Computing Skills Progression

Curriculum Aims

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

Computer Science	Information Technology	Digital Literacy
Understanding how Computers and networks work, learning foundation principles of Computer Programming.	Using Computers in a purposeful way – research, create, edit, and manage files.	Becoming a responsible digital citizen - understanding digital footprint and how to use and navigate internet safely.

Skills Progression

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	Computer programming and game creation	How computers/ networks work	Data Handling	Creating Digital Media and Content	Presenting Information	Online Safety	Digital awareness & communication
Year 1 Units	1.4 Lego builders 1.5 Maze Explorers 1.7 Coding		1.2 Grouping & Sorting 1.3 Pictograms 1.8 Spreadsheets	1.6 Animated Story Books		1.1 Online Safety	1.9 Technology outside of school
Year 1 Coverage	1.4 Follow and write instructions. Understand that computers need precise instructions to follow and that a set of instructions is called an algorithm. Consider how the order of instructions affects an outcome. Begin to understand that correcting errors is called debugging. 1.5 (**works well with bee-bots/ roamers*, *follows 1.4*) use a keypad to input instructions to direct a 'turtle' around a given path. 1.7 (*follows 1.4, 1.5*) Understand event – object – action and have a go and designing and making a computer program using block code.		1.2 Sort sets of objects into groups according to properties. 1.3 (*follows 1.2*) Collect data and use pictograms to organise and represent it. 1.8 Navigate a spreadsheet and identify rows, columns and cells. Learn to enter data into cells including adding images and assigning them a value. Use the 'move cell', 'lock'. 'count' and 'speak' tools.	1.6 Combine pictures, text and sound, and use simple animation to create an interactive story.		1.1 Understand the need and reason to keep passwords safe, log in, familiarise with the structure of an online environment. Understand that you can save work and communicate online.	1.9 Consider what technology is and how it is used in the wider environment.

Year 2 Units	2.1 Coding		2.3 Spreadsheets 2.4 Questioning	2.6 Creating Pictures 2.7 Making Music	2.8 Presenting Ideas	2.2 Online Safety	2.5 Effective Searching
Year 2 Coverage	2.1 Review and consolidate understanding of algorithms and concepts taught in Year 1 (*1.4, 1.5, 1.7*). Introduce the 'collision detection' event and using the 'timer-after' command. Explore the properties of objects (*1.7L5*) and understand that different object types (including buttons) have different properties, apply this knowledge when designing, making (and debugging) simple programs.		2.3 Review and consolidate understanding of vocabulary and learning from Year 1 (*1.8*). Use the spreadsheet to make simple calculations including using the 'total' tool adding coin values. Use the 'move' tool to create a block graph using a set of data collected. 2.4. Recap and consolidate understanding of grouping and sorting and pictograms from Year 1 (*1.2, 1.3*). Use a range of yes/ no questions to separate a set of items, create a binary tree. Investigate questions using a binary tree and non-binary database and understand the difference between them.	2.6 Explore a range of art movements and artists including impressionism, pointillism, Mondrian, William Morris and pattern, surrealism and eCollage. Create a range of digital art that reflect these styles. Use the art tools to combine more than one effect. 2.7 Organise different sounds in different ways to create different tunes. Include uploading and recording sounds and understand the impact of adjusting the volume and tempo. Consider how music can be used to express feeling.	2.8* Examine examples of the same traditional tale presented in different ways – a concept map, quiz, e-book and fact file. Create a quiz about a story, make a non-fiction fact-file, write a presentation and present it individually or as part if a pair or group, using a chosen/ preferred method. Use clipart and photos and consider how data can be structured in tables. **could be combined with unit 2.5 – effective searching.*	2.2 Use the search functionality in Purple Mash and apply filter options. Understand that work can be shared online, experience this by sharing work to a display board. Understand that email is a form of digital communication (*1.1 introduction to the concept of online communication*) and experience using email in an email simulation activity. Consider what a digital footprint is and what users would and wouldn't want in their digital footprint.	2.5* Understand what a browser is, what a website is and what a search engine is and does. Use in internet search engine to perform a search (*2.2*) and consider how the results can be organised and filtered using given options (e.g. all items, images, news). **if this unit follows 2.2. draw from prior experience using the Purple Mash search in Lesson 1 of that unit.* **could be combined with unit 2.8 – presenting ideas.*

Year 3 Units	3.1 Coding		3.3 Spreadsheets 3.8 Graphing			3.2 Online Safety	3.5 Email
Year 3 Coverage	3.1 Review and consolidate understanding of vocabulary and concepts taught in Year 2. Introduce flowcharts as a way of mapping out algorithms, recap the 'timer-after' command and introduce 'timer-every' and using the 'repeat' command. Apply new and prior knowledge when designing, making (and debugging) programs.		3.3 Review prior knowledge. Input a table of data and create a graph/ chart that represents it. Use 'more than', 'less than' and 'equals' tools. Use the 'spin' tool. Understand that rows and columns (*1.8, 2.3*) are labelled with letters and numbers and use these to find specific cells. 3.8 Set up a data table, enter data and produce and share a graph (*3.3*). Consider selecting an appropriate style of graph to represent the data represented. Solve a maths investigation and present the data in a graph. Use the sorting option to aid data analysis.		-	3.2 Discuss what makes a good password and the importance of keeping passwords safe (*1.1*). Discuss ways in which the internet can be used to communicate and contribute a clear and appropriate message to a blog. Consider the authenticity of information on the internet and the impact of exposure to 'fake news' and incorrect information. Create a 'spoof' website, share it to a display board and think about how to 'fact-check' information found online. Identify physical/ emotional effects of playing/ watching inappropriate content/ games, relate cyber-bullying to bullying in the real world and develop strategies for dealing with it.	3.5 Discuss ways in which the internet can be used to communicate and discuss the strengths/ weaknesses of each method. Write and respond to emails (*2.2*) sent within the class, use the address book to select a recipient. Consider ways to email safely. Attach files to emails, understand how CC and BCC are used and when to use them.

Year 4 Units	4.1 Coding		4.3 Spreadsheets	4.6 Animation		4.2 Online Safety	4.7 Effective search **(**also relevant to KS2 Information Technology*)**
Year 4 Coverage	4.1 Review and consolidate understanding of vocabulary and concepts taught previously. Introduce 'Selection' and create programs that include IF and IF/ELSE statements. Understand how co-ordinates can be used in programming. Introduce 'variables' and use number variables in programming. Apply new and prior knowledge when designing, making (and debugging) programs.		4.3 Review prior knowledge. Use the number formatting tools (%, fraction, number of decimal places) to appropriately format numbers in cells. Use 'timer', 'random number' and 'spin' tools, and combine tools. Use a series of data to create a line graph, use a line graph to answer a question (when the temperature in the playground will reach 20ºC). Use a spreadsheet to help plan a budget and use the currency formatting tools.	4.6 Create simple animations (*1.6. intro to using animations*) – understand and use the following: - animation frames - onion skin tool - adding backgrounds and sounds Discuss understanding of stop-motion and films they know that use it. Create own stop-motion animations by adding photographs to frames and share work.		4.2 Know security symbols such as the padlock and the meaning of the term 'phishing', we aware of the existence of scam websites (*3.2*). Consider how a person's digital footprint (*2.2*) can be related to identity theft. Consider the risks of installing free software vs paid for software and learn about malware and what a computer virus is. Understand what plagiarism is and learn about the importance of citing sources. Consider what a healthy amount of screen-time would be and how to find the right balance between being active and digital activities.	4.7 using an online search engine (*2.2, 2.5*) Structure search queries to locate specific information. Use a search engine to answer a variety of questions. Write search questions for a friend to solve. Analyse the contents of a web page for clues about the credibility of information (*3.2*).

Year 5 Units	5.2 Coding 5.5 Game Creator		5.3 Spreadsheets 5.4 Databases			5.2 Online Safety	
Year 5 Coverage	5.1 Review and consolidate understanding of vocabulary and concepts taught previously. Consider how 'simplified code' can be used to make programming more efficient. Make a computer program that simulates a physical system (*3.7, 4.4*) e.g. traffic lights, a football game. Learn about decomposition and abstraction and consider it when planning code. Introduce 'functions' and 'strings' – text variables. Apply new and prior knowledge when designing, making (and debugging) programs. 5.5 Design and create a 3D maze game.		5.3 Use formulae in a spreadsheet to convert between units of measure. Develop use of the 'count' tool. Use formulae to calculate the area and perimeter of rectangles and solve real-life problems. Develop knowledge of formulae. Create and use variables (*4.1, 5.1*). Use a spreadsheet that models a real-life situation and come up with practical solutions (e.g. calculating the amount of ingredients to buy for a recipe and cost for 'x' or 'y' amount of people). 5.4 Use a database (*2.5, 4.2)*. Search a database and use it to answer questions. Contribute to a class database Create own database. Know what a database 'field' and 'record' is and correctly add information and populate the database. Understand how to word questions so that they can be effectively answered using a search of their database.		-	5.2 Consider what information is suitable for sharing online (*digital footprint, 4.2)*, know who to tell if something upsetting happens online, use the SMART rules for guidance. Understand the need for strong passwords (*3.2*). Understand that images can be digitally manipulated and that this can have a negative impact. Know to cite sources (*4.2*) and develop search techniques to find the most relevant and reliable information online. Become aware of choice in communication methods and be able to choose which is the most appropriate for purpose.	

Year 6 Units	6.1 Coding	6.6 Networks	6.3 Spreadsheets		6.4 Blogging	6.2 Online Safety	6.4 Blogging
Year 6 Coverage	6.1 Review and consolidate understanding of vocabulary and concepts taught previously. Develop and apply knowledge of how to use functions (*5.1L5*) and flowcharts (*3.1*, *4.1*) and create a control simulation. Create a program that asks for user input (*4.1L2&4*). Develop use of functions, variables (*4.1, 5.1*) and the 'repeat until' command (*4.1L4*) while creating a text-based adventure* game.	6.6 Know the different between the 'World Wide Web' and the 'Internet'. Understand what a network is and that there is a network at school. Begin to understand that there are different network types. Find out about Tim Berners-Lee and consider major changes in technology over a lifetime.	6.3 Create a spreadsheet to solve a mathematical problem relating to probability. Copy and paste shortcuts. Problem solve using the 'count' tool. Create a computational model. Use formulae, use a spreadsheet to solve a problem. Use a spreadsheet to model a real-life situation and come up with solutions. Make use a of a spreadsheet to help plan actions. presenting data.		6.4 Understand what a blog is and identify the key features of a blog. Work collaboratively (*5.7*) to plan a blog. Create a blog or blog post with a specific purpose, written appropriately for an intended audience. Understand that the way in which information is presented has an impact upon the audience. Understand that contributions to a shared blog can be subject to an approval process and demonstrate the awareness of issues caused by inappropriate posts and online bullying.* Be able to assess the effectiveness and impact of a blog. **crosses into Digital Literacy*	6.2 Recap risks online including sharing location, secure websites, spoof websites, phishing, and other email scams. Recap the steps that can be taken to protect ourselves online - including protecting our digital footprint, where to go for help, smart rules and security software. Understand the impact of what is shared online (*6.4, 4.2*) and the consequences of promoting inappropriate content. Know how to report or stop inappropriate activity. Recognise a need to find a balance between being active and digital activities (*4.2L4*) and can give reasons for limiting screen time.	6.4 Understand that contributions to a shared blog can be subject to an approval process and demonstrate the awareness of issues caused by inappropriate posts and online bullying.* **see full unit description under Information Technology*