

Computing Skills Progression

| | Reception | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
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| Autumn 1 | | <p>We are treasure hunters</p> <p>Know that a programmable robot is a computer</p> <p>Know that a programmable robot can be controlled by inputting a sequence of instructions</p> <p>Know that these instructions are called an algorithm</p> <p>Know that programs can be debugged when they don't work as intended</p> | <p>We are astronauts</p> <p>Know how to verbally construct algorithms to move between places</p> <p>Know how to implement and algorithm to move a sprite using a block-based language</p> <p>Know that a program can give different sort of outputs (e.g. moving a sprite or playing a sound)</p> <p>Know that programs can respond to input (such as touch)</p> <p>Know how to program communication between sprites with messages</p> | <p>We are programmers</p> <p>Know how to implement a story as an algorithm</p> <p>Know how to storyboard an animation</p> <p>Know how to create assets to program an animation (i.e. sprites that will be used in the animation)</p> <p>Know how to implement an animation as algorithm in a programming language</p> <p>Know how to add sound to an animation</p> | <p>We are software developers</p> <p>Know the features of a good educational game</p> <p>Know how to prototype educational games using questions</p> <p>Know how to use selection (if/then/else) to give answers to questions that are right or wrong</p> <p>Know how to use repetition to ask multiple questions</p> <p>Know how to use variables to record operands in questions and scores</p> <p>Know how to create assets (graphics and</p> | <p>We are game developers</p> <p>Know how to plan an programming project</p> <p>Know how to create vector graphic assets for a game</p> <p>Know how to plan algorithms for a simple game using selection, repetition and variables</p> <p>Know how to test, debug and improve a game</p> <p>Know how to write instructions for a game</p> <p>Know how to share a game safely and respectfully</p> | <p>We are toy makers</p> <p>Know that computers use stored programs to connect input and output</p> <p>Know that products need to be designed to a brief</p> <p>Know that complex projects can be decomposed into small parts</p> <p>Know that programs can be written for embedded systems</p> |

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| | | | <p>Know how to use loops (iteration) to rotate and move sprites</p> | | <p>sound) to improve user experience</p> <p>To know how to test and refine a game based on player feedback</p> | | |
| Autumn 2 | | <p>We are TV chefs</p> <p>Know that processes can be broken down into simple, clear steps</p> <p>Know the different features of a video camera</p> | <p>We are games testers</p> <p>Know that rules for games can be described as algorithms</p> <p>Know how to write or record the algorithms for simple games</p> <p>Know how to write record the algorithms for two-player sports</p> <p>Know that strategies for games can be broken down into algorithms</p> <p>Know what to do if the content of a game concerns them</p> | <p>We are bug fixers</p> <p>Know how to spot and correct “off-by-one” bugs in a program</p> <p>Know how to spot and correct bugs in a program related to performance</p> <p>Know what multithreading is</p> <p>Begin to know potential issues caused by concurrency and multithreading</p> <p>Know how to spot and correct conceptual bugs in programs</p> <p>Know how to spot and correct</p> | <p>We are makers</p> <p>Know that computers take many forms, and that some are embedded systems that can be programmed from another computer (e.g. the BBC micro:bit)</p> <p>Know how to read a program for the micro:bit, and upload this to the hardware</p> <p>Know how to modify and upload micro:bit programs, using selection, repetition and variables</p> <p>Know how to use a simulator of an embedded system</p> | <p>We are cryptographers</p> <p>Know that information can be encoded to communicate over distance</p> <p>Know about semaphore and morse code</p> <p>Know that encoded information can also be encrypted to hide its contents</p> <p>Know the algorithms and weaknesses of Caesar and substitution ciphers</p> <p>Know what makes a secure password and why this is important</p> | <p>We are computational thinkers</p> <p>Reason about algorithms</p> <p>Know that an algorithm can be expressed as a program</p> <p>Know that some algorithms are more efficient than others</p> <p>Know how route finding algorithms work</p> <p>Know random, linear, and binary search</p> <p>Know selection sort and quicksort</p> |

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| | | | | <p>arithmetical bugs in a program</p> <p>Know that algorithms can be thought of a sets of rules, as well as steps to achieve a goal</p> | <p>to test and refine a program</p> | <p>Know how information is kept secure on the internet</p> | |
| Spring 1 | | <p>We are digital artists</p> <p>Know that I can select brushes in a paint program</p> <p>Know that I can select colours</p> <p>Know that I can undo my actions</p> <p>Know that I can use layers in my art</p> <p>Know that I can paint on top of photographs</p> | <p>We are photographers</p> <p>Know what makes a good photo</p> <p>Know how to find photos online</p> <p>Know how to use a digital camera</p> <p>Know how to take effective photos</p> <p>Know how to review and think critically about our photos</p> | <p>We are presenters</p> <p>Know how to research a topic safely using the web</p> <p>Know about licensing, Creative Commons and using other people’s work</p> <p>Know about Chroma keying and how green screen is applied</p> <p>Know how to record a presentation</p> <p>Know how to edit a presentation to</p> | <p>We are musicians</p> <p>Know how to sequence beats on a device</p> <p>Know how to play a melody on a device using a touchscreen keyboard</p> <p>Know how to play a melody on device using a piano roll</p> <p>Know how to play music on a device using loops</p> <p>Know how to compose on a</p> | <p>We are algorithmic artists</p> <p>Know that turtle commands (pen up, pen down, rotate, move, clear) can be used to create drawings on a computer</p> <p>Know how colour can be represented as numbers</p> <p>Know that position can be represented as numbers (i.e. coordinates)</p> <p>Know that repetition can be used to draw</p> | <p>We are publishers</p> <p>Know that online tools facilitate contributing to large collaborative projects</p> <p>Know we can use computers to write and review content</p> <p>Know that digital media should be sourced safely, respectfully and responsibly</p> <p>Know that computers can produce a high-</p> |

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| | | | <p>Know how to edit and enhance photos</p> | <p>include green screen elements</p> <p>Know how to constructively review and feed back on presentations</p> | <p>device using multiple tracks</p> <p>Know how to reflect on and refine compositions</p> | <p>repeated shapes and patterns</p> <p>Know that code can be encapsulates (as functions) to be reused</p> <p>Know that controlled randomness can be used to add interest to digital art</p> | <p>quality printed output</p> |
| Spring 2 | | <p>We are publishers</p> <p>Know that I can use a device to create an ebook</p> <p>Know that I can import images into ebooks</p> <p>Know that I can add and format titles and text</p> <p>Know that I should protect my privacy</p> <p>Know that it is important to respect people's copyright</p> | <p>We are researchers</p> <p>Know how to mind map a topic for research</p> <p>Know how to use a search engine to search specific sites</p> <p>Know that a range of search engines are available</p> <p>Know what to do if a search returns something that concerns them</p> <p>Know what tools can help them to search safely</p> | <p>We are who we are</p> <p>Know how to use a slideshow tool to create presentations</p> <p>Know how to add pages and images to slideshows</p> <p>Know how to share work online and write constructive comments on each other's work</p> <p>Know how to share work online safely (i.e. understand what constitutes personal information that</p> | <p>We are bloggers</p> <p>Know the difference between a website and a webpage</p> <p>Know how to author content for a webpage</p> <p>Know how to include images in a webpage</p> <p>Know how to ensure content is safe and appropriate to share online</p> <p>Know to ensure that content published to the internet respects</p> | <p>We are web developers</p> <p>Know the components of a local area network such as the school's</p> <p>Know how packets of information are passed around the internet</p> <p>Know that web pages are built for html</p> <p>Know how to plan and organise a simple website</p> <p>Know how to create content for a website, including</p> | <p>We are connected</p> <p>Know appropriate rules of guidelines for a civil online discussion</p> <p>Know how search results are selected and ranked</p> <p>Know that points can be argued and supported with evidence and sources</p> <p>Know that others' views can be countered with respect and tolerance</p> |

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| | | | <p>Know how to prepare a short multimedia presentation</p> <p>Know how to present using an electronic device</p> | <p>shouldn't be shared)</p> <p>Know how to use technology alongside verbal presentation</p> | <p>others' intellectual property</p> | <p>images and links to other pages</p> <p>Know how to safely share a website on the internet</p> | <p>Know that we can judge online sources' reliability</p> <p>Know that online bully can be dealt with</p> |
| Summer 1 | | <p>We are rhythmic</p> <p>Know how to record and play back audio on a device</p> <p>Know how to program sprites to play sounds in response to input</p> <p>Know how to use iteration to repeat sounds</p> <p>Know how to add effects to change a recorded sound</p> <p>Know how to sequence sounds to create a beat</p> <p>Know how to record a play back multiple tracks using software instruments</p> | <p>We are animators</p> <p>Know how to plan/storyboard an animation</p> <p>Know how to make/collect media assets for an animation</p> <p>Know how to use stop motion animation software</p> <p>Know what makes a successful animation (i.e. small movements, keeping equipment stationary)</p> <p>Know how to add audio to animations</p> | <p>We are co-authors</p> <p>Know what a wiki is, and how websites can be collaboratively authored</p> <p>Know the five pillars of Wikipedia and begin to apply these to collaborative work</p> <p>Know how to safely add content</p> <p>Know how edit content on a wiki</p> <p>Know how to review content added to a collaborative website</p> | <p>We are artists</p> <p>Know how to create increasingly complex geometric tessellations on a device</p> <p>Know the difference between vector and raster images</p> <p>Know how to use turtle graphics to create drawings</p> <p>Know how to combine turtle graphics commands with repetition to create repeating patterns</p> | <p>We are adventure gamers</p> <p>Know how interactive fiction and text adventures work</p> <p>Know how plan and structure a text adventure using a flow chart</p> <p>Know how to create text for an adventure game</p> <p>Know how to responsibly source images for an adventure game that improve user experience</p> | <p>We are advertisers</p> <p>Know what makes an effective advertisement</p> <p>Know that video can be used to promote a cause</p> <p>Know that ideas can be planned with storyboards</p> <p>Know that technology allows us to shoot original content which can be combined with additional footage</p> <p>Know that content can be edited and assembled into an</p> |

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| | | | Know how to review and reflect on our work | | | <p>Know how to create clickable links between slides in a slideshow</p> <p>Know how to add audio to slideshow</p> <p>Know how to share and reflect on our work</p> | effective advertisement |
| Summer 2 | | <p>We are detectives</p> <p>To know what a dataset is</p> <p>To know that data can be filtered</p> <p>To know that data can be classified using a tree of yes/no questions</p> <p>To know that forms can collect data into a spreadsheet</p> <p>To know that spreadsheet data can be filtered</p> <p>To know that spreadsheet data can be searched</p> | <p>We are zoologists</p> <p>Know that keys and branching databases can be used to classify objects</p> <p>Know how to collect data from the local area</p> <p>Know how to annotate photos in a shared document</p> <p>Know how to collect data electronically</p> <p>Know how to record data onto a digital map</p> | <p>We are opinion pollsters</p> <p>Know what a survey is, and that computers can be used to help with these</p> <p>Know how to create varied questions for a survey</p> <p>Know how to create surveys in a digital tool</p> <p>Know how to distribute surveys online and collect data from them</p> <p>Know how to analyse data for</p> | <p>We are meteorologists</p> <p>Know how the weather can be described and measured</p> <p>Know how to record simple weather measurements and record these on a device with photos</p> <p>Know how to reflect on the reliability of data</p> <p>Know how to present data using appropriate graphs and tables</p> | <p>We are VR designers</p> <p>Know what augmented and virtual reality are</p> <p>Know how to create a 360° photograph</p> <p>Know how to create and use QR codes</p> <p>Know how to navigate VR and AR spaces</p> <p>Know how to create VR scenes and objects</p> | <p>We are AI developers</p> <p>Know that decision trees can be used to classify data</p> <p>Know how speech recognition works</p> <p>Know how a neural net recognizes images</p> <p>Know that neural nets can be trained to recognize images</p> <p>Know that machine learning systems can be trained to identify sentiments</p> |

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| | | | | errors or suspicious answers Know how to present data and findings to an audience | Begin to predict the weather based on photographs taken Know how to use presentation tools and data collected to give a weather forecast | | Know that AI systems present ethical challenges |
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