

COMPUTING PROGRESS MAP

	<u>FS1</u>	<u>FS2</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>YEAR 6</u>
<u>Context of study</u>	Remote control devices Unplugged activities Computational Thinking iPads ChatterPix Scribbaloo Paint		Computational Thinking BeeBots (physical device) Unplugged activities BeeBot software / app Scratch Junior Clicker Paint Microsoft Word Clicker (text) Paintz app iPads Laptops J2data Chrome music lab Photo editor 2 Simple – 2 animate		Computational Thinking Scratch (desktop version) Logo (turtle academy) iPads Laptops iMovie, iMotion 2 Simple – 2 animate Pivot animator J2data – branching databases Microsoft Publisher / PowerPoint Data logger (physical device and apps) Audacity Paint.net Chrome music lab		Computational Thinking Scratch (desktop version) Tinkercad Micro-bit Make Code emulator Microsoft Publisher Microsoft PowerPoint Microsoft Excel Paint.net iPads Laptops Video editor / iMovie / Movie maker Chrome music Lab 3D printer if available Consider Kodu game lab, Krita paint	
<u>National Curriculum</u>	<u>I can Nursery</u> I can operate some ICT or mechanical toys I can operate a CD player or MP3 player and show understanding	<u>I can Reception</u> I can operate a CD player or MP3 player and show understanding of the remote controls (CL-LAU) I can show interest in	Understand what algorithms are Create simple programs Use technology purposefully to create and store digital content Recognise common uses of information	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	Write programs that accomplish specific goals, systems; solve problems by decomposing them into smaller parts Use sequence, in programs; with various forms	Design, write and debug programs that accomplish specific goals, systems Use sequence, and repetition in programs; work with various forms of input and output	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	

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	<p>of the remote controls</p> <p>I can show interest in other technological items</p>	<p>other technological items (CL-LAU)</p> <p>I can understand and complete a simple program on a computer (CL-listening, attention and understanding)</p>	<p>technology beyond school</p> <p>Use technology safely, keeping personal information private;</p>	<p>Create and debug simple programs</p> <p>Use logical reasoning to predict the behaviour of simple programs</p> <p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>Recognise common uses of information technology beyond school</p> <p>Use technology safely and respectfully, keeping personal information private;</p>	<p>of input and output</p> <p>Explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>Use search technologies effectively</p> <p>Use a variety of software (including internet services) on a range of digital devices to design and create a range of programs and content that accomplish given goals, including collecting and presenting data and information</p>	<p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>errors in algorithms and programs</p> <p>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</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>
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				<p>identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies</p>	<p>Use technology safely, respectfully and responsibly</p> <p>Identify ways to report concerns about contact.</p>	<p>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</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns</p>	
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						about content and contact.		
<u>Significant/Diverse Individuals</u>	<ul style="list-style-type: none"> • People within own family who work with / use information technology • People within school / community environment who work with / use information technology <p>These link to: - I can start to show an interest in different occupations and ways of life</p> <p>I can remember and talk about significant events in my own experience (related to Information technology)</p> <p>Comment on images of familiar situations in the past</p> <p>I can talk about the lives of people around me and their role within society (when using information technology.)</p>		<ul style="list-style-type: none"> • Douglas Engelbart (invented the mouse) • Tim Berners-Lee (Inventor of WWW) 		<ul style="list-style-type: none"> • Ada Lovelace (computer program / algorithm) • Gladys West (instrumental in the development of GPS) • Bill Gates (Co founder of Microsoft) 		<ul style="list-style-type: none"> • Alan Turing (principle of the modern computer) • Juliana Rotich (information technologist) • Steve Jobs (Co founder of Apple) • Annie Easley (computer scientist at NASA) • Katherine Johnson (mathematician at NASA) – link to text Hidden Figures • Evelyn Boyd Granville 	
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<p><u>Computer Science – Programming inc algorithms</u></p>	<p>Computation al Thinking Skills: - Begin to demonstrate approaches of: - tinkering, creating, collaboration and perseveranc e Demonstrate concepts of: - pattern and logical reasoning Links to development matters: - creating and thinking critically</p>	<p>Computational Thinking Skills: - Demonstrate approaches of: - tinkering, creating, collaboration and perseverance Demonstrate concepts of: - Pattern, logical reasoning, algorithms, abstraction and decomposition Links to ELG: - Listening, attention and understanding Speaking Fine motor skills</p>	<p>Physically follow and give others instructions to move around Explain what a given command does Begin to identify an algorithm to achieve a specific purpose Predict the outcome of a command on a device Build a sequence of commands in steps Understand that a program is a set of</p>	<p>Describe that a series of instructions is a sequence Explain what happens when the order of instructions is changed Recall that a series of instructions can be issued before they are enacted (carried out) Recognise that you can use logical reasoning to predict the outcome of a program Know that programs can be tested and mistakes (bugs) identified</p>	<p>Explain that programs start because of an input and the command order can affect the output Know that a program includes sequences of commands and this is a process Identify that different sequences can achieve the same or different outputs Recognise repetition in an everyday sequence</p>	<p>Explain the term ‘repeat’ and identify repetition in an everyday sequence Identify a loop within a sequence and program Explain different types of loops (indefinite / forever, count controlled) Identify a procedure (function) within a program</p>	<p>Explain that a condition can only be true or false Recognise that both the terms selection / conditionals / conditions are used Know that a count-controlled loop contains a condition Know that condition-controlled loops follow a cycle Recognise differences between a count-controlled loop and a condition-controlled loop</p>	<p>Explain the term ‘variable’ as something that is changeable & give everyday examples eg score at football, count down timer Recognise variables within programs Understand that a placeholder in memory holds a single value & it is used by the program variable and can be updated Recognise that a variable has</p>
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			commands that a computer / device can run	Recognise ways to modify / debug programs			<p>Explain that selection can be used to branch the flow of a program</p> <p>Understand that loops can be used to repeatedly check for a condition</p> <p>Explain the importance of order in “if ..., then..., else statements</p> <p>Use or change a subroutine (function / procedure) and explain its uses</p>	<p>both a name & value</p> <p>Recognise that variables can hold numbers (integers) or letters (strings)</p> <p>Explain the importance of setting up a variable at the start of a program (initialisation)</p> <p>Know that previous values of a variable cannot be accessed</p> <p>Explain that the name of a variable needs to be unique & explains it's role to the human user however it is</p>
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								<p>meaningless to the computer</p> <p>Know how to create and use a subroutine (function / procedure) and explain its uses</p> <p>Demonstrate the importance of order in “if ..., then..., else...” statements</p>
<p><u>Information Technology - Creating Media</u></p>	<p>Links to development matters: - expressive arts and design</p> <p>Explore different materials freely, to develop their ideas about</p>	<p>Links to ELG:-</p> <p>Creating with materials:- safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;</p>	<p>Explain what different freehand tools do when creating digital pictures</p> <p>Recognise a tool can be adjusted to suit my need</p>	<p>Recognise that some digital devices can capture images using a camera</p> <p>Demonstrate how to capture digital photographs and talk about my experiences</p>	<p>Know that text and images can be used together to convey information</p> <p>Describe how different layouts, font styles and effects can suit</p>	<p>Explain that animation is a sequence of images captured from a fixed position</p> <p>Recognise smaller movements help create smoother animation</p> <p>Understand that combining other media will influence the impact</p>	<p>Explain features of video as a visual media format</p> <p>Explain the purpose of a storyboard</p> <p>Recognise that different filming techniques create</p>	<p>Recognise that a website is a set of hyperlinked web pages</p> <p>Recognise the relationship between HTML and the visual displayed</p>

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	<p>how to use them and what to make.</p>	<p>The natural world: - explore the natural world around them, making observations and drawing</p> <p>pictures of animals and plants;</p> <p>Writing: - write simple phrases and sentences that can be read by others</p> <p>Fine motor skills: - begin to show accuracy and care when drawing.</p>	<p>Demonstrate how to combine a range of tools to create a piece of artwork eg add text to picture</p> <p>Explain how a mouse / track pad can be used in different ways</p> <p>Recognise that a keyboard is used to enter text / numbers into a computer</p> <p>Describe how text can be changed or edited</p>	<p>Explain my choices when taking / composing photographs (landscape / portrait, zoom, lighting, retake)</p> <p>Understand that not all photographs / images are real or accurate and they can be changed after being taken</p> <p>Recognise that a computer can be used to create music.</p> <p>Know that music on a computer can be changed in different ways (tempo, instruments, pitch)</p>	<p>different purposes</p> <p>Know that placeholders can be used to structure pages</p> <p>Consider the benefits of using a DTP application</p>	<p>Explain that the animation project must be exported so it can be shared with others</p> <p>Know that audio files can be edited & layered</p> <p>Recognise that sound can be represented visually as a waveform</p> <p>Identify common audio file formats (eg.wav, mp3)</p> <p>Demonstrate that images can be edited using apps to change all or part of an image</p> <p>Demonstrate how the composition / image can be changed (flip, rotate, crop, colours, filters, clone or adding text)</p> <p>Recognise familiar editing tool icons across different applications</p>	<p>different effects</p> <p>Recognise & identify that videos can be edited both on the recording device & a computer with some limitations on the recording device</p> <p>Explain how videos can be improved via reshooting or editing</p> <p>Explain that the video projects must be exported to be shared with others</p> <p>Know that a vector drawing comprises of different objects in its own layer</p>	<p>Describe and recognise components of a web page layout</p> <p>Understand the ownership and use of images & sound (copyright)</p> <p>Recognise the need for a navigation path between web pages (hyperlinks)</p> <p>Discuss the implications of linking to content owned by others</p> <p>Know that 3D models can be created on a computer</p> <p>Recognise that a 3D</p>
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			Consider and talk about my choices made			Start to explain choices and impact of changes made to images	<p>Explain that objects can be grouped together to modify them</p> <p>Recognise how alignment & size guides / tools can help</p> <p>Know that vector images Can be scaled without impact on quality</p> <p>Recognise used of vector images within lives</p>	<p>environment can be viewed from different perspectives</p> <p>Demonstrate that digital tools can be used to manipulate 3D objects</p> <p>Understand that placeholders can create holes in 3D objects</p> <p>Know that artefacts can be broken down into a collection of 3D objects</p>
<u>Information Technology - Data and Information</u>	<p>Links to development matters: -</p> <p>Talk about and identify the patterns around them.</p>	<p>Links to ELG: -</p> <p>Understanding the world - Know some similarities and differences between things</p>	<p>Recognise that objects can be matched, grouped and counted</p>	<p>Know that tally charts can be used to collect data.</p> <p>Compare objects that have been</p>	<p>Identify and select attributes to separate objects into two groups</p>	<p>Identify ways data can be logged over time</p> <p>Know that data loggers capture 'data points'</p>	<p>Explain the term flat file database</p> <p>Know that data can be organised on a computer</p>	<p>Explain the term cells....</p> <p>Identify different software tools to work with data</p>

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			<p>Explain that objects can be grouped by similarities (property / attribute)</p> <p>Know that Data can be collected</p> <p>Recognise that information can be presented in different ways</p>	<p>grouped by attribute</p> <p>Understand that comparison questions can be asked or answered based on the data</p> <p>Know that information can be presented using a computer</p> <p>Give simple examples of why some information should not be shared</p>	<p>Explain that a branching database is an identification tool</p> <p>Recognise that a data set can be structured using yes/no questions</p>	<p>Explain that questions can be answered using a table of data</p>	<p>Explain that tools can be used to select data to answer questions & how data can be filtered or ordered</p> <p>Recognise how 'AND' and 'OR' can refine data</p> <p>Demonstrate how computer programs can be used to visually compare data</p> <p>Explain that presenting information communicates a message</p>	<p>Identify questions that can be answered using spreadsheet data</p> <p>Explain how the data type determines how a spreadsheet can process the data</p> <p>Recognise that cells can be linked and cell values updated</p> <p>Explain that formulas can be used to produce calculated data</p> <p>Explain why data should be organised in a spreadsheet</p>
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<p><u>Digital Literacy - Computing Systems and Networks</u></p>	<p>Links to Education for a connected World:- Online relationships and health, well-being and lifestyle Recognise some ways in which the internet can be used to communicate</p> <p>Identify rules that help keep us safe and healthy in and beyond the home when using technology</p>	<p>Identify the main parts of a computer</p> <p>Identify examples of technology</p> <p>Explain that technology is something that can help us and how it helps us</p>	<p>Identify examples of information technology</p> <p>Explain why rules are needed when using information technology</p> <p>Recognise how IT is used at home, school and beyond</p> <p>Explain how examples of IT help us</p> <p>Describe how IT devices can work together</p> <p>(IT- information technology)</p>	<p>Identify input and output devices</p> <p>Explain that a process acts on an input & produces an output</p> <p>Give examples of components within a network</p> <p>Explain how devices are connected in a network</p> <p>Identify benefits of computer networks</p> <p>Identify different</p>	<p>Identify that both input and output devices are needed to record & play audio</p> <p>Know that sensors are input devices that can collect data</p> <p>Explain how networks are connected to other networks</p> <p>Explain that the internet is the global interconnection of networks</p> <p>Recognise that security is needed on the internet</p> <p>Describe how information can be shared via the World Wide Web</p> <p>Describe how to access the WWW, that it comprises of websites & web pages & different types of media / content</p>	<p>Recognise that a system is a set of interconnected parts that work together</p> <p>Explain that connected computers can transfer data between IT systems</p> <p>IT systems use inputs, processes & outputs</p> <p>Describe IT systems within own life (inc search engines)</p> <p>Explain that search engines create indices (index)</p> <p>Explain the role of a web crawler in</p>	<p>Recognise that agreed protocols (methods) are used to transfer data across networks</p> <p>Explain that data is transferred in packets</p> <p>Recognise that computers connected to the internet allow people in different parts of the world to work together (collaboration)</p> <p>Give examples of opportunities that technology offers to support communication</p>
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				search engines	<p>Explain that the WWW is created, owned and shared by people</p> <p>Recognise the limitations of the WWW media</p> <p>Recognise & evaluate the reliability of content</p> <p>Describe the consequences of unreliable content</p>	<p>creating an index</p> <p>Know that the indices are different for each search engine</p> <p>Know that search results are ranked in order</p> <p>Describe how rules are used to rank results</p> <p>Explain how search engines make money by selling advertising space</p>	<p>on & collaboration</p> <p>Explain that communication & collaboration using the internet can be public or private</p> <p>Explain which types of media can be shared through the internet</p>
<u>Vocabulary and definitions</u>		<p>Playback – re play / play again a recorded sound or images</p> <p>Sound recording - the storage of sound so that a person can hear the same sound more than once.</p> <p>Icon – symbol or picture that represent</p>	<p>Code - the commands that a computer can run</p> <p>Code snippet - a section of a program viewed in isolation</p> <p>Command - a single instruction that can be used in a program to control a computer</p> <p>Algorithm - a precise set of ordered steps that can be followed by a human or a computer to achieve a task.</p>	<p>Initialisation – setting the starting values for a program (set up)</p> <p>Repetition - part of a program where one or more commands are run multiple times (repeated) in a loop</p> <p>Loops - (Count-controlled, condition-controlled, or infinite) commands that repeatedly run a defined section of code</p> <p>Procedure - a named set of commands that can be run multiple times</p>	<p>Condition - a statement that can be either true or false</p> <p>Conditional statements</p> <p>Selection - part of a program where if a condition is met, then a set of commands is run</p> <p>Variable - a named piece of data (often a number or text) stored in a computer's memory, which can be accessed and changed by a computer program</p>		

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		<p>a file, program or object</p> <p>Tools – icons that are used to carry out certain tasks</p> <p>**Only use vocab, definitions below are for KS2</p> <p>Website - a collection of interlinked web pages, stored under a single domain</p> <p>Webpage - a (HTML) document viewed using a web browser</p> <p>Internet - the global system of interconnected computer networks</p> <p>World Wide Web (WWW) - a service provided via the internet that allows access to web pages and other shared files</p>	<p>Sequence – more than one instruction put in an order</p> <p>Program - a set of ordered commands that can be run by a computer to complete a task</p> <p>Route – set of directions from one place to another</p> <p>Predict – think and say what might happen</p> <p>Debug - the process of finding and correcting errors in a program</p> <p>Run - to action the commands in a program</p> <p>Software / application - the programs used to control computers and perform specific tasks</p> <p>Erase – to remove or delete data</p> <p>Fill – changing part of an image to a colour or pattern</p> <p>Undo – removes the last change made to the document, image or file</p> <p>Redo – reverses the last change made by undo</p> <p>Text – words, letters or numbers</p> <p>Select – to chose or highlight text or objects</p> <p>Digital Device - a computer or a device with a computer inside that has been programmed for a specific task</p> <p>Capture – to take a photograph</p> <p>Landscape – format that is wider than high</p> <p>Portrait – format that is higher than wide</p> <p>Framing – position of objects within composition of photograph</p>	<p>Modify - edit the program to change its functionality</p> <p>Refine - simplifying existing programs to make more efficient</p> <p>Onion skinning - technique used in creating animation. The previous frame is faintly shown to help you see where to draw next frame</p> <p>Placeholder – boxes / space that holds the place of the text, image or object</p> <p>Transitions – the way the film or slides moves from one picture to the next</p> <p>Desktop publishing - a method of creating documents that include both text and images</p> <p>Audio – sounds that you can hear</p> <p>Export – the movement of data so it can be accessed in other formats</p> <p>Arrange – to put into order</p> <p>Copyright - legal term describing ownership. Copyright law protects the control you have over the things that you create. It also protects the work of others.</p> <p>Composition - the way that something is put together or arranged</p> <p>Pixel - the smallest single part of a digital image</p> <p>Rotate - to turn or cause something to turn</p> <p>Duplicate – to make a copy</p> <p>Flip – change an image so that the left side becomes the right side or the top becomes the bottom</p> <p>Clone – to copies pixels from one part of an image to another</p> <p>Composite - images that are made up of two or more images / photographs, which are combined to create one image</p>	<p>Physical computing - using specialist hardware to interact with the real world</p> <p>Vector drawing – images created using simple shapes and lines</p> <p>Alignment - lining up text or graphics on a page</p> <p>HTML – hyper text mark up language - a standardised language used to define the structure of web pages</p> <p>Bread crumb trail – helps you get back to where you came from on a webpage (navigation path)</p> <p>Hyperlink - text or media that when clicked, takes the user to another specified location (URL)</p> <p>Subpage – pages that lead from the main home page to other pages below</p> <p>Embed – integration of images, video or other media from another source</p> <p>External link – links from main source to other content</p> <p>Database - a collection of organised data that is stored on a computer that can easily be used or added to</p> <p>Record – a collection of fields about the same object. Can sometimes be a row.</p> <p>Field - a piece of data of a specific type eg first name. Can sometimes be a column.</p> <p>Spreadsheet – data arranged in rows and columns</p> <p>Cell – individual location containing a piece of data</p> <p>Formula – mathematical calculations based on cell information</p>
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			<p>Focus – sharpest and clearest part of the image Editing – altering or changing image or text Filters – size, colouring or shading of an image changed</p> <p>Animation – still images put together to look like movement</p> <p>Group – a set of objects arranged by properties Value – word to describe the label / property Data - A letter, word, number etc. that has been collected for a purpose, but stored without context Data set - A term used to describe a collection of related data (property and count) Organise – putting objects together based on a property Property / Attribute - A word or a phrase that can be used to describe an object such as its colour, size, price or shape Information - Data put into a context that provides meaning</p> <p>Technology - is anything made by people to help us Information technology – is a computer or something that works with a computer</p>	<p>Branching database – data organised by questions with a yes or no answer Decision tree - a tree-like structure that represents a series of decisions and their possible consequences Data point – each capture of data (also known as sampling) Analyse – finding out information and conclusions from the data</p> <p>Input - data that is sent to a program to be processed Output - the result of data processed by a computer</p> <p>Process - a program, or part of a program, that is running on a computer Network - a group of interconnected computing devices Server - a networked computer that manages, stores, and provides data such as files to other computers WAP – wireless access point - A network device that allows wireless computing devices to connect to a wired network Router - A device that manages the flow of data between computer networks Browser / Web browser - a program used to view, navigate, and interact with web pages WWW – World Wide Web - a service provided via the internet that allows access to web pages and other shared files Search engine - search engines are systems used to access information on the WWW – input (entering search term) – process (looks for information) - output (output of results displayed) Routing - the process of path selection in any network Download – transfer data from another device Upload – transfer data to another device</p>	<p>Range – a group of selected cells</p> <p>Computer system - how devices and processes are connected Protocol - an agreed way of doing something Packet – small parts of data shared between two digital devices Data packet - way to transfer data (images, text, video, audio) over the Internet - the global system of interconnected computer networks Index – sorting data by keywords or lists Web crawler / bot – programs used to create a web index by looking for key words or phrases Ranking - a sequence of steps followed by a search engine to determine the order in which search results appear for a particular search term Optimisation - used to improve the position of a website in the search engine results page</p>
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Based on the NCCE Teach Computing units <https://teachcomputing.org/>