Overview of Computing at Chorley St Marys Catholic Primary and Nursery

Pillars of Progression:

A useful way of thinking about progression in computing is to consider the 3 main content areas that pupils develop knowledge of:
computer science
information technology
digital literacy
These 'pillars' of progression are visible in the aims of the national curriculum for computing. Pupils make progress in computing by knowing and remembering more about and, importantly, across each of these categories, and being able to apply this knowledge. However, these pillars do not sit separately from each other. Knowledge from each pillar complements the others and some subject content only exists at the interplay between these 3 pillars.

Declarative and procedural knowledge:
For declarative (knowing what) and procedural (knowing how) knowledge please see Purple Mash document.

Online Safety:
Online Safety is also covered in each year group in PSHE, please see the overview for more information.

Computing Substantive Key Knowledge and Concepts: (Pillars of progression)		
Computer Science The technical design. The design of new software, the solution to computing problems and the development of different ways to use technology.	**Information Technology** The technical knowledge. The design, use and understanding of hardware and software; computers and electronic systems for storing and using information.	**Digital Literacy** The technical skills. The ability to use information and communication technologies to find, create, evaluate, and communicate information.

Computing Disciplinary Key Knowledge:			
Code Using and writing codes to produce instructions and algorithms; to solve problems; to test and use logic and sequences against inputs and outputs.	**Connect** Being able to safely, efficiently and confidently digitally connect with others.	**Communicate** Being able to safely, efficiently and confidently use apps and information technology to communicate ideas.	**Collect** Being able to safely, efficiently and confidently find, evaluate, store, sort and use appropriate data.

	Substantive Concepts (pillars of progression)	EYFS outcomes ELGs	Composites and components	Key Vocabulary
A1	Computer Science	Communication and language Personal, social and emotional development Characteristics of Effective Learning Physical development	Programming: Instructions Can I follow instructions? Can I give simple instructions? Can I explain what an algorithm is?	Instructions Describe Algorithm Predict Sequence
Sp2	Information Technology	Communication and language Physical development Characteristics of Effective Learning Understanding the World Literacy	Computer Systems Information Technology Communicate Can I use an operate simple technological devices in everyday life?	On Off Record Pause Play Controller Twist Push
Sum2	Information Technology	Communication and language Physical development Characteristics of Effective Learning Understanding the World Literacy	Computing systems and networks: Information Technology Communicate Can I identify hardware? Do I know where technology is used at home and in school?	Mouse Keyboard USB Hard drive Monitor Technology Camera lens

			Can I take photographs on a camera?	

Reception					
	Substantive Concepts (pillars of progression)	**EYFS outcomes ELGs**	**Composites and components**	**Key vocabulary**	**Skills progression**
Summer	Information Technology	Literacy Mathematics Characteristics of Effective Learning Physical development	Networks and systems: Using a computer Do I know what a keyboard is and can I locate relevant keys? Can I log in and out? Can I control a mouse?	Computer Monitor Keyboard Mouse Uppercase and lowercase Password Private Cursor	
Spring	Computer Science	Personal, social and emotional development Characteristics of Effective learning Mathematics	Programming: Bee-Bots Can I follow a simple sequence of instructions? Can I program a Bee-Bot? Can I debug instructions?	Algorithm Debug Sequence Right Left	
Autumn	Information Technology	Communication and language Mathematics	Data handing: Introduction to data Can I sort and categorise objects?	Sort Share Group Category	

		Characteristics of Effective learning	Can I learn about branching databases thought physical sorting? Can I interpret basic pictogram?	Total Graph Data	

Year 1							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**
AT1	**Digital Literacy** Information Technology	Safer Internet Day in Reception PSHE Autumn 2 Keeping Safe Online	1. Safe logins 2. My work area 3. Purple Mash topics 4. Purple Mash tools	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	Online Safety 1.1 What is a password and why should we keep them safe? What is a digital avatar? Where is my work saved on Purple Mash?	**Avatar**: A digital picture to represent someone. **Icon:** An image on a web page that you can click on to navigate to somewhere. **Login:** Using a username and password to access a system.	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

				other online technologies.		Notification: A message telling you about something. **Password:** A series of letters, numbers and special characters that is entered after the username to access an online site. In Purple Mash, this can also be a series of pictures.	their own private space such as their My Work folder on Purple Mash.
AT2	**Computer Science** Digital Literacy	Reception BeeBots topic	1. Sorting away from the computer 2. Sorting on the computer	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and	Grouping and sorting 1.2 In what ways can we sort objects?	**Algorithm:** a precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Criteria**: A way in which something is judged.	Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that a computer

				unambiguous instructions.		**Describe**: To give a detailed account of something. **Equal:** When two amounts are the same. **Groups**: Objects arranged and put together because they have features in common.	program turns an algorithm into code that the computer can understand
Sum2	Digital Literacy	Nursery Summer 2 Computing systems and networks	1. What is Technology? 2. Technology outside of school	Recognise common uses of information technology beyond school.	Technology outside of school 1.9 What is technology? How does technology make our lives easier?	**Computer:** An electronic device for storing and processing data. **Technology:** Science and engineering knowledge put into practical use to solve problems or invent useful tools.	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.
SpT2	**Computer Science**	Reception Bee-Bots topics Year 1 Grouping and sorting 1.2 Lego Builders 1.4	1. Challenges 1 and 2 2. Challenges 3 and 4 3. Challenges 5 and 6 4. Setting more challenges	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.	Maze explores 1.5 What is 2Go? How do I undo a mistake on 2Go?	**Algorithm:** a precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Command:** An action such as left command. **Undo:** If we make a mistake, we can press the undo button. **Unit**: A unit such as make the turtle move 2 units (squares).	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.
SumT1	**Computer Science** Information Technology	Reception Bee-Bots topics Year 1 Grouping and sorting 1.2	1. Instructions 2. Objects and actions 3. Events	Understand what algorithms are; how they are implemented as	Coding 1.7 What is coding? Why is it useful	**Algorithm:** a precise, step-by-step set of instructions used to solve a	Children are able to sort, collate, edit and store simple digital

		Lego Builders 1.4 Maze Explorers 1.5	4. When code executes 5. Setting the scene 6. Using a plan	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.	to design before coding? How can you make characters move in a 2Code program?	problem or achieve an objective. **Code**: Instructions that a programmer enters into a computer that cause the computer to perform a certain way. **Code blocks**: A way to write code using blocks which each have an object or an action. **Command:** A single instruction in 2Code. **Debug\ Debugging**: Fixing code that has errors so that the code will run	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.

						the way it was designed. **Execute:** This is the proper word for when you run the code. We say, 'the program (or code) executes.'	
SumT1	**Information Technology** **Digital Litercy**	Reception Using a Computer topic	1. Drawing and creating 2. Animation 3. Sounds and more 4. Making a story 5. Copy and paste	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Animated stories 1.6 What is 2Create a story? What is an animated story? How can I make my story better?	**Animation:** An object that moves on screen. **Font:** The style of text used in a piece of writing on a computer or tablet. **Overwrite:** When opening a previous file, users can make changes and save, which overwrites the file.	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.

Year 2							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**
AT1	Computer Science	Year 1 Coding 1.1 Lego Builders 1.4 Maze Explorers 1.5	1. Algorithms 2. Collision Detection 3. Using a timer 4. Different object types 5. Buttons 6. 'Smelly Code'	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by	Coding 2.1 What is an algorithm? Why is it useful in coding? Why is it important to know there are	**Algorithm: a** precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Bug**: A problem in a computer	Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs,

				following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	different object types? If you are good at coding, you don't need to debug. Is this true?	program that stops it working the way it was designed. **Collision detection:** In 2Code, this measures whether 2 objects have touched each other. **Debug\ Debugging**: Fixing code that has errors so that the code will run the way it was designed to. **Execute:** This is the proper word for when you run the code. We say, 'the program (or code) executes.' **Interval:** In a timer, this is	children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code. 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,

						the length of time between the timer code running and the next time it runs e.g. every 1 second. **Scale:** This is a property of an object that changes its size.	programmable steps. 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.
AT2	Information Technology	Year 1 Grouping and sorting 1.2 Pictograms 1.3	1. Using and creating pictograms 2. Asking yes/ no questions 3. Binary trees	Use technology purposefully to create, organise, story, manipulate and	Questioning 2.4 How does a Pictogram show information? How is information	**Avatar:** A digital picture to represent someone. **Binary Tree:** A simple way of sorting	Children demonstrate an ability to organise data using, for example, a database such

			4. Using 2Question (a computer based binary tree program) 5. Using 2Investigate a non-binary database	retrieve digital content.	organised in a binary tree? How can a database help organise information?	information into two categories. **Database:** A computerised system that makes it easy to search, select and store information. **Pictogram:** A diagram that uses pictures to represent data.	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,

SpT1	Information Technology Digital Literacy	Year 1 Online safety 1.1	1. Understanding the internet and searching 2. Searching the internet 3. Sharing knowledge of the internet and effective searching	Use technology purposefully to create, organise, story, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.	Effective searching 2.5 How can I search the internet?	**Browser:** A tool to help us access the World Wide Web. **Device**: A piece of electrical equipment made for a purpose. **Digital Footprint**: the information about a particular person that exists on the internet as a result of their online activity. **Domain:** Part of the Internet owned by an individual, company or organisation. **Search Engine**: A program to help you find	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

						web pages on the Internet. **URL**: Another word for web address **Web Address**: Identifying address for a file, or webpage on the Internet.	in their digital content including photos, text and sound.
Sp2	Digital Literacy	Year 1 Online safety 1.1	1. Searching and sharing 2. Email using 2Respond 3. Digital Footprint	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.	Online Safety 2.2 Why is a search bar useful? What is an email? What is meant by Digital Footprint?	**Attachment**: A computer file sent with an email. **Digital footprint:** The information about a person that exists on the Internet as a result of their online activity. **Filter:** A feature of search engines, where a user can filter results according to	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

						criteria. For example, news, date published. **Personal information:** This is information that is personal to someone. For example, their favourite food, their name and age. **Private information:** This is personal information that should be kept secure. For example, their date of birth, their full address, credit card numbers.	of using email safely by using 2Respond activities on Purple Mash and know ways of reporting inappropriate behaviours and content to a trusted adult
Sum1	Information Technology	Year 1 Grouping and sorting 1.2	1. Reviewing prior knowledge of spreadsheets 2. Copying and pasting	Use technology purposefully to create, organise, story,	Spreadsheets 2.3 Why would you copy and paste	**Block graph:** This is a type of graph that displays data with blocks.	Children demonstrate an ability to organise data using, for

			Totalling tools 3. Using a spreadsheet to add amounts 4. Creating a table and block graph	manipulate and retrieve digital content.	when using a spreadsheet? How could a spreadsheet help you when you are planning some shopping?	These can be made using cells, colours and labels in 2Calculate. **Cell:** An individual section of a spreadsheet grid. It contains data or calculations. **Data:** A collection of information, used to help answer questions.	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.

Sum2	Information Technology	Year 1 1.6 Animated Story Books	1. Presenting a story Three Ways 2. Presents ideas as a quiz 3. Making a non-fication fact file 4. Making a presentation	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Presenting Ideas 2.8 What do we need to think about when planning a presentation? What should I plan out my presentation?	**E-book**: An electronic version of a printed book. **Fact file**: A document containing all the important information about one subject.	Children use a range of media in their digital content including photos and text.

Year 3							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**
AT1	Digital literacy	Year 2 Online safety 2.2 Effective searching 2.5	1. Safety in numbers 2. Fact or fiction? 3. Appropriate content and ratings	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report	Online safety 3.2 What is a password and why should we keep them safe? Is everything I read on the Internet true? How do I know if I am old	**Blog:** A regularly updated website or web page, typically one run by an individual or small group, that is written in an informal or	Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the

				concerns about content and contact.	enough to play a computer game?	conversational style. **Permission:** When someone shares or accesses content online, it's important that permission is given if it belongs to someone else or has information about them. **Reliable Source**: A source of information that provides thorough, well-reasoned details based on valid evidence. **Spoof:** An imitation of something that appears to look genuine.	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.

						Verify: When seeking content online, it is important that a user verifies the information. They can do this by checking other sources and looking for signs that may indicate inaccuracy in the information.	
AT2	Computer Science	Year 2 Code 2.1 Questioning 2.4	1. Using flowcharts 2. Using timers 3. Using repeat 4. Code, test and debug 5 &6. Design and make an interactive scene	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Coding 3.1 Why is it useful to use a flowchart to design a computer program? What does repeat mean in computer programming? What is the difference between timer	**Algorithm:** a precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Bug:** A problem in a computer program that stops it working the	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

				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.	after and timer every?	way it was designed. **Debug\ Debugging**: Fixing code that has errors so that the code will run the way it was designed to. **Flowchart:** A diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram. **Interval:** In a timer, this is the length of time between the timer code running and the next time it runs e.g. every 1 second. **Timer:** In coding, use a	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. 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

						timer command to run a block of commands after a timed delay or at regular intervals.	using a timer command rather than a repeat command when creating repetition effects. 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.
SpT1	Information technology	Year 2 Effective searching 2.5	1. Home, top and bottom row keys 2. Consolidation of lesson 1 3. Left keys 4. Right keys	Select, use and combine a variety of software (including internet services) on a range of digital	Touch typing 3.4 Why should I have a good posture at the computer? Why should I type certain	**Keys:** buttons that are pressed on a computer keyboard or typewriter. **Posture**: The position in	Children can collect, analyse, evaluate and present data and information using a selection of software,

				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.	keys with a certain finger?	which someone holds their body when standing or sitting. **Spacebar:** The bar at the bottom of the keyboard.	
SpT2	Information technology	Year 2 Spreadsheets 2.3 Questioning 2.4	1. Creating pie charts and bar graphs 2. Using more than and spin time buttons 3. Advanced mode and cell addresses	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,	Spreadsheets 3.3 Explain how you would collect data to find out children's favourite school subjects. What sort of graph would you create? How can you make a 3 times table machine using the spin	**Bar graph:** A chart that uses bars to show quantities or numbers, so they can be easily compared. **Cell address**: Every cell has an address. This can be found by reading the column	Children can collect, analyse, evaluate and present data and information using a selection of software,

				including collecting, analysing, evaluating and presenting data and information.	tool? Could you use the equals tool to check your answer. Explain how you would locate a cell in the advanced mode?	letter then row number. **Data:** A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision making.	
SumT1	Computer Science Information Technology Digital Literacy	Year 2 Online safety 2.2 Effective searching 2.5	1. Communication 2. Composing Emails 3 & 4. Using Email safely 5. Attachments 6. Email simulations	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	Email 3.5 What is email? What should I do if I receive an email that make me upset or scared? What information can I send in an email?	**Attachment**: A file, which could be a piece of work or a picture, that is sent with the email. **BCC – Blind Carbon Copy**: A way of privately sending a copy of your email to other people so they can see	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 Children can carry out

				and collaboration. 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		the information in it, without the recipient knowing. **CC – Carbon Copy**: A way of sending a copy of your email to other people so they can see the information in it. **Save to draft:** Feature which allows you to compose an email and save it to draft folder to review later before sending.	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 can collect, analyse, evaluate and present data and information using a selection of software,

				acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			
SumT2	Information Technology	Year 1 Animated story books 1.6 Year 2 Presenting ideas 2.8	1. Making a presentation from a blank page 2. Adding media 3. Adding animation 4. Presenting with timings 5 & 6. Create a presentation	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	Presenting with Microsoft PowerPoint 3.9 What is a presentation program used for? How do you add a transition to a presentation? What features can you use to make a presentation more engaging?	**Animation:** The process of adding movement to still objects. **Editing:** To improve something so that it is ready for publication. **Font formatting**: Changing the appearance of text on the screen. **Slideshow:** A collection of pages arranged in sequence that contains text and	Children can collect, analyse, evaluate and present data and information using a selection of software,

				and information.		images to present to an audience. **Transition:** How a slide moves from one to the next.	

Year 4							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**
AT1	Digital Literacy	Year 3 Online safety 3.2 Email 3.5	1. Going phishing 2. Beware malware 3. Plagiarism 4. Healthy screen time	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about	Online Safety 4.2 What is meant by a digital footprint? What is SPAM? What is meant by plagiarism?	**Attachment:** A file, which could be a piece of work or a picture, that is sent with an email. **Cookies:** A small amount of data generated by a website and saved by a web browser.	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.

				content and contact.		Its purpose is to remember information about the user. **Copyright:** When the rights to something belong to a specific person. **Digital footprint**: The information about a person that exists on the Internet as a result of their online activity. **Plagiarism:** Taking someone else's work or ideas and passing them off as one's own. **Spam:** Messages sent over the Internet, typically to	Children know a range of ways of reporting inappropriate content and contact

						many users, for the purposes of advertising, phishing or spreading malware.	
AT2	Computer Science	Year 3 Coding 3.1	1. Design, code, test and debug 2. IF statements 3. Co-ordinates 4. Repeat Until and IF/ELSE statements 5. Number Variables	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	Coding 4.1 How can variables and if/else statements be useful when coding programs with selection? What does selection mean in coding and how can you achieve this in 2Code? What is the difference between the different object types in 2Code Gibbon level?	**Algorithm:** a precise, step-by-step set of instructions used to solve a problem or achieve an objective. '**If' statement**: A computer uses an IF statement to decide which bit of code to run. IF a condition is true, then the commands inside the block will be run. '**If/Else' statement**: A conditional command. This tests a	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's use of timers to achieve

				some simple algorithms work and to detect and correct errors in algorithms and programs.		statement. If the condition is true, then the commands inside the 'if block' will be run. If the condition is not met, then the commands inside the 'else block' are run. **Prompt:** A question or request asked in coding to obtain information from the user in order to select which code to run. **Selection:** Selection is a decision command. When selection is used, a program will choose which bit of code to	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

						run depending on a condition. **Variable:** A named area in computer memory. A variable has a name and a value. The program can change this variable value. Variables are used in programming to keep track of things that can change while a program is running.	manipulate the value of variables. Children can make use of user inputs and outputs such as 'print to screen'. e.g. 2Code. 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.
SpT1	Information Technology	Year 3 Spreadsheets 3.3	1. Formula Wizard and formatting cells 2. Using the timer and spin buttons 3. Line graphs 4. Using a spreadsheet for budgeting 5. Exploring place value with a spreadsheet	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,	Spreadsheets 4.3 How would you add a formula so that the cell shows the percentage score for a test? Which tools would you use to create a timed times tables test in 2Calculate?	**Budget:** The amount of money available to spend on a project. **Format Cell**: The way that data is displayed in a cell. For example, using units such as £ or $. **Formula**: A group of letters,	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

				including collecting, analysing, evaluating and presenting data and information.	Explain what a spreadsheet model of a real-life situation is and what it can be used for?	numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae. **Formula Wizard:** The formula wizard helps a user create formulas which perform calculations on selected cells. For example, adding, multiplying, average, total.	software such as 2Connect and 2Publish+. Children share digital content within their community, i.e. using Virtual Display Boards.
SpT2	**Information Technology** Computer Science	Year 3 Online safety 3.2	1. Using a search engine 2. Use search effectively to answer questions	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in	Effective searching 4.7 What is a search engine?	**Easter eggs**: An unexpected or undocumented feature in a piece of computer software or on	Children understand the function, features and layout of a search engine. They can appraise

			3. Reliable information sources	evaluating digital content		a DVD, included as a joke or a bonus. **Internet:** A global computer network providing a variety of information and communication facilities. **Key words:** A word or a group of words an Internet user uses to perform a search in a search engine. **Reliability:** The degree to which the result of something can be depended on to be accurate. **Search engine:** A program that searches for and identifies	selected webpages for credibility and information at a basic level. 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

						items in a database. Used especially for finding sites on the World Wide Web.	
SumT1	Computer Science Information Technology	Year 3 Coding 3.1 Year 1 Animated stories 1.6	1. Introduction to 2Logo 2. Creating letters using 2Logo 3. Using the repeat command in 2Logo 4. Using Procedures 1. Animating an object 2. 2Animate tools 3. Stop motion animation	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	Logo and Animations 4.5 & 4.6 What is Logo? What is an animation? What is meant by onion skinning? What is meant by stop motion animation?	**Logo:** A text-based coding language used to control an on-screen turtle to create mathematical patterns. **Logo Commands (e.g. FD, BK, RT, LT)** : A list of commands inputted into 2Logo to move the turtle around the screen. **Animation:** The process of adding movement to still objects. **FPS (Frame Per Second):**	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 are able to make improvements

				some simple algorithms work and to detect and correct errors in algorithms and programs. 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.		The number of frames played per second. **Frame:** A single image in an animation. **Onion skinning:** A process where the shadow image of the previous frame is present to help you line up the objects of the animation correctly. **Stop motion:** A technique whereby the camera is repeatedly stopped and started, for example to give animated figures the impression of movement.	to digital solutions based on feedback. Children make informed software choices when presenting information and data

SumT2	Information Technology	Year 1 Technology outside of school 1.9	1. What is artificial intelligence? 2. How artificial intelligence can help us 3. The future of artificial intelligence 4. Artificial intelligence in action	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.	Introduction to Artificial Intelligence 4.10 What is artificial intelligence? How is artificial intelligence used in our lives?	**Artificial Intelligence:** Computer systems able to perform tasks normally requiring human intelligence, such as seeing things, speech recognition, decision-making, and translation between languages. **Algorithm:** A precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Data:** A collection of information, especially facts or numbers, obtained by	Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data

						observation, questions or measurement to be analysed and used to help decision making.	

Year 5							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**
Sum2	Computer Science	Year 4 Coding 4.1 Logo 4.5 Animation 4.6	1. Coding efficiently 2. Simulating a physical system 3. Decomposition and abstraction 4. Friction and functions 5. Introducing strings	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing	Coding 5.1 What does simulating a physical system mean? What do the terms decomposition and abstraction mean? Describe how you would use variables to	**Abstraction:** Abstraction is a way of de-cluttering and removing unnecessary details to get a program functioning. **Algorithm:** a precise, step-by-step set of instructions	Children may attempt to turn more complex reallife situations into algorithms for a program by deconstructing it into manageable parts. Children are able to test and debug their

			6. Text variables and concatenation	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.	make a timer countdown and a score pad for a game.	used to solve a problem or achieve an objective. **Concatenation** The action of linking a mixture of strings, variable values and numbers together in a series. **Debug\ Debugging**: Fixing code that has errors so that the code will run the way it was designed. **Decomposition:** A method of breaking down a task into manageable components. This makes coding easier as the components can	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 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

						then be coded separately and then brought back together in the program. **Physical System**: In this context, this is any object or situation that can be analysed and modelled. For example, modelling the function of a traffic light, modelling friction of cars moving down surfaces or modelling the functions of a home's security system. **Simulation:** A model that represents a real or imaginary situation. Simulations can	structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design. 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

						be used to explore options and to test predictions.	
AuT2	Computer Science	Year 4 Online safety 4.2 Effective searching 4.7	1. Responsibilities and support when online 2. Protecting privacy 3. Citing sources 4. Reliability	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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a	Online safety 5.2 Who do I tell if I see anything online that makes me upset or scared? Why are passwords so important? Why is it important to reference sources in my work?	**Bibliography**: A list of all the books and articles used in a piece of work. **Citation:** A quotation from or reference to a book, paper, or author, especially in an academic work. **Copyright**: When the rights to something belong to a specific person. **Identity theft**: When someone pretends to be another person online. It can be done for financial gain or to steal others'	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.

				range of ways to report concerns about content and contact.		private information. **Plagiarism:** Taking someone else's work or ideas and passing them off as one's own.	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.

SpT1	Information Technology	Year 4 Spreadsheets 4.3	1. Conversions of measurements 2. The count tool 3. Formulae including the advanced mode 4. Using text variables to perform calculations 5. Event planning with a spreadsheet	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.	Spreadsheets 5.3 How would you add a formula so that the cell shows the product of the two other cells? What would you use in 2Calculate to have a cell that automatically calculates the number of days since a certain date? Explain what a spreadsheets model of real life situation is and what is can be used for?	**Format Cell:** The way that text looks. Formatting cells is helpful for interpreting a cell's contents for example you might want to format a cell to show a fraction e.g. 4 ½ or include units such as £ or $. **Formula:** A group of letters, numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae. **Variable:** A variable is used in computing to	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

						keep track of things that can change while a program is running.	able to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email.
SumT1	Information Technology	Year 4 Spreadsheets 4.3	1. Searching Database 2. Creating a class database 3. Creating a topic database	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Databases 5.4 What is a database? What is the collaborative feature important? In what ways can I sort information in a database?	**Collaborative:** Produced by, or involving, two or more parties working together. **Data:** A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision making. **Database:** A set of data that can be held in a computer in a	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.

						format that can be searched and sorted for information. **Database Report:** A way of producing a written paragraph that incorporates the data from the fields and records of the database.	
Aut1	Information Technology	Year 3 Word processing 3.8 Year 4 Effective searching 4.7	1. Making a page from a blank document 2. Inserting images 3. Editing images 4. Adding the text 5. Finishing touches 6. Presenting information- Using tables	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	Word Processing with Microsoft Word 5.8 What is a word processing tool used for? What features can you use to make a document more readable? How do you successfully	**Captions:** Text under an image to provide more information about what is shown. **Cropping:** Removing the unwanted outer areas from an image. **Hyperlink:** A clickable link from a document to	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

			7. Writing a letter 8. Presenting information- Newspaper	given goals, including collecting, analysing, evaluating and presenting data and information.	add an image to a document?	another location, often a webpage. **Text Formatting**: When you change the format of text on a page, including the font and the size and whether it is bold, underlined or in italics.	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.

Year 6							
	Substantive Concepts (pillars of progression)	**Prior knowledge**	**Components**	**NC Focus**	**Composites**	**Key Vocabulary**	**Skills progression**

AT1	Digital Literacy		1. Message in a game 2. Online behaviour 3. Screen time	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Online Safety 6.2 Why do I need to be aware of the dangers of being online? What is meant by my digital footprint? Why is it important to think about how much time use a screen for?	**Digital Footprint**: The information about a person that exists on the Internet as a result of their online activity. **Location sharing:** A way of sharing with others your device's location, these can be switched off for added security. **Screen Time:** The time spent using a device with a screen, such as a computer, television, tablet or phone.	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.

AT2	Computer Science		1 & 2. Designing and making a more complex program 3. Using functions 4. Flowcharts and control simulations 5. User input 6. Using text-based adventures	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	Coding 6.1 How can you use Tabs in 2Code Gorilla? What is a function in coding? Give an example that you have used in 2Code Gorilla. In 2Code Gorilla, how can a program receive user input?	**Algorithm:** a precise, step-by-step set of instructions used to solve a problem or achieve an objective. **Concatenation:** The action of linking things together in a series. **Variable:** A named area in computer memory. A variable has a name and a value. The program can change this variable value. Variables are used in programming to keep track of things that can change while a program is running.	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 **u**sing 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

				in algorithms and programs.		**x and y properties:** Properties of an object that denote its position on the screen. In 2Code the top left of the screen is (0,0) with maximum values of x and y determined by the grid size property of the background.	to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem. 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. 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.
SpT1	Computer Science Information Technology		1. What is binary? 2. Counting in binary 3. Converting from decimal to binary 4. Game states	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Select, use and combine a variety of software (including internet services) on a range of digital devices to	Binary 6.8 How does binary relate to the programs that you use or create? How does binary relate to computer memory? How would you write the numbers 0 to 10 in binary?	**Binary:** A number system in which there are two separate integers that can be used to make all numbers. This is also called the base 2. **Bit**: A single 0 or 1 is called a bit. This word comes from 'Binary Digit'. **Nibble, Byte, Kilobyte,**	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.

				design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.		**Megabyte, Gigabyte and Terabyte:** Words used to describe numbers of bits and the computer memory space that they use. (Nibble - 4 bits, Byte - 8 bits, Kilobyte (KB) - 1024 bytes, Megabyte (MB) - 1024 KB, Gigabyte (GB) - 1024 MB, Terabyte (TB) - 1024 GB).	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,
SpT2	Information Technology		1. What is a spreadsheet? 2. Basic calculations 3. Modelling	Select, use and combine a variety of software (including internet services) on a range of digital devices to	Spreadsheets with Microsoft Excel 6.9 What is a spreadsheet used for? How do you carry out a	**Cell:** An individual section of a spreadsheet grid. It contains data or calculations. **Cell Reference**: Each cell has a	Children make clear connections to the audience when designing and creating digital content. The

			4. Organising data 5. Advanced formulae and big data 6. Charts and graphics	design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	multiplication calculation? How does using the SUM function save time?	cell reference that shows its position. The cell reference is displayed in the box on the top left (not on tablet version). **Flash-fill*:** A function of Excel that fills cells using a pattern started by the user. **Formatting:** The way that text looks (in a cell). **Formula:** A group of letters, numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae.	children design and create their own blogs to become a content creator on the Internet,

SumT1	Computer Science		1. The World Wide Web and the internet 2. Our school network and accessing the internet 3. Research	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.	Networks 6.6 What is the difference between the Internet and the World Wide Web? What is the difference between LAN and WAN? Who is Tim Berners-Lee?	**DNS (Domain Name Server):** The system that automatically translates internet addresses to the numeric machine addresses that computers use. **Internet:** A global computer network providing a variety of information and communication facilities consisting of interconnected networks using standardized communication protocols. **IP address:** A unique string of characters that identifies each computer	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.

						using the Internet Protocol to communicate over a network. **LAN (Local Area Network**): A computer network that links devices within a building or group of adjacent buildings, especially one with a radius of less than 1 km. **WAN (Wide Area Network):** A collection of local-area networks (LANs) or other networks that communicate with one another over a	

						large physical area or even globally. **World Wide Web**: An information system on the Internet which allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.	