>• Explain and demonstrate how to use email safely.</li> <li>• Use different search engines.</li> </ul>	<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Discuss the positive and negative impact of the use of ICT in my own life, my friends and family.</li> <li>• Understand the potential risk of providing personal information online.</li> <li>• Recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content.</li> <li>• Understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented.</li> <li>• Recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing).</li> <li>• Understand that some material on the internet is copyrighted and may not be copied or downloaded.</li> <li>• Understand that some messages may be malicious and know how to deal with this.</li> <li>• Understand that online environments have security settings, which can be altered, to protect the user.</li> <li>• Understand the benefits of developing a 'nickname' for online use.</li> <li>• Understand that some malicious adults may use various techniques to make contact and elicit personal information.</li> <li>• Know that it is unsafe to arrange to meet unknown people online.</li> <li>• Know how to report any suspicions.</li> <li>• Understand I should not publish other people's pictures or tag them on the internet without permission.</li> <li>• Know that content put online is extremely difficult to remove.</li> <li>• Know what to do if I discover something malicious or inappropriate.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Follow the school's safer internet rules.</li> <li>• Make safe choices about the use of technology.</li> <li>• Use technology in ways which minimises risk. e.g. responsible use of online discussions, etc.</li> <li>• Create strong passwords and manage them so that they remain strong.</li> <li>• Independently, and with regard for e-safety, select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school.</li> <li>• Competently use the internet as a search tool.</li> <li>• Reference information sources.</li> <li>• Use appropriate strategies for finding, critically evaluating, validating and verifying information. e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources.</li> <li>• Use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information.</li> </ul>