Computing progression of knowledge and skills

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology

NC Attainment targets Subject Content	Pupils should be taught to:	Pupils should be taught to:
	- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions - create and debug simple programs - use logical reasoning to predict the behaviour of simple programs - use technology purposefully to create, organise, store, manipulate and retrieve digital content - recognise common uses of information technology beyond school - 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	- design, write and debug 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 - 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 - use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - 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 - use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Year Group		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science	Knowledge	I know that a computer program turns an algorithm into code that the computer can understand. (1.4, 1.7) I know that correcting errors in an algorithm or program is called 'debugging'	I know I need to carefully plan my algorithm so it will work when I make it into code. (2.1) I know that an error in a program is called a 'bug'	I know that a variable stores information while a program is running (executing). (3.1) I know that fixing errors in programming is called 'debugging'	I recognise the main component parts of hardware which allows computers to join and form a network. (4.8) I know how to change the value of variables. (4.1)	I know the importance of computer networks and how they help solve problems and enhance communication. (5.2) I recognise the main dangers that can be perpetuated via computer networks. (5.2)	I know that algorithm means instruction I know that programming means writing instructions I know that to 'debug' means to identify errors in a program and correct them
	Skills	I can explain that an algorithm is a set of instructions. (1.4, 1.5) I can work out what is wrong when the steps are out of order in instructions. (1.4, 1.5) I can say that if something does not work how it should it is because my code is incorrect. (1.7) I can try and fix my code if it isn't working properly. (1.7) I can make good guesses of what is going to happen in a program. For	I can explain an algorithm is a set of instructions to complete a task. (2.1) I can design a simple program using 2Code that achieves a purpose. (2.1) I can find and correct some errors in my program. (2.1) I can say what will happen in a program. (2.1) I can spot something in a program that has an action or effect (does something). (2.1)	I can make a real-life situation into an algorithm for a program. (3.1) I can design an algorithm carefully, thinking about what I want it to do and how I can turn it into code. (3.1) I can identify an error in my program and fix it. (3.1) I can experiment with timers in my programs. (3.1)	I can turn a real-life situation to solve into an algorithm, using a design that shows how I can accomplish this in code. (4.1, 4.5) I can use repetition in my code. For example, using a loop that continues until a condition is met such as the correct answer being entered. (4.1) I can use timers within my program designs more	I can make more complex real-life problems into algorithms for a program. (5.1) I can test and debug my programs as I work. (5.1, 5.5) I can convert (translate) algorithms that contain sequence, selection and repetition into code that works. (5.1) I can use sequence, selection, repetition, and some	I can turn a complex programming task into an algorithm. (6.1) I can identify the important aspects of a programming task (abstraction). (6.1) I can decompose important aspects of a programming task in a logical way, identifying appropriate coding structures that would work. (6.1)

		example, where the turtle might go. (1.5, 1.7)		I can identify the difference in using between the effect of a timer or repeat command in my code. (3.1) I can identify 'If' statements, repetition and variables. (3.1) I can read programs with several steps and predict what it will do. (3.1) I can identify different ways that the internet can be used for communication. (3.5) I can use email such as 2Email to respond to others appropriately and attach files. (3.5)	accurately to create repetition effects. For example, I can create a counting machine. (4.1) I can use selection (decision) in my programming. For example, using an 'if statement' for a question being asked and the program takes one of two paths. (4.1) I can use variables within my program (4.1) I can use the user inputs and output features within my program, such as 'Print to screen'. (4.1) I can identify errors in my code by using different methods, such as steeping through lines of code and fixing them. (4.1) I can read programs that contain several steps	other coding structures in my code. (5.1) I can organise my code carefully for example, naming variables and using tabs. I know this will help me debug more efficiently. (5.1) I can use logical methods to identify the cause of any bug with support to identify the specific line of code. (5.1) I can explain what personal information is and know strategies for keeping this safe. (5.2) I can use the most appropriate form of online communication according to the digital content. For example, use 2Email, 2Blog and Display Boards. (5.2 & others)	I can test and debug my program as I work on it and use logical methods to identify a cause of a bug. (6.1) I can identify a specific line of code that is causing a problem in my program and attempt a fix. (6.1) I can translate algorithms that include sequence, selection and repetition into code and nest these structures within each other. (6.1) I can use inputs and outputs within my coded programs such as sound, movement and buttons and represent the state of an object (6.1, 6.7) I can interpret (understand) a program in parts and

| | | | | and predict the outcomes with increasing accuracy. (4.1, 4.5)

I understand that network and communication components can be found in many different devices which allow them to join the internet. (4.2, 4.7, 4.8) | | can make logical attempts to put the separate parts together in an algorithm to explain the program as a whole. (6.1)

I can explain the difference between the internet and the World Wide Web. (6.2, 6.4,6.6)

I can explain what a WAN and LAN is and describe the process of how access to the internet in school is possible. (6.2,6.6) |

Information Technology							
	Knowledge	I know the difference between a traditional book and an e-book I know that I need to name my work so that I know who it belongs to	I know how to add an image into my document I know that data can be collected, searched and edited in pieces of software	I know how to use a search engine to find information I know how to input data into databases and spreadsheets	I understand the purpose of a search engine and the main features within it. (4.7)	I know I can add additional words or removes words to help find better results. (5.2)	I know how to concisely word a question in a search engine I know that not all information is reliable and check the reliability of a source
	Skills	I can sort sound, pictures and text. (1.2) I can add sound, pictures and text to a program such as 2Create a Story. (1.6) I can change content on a file such as text, sound and images. (1.3, 1.6, 1.7, 1.8) I can name my work. (1.2, 1.3, 1.6, 1.7, 1.8) I can save my work. (1.2, 1.3, 1.6, 1.7, 1.8) I can find my work. (1.2, 1.3, 1.6, 1.7, 1.8)	I can organise data – for example, using a database such as 2Investigate. (2.3, 2.4) I can find data using specific searches – for example, using 2Investigate. (2.4, 2.5) I can use several programs to organise information – for example, using binary trees such as 2Question or spreadsheets such as 2Calculate. (2.4, 2.8) I can edit digital data such as data in music composition software like 2Sequence.	I can carry out searches to find digital content on a range of online systems, such as within Purple Mash or on an internet search engine. (Across units) I can collect data and input it into software. (3.3, 3.6, 3.8) I can analyse data using features within software to help such as, formula in 2Calculate (spreadsheets). (3.3, 3.6, 3.8)	I can look at information on a webpage and make predictions about the accuracy of information contained within it. (4.7) I can create and improve my solutions to a problem based on feedback. For example, create a program using 2Code. (4.1, 4.2) I can review solutions that others have created, using a checklist of criteria.	I can search precisely when using a search engine. (5.2) I can explain in detail how accurate, safe and reliable the content is on a webpage. (5.2) I can make appropriate improvements to digital work I have created. (Across units) I can comment on how successful a digital solution is that I have created. For example, a program built in 2Code that sorts	I can use filters when searching for digital content. (6.2,6.9) I can explain in detail how accurate and reliable a webpage and its content is. (6.2) I can compare a range of digital content sources and rate them in terms of content quality and accuracy. (6.1, 6.3, 6.4, 6.7,6.9) I can consider the intended audience carefully when I

			(2.7 and most units) I can name, save and find my work. (2.3, 2.4, 2.6, 2.7, 2.8 & most units) I can include photos, text and sound in my creations. (2.8, 2.6)	I can present data and information using different software such as 2Question (branching database) or 2Graph (graphing tool). (3.3, 3.6, 3.8,3.9) I can consider what the most appropriate software to use when given a task by my teacher. (Across units) I can create purposeful (appropriate) content and attach this to emails. (3.3, 3.5, 3.6, 3.7, 3.8, 3.9)	(4.1, 4.2) I can work collaboratively to create content and solutions. (4.1, 4.3, 4.4,48) I can share digital content using a variety of applications such as: 2Blog, 2Email and Display Boards. (Across units)	decimals numbers. (Across units) I can work collaboratively with others creating solutions to problems using appropriate software such as 2Code. (Across units) I can use collaborative modes such as within 2Connect to work with others and share it. (5.7)	design and make digital content. (6.1, 6.3, 6.4, 6.7,6.9) I can design and create my own online blogs. (6.4) I can use criteria to evaluate the quality of my own and others digital solutions, suggesting refinements. (6.1, 6.3, 6.4, 6.7,6.9)

Digital Literacy							
	Knowledge	I know that a chair uses old technology and a smart phone uses new technology. (1.9) I know that the 'My Work' folder is a private space just for my work I know key icons such as 'save', 'print', 'open' and 'new'	I know the consequences of not searching online safely. (2.2, 2.5) I understand that my creations such as programs in 2Code, need similar skills to the adult world. e.g., The program used for collecting money for school trips. (2.1)	I understand the importance of keeping safe online and behaving respectfully. (3.2) I know how to stay safe online when communicating electronically	I have a good understanding of the online safety rules we learn at school. (4.2 & across curriculum) I know I have a right to privacy both on and offline. (4.2 & across curriculum) I recognise that my wellbeing can be affected by how I use technology. (4.2 & across curriculum)	I have a secure knowledge of online safety rules taught at school. (5.2 & across units) I know how to not let my mental wellbeing or others be affected by use of online technologies and services. (5.2 & across units)	I know the value of protecting my privacy and others online. (6.2, 6.4)
	Skills	I can say what technology is. (1.9) I can say what examples of technology are in school. (1.9) I can say what examples of technology are at home. (1.9) I can keep my login information safe. (1.1 and most units)	I can find information I need using a search engine. (2.5) I can share work and communicate electronically – for example using 2Email or the display boards. (2.2 and others) I can report unkind behaviour and things that upset me online, to a trusted adult. (2.2)	I can create a secure password. (3.2) I can explain the importance of having a secure password and not sharing it with others. (3.2, 3.5) I can explain the negative consequences of not keeping passwords safe and secure. (3.2, 3.5)	I can demonstrate how to use different online technologies safely. (4.2 & across curriculum) I can demonstrate how to use a few different online services safely. (4.2 & across curriculum) I can report with ease any concerns with content and contact online and know	I can demonstrate the safe and respectful use of different online technologies and online services. (5.2 & across units) I always relate appropriate online behaviour to my right to have personal privacy. (5.2 & across units)	I can demonstrate safe and respectful use of a range of different technologies and online services. (6.2, 6.4) I can identify more discrete inappropriate behaviours online. For example, someone who may be trying to groom me or someone else. (6.2)

		I can save my work in a safe place such as 'My Work' folder. (1.1 and most units)	I can see where technology is used at school such as in the office or canteen. (2.2)	I can use communication tools such as 2Email respectfully and use good etiquette. (3.2, 3.5) I can report unacceptable content and contact online in more than one way to a trusted adult. (3.2)	immediate strategies to keep safe. (4.2 & across curriculum)		I can use critical thinking to help me stay safe online. (6.2)
Vocabulary		Log in Log out Avatar Tools Username Notification Save Password Topics Sort Criteria Pictogram Data Collate Instruction Algorithm Computer Program Debug Direction Undo Backwards Challenge Rewind Right turn Left turn	Button Collision Detection Design Mode key Pressed Predict Nesting Sequence Test Timer Text When Clicked/Swiped Search Internet Sharing E-mail Attachment Digital Footprint Backspace Key Copy and Paste Columns Cells Equals Tool Lock Tool Move Cell Tool Speak Tool Question	Action Alert Blocks of Command Develop Flowchart Procedure Plan Repeat Values Blog Website Webpage Spoof Webpage PEGI Rating < > = Advanced Mode Delete Key Spin Tool Posture Top Row Keys Bottom Row Keys Home Row Keys Space Bar Communication Compose Send	Co-ordinates If If/else Number Variable Prompt Repeat Until Prompt for Input Selection Variable Variable Value Computer Virus Cookies Copyright Identity Theft Malware Phishing Plagiarism Spam Average Charts Formula Wizard Random Tool Bold Italic Underline LOGO	Abstraction Called Decomposition Function Physical System Simplify Tab Smart Rules Reputable Encryption Shared Image Citations Reference Bibliography Collaborative Record Sort, Group and Arrange Statistics and Reports Table Customise Playability Screenshot Perspective Evaluation	Developer Launch Command Get Input User Input Screen Time Blog Page Block post Icon Local Area Network Network Cables Wide Area Network Wireless Router Binary Gigabyte Machine Code Megabyte Kilobyte Terabyte Alignment Cell Reference Formulae Text Wrapping

		Instruction Arrow Animation E-Book Font Sound effect Display Board Action Background Code Command Event Execute Input Output Object Run Properties Scale Scene Sound Backspace Arrow Keys Cursor Rows Spreadsheet Technology	Data Collate Binary Tree Database Search Search-Engine Palette Template Composition Sound Effects Volume Digitally Concept Map Quiz Presentation Node Animated	CC Formatting Address Book Save to Draft Report Branching Simulation Graph Field Bar Chart Block Graph Line Graph Animation Audio Entrance Animation Design templates Slideshow Stock Image Text Box Transition Text Formatting	BK- Move back FD- Move forward RT- Turn right LT- Turn left REPEAT SETPC- Set the pen colour to a given colour SETPS- Set the pen thickness PU- Lift the pen up off the screen PD- Put the pen back down on the screen Onion Skinning Stop Motion Video Clip Frame Flipbook Easter Egg Internet Browser Motherboard RAM CPU Network Card Keyboard and Mouse Speakers Graphic Cards Rippler	CAD- Computer aided design 3D Printing Connection Idea In-built Styles Merge Cells Paragraph Formatting Word Art Word Processing Tool	