Purple Mash Computing Progression of Skills

The core of computing is **computer science**, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use **information technology** to create programs, systems and a range of content. Computing also ensures that pupils become **digitally literate** – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Key stage 1

Computer Science

NC objective - 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	Year 2
• 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. **Covered in:** **1.2 Grouping and Sorting Mash (2Quiz)** **1.5 Maze Explorers (2Go)** **1.7 Coding (2Code)** *See vocabulary cards for year 1*	• 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. **Covered in:** **2.1 Coding (2Code)** *See vocabulary cards for year 2*

NC objective – Create and debug simple programs

Year 1	Year 2
• Children know that an unexpected outcome is due to code they have created and can make logical attempts to fix the code **Covered in:** **1.5 Maze Explorers (2Go)** **1.7 Coding Bubbles activity (2Code)** *See vocabulary cards for year 1*	• 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. **Covered in:** **2.1 Coding (2Code)** *See vocabulary cards for year 2*

NC objective – Use logical reasoning to predict the behaviour of simple programs

Year 1	Year 2
• 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. **Covered in:** **1.5 Maze Explorers (2Go)** **1.7 Coding (2Code)** *See vocabulary cards for year 1*	• Children can identify the parts of a program that responds to specific events and initiate specific actions. • For example, they can write a cause and effect sentence of what will happen in a program. **Covered in:** **2.1 Coding (2Code)** *See vocabulary cards for year 2*

Information Technology

NC objective – Use technology purposefully to create, organise, store, manipulate and retrieve digital content

Year 1	Year 2
• Children are able to sort, collate, edit and store simple digital content. • For example, 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). **Covered in:** **1.5 Maze Explorers (2Go)** **1.7 Coding (2Code)** **1.8 Spreadsheets (2Calculate)** *See vocabulary cards for year 1*	• Children can retrieve specific data for conducting simple searches **(2.5 Effective Search)**. • Children are able to edit more complex digital data such as music compositions within 2Sequence **(2.7 Making Music)**. • 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. **Covered in:** **2.3 Spreadsheets (2Calculate)** **2.5 Effective Searching (Browser, 2Quiz, Writing Templates)** **2.7 Making Music (2Sequence)** **2.8 Presenting ideas** *See vocabulary cards for year 2*

Digital Literacy

NC objective – Recognise common uses of information technology beyond school

Year 1	Year 2
• 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 **Covered in:** **1.9 Technology outside school (Writing templates)** *See vocabulary cards for year 1*	• 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. This can also link to Microsoft Word and PowerPoint that is completed in other subjects. **Covered in:** **2.5 Effective Searching (Browser, 2Quiz, Writing Templates)** **Discussed in other units when appropriate** *See vocabulary cards for year 2*

Year 1	Year 2
• 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. **Covered in:** **1.1 Online Safety and Exploring Purple Mash (Avatar creator, Paint Projects, writing templates, 2Count Pictograms)** *See vocabulary cards for year 1*	• 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. **Covered in:** **2.2 Online Safety (Writing templates, display boards, 2Respond on 2Email)** **Discussed in other units when appropriate** *See vocabulary cards for year 2*

Key Stage 2

Computer Science

NC objective – 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	Year 4	Year 5	Year 6
• 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. **Covered in:** **3.1 Coding (2Code)** *See vocabulary cards for year 3*	• 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. **Covered in:** **4.1 Coding (2Code)** **4.5 Logo (2Logo)** *See vocabulary cards for year 4*	• 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. **Covered in:** **5.1 Coding (2Code)** **5.5 Game Creator (2DIY 3D, writing templates, 2Blog)** *See vocabulary cards for year 5*	• Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task 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. **Covered in:** **6.1 Coding (2Code)** *See vocabulary cards for year 6*

NC objective – Use sequence, selection and repetition in programs; work with variable and various forms of input and output

Year 3	Year 4	Year 5	Year 6
• Children demonstrate the ability to design and code a program that follows a simple sequences. • 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. **Covered in:** **3.1 Coding (2Code)** *See vocabulary cards for year 3*	• 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. **Covered in:** **4.1 Coding (2Code)** **4.5 Logo (2Logo)** *See vocabulary cards for year 4*	• 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. **Covered in:** **5.1 Coding (2Code)** *See vocabulary cards for year 5*	• 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. **Covered in:** **6.1 Coding (2Code)** *See vocabulary cards for year 6*

NC objective – Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Year 3	Year 4	Year 5	Year 6
- 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. **Covered in:** **3.1 Coding (2Code)** *See vocabulary cards for 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. - 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. **Covered in:** **4.1 Coding (2Code)** **4.5 Logo (2Logo)** *See vocabulary cards for year 4*	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. **Covered in:** **5.1 Coding (2Code)** *See vocabulary cards for year 5*	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. **Covered in:** **6.1 Coding (2Code)** *See vocabulary cards for year 6*

NC objective – 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	Year 4	Year 5	Year 6
• 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. **Covered in:** **3.5 Email including email safety (2Email)** ***See vocabulary cards for year 3***	• 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. **Covered in:** **4.2 Online Safety (2Connect for mind maps, 2Publish+, display boards)** **4.7 Effective Searching (Browser, 2Quiz and 2Connect for mind maps)** **4.8 Hardware investigators (2Quiz, 2Connect for mind maps and writing templates)** ***See vocabulary cards for year 4***	• 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. **Covered in:** **5.2 Online Safety (2Publish+, writing templates, display boards and 2Connect for mind maps)** ***See vocabulary cards for year 5***	• 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. **Covered in:** **6.2 Online Safety (2DIY 3D, 2Code and 2Blog)** **6.4 Blogging (2Blog)** **6.6 Networks (2Connect for mind maps and writing templates)** ***See vocabulary cards for year 6***

Information Technology

NC objective – Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Year 3	Year 4	Year 5	Year 6
• 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. **Covered in other subjects when researching on the internet – chn apply skills from Unit 2.5 Effective search** *See vocabulary cards for year 3*	• Children understand the function, features and layout of a search engine. • They can appraise selected webpages for credibility and information at a basic level. **Covered in:** **4.7 Effective Searching (Browser, 2Quiz and 2Connect for mind maps)** *See vocabulary cards for year 4*	• 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. **Covered in various units - Search technologies are taught more specifically in unit 4.7.** **Children will utilise this knowledge in many internet based sessions in all areas of the curriculum** *See vocabulary cards for year 5*	• 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. **Covered in:** **6.2 Online Safety (2DIY 3D, 2Code and 2Blog)** *See vocabulary cards for year 6*

NC objective – 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 3	Year 4	Year 5	Year 6
• 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. **Covered in:** **3.5 Email including email safety (2Email)** **3.6 Branching Databases (2Question)** **3.8 Graphing (2Graph, writing templates 2Blog)** **3.9 Presenting (MS PowerPoint)** *See vocabulary cards for year 3*	• 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+ **(completed in other subjects).** • Children share digital content within their community, i.e. using Virtual Display Boards. **Covered in:** **4.1 Coding (2Code)** **4.3 Spreadsheets (2Calculate)** **4.6 Animation (2Animate)** *See vocabulary cards for year 4*	• 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. • They are able to use several ways of sharing digital content, i.e. 2Blog, Display Boards, 2Email, Microsoft Word and PowerPoint. **Covered in:** **5.1 Coding (2Code)** **5.3 Spreadsheets (2Calculate)** **5.5 Game Creator (2DIY 3D, writing templates and 2Blog)** **5.8 Word processing (MS Word)** **Other subjects (Microsoft Word and PowerPoint)** *See vocabulary cards for year 5*	• 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. **Covered in:** **6.1 Coding (2Code)** **6.9 Spreadsheets (MS Excel)** **6.4 Blogging (2Blog)** *See vocabulary cards for year 6*

Digitally literate

NC objective – Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.

Year 3	Year 4	Year 5	Year 6
- 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. **Covered in:** **3.2 Online Safety (2Connect for mind maps, 2Blog, writing templates, display board)** **3.5 Email including email safety (2Email)** **3.9 Presenting (MS PowerPoint)** *See vocabulary cards for year 3*	- 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. **Covered in:** **4.2 Online Safety (2Connect for mind map, 2Publish+ and display boards)** **Discussed in other units** *See vocabulary cards for year 4*	- 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. **Covered in:** **5.2 Online Safety (2Publish+, writing templates, display boards and 2Connect for mind maps)** **Discussed in other units** *See vocabulary cards for year 5*	- Children demonstrate the safe and respectful use of a range of different technologies and online services. - They recognise the value in preserving their privacy when online for their own and other people's safety. **Covered in:** **6.2 Online Safety (2DIY 3D. 2Code and 2Blog)** **6.4 Blogging (2Blog)** **Discussed in other units** *See vocabulary cards for year 6*