Computing Progression

	Milestone 1	Milestone 2	Milestone 3
Computer Science	• **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions** Year 1 - know that an algorithm is a set of instructions / problem and a computer algorithm is called a problem (Unit 1.4 Lego builder, Unit 1.5 Maze Explorer, Unit 1.7 Coding) Year 2 - 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. (Unit 2.1 Coding) • **Create and debug simple programs.** Year 1 - Work out what is wrong with a simple algorithm when the steps are out of order. E.g. The Wrong sandwich: Colouring in a Bird activity (Unit 1.4 Lego Builders, Unit 1.5 Maze Explorer, Unit 1.7 Coding) Year 2 - Create a simple program that achieves a specific purpose.	• **Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.** Year 3 - Turn a real-life situation into an algorithm for a program by deconstructing it into manageable parts. The design shows that they are thinking of the desired task and how this translates into code. (Unit 3.1 Coding) Year 4 - 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. - Make more intuitive attempts to debug their own programs. (Unit 4.1 Coding, Unit 4.5 Logo) • **Use sequence, selection and repetition in programs; work with variables and various forms of input and output.** Year 3 - Design and code a program that follows a simple sequence.	• **Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.** Year 5 - Attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts. - 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. (Unit 5.1 Coding, Unit 5.5 Game creator) Year 6 - 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. - Test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach

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	- 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. (Unit 2.1 Coding) • **Use logical reasoning to predict the behaviour of simple programs.** Year 1 - Read code one line at a time and can see the overall effect of the program. (2Go Challenge) Unit 1.5 Maze explorer, Unit 1.7 Coding Year 2 - Identify the parts of a program that respond to specific events and initiate specific actions. E.g. Write a cause and effect sentence of what will happen in a program. (Unit 2.1 Coding) **<u>Year 1 - Unit 1.4 Lego builders, Unit 1.5 Maze explorers and Unit 1.7 Coding</u>** **<u>Year 2 - Unit 2.1 Coding</u>**	- Experiment with timers to achieve repetition effects in their programs. - Begin to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. - Know how variables can be used to store information while a program is executing (Unit 3.1 Coding) Year 4 - Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. - 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 can use and manipulate the value of variables. - Make use of user inputs and outputs such as 'print to screen'. e.g. 2Code. (Unit 4.1 Coding) • **Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in**	to try to identify a particular line of code causing a problem. (Unit 6.1 Coding) • **Use sequence, selection and repetition in programs; work with variables and various forms of input and output.** Year 5 - 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. - Combine, sequence, select and repeat with other coding structures to achieve their algorithm design. (Unit 5.1 Coding and Unit 5.5 Game creator) Year 6 - 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.

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		algorithms and programs. Year 3 - 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. - 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. (Unit 3.1 Coding) Year 4 - 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. - 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.	(Unit 6.1 Coding and Unit 6.7 Binary) • **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.** Year 5 - 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. (Unit 5.1 Coding, Unit 5.2 Online safety, Unit 5.5 Game Creator) Year 6 - 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. (Unit 6.1 Coding) • **Understand Computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for**

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		- In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately. (Unit 4.1 Coding, 4.5 Logo) • **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** Year 3 - List a range of ways that the internet can be used to provide different methods of communication. - Can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email. - Describe appropriate email conventions when communicating in this way. (Unit 3.5 Email) Year 4 - 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.	**communication and collaboration** Year 5 - Understand the value of computer networks but also aware of the main dangers. - Recognise what personal information is and can explain how this can be kept safe. - Can select the most appropriate form of online communications contingent on audience and digital content, e.g. 2Blog, 2Email, Display Boards. (Unit 5.2 Online safety) Year 6 - - Children understand and can explain in some depth the difference between the internet and the World Wide Web. - Know what a WAN and LAN are and can describe how they access the internet in school. (Unit 6.2 Online safety, Unit 6.4 Blogging, Unit 6.6 Networks)

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		(Unit 4.2 Online safety, Unit 4.7 Effective searching, Unit 4.8 Hardware investigators)	
Information Technology	• **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** Year 1 - 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. **(Unit 1.2 Grouping and sorting, Unit 1.3 Pictograms, Unit 1.6 Animated stories, Unit 1.8 Spreadsheets)** Year 2 - Demonstrate an ability to organise data using for example, a database such as 2Investigate (2.3, 2.4) and can retrieve specific data for conducting simple searches. (2.4, 2.5) - Can edit more complex digital data such as music compositions within 2Sequence. (2.7) - Are confident when creating, naming, saving and retrieving	• **Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.** Year 3 - 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. (Across several units: 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9) Year 4 - Understand the function, features and layout of a search engine. - Appraise selected webpages for credibility and information at a basic level (Unit 4.7 Effective searching) • **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,**	• **Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.** Year 5 - Children search with greater complexity for digital content when using a search engine. (Unit 5.2 Online safety) - Able to explain in some detail how credible a webpage is and the information it contains. (Unit 5.2 Online safety) Year 6 - Apply filters when searching for digital content. (Unit 6.2 Online safety and Unit 6.9 Spreadsheets excel) - Can explain in detail how credible a webpage is and the information it contains. (Unit 6.2 Online safety) - Compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. - Use critical thinking skills in everyday use of online communication

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	content. (2.4, 2.8) - Use a range of media in their digital content including photos, text and sound. (2.7) - Link to outdoor learning opportunities and get children to record trips etc using ICT. **Year 1 - Unit 2.1 Grouping and sorting, Unit 1.3 Pictograms, Unit 1.6 Animated stories, links to Unit 1.7 Coding and Unit 1.8 Spreadsheets)** **Year 2 (Units 2.3 Spreadsheets, 2.4 Questioning, 2.5 Effective searching, 2.6 Creating Pictures, 2.7 Making music and 2.8 Presenting ideas)**	**analysing, evaluating and presenting data and information.** Year 3 - 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. Consider what software is most appropriate for a given task. Create purposeful content to attach to emails, e.g. 2Respond **(Units 3.3 Spreadsheets, Unit 3.6 Branching databases, Unit 3.7 Simulations, Unit 3.8 Graphing, Unit 3.9 Presenting)** Year 4 - Make improvements to digital solutions based on feedback. - Make informed software choices when presenting information and data. - They create linked content using a range of software such as 2Connect and 2Publish+. - Share digital content from outdoor learning opportunities as well as Computing learning within their community, i.e. using Virtual Display Boards. **(Unit 4.1 Coding, Unit 4.2 Online safety, Unit 4.3 Spreadsheets, Unit**	(Unit 6.1, 6.3, 6.4, 6.5, 6.7, 6.9) • **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** Year 5 - 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. - Can objectively review solutions from others. - Collaboratively create content and solutions using digital features within software such as collaborative mode. **(Unit 5.7 Concept maps)** - Able to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email. **Unit 5.3 Spreadsheet, Unit 5.4 databases, Unit 5.5 Game creator, Unit 5.6 3-D modelling, Unit 5.7 Concept maps, Unit 5.8 Word Processing)**

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		4.4 Writing for different audiences, Unit 4.6 Animation, Unit 4.7 Effective searching, Unit 4.8 Making Music) Year 3 Unit 3.4 Typing	Year 6 - Make clear connections to the audience when designing and creating digital content - children to use a range of media from experiences out of school to share with the community - Design and create their own blogs to become a content creator on the internet, e.g. 2Blog. **(Unit 6.4 Blogging)** - Able to use criteria to evaluate the quality of digital solutions and are able to identify improvements and make refinements (Unit 6.1 Coding, Unit 6.3 Spreadsheets, Unit 6.4 Blogging, Unit 6.5 Text adventures, Unit 6.7 Quizzing, Unit 6.9 Spreadsheets Excel)
Digital Literacy	• **Recognise common uses of information technology beyond school.** Year 1 - Understand what is meant by technology and can identify a variety of examples both in and out of school. (Unit 1.9 Technology out of school) - Make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair. (Unit 1.9)	• **Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.** Year 3 -Demonstrate the importance of having a secure password and not sharing this with anyone else. - Can explain the negative implications of failure to keep passwords safe and secure.	• **Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact.** Year 5 - 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.

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	Year 2 - Effectively retrieve relevant, purposeful digital content using a search engine. (2.5) -Apply learning of effective searching beyond the classroom. (2,2, 2.5) - Can share this knowledge, e.g. 2Publish example template. (2.2) - Make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs (2.2) • **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.** Year 1 - Understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. (Unit 1.1 Online safety) - Take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash (Unit 1.1 Online safety) Year 2	- Understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash. - Know more than one way to report unacceptable content and contact. **(Unit 3.2 Online safety and Unit 3.5 Email)** Year 4 - Explore key concepts relating to online safety using concept mapping such as 2Connect. - Can help others to understand the importance of online safety. - Know a range of ways of reporting inappropriate content and contact. **(Unit 4.2 Online safety)**	- Implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others. **(Unit 5.2 Online safety)** Year 6 - Demonstrate the safe and respectful use of a range of different technologies and online services. - Identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities. - Recognise the value in preserving their privacy when online for their own and other people's safety. **(Unit 6.2 Online safety and Unit 6.4 Blogging)**

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	- Know the implications of inappropriate online searches. (2.2 / 2.6) - Begin to understand how things are shared electronically such as posting work to the Purple Mash display board. (2.2) - Develop an understanding of using email safely by using 2Respond activities on Purple Mash. - Know ways of reporting inappropriate behaviours and content to a trusted adult. (2.1 Coding, 2.2 Online safety and 2.6 Effective searching)		