Computing Progression Map

Computer Science

Year group	Key skills and 'sticky' knowledge	Key vocabulary	Links to curriculum drivers VOCABULARY DIVERSITY ASPIRATION HEALTH AND WELL BEING (Including aspirational figures to be studied)
Year 1	-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. Create a series of instructions and plan a journey for a programmable toy • Know and understand that algorithms are sets of instructions • Know that an output is the result of an input, e.g. the Bee Bot moved because the direction button was pressed • Know that algorithms are implemented as programs on digital devices • Know that instructions require sequential and precise inputs to achieve a given goal • Know how to debug (find errors) in given instructions • Know how to create a simple program e.g. a sequence of instructions for a Bee Bot to perform given tasks, or control an on screen sprite	Device Control Input Output Direction Algorithm Instruction Sequence Sprite Commands	**Aspiration and Diversity** **Florence Nightingale** - the first person to combine lots of data with good ways of presenting all those numbers so the patterns can be seen. **We are treasure hunters@** Using programmable toys - Summer 2.
Year 2	-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. Understand that algorithms are used on digital devices Write a simple program and test it Predict what the outcome of a simple program will be (logical reasoning). Understand that programs require precise instructions • Know how to write clear and precise algorithms for every day tasks • Know how to make predictions using logical reasoning for given algorithms • Know how to implement simple algorithms on digital devices e.g. Bee Bot, Blue Bot, Daisy the Dinosaur App, Scratch Jr App • Know how to decompose algorithms into small chunks to find errors and debug programs • Know how to use logical reasoning to predict the outcome of simple programs • Know how to improve and change a sequence of commands using a trial and error approach	Precise Logical Reasoning Digital devices Decompose Predict Logical reasoning Trial and error Sequence/sequential	**Aspiration and Diversity** **Grace Hopper** - pioneered the term bug.
Year 3	-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 simple algorithms work and to detect and correct errors in algorithms and programs Write programs that accomplish specific goals	Navigate Sprite Foreground Background Coordinates Commands Network	**Aspiration and Diversity** **Jeannette Wing** - promotes the idea of computational thinking as the key problem solving skill set of computer scientists.

	Design a sequence of instructions, including directional instructions • Know how to navigate the Scratch programming environment • Know how to create and alter a sprite and background • Know how to work with various forms of input to control the sprite (mouse/keys) • Know how to change the position of the sprite by using x and y coordinates • Know how to design and create programs that accomplish specific goals in Scratch (e.g. draw a shape) • Know how to decompose tasks into smaller, separate steps to create an algorithm • Know how to use repetition in programs by identifying patterns • Know how to improve and change a sequence of commands using a trial and error approach -understand computer networks including the internet; how they can provide multiple services, such as the world wide web Understand what computer networks do and how they provide multiple services • Know that digital devices accept inputs, create outputs by following a process • Know how to classify inputs, processes and outputs • Know the similarities and differences between digital and analogue tools • Know that computers in school are connected in a network • Know why computers are networked • Know the difference between the Internet and the World Wide Web (WWW)	Position	
Year 4	-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 simple algorithms work and to detect and correct errors in algorithms and programs Give an 'on-screen' sprite specific instructions that take them from A to B Experiment with variables to control sprites Make an accurate prediction and explain why they believe something will happen • Know how to write increasingly more precise algorithms for use when programming – using repetition • Know how to use simple selection using conditional statements 'If, Then, Else' in programs to make a decision • Know how to use a range of outputs (visual/audio) • Know how to use logical reasoning to systematically detect and correct errors in programs -understand computer networks including the internet; how they can provide multiple services, such as the world wide web Understand how information can be shared online • Know that servers on the internet are located across the planet • Know how networks are physically connected • Know what can be shared using the internet • Know how websites can be shared on the world wide web • Understand how email is sent across the internet in packets	Precise Repetition Selection Conditional Statements Visual/audio Servers Email Internet Physical	**Aspiration and Diversity** **Charles Babbage** – A mathematician, philosopher, inventor and mechanical engineer, Babbage originated the concept of a digital programmable computer.
Year 5	-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	Variables Timers Counters Conditionals	**Aspiration and Diversity** **Tim Berners-Lee** – Invented World Wide Web. With Robert Cailliau, sent first

	-use logical reasoning to explain how simple algorithms work and to detect and correct errors in algorithms and programs Use technology to control an external device Develop a program that has specific variables Combine sequences of instructions and procedures to turn devices on and off • Know how to design and create a game platform incorporating skills learnt • Know how to evaluate their own work, and that of peers, identifying errors. • Know how to use variables within programs e.g. timers and score counters using conditional statements e.g. if the timer reaches 0, the game ends • Know how to create programs that control or simulate physical systems (crumble boards/Lego Mindstorms) • Know how to evaluate, and debug algorithms -understand computer networks including the internet; how they can provide multiple services, such as the world wide web -appreciate how search results are selected and ranked Understand how search results are selected and ranked Identify and know examples of physical computer systems • Know how we view web pages on the internet • Know how pages are ranked in a search engine and that the quality of results can vary • Know and name a range of computer networks and how these connect people e.g. social media, internet, intranet and cloud services • Know that computers can be connected together to form systems • Know and recognise the role of computer systems in our lives • Know how information is transferred over the internet	Simulate Evaluate Social media Intranet Cloud services External Platform	HTTP communication between client and server. **Larry Page** - along with his co-founder Sergey Brin, invented Google (link to 'appreciate how search results are selected and ranked')
Year 6	-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 simple algorithms work and to detect and correct errors in algorithms and programs Write a program that combines repetition, selection and variables Write generic code that can be used across multiple projects • Know how to use a range of sequence, selection and repetition commands, combined with variables to implement game designs • Know how to broadcast messages • Know how to write generic code for use across multiple projects • Know how to critically evaluate projects, suggesting improvements • Know how to decompose code into sections for effective debugging -understand computer networks including the internet; how they can provide multiple services, such as the world wide web -appreciate how search results are selected and ranked Be aware that some search engines may provide misleading information • Know how to effectively use a search engine, • Know that to ensure information is valid and accurate, cross referencing of different sources is necessary • Know and understand the need to critically evaluate information	Broadcast messages Generic code Critically evaluate HTML Sources Cross reference Critically evaluate	**Aspiration and Diversity** **Hedy Lamarr** - During WWII she co-invented frequency hopping: constantly jumping from one frequency to another. **Alan Turing** - British scientist and a pioneer in computer science. During World War II, he developed a machine that helped break the German Enigma code. (Both wider links to WW2 topic)

Digital Literacy

Year group	Key skills and 'sticky' knowledge	Key vocabulary	Links to curriculum drivers VOCABULARY DIVERSITY ASPIRATION HEALTH AND WELL BEING (Including aspirational figures to be studied)
Year 1	-Recognise common uses of information technology beyond school Talk about some of the IT uses in their own home • Know a range of uses for information technology beyond school, e.g. a library -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 Use technology safely Keep personal information private Use a website safely • Know, discuss and understand the individual elements of SMART rules acronym: Safe, Meet, Accepting, Reliable, Tell • Know that there are people online who could make you feel sad, embarrassed or upset, and give examples of when and how to speak to a trusted adult • Know how to use the internet, with adult support, to communicate with known people and use key words in search engines • Know that information posted online can be copied, and begin to know what personal information should be kept offline • Know and explain that work created digitally belongs to them; it's their idea, or has their name on • Know how to safely log out of websites and equipment when tasks are finished	SMART rules Safe, Meet, Accepting, Tell Information technology Online Trusted adult Internet Offline Digitally Log out	**Health and Well Being** Safer Internet Day
Year 2	-Recognise common uses of information technology beyond school Know how technology is used in school and outside of school • Know more ways in which information technology is used beyond school, e.g. how a supermarket works • Know how technology can be connected and help people • Know that the internet is a source of information e.g. books, newspapers, tv programmes • Know which devices at home are connected to the internet -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	Source of information Connected Appropriate Permission Identity Search engine	**Health and Well Being** Safer Internet Day

	Know where to go for help if concerned. • Know that some websites are more child friendly and appropriate than others • Know which search engines are acceptable to use to stay safe • Know which websites are safe to use in school, and at home, with permission • Know how people's identity online can be different to their identity in real life, and what these differences could be • Know examples of ways to communicate online • Know examples of bullying behaviour, and what this might look like online, and what can be done about this • Know and explain rules and guidance for using technology • Know how to report unsafe things online		
Year 3	-use technology safely ,respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact -be discerning in evaluating digital content Use technology respectfully and responsibly Know different ways they can get help if concerned • Know what is meant by the term identity, how you can represent yourself online and ways in which you can change your identity e.g. using an avatar • Know and understand the term digital footprint, being able to give positive and negative examples • Know the need to be careful before sharing things online, and the consequences of this • Know and understand the term privacy settings, and how these can be applied • Know simple strategies for creating and keeping passwords private, and why they are important • Know that websites/games implement age restrictions to keep users safe • Know different examples of technology specific forms of communication e.g. emojis, text speech • Know and explain the risks of communicating online with people you don't know well • Know the difference between knowing someone online, and knowing someone in real life • Know what bullying is, and explain how this may happen online, explaining strategies to stop this from happening	Digital footprint Privacy settings Devices Implement Technology specific Emoji Strategies	**Health and Well Being** Safer Internet Day
Year 4	-use technology safely ,respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact -be discerning in evaluating digital content Recognise acceptable and unacceptable behaviour using technology • Know how online identities can be different to real life identities • Know the importance of reflecting on their online behaviour, and the impact this can have on their digital footprint, thinking carefully about how content posted online might affect how others feel about them (their reputation) • Know and understand that the same friendship values apply online as to face to face • Know strategies for safe and fun experiences in a range of online social environments, giving examples of how to be respectful to others online. • Know a range of online technologies where bullying might take place, and the ways in which this might happen	Reputation Online social environments Online technologies Reliable Accurate Copyright Opinion Belief Fact Password Passcode	**Health and Well Being** Safer Internet Day

	• Know that some information on the internet is protected by copyright, consider who has the right to use it, with examples • Know that not all sources of information on the internet are reliable/ accurate, knowing the difference between opinion, belief and fact • Know how technology can distract from other things, identifying times or situations where limiting the amount of time of technology might be of use, and strategies to support this • Know what a strong password is, and explain strategies for keeping personal information private in a range of contexts		
Year 5	-use technology safely ,respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact -be discerning in evaluating digital content -understand the opportunities they (computer networks, incl. internet) offer for communication and collaboration Understand that children have to make choices when using technology and that not everything is true and/or safe • Know and explain how online identities can be copied, modified or altered • Know, and be familiar with scenarios associated with online risk and danger, and what to do about them • Know that all online activity can be traced • Know how to make positive contributions to online communities, giving examples • Know when someone is upset, hurt or angry online, and know strategies to support • Know how to block and report abusive content/users on a range of platforms • Know and describe helpline services that are there to support , and how they can be contacted e.g. Childline • Know the difference between online mis-information (accidental) and dis-information (deliberate) • Know what it means to be sceptical, and understand the term hoax • Know that not all information found online is honest, accurate or legal, and can explain why and how this might happen • Know ways in which technology can affect sleep and describe some of the issues, knowing strategies, tips or advice to overcome these, to promote healthy sleep • Know how to create and use strong and secure passwords • Know and explain how many free apps or services may read and share private information from devices • Know when it is acceptable to use the work of others, giving examples • Know how to work collaboratively to create a blog	Modified Scenario Risk/danger Online communities Traced Positive contributions Platforms Abusive content/users Mis-information Dis-information Sceptical Hoax Blog Collaboratively	**Health and Well Being** Safer Internet Day
Year 6	-use technology safely ,respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact -be discerning in evaluating digital content -understand the opportunities they (computer networks, incl. internet) offer for communication and collaboration Be increasingly aware of the potential dangers in using aspects of IT and know when to alert someone if feeling uncomfortable • Know that not all online information can be trusted • Know how to check and identify the reliability of websites • Know and understand different ways to collaborate on projects online • Know and understand the need to critically evaluate information found online	Reliability Collaborate Vlog Critically evaluate Influence Manipulation Persuasion Inappropriate content Plagiarism Copyright Data protection	**Health and Well Being** Safer Internet Day

	• Know how and why some people may present opinions as facts, being able to define the terms 'influence', 'manipulation' and 'persuasion', and how these might be encountered online (advertising, ad targeting) • Know how to identify, and flag inappropriate content • Know and be aware of the terms: plagiarism, copyright and data protection in relation to their own work • Know and be able to describe issues online that might make others feel sad, worried, uncomfortable, or frightened, giving examples of ways to help both online and offline • Know why you should keep asking for help until you get the help you need • Know how impulsive content and communication online may cause problems • Know ways to support others online, demonstrating ways of reporting problems, understanding responsibilities for the well being of others • Know how to capture bullying content as evidence (screen grabs, profile links) • Know how to develop an online reputation which will allow others to form a positive opinion • Know and describe the common systems that regulate age related content (PEGI, BBFC and parental warnings) and describe their purpose • Know, assess and action different strategies to limit the impact of technology on health (nightshift mode, regular breaks, correct posture, sleep, diet and exercise) and explain the importance of self-regulation of the use of technology, with strategies • Know to use different passwords for a range of online services, and know what to do if passwords are lost or stolen • Know and explain simple ways to increase privacy on apps, and explain ways in which some online content targets people to gain money or information, describing strategies to help identify content • Work collaboratively to create a piece of work (Google docs/Teams/Vlog)	Impulsive content Screen grabs PEGI BBFC Self regulation	

Information Technology

Year group	Key skills and 'sticky' knowledge	Key vocabulary	Links to curriculum drivers VOCABULARY DIVERSITY ASPIRATION HEALTH AND WELL BEING (Including aspirational figures to be studied)
Year 1	Use technology purposefully to create, organise, store, manipulate and retrieve digital content Record sound and video and play back using an ipad Create, store and retrieve digital content • Know how to safely turn on and off a laptop, computer or other device. • Know the different parts of a computer/laptop e.g mouse, keyboard • Know where numbers, letters and symbols are located on the keyboard (use of Shift key for symbols). • Know and input username and password to log onto the device (laptop/computer). • Know the use of the Enter key. • Know how to locate a specific program (Word, PowerPoint, Internet). • Know how to save a document into the correct folder on the server. • Know how to open a saved document. • Use at least 2 different types of software to present information, e.g. a booklet using 'Book Creator' app on ipad, inserting images from camera roll and text.	Curser Mouse Keys Keyboard Upper/lower case Username Password Program Word processor Document File Save Retrieve	Health and Wellbeing – learning about ways technology can be used to communicate with people we don't live with. Continuous provision -iPads always available to access and develop independence to record learning. Ebook about vehicles/transport - Spring 1 Create card digitally for Easter - Spring 2 Talking story book - Summer 1
Year 2	Use technology purposefully to create, organise, store, manipulate and retrieve digital content Organise, retrieve and manipulate digital content • Know how and when to use caps lock vs shift key for capital letters. • Know how to locate the 'Home' Tab in Microsoft Office programs. • Know how to change the size, font and colour of text. • Know how to copy and paste images from the internet. • Know how to insert images from a file. • Know how to insert a text box. • Know how to input information/data to achieve an output – pictogram, bar chart, table. • Use at least two different types of software to present information.	Tab Insert Font Text box Output Data Copy Paste Data	
Year 3	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	Layout Orientation Portrait	PowerPoint based on visit to Rand Farm

	accomplish given goals, including collecting, analysing, evaluating and presenting data and information Discern when it is best to use technology and where it adds little or no value Use a range of software for similar purposes Collect and present information • Know how to use the 'Layout' tab in Microsoft Word to change the orientation of a document. • Know how to add, remove and format a slide in Microsoft PowerPoint. • Know how to insert pictures alongside text. • Know how to manipulate pictures using the 'Format' tab to rotate, bring forwards and backwards. • Know how to copy and paste texts and images • Know how to evaluate own and peers work by commenting on its effectiveness against given criteria. • Know how to input information to create a **chosen** output – e.g. graph, and insert to a document. • Use at least two different types of software to present information. • Know that information can be imported and exported via external drives e.g. USB Use search technologies effectively Navigate the web to complete simple searches • Know that the internet contains fact, fiction and opinions, and how this can affect their reliability. • Know a range of safe search options. • Know that URL (Uniform Resource Locator) stands for the address of a world wide web page • Know how to reach a desired web page.	Landscape Format Rotate Manipulate Evaluate Effectiveness Imported Exported USB Input Output URL Reliability	Research on barn owls (Autumn 1) Research on volcanoes and earthquakes (Summer 1)
Year 4	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 Select and use software to accomplish given goals, e.g. produce and upload a podcast, create a PowerPoint and export as a video • Know and understand how and why 'Transitions' are used when combining multiple slides in a PowerPoint presentation. • Know where to locate the 'Transitions' menu in Microsoft PowerPoint. • Know how to choose an appropriate transition for purpose and effect. • Know and understand how and why 'Animations' are used to manipulate text and images within a slide presentation. • Know where to locate the 'Animations' menu in Microsoft PowerPoint. • Know how to choose an appropriate animation for purpose and effect. • Know how to evaluate, edit and improve own, peers and published work by commenting on its effectiveness against given criteria. • Use at least two different types of software to present information.	Transitions Animations Appropriate Published Edit Improve Manipulate	Create music online **Ada Lovelace** points out that once other things, like music, are represented by numbers computers can be much more than just calculators.
Year 5	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 Analyse and evaluate information reaching a conclusion that helps with future projects	Presentation Diverse Green screen Collaboratively Blog	Green screen space report **Katherine Johnson, Mary Jackson and Dorothy Vaughan:**

	Know how to work collaboratively on digital projects • Know how to choose which presentation program/app would best meet the needs of the project. • Know how to create more diverse projects e.g. using green screen and animation. • Know how to upload a video/image from one location to another. • Know how to work collaboratively to create a blog, sharing information and personal views. • Know the difference between a column and a row in a spreadsheet, and understand these are made up of cells. • Know how to identify and write within a cell • Know how to input data by inserting into columns and cells • Know how to highlight specific cells to be used to create a chart/graph • Know where the 'Insert' – 'Charts' menu is located and how to create the most appropriate chart/graph. • Use at least two different types of software to present information. Use search technologies effectively Understand that not all search results are reliable • Know that search results vary in reliability, and to be objective when reviewing results.	Column Row Cell Highlight Menu	Space-Age Computations (Science Link)
Year 6	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 Present data collected in a variety of ways that makes it easy for others to understand • Know how to add: music, hyperlinks and use slideshow tab edit timings to create powerful presentations. • Choose the most appropriate software for given tasks, with justification. • Know what HTML (Hypertext Markup Language) is and recognise HTML tags • Know how to create a webpage using HTML • Work collaboratively to create a piece of work (Google docs/Teams) • Use at least two different types of software to present information.	Hyperlink Software Justification Vlog HTML	WW2 PowerPoint

EYFS

Communication and Language: Listening, Attention and Understanding

Foundation 1	
Links to Curriculum Drivers	Language Development Focus Diversity – range of books and stories from different cultures, communities, countries with a diverse range of characters

Language	I think … It is … because … It has … happened because … *What can you see? Who do you think …? Why do you think this is a …? Why did … happen?*				
	After one third of F1	**After two thirds of F1**	**End of F1**		**Vocabulary**
Understanding technology	I can anticipate actions and sounds from an action toy. I can operate some IT or mechanical toys.	I can start to identify objects according to simple properties. I can turn a toy/technological item on and off. I can show an understanding of remote controls.	I can find the right tool for the job. I can show an interest in technological items. I can begin to use some features of the iPad. I can use a remote control purposefully to produce a wanted action.		Work, power, buttons, press, iPad, battery, remote, phone, turn, on, off, camera
Foundation 2					
Links to Curriculum Drivers	Language Development Focus Diversity – range of books and stories from different cultures, communities, countries with a diverse range of characters				
Language	I think … because … It is … because … It has … because … happened because … *Why do you think this is a …? What can you see? Why did … happen?*				
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**	**Vocabulary**
Understanding technology	I can find the right tool for a job. I can show an interest in technological items and making them work.	I can take a photograph on an iPad and review it.	I know that technology needs power to work. I know that there are rules when using technology.	I can select and use technology for a purpose.	I know that we can use technology to find out information. I can record a video on an iPad. I can input instructions into a piece of technology.		Record, video, photograph, review, charge, battery, power, internet, safety, rules, pop-up, instruction