Computing: Whole-School Curriculum Progression Map

	EYFS	KS1		KS2			
	(30 - 50mths to ELGs)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.		**Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.**			
Computer Science	Children help adults operate equipment around the school, independently operating simple equipment Children use simple software to make things happen Children press buttons on a floor robot and talk about the movements Children explore options and make choices with toys, software and websites	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.	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.	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 to use 'Scratch' a new interface to transfer their coding skills.*** ***To produce an animated story.***	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**. ***Children to use Scratch to create a game using all the skills they have learnt over the years. Variables such as timing and scoring to be included.***

Greater Depth	Children program toy to reach particular outcome.	Children understand the effect that precise accuracy of the instructions has on the outcome. Children can give instructions that demonstrate they are anticipating the outcome.	Children can use cause and affect language, children can reason in detail about what will happen in a program.	Children are attempting to turn **increasingly complex** real-life situations into algorithms for a program by deconstructing the situation into manageable parts.	Children designs are ambitious but logical and achievable. Children are attempting to turn increasingly complex real-life situations into algorithms for a program by deconstructing the situation into manageable parts. Pupils realise the constraints of creating purely sequential programs and intuitively grasp the concepts of selection, repetition and variables.	Children's designs are ambitious, but the algorithms are logical and achievable. Children are attempting to turn increasingly complex real-life situations into algorithms for a program by deconstructing the situation into manageable parts (lessons 1 & 2). 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 and variables	Children can 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. They can then use this design to write a program for a game. Children's design shows that they are thinking both, of the required task, and of how to accomplish this in code.
		Create and debug simple programs.		**Use sequence, selection and repetition in programs; work with variables and various forms of input and output.**			
Computer Science	Children help adults operate equipment around the school, independently operating simple equipment Children use simple software to make things happen Children press buttons on a floor robot and talk about the movements Children explore options and make choices with toys, software and websites Examples: Tea Bot Jam Sandwich Bot PE Bot- PE	Children can 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, e.g. **Colouring in a Bird activity.** 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. **Bubbles activity in 2Code**.	Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. **Debug Challenges: Chimp**. Children's program designs display a growing awareness of the need for logical, programmable steps.	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 understand how variables can be used to store information while a program is executing.	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 variables. Children can make use of user inputs and outputs such as 'print to screen'. e.g. **2Code**.	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 an 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**.

Greater Depth	Children can order a set of instructions and explain why something won't work out when it has been put in the wrong	Children challenge themselves by creating their own complex challenges. They intuitively debug their code. When looking at a program they can 'read' the code one line at a time and envision the bigger picture of the overall effect of the program; they can often work out where the turtle will end up at the end of the program and when they are incorrect, they are able to work out why.	Chidlrenwill be able to apply their knowledge as a transferable skill across a range of debugging scenarios including making logical attempts to debug their own more complex code.	Children make use of variables in their programs and combine these with timers to creative effect	Children like to challenge themselves to combine these with other coding structures to achieve the effects that they design in all their programs. Their designs are ambitious but logical and achievable Children can 'read' others' code and predict what will happen in a program which helps them to correct errors. They can compare two codes and decide which is more effective.	Children intuitively grasp the concepts of selection, repetition and variables. Children test and debug their program as they go and can use logical methods to identify the approximate cause of any bugs then test systematically to identify the specific line of code that is causing the problem.	Children intuitively grasp the concepts of selection, repetition and variables and make use of the various commands to use input from users and produce output including sound and movement. Pupils like to challenge themselves to combine these with other coding structures to achieve the effects that they design to personalise and to improve their programs.
		Use logical reasoning to predict the behaviour of simple programs.		**Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.**			
Computer Science	Children help adults operate equipment around the school, independently operating simple equipment Children use simple software to make things happen Children press buttons on a floor robot and talk about the movements Children explore options and make choices with toys, software and websites	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.	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 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.** In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	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. e.g. traffic light algorithm in **2Code**. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	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**.

Greater Depth	As above	Children design their code purposefully and consider a variety of factors when coding including the way that the program is designed. They can then code more complex programs that control the look and the actions of objects and their interactions with one another including click events and collision detection. They intuitively debug their code knowing that any unexpected outcome is down to the code and not the computer's understanding.	Children can identify the parts of a program that respond to specific events and initiate specific actions. Based on this, children can adopt a systematic approach for predicting the behaviour of programs.	Children's design more complex algorithms for their programs, show that they are absorbing new knowledge of coding structures	Children are attempting to turn increasingly complex real-life situations into algorithms for a program by deconstructing the situation into manageable parts	Children to think about good structure to their code with a view to debugging such as the use of tabs to organise code and the naming of variables.	Children to think about good structure to their code with a view to debugging such as the use of tabs and functions to organise code and the naming of variables.
		N/A		**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.**			
Computer Science				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.	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 communications 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**.

Greater Depth				**Children can attach hyper links**	Children are also able to explain that there are different types of network and how they are connected.	Children demonstrating greater depth have a detailed knowledge of what the SMART rules are and understand how these are applied to using technology safely and respectfully. Furthermore, they understand the implications of improper use of technology and the internet	Children can explain the differences between more than two network types such as: LAN, WAN, WLAN and SAN. In greater detail, children can describe how they access the internet at school and the hypothetical connections their computing device makes.
		Use technology purposefully to create, organise, store, manipulate and retrieve digital content.		**Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.**			
Information Technology	Children use a mouse, or mouse pad to rearrange objects and pictures on a screen. Children recognise text, images and sound when using ICT. Children use a camera or sound recorder to collect photos or sound Children use paint programs to create pictures. Children begin to use a keyboard Children develop an interest in ICT by using age appropriate websites or programs.	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.	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.	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.

Greater Depth		*Sorting- Children demonstrate their depth of understanding by creating their own criteria for items against which they can physically sort, collate, edit, present, search through, re-order and re-structure and explain their reasoning* *Spreadsheet- Children will demonstrate greater depth by explaining the data and summarising this into simple 'more than and less than' statements*	**Throughout this unit, children show that they can efficiently store and retrieve their work from their saved area on Purple Mash.** *Paint- Children demonstrate their ability to seamlessly use all aspects of Paint software; they can upload a background image of their choice and manipulate this using the tools and ability to layer images to create a given style.* *Pictogram- Children can create their own questions using the data and will use skills covered in other units to assist with this.* *Spreadsheet- Children will demonstrate greater depth by explaining the data and summarising this into simple statements*	By outcome.	They make connections between the positive possibilities that technology provides e.g. collaboration and sharing and the possible downsides of this such as malware and phishing. They actively and intuitively, use this knowledge to support their own online activities safely.	Children to explain in greater detail how credible a webpage is and the information it contains.	Children use critical thinking skills in everyday use of online communication.
		N/A		**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.**			

Information Technology				Children can 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**. Children can consider what software is most appropriate for a given task. They can create purposeful content to attach to emails, e.g. **2Respond**.	Children are able to make improvements to digital solutions based 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**.	Children are able to make appropriate improvements to digital 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, DataBase**	Children make clear connections to the audience when designing and 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.
Greater Depth				Using the software, children will create a quiz and further resources and attach these as multiple files to an email in response to a fictional email from a well-known character. Children demonstrating greater depth can justify and explain why they have presented information in the way that they have	Children demonstrating greater depth will seamlessly use a variety of software to create content for a variety of different audiences. Using the variety of software, children must make informed choices about the best way to present their information e.g. appropriate font and text formatting and give reasons for their choices	Children demonstrating greater depth will lead a small group in the design and creation of a collaborative database. They can create an individual database with a greater number of fields and create complex search questions about their database for their classmates to answer (Questions using and/or statements). Furthermore, they can seamlessly use the search functionalities to answer complex questions	Children demonstrating greater depth, understand that 2Blog is an introduction to the world of blogging and is a way for the user to become a content creator on the internet. As such the content included in their blog carefully considers the end user (Throughout Unit). Children demonstrating greater depth, understand that 2Blog is an introduction to the world of blogging and is a way for the user to become a content creator on the internet. As such they understand the implications of inappropriate use of the blog and how this relates to the real world.

	Recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.	**Recognise common uses of information technology beyond school.**		N/A			
Digital Literacy	Children recognise purposes for using technology in school and at home. Children understand that things they create belong to them and can be shared with others using technology. Children recognise that they can use the Internet to play and learn.	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.	Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. **2Publish example template**. Children make links between technology they see around them, coding and multimedia work they do in school e.g. **animations**, **interactive code** and **programs.**				
Greater Depth	Children to use own initiative to use technology to discover new things- iPads, Internet with support, e-books.	They can explain why a certain technology has been chosen as a solution to a specific problem.	Children can refine searches using Boolean search terms (AND, OR, NOT). Children can apply their learning of effective searching beyond the classroom.				
		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.		**Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.**			

Digital Literacy	Children can talk about good & bad choices in real life e.g. taking turns, saying kind things, helping others, telling an adult if something upsets you. Children can play appropriate games on the Internet. Children will talk about good and bad choices when using websites – being kind, telling a grown up if something upsets us & keeping ourselves safe by keeping information private. Suggested resources: Smartie the Penguin Digi Duck	Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash.	Children know the implications of inappropriate online searches. Children begin to understand how things are shared electronically such as posting work to the Purple Mash display board. They develop an understanding of using email safely by using **2Respond** activities on Purple Mash and know ways of reporting inappropriate behaviours and content to a trusted adult.	Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as **2Email** in Purple Mash. They know more than one way to report unacceptable content and contact.	Children can explore key concepts relating to online safety using concept mapping such as **2Connect**. They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact.	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**. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.	Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking, e.g. **2Respond** activities. They recognise the value in preserving their privacy when online for their own and other people's safety.
Greater Depth		Children demonstrating greater depth understand the principle but not the terminology of 'intellectual property' e.g. children might say 'I am saving my work, in my folder because I have created it and it belongs to me'.	Children know how to report inappropriate content to their teacher.	Children will be able to appraise the accuracy of information shared on a website and provide suitable evidence to support their decisions on whether it is trustworthy or not. Children understand the importance of staying safe when using email and can apply these principles to the related aspects of messaging.	Children demonstrating greater depth understand the key concepts and implications of the choices they make relating to online safety. They help others to understand the importance of online safety and apply their knowledge and approach to staying safe online in all areas of the curriculum	Children are developing a deeper understanding of the interaction of the positive benefits and negative risks of innovative technology. They take advantage of these technologies in their work but are mindful of protecting themselves and others from harm. Children demonstrating greater depth have a detailed knowledge of what the SMART rules are and understand how these are applied to using technology safely and respectfully. Furthermore, they understand the implications of improper use of technology and the internet.	Children have an internalised in-depth understanding of the risks and benefits of an online presence. Their actions demonstrate that they also feel a responsibility to others when communicating and sharing content online. They feel confident in having strategies to help them promote a positive online image of themselves and deal with issues that might arise in the future.