COMPUTING KNOWLEDGE PROGRESSION MAP

Year 3	Year 4	Year 5	Year 6
Computing systems and networks			
Connecting computers • To describe what an input is • To explain that a process acts on the inputs • To explain that an output is produced by the process • To identify how changing the process can affect the output • To recognise that a digital device is made up of several parts • To recognise that computers can be connected to each other • To explain how computer systems can change the way we work • To identify how devices in a network are connected with one another • To recognise that a network is made up of a number of components • To explain how information is passed through multiple connections • To identify the benefits of computer networks	**The internet** • To describe how networks connect to other networks • To outline how information can be shared via the World Wide Web • To recognise that the World Wide Web is part of the internet • To explain that the global interconnection of networks is the internet • To recognise the need for security on the internet • To describe how to access the World Wide Web • To describe the types of content/media that can be added, created, and shared on the World Wide Web • To explain how the content of • the World Wide Web is created, owned and shared by people • To explain that the internet enables us to view the World Wide Web • To explain that the World Wide Web comprises of websites and web pages • To describe the current limitations of the World Wide Web media	**Systems and searching** • To recognise that a system is a set of interconnected parts which work together • To recognise inputs, processes, and outputs in large IT systems • To explain that computers can be connected together to form IT systems • To identify that data can be transferred between IT system • To relate that search engines are examples of large IT systems • To describe the role of a particular IT system in their lives • To explain why search engines create indices, and that they are different for each search engine • To explain the role of web crawlers in creating an index • To explain how search results are selected • To explain that ranking orders search results to make them more useful • To explain how ranking is determined by rules, and that	**Communication and collaboration** • To recognise that connections between computers allow access to shared stored files • To explain that data is transferred in packets • To recognise that data is transferred across networks using agreed protocols (methods) • To discuss the opportunities that technology offers for communication and collaboration • To recognise computers connected to the internet allow people in different places to work together • To explain that communicating and collaboration using the internet can be public or private • To explain which types of media can be shared through the internet

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	• To evaluate the reliability of content and the consequences of unreliable content • To explain the benefits of the World Wide Web	different search engines use different rules • To explain why the order of results is important and to whom • To explain how search engines make money by selling targeted advertising space • To identify some of the limitations of search engines	
Data and information			
Branching databases • To identify attributes that you can ask yes/no questions about • To investigate questions with yes/no answers • To select an attribute to separate objects into two similarly sized group • To explain that a branching database is an identification tool • To recognise that a data set can be structured using yes/no questions • To explain that a well-structured branching database will enable you to identify objects using fewer questions • To relate two levels of a branching database using AND	**Data logging** • To suggest questions that can be answered using a table of data • To identify data that can be logged over time • To identify that sensors are input devices • To recognise that a sensor can be used as an input device for data collection • To explain that a data logger captures 'data points' from sensors over time	**Flat file databases** • To explain that a computer program can be used to organise data • To explain that tools can be used to select data to answer questions • To outline how ordering data allows us to answer some questions • To outline how operands can be used to filter data • To outline how 'AND' and 'OR' can be used to refine data selection • To explain that computer programs can be used to compare data visually • To explain that we present information to communicate a message	**Spreadsheets** • To identify questions that can be answered using spreadsheet data • To explain what an item of data is in a spreadsheet • To explain how the data type determines how a spreadsheet can process the data • To outline that there are different software tools to work with data • To explain that formulas can be used to produce calculated data • To recognise cells can be linked • To explain why data should be organised in a spreadsheet • To recognise that a cell's value automatically updates when the value in a linked cell is changed • To evaluate results in comparison to the question asked

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• To suggest real-world applications for branching databases			
Creative media			
Stop Frame animation • To explain that an animation is made up of a sequence of images • To identify that a capturing device needs to be in a fixed position • To recognise that smaller movements create smoother animation • To explain the impact of adding other media to an animation • To explain that a project must be exported so it can be shared **Desktop publishing** • To recognise how text and images can be used together to convey information • To define landscape and portrait as two different page orientations	**Audio editing** • To identify that output devices are needed to play audio • To identify that an input device is needed to record sound • To identify that sound can be recorded • To recognise that recorded audio can be stored on a computer • To recognise that audio can be edited • To recognise that sound can be represented visually as a waveform • To recognise that audio can be layered so that multiple sounds can be played at the same time • To consider the results of editing choices made	**Video production** • To recognise projects need to be exported to be shared • To identify that videos can be edited on a recording device or on a computer • To identify videos can be improved through and reshooting or editing • To explain the limitations of editing video on a recording device • To recognise the need to regularly review and reflect on a video project • To recognise that filming techniques can be used to create different effects • To explain the purpose of a storyboard • To explain the features of video as a visual media format • To recognise which devices can and can't record video	**Web page creation** • To recognise the relationship between HTML and visual display • To recognise that web pages can contain different media types • To recognise that web pages are written by people • To recognise that a website is a set of hyperlinked web pages • To recognise components of a web page layout • To consider the ownership and use of images (copyright) • To recognise the need for a navigation path • To recognise the need to preview pages (different screens / devices) • To recognise the implications of linking to content owned by others **3D modelling** • To explain that 3D models can be created on a computer

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• To consider how different layouts can suit different purposes • To recognise that DTP pages can be structured with placeholders • To recognise how different font styles and effects are used for particular purposes • To consider the benefits of using a DTP application			• To recognise that a 3D environment can be viewed from different perspectives • To recognise that digital tools can be used to manipulate 3D objects • To recognise that artefacts can be broken down into a collection of 3D objects • To show how placeholders can create holes in 3D objects
Programming			
Sequencing sounds • To explain that programs start because of an input • To identify that a program includes sequences of commands • To explain what a sequence is • To identify that the sequence of a program is a process • To identify that different sequences can achieve different outputs • To identify that different sequences can achieve the same output	**Repetition in shapes/ Repetition in games** • To relate what 'repeat' means • To identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves • To explain that we can use a loop command in a program to repeat instructions • To identify a loop within a program • To identify patterns in a sequence • To explain that an indefinite loop will run until the program is stopped • To explain that you can program a loop to stop after a specific number of times • To explain that in programming there are indefinite loops and count-controlled loops	**Selection in physical computing / Selection in quizzes** • To relate that a count-controlled loop contains a condition • To explain that a condition can only be true or false • To explain that selection can be used to branch the flow of a program • To explain that a loop can be used to repeatedly check whether a condition has been met • To compare a count controlled loop with a condition-controlled loop	**Variables in games** • To define a program variable as a placeholder in memory for a single value • To explain that a variable has a name and a value • To explain that a variable can be used in a program, e.g. 'score' • To identify examples of information that is variable, e.g. a football score during a match • To define 'variable' as something that is changeable • To recognise that the value of a variable can be used by a program • To recognise that the value of a variable can be updated

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• To explain that the order of commands can affect a program's output	• To identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' • To explain the importance of instruction order in a loop • To justify when to use a loop and when not to • To recognise that not all tools enable more than one process to be run at once	• To explain that a condition-controlled loop will stop when a condition is met • To explain that when a condition is met a loop will complete a cycle before it stops • To explain the importance of instruction order in 'if... then... else...' statements	• To identify that variables can hold numbers (integers) or letters (strings) • To recognise that a variable can be set as a constant (fixed value) • To define the way that a variable is changed • To explain the importance of setting up a variable at the start of a program (initialisation) • To explain that if you change the value of a variable, you cannot access the previous value (cannot undo) • To explain that if you read a variable, the value remains • To explain that there is only one value for a variable at any one time • To explain that the name of a variable needs to be unique • To explain that the name of a variable is meaningless to the computer