

Lower Peover C of E Primary School

Progression in Computing under the 2014 National Curriculum



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 a sequence of instructions
- write and test simple programs
- use logical reasoning to predict the behaviour of simple programs
- organise, store, manipulate and retrieve data in a range of digital formats
- communicate safely and respectfully online, keeping personal information private, and recognise common uses of information technology beyond school

E-Safety in Key Stage 1

Knowledge & understanding

- Understand the different methods of communication (e.g. email, online forums, etc.)
- Know you should only open email from a known source
- Know the difference between email and communication systems such as blogs and wikis
- Know that websites sometimes include pop-ups that take them away from the main site
- Know that bookmarking is a way to find safe sites again quickly
- Begin to evaluate websites and know that everything on the internet is not true
- Know that it is not always possible to copy some text and pictures from the internet

Skills

- Follow the school's safer internet rules
- Use the search engines agreed by the school
- Act if they find something inappropriate online or something they are unsure of (including identifying people who can help; minimising screen; online reporting using school system, etc.)
- Use the internet for learning and communicating with others, making choices when navigating through sites
- Send and receive email as a class
- Recognise advertising on websites and learn to ignore it
- Use a password to access the secure network

Key Stage 2

Pupils should be taught to:

- design and write 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; generate appropriate inputs and predicted outputs to test programs
- use logical reasoning to explain how a simple algorithm works 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
- describe how internet search engines find and store data; use search engines effectively; be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely
- select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information

E-Safety in Key Stage 2

Knowledge & understanding

- Discuss the positive and negative impacts of the use of ICT in their own lives and those of their peers and family
- Understand the potential risk of providing personal information online
- Recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content
- Understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented
- Recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)
- Understand that some material on the internet is copyrighted and may not be copied or downloaded
- Understand that some messages may be malicious and know how to deal with this
- Understand that online environments have security settings, which can be altered, to protect the user
- Understand the benefits of developing a 'nickname' for online use.

Skills

- Follow the school's safer internet rules
- Make safe choices about use of technology
- Use technology in ways which minimises risk, e.g. responsible use of online discussions, etc.
- Create strong passwords and manage them so that they remain strong
- 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
- Competently use the internet as a search tool
- Reference information sources
- 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 not ICT resources
- 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

Key Questions:	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science	<ul style="list-style-type: none"> • Do they understand that an algorithm is a set of instructions used to solve a problem or achieve an objective? • Do they know that an algorithm written for a computer is called a program? • Can they work out what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash and can write their own simple algorithm, Colouring in a Bird activity? • Do they know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code, e.g. Bubbles activity in 2Code? • Can they read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program when looking at a program? 	<ul style="list-style-type: none"> • Can they explain that an algorithm is a set of instructions to complete a task? • Do they show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code when designing simple programs? • Can they create a simple program that achieves a specific purpose and can identify and correct some errors, e.g. Debug Challenges: Chimp? • Can they display a growing awareness of the need for logical, programmable steps in program designs? • Can they identify the parts of a program that respond to specific events and initiate specific actions, for example, they can write a cause and effect sentence of what will happen in a program? 	<ul style="list-style-type: none"> • Can they turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts? • Can they show that they are thinking of the desired task and how this translates into code in their designs? • Can they identify an error within their program that prevents it following the desired algorithm and then fix it? • Can they demonstrate the ability to design and code a program that follows a simple Sequence? • Can they experiment with timers to achieve repetition effects in their programs? 	<ul style="list-style-type: none"> • Do they consider, that when turning a real-life situation into an algorithm, their design shows that they are thinking of the required task and how to accomplish this in code, using coding structures for selection and repetition? • Can they make more intuitive attempts to debug their own programs? • Can they consider that their use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs? • Do they understand 'if statements' for selection and attempt to combine these with other coding structures, including variables to achieve the effects that they design in their programs? 	<ul style="list-style-type: none"> • Can they attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts? • Can they test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug, but may need some support identifying the specific line of code? • Can they translate algorithms that include sequence, selection and repetition into code with increasing ease, and their own designs show that they are thinking of how to accomplish the set task in code, utilising such structures? • Can they combine sequence, selection and repetition with other coding structures to achieve their algorithm design? 	<ul style="list-style-type: none"> • Can they turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way, using their knowledge of possible coding structures and applying skills from previous programs? • Can they test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem? • Can they translate algorithms that include sequence, selection and repetition into code and in their own designs show that they are thinking of how to accomplish the set task in code utilising such structures, including nesting structures within each other?

Computer Science (continued)

- Can they interpret where the turtle in 2Go challenges will end up at the end of the program?

- Can they begin to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects?

- Do they understand how variables can be used to store information while a program is executing?

- Can they show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures in their program designs, for example, 'if' statements, repetition and variables?

- Can they make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this, e.g. traffic light algorithm in 2Code?

- Do they understand that variables can be used to store information while a program is executing, and that they are able to use and manipulate the value of variables?

- Can they make use of user inputs and outputs such as 'print to screen', e.g. 2Code?

- Can they show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures in their program designs, for example, 'if' statements, repetition and variables?

- Can they 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?

- Can they begin to think about their 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?

- Do they understand the value of computer networks and are they also aware of the main dangers?

- Can they recognise what personal information is and can they explain how this can be kept safe?

- Can they select the most appropriate form of online communications contingent on audience and digital content, e.g. 2Blog, 2Email, Display Bards?

- Can they improve their understanding of 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 through coding displays?

- Can they interpret a program in parts and can they make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole?

- Do they understand and can they explain, in some depth, the difference between the Internet and the World Wide Web?

- Do they know what a WAN and LAN are and can they describe how they access the Internet in school?

**Computer
Science
(continued)**

- Can they read programs with several steps and predict the outcome accurately in programs such as Logo?
- Can they list a range of ways that the Internet can be used to provide different methods of communication and use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email, and describe appropriate email conventions when communicating in this way?

- Can they read programs with several steps, e.g. Logo, and predict the outcome accurately?
- Can they recognise the main component parts of hardware which allow computers to join and form a network?
- Do they understand the online safety implications associated with the ways the Internet can be used to provide different methods of communication is improving?

Information Technology

<ul style="list-style-type: none"> • Can they sort, collate, edit and store simple digital content, e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count? 	<ul style="list-style-type: none"> • Can they demonstrate an ability to organise data using, for example, a database such as 2Investigate and can they retrieve specific data for conducting simple searches? • Can they edit more complex digital data such as music compositions within 2Sequence? • Are they confident when creating, naming, saving and retrieving content? • Can they use a range of media in their digital content including photos, text and sound? 	<ul style="list-style-type: none"> • Can they carry out simple searches to retrieve digital content and do they understand that to do this, they are connecting to the Internet and using a search engine such as Purple Mash search or Internet-wide search engines? • Can they collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database (2Question), using software such as 2Graph? • Can they consider what software is most appropriate for a given task? • Can they create purposeful content to attach to emails, e.g. 2Respond? 	<ul style="list-style-type: none"> • Do they understand the function, features and layout of a search engine and can they appraise selected webpages for credibility and information at a basic level? • Can they make improvements to digital solutions based on feedback? • Can they make informed software choices when presenting information and data? • Can they create linked content using a range of software such as 2Connect and 2Publish+? • Can they share digital content within their community, i.e. using Virtual Display Boards? 	<ul style="list-style-type: none"> • Can they search, with greater complexity, for digital content when using a search engine? • Can they explain, in some detail, how credible a webpage is and the information it contains? • Can they make appropriate improvements to digital solutions based on feedback received and can they confidently comment on the success of the solution, e.g. creating their own program to meet a design brief using 2Code, and objectively review solutions from others? • Can they collaboratively create content and solutions using digital features within software such as collaborative mode? • Can they use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email? 	<ul style="list-style-type: none"> • Can they readily apply filters when searching for digital content? • Can they explain, in detail, how credible a webpage is and the information it contains? • Can they compare a range of digital content sources and are they able to rate them in terms of content quality and accuracy? • Can they use critical thinking skills in everyday use of online communication? • Can they make clear connections to the audience when designing and creating digital content? • Can they design and create their own blogs to become a content creator on the Internet, e.g. 2Blog? • Can they use criteria to evaluate the quality of digital solutions and are they able to identify improvements, making some refinements?
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<p style="text-align: center;">Digital Literacy</p>	<ul style="list-style-type: none"> • Do they understand what is meant by technology and can they identify a variety of examples both in and out of school? • Can they make a distinction between objects that use modern technology and those that do not, e.g. a microwave vs. a chair? • Do they understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons? • Do they take ownership of their work and save this in their own private space, such as their My Work folder on Purple Mash? 	<ul style="list-style-type: none"> • Can they effectively retrieve relevant, purposeful digital content using a search engine? • Can they apply their learning of effective searching beyond the classroom and share this knowledge, e.g. 2Publish example template? • Can they make links between technology they see around them, coding and multimedia work they do in school, e.g. animations, interactive code and programs? • Do they know the implications of inappropriate online searches? • Do they understand how things are shared electronically, such as posting work to the Purple Mash display board? • Are they developing an understanding of using email safely by using 2Respond activities on Purple Mash and do they know ways of reporting inappropriate behaviours and content to a trusted adult? 	<ul style="list-style-type: none"> • Can they demonstrate the importance of having a secure password and not sharing this with anyone else? • Can they explain the negative implications of failure to keep passwords safe and secure? • Do they understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash? • Do they know more than one way to report unacceptable content and contact? 	<ul style="list-style-type: none"> • Can they explore key concepts relating to online safety using concept mapping such as 2Connect? • Can they help others to understand the importance of online safety? • Do they know a range of ways of reporting inappropriate content and contact? 	<ul style="list-style-type: none"> • Do they have a secure knowledge of common online safety rules and can they apply this by demonstrating the safe and respectful use of a few different technologies and online services? • Can they implicitly relate appropriate online behaviour to their right to the personal privacy and mental wellbeing of themselves and others? 	<ul style="list-style-type: none"> • Can they demonstrate the safe and respectful use of a range of different technologies and online services? • Can they identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities? • Can they recognise the value in preserving their privacy when online for their own and other people's safety?
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