



Progression of Skills

Area of Computing	NC Objectives KS1	Yr1 Outcome	Yr2 Outcomes	NC Objectives LKS2	Yr3 Outcomes	Yr4 Outcomes	NC Objectives UKS2	Yr5 Outcomes	Yr6 Outcomes
<u>Computer Science</u> <u>(Digital Specialism)</u>	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that an algorithm written for a computer is called a program	Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.	When turning a real-life situation into an algorithm, the children's design shows that they are thinking of the required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Children may attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts. Children are able to 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.	Children are able to 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. Children 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.
	Create and debug simple programs	Children can work out what is wrong with a simple algorithm when the steps are out of order, e.g. <i>The Wrong Sandwich</i> in Purple Mash and can write their own simple algorithm, e.g. <i>Colouring in a Bird activity</i> . Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code, e.g. <i>Bubbles activity</i> in 2Code.	Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. <i>Debug Challenges</i> ; <i>Chimp</i> . Children's program designs display a growing awareness of the need for logical programmable steps.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects.	Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. 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. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Children can 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. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design.	Children translate algorithms that include sequence, selection and repetition into code and 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. Coding displays and improving 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.

						variables. Children can make use of user inputs and outputs such as 'print to screen' e.g. 2Code.			
	Use logical reasoning to predict the behaviour of simple programs	When looking at a program, children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program. Children can, for example, interpret where the turtle in 2Go challenges will end up at the end of the program.	Children can 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.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Children's designs for their programs show that they are thinking of the structure of a program in logical achievable steps and absorbing some new knowledge of coding structures. For example repetition and the use of timers. They make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this e.g. In programs such as Logo they can 'read' programs with several steps and predict the	Children's designs for their programs show that they are thinking of the structure of a program in logical achievable steps and absorbing some new knowledge of coding structures. For example, 'if' statements, repetition and variables. They can trace code and use 'step through' methods to identify errors in code and make logical attempts to correct this. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	When children code, they are beginning 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.	Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.

					outcome accurately.				
				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	Children can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open respond to and attach files to emails using 2Email. They can describe appropriate email conventions when communicating in this way	Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the internet can be used to provide different methods of communication is improving.	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	Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communication contingent on audience and digital content, e.g. 2Blog, 2Email, Display Boards.	Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the internet in school.

Area of Computing	NC Objectives KS1	Yr1 Outcome	Yr2 Outcomes	NC Objectives LKS2	Yr3 Outcomes	Yr4 Outcomes	NC Objectives UKS2	Yr5 Outcomes	Yr6 Outcomes
<u>Information Technology</u> (Working Skills)	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Children are able to 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.	Children demonstrate an ability to organise data using for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions within 2Sequence. Children are confident when creating, naming saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Children can carry out simple searches to retrieve digital content. 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.	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.	Children readily apply filters when searching for digital content. They are able to explain in detail how credible a webpage is and the information it contains. They compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. Children use critical thinking skills in everyday use of online communication.
				Select, use and combine a variety of software (including	Children can collect, analyse, evaluate and present data	Children are able to make improvements to digital solutions based	Select, use and combine a variety of software (including	Children are able to make appropriate improvements to digital	Children make clear connections to audience when designing and

				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.	and information using a selection of software, e.g. using a branching database (2Question), using software such a 2Graph. Children can consider what software is most appropriate for a given task. They can create purposeful content to attach to emails, e.g. 2Email.	on feedback. Children make informed software choices when presenting information and data. They create linked content using a range of software such as 2Connect and 2Publish. Children share digital content within their community, i.e. Using Virtual Display Boards.	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	solutions based on feedback received and can confidently comment on the success of the solution. E.g. creating their own program to meet a design brief using 2Code. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email.	creating digital content. The children design and create their own blogs to become a content creator on the internet, e.g. 2Blog. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.
--	--	--	--	--	---	---	---	--	---