Progression of Skills and Knowledge in Computing

	EYFS		KS1		LKS2			UKS2		KS3
	Nursery	Reception	Y1	Y2	Y3	Y4	Y4/5	Y5	Y6	
			-Technology around us. -Digital paintings. -Digital writing. -Grouping data. -Moving a robot. -Introduction to animations.	-Information technology in our world. -Digital photography. -Making music. -Pictograms. -Robot algorithms. -An introduction to quizzes.	-Connecting computers. -Branching databases. -Desktop publishing: wonders of Antarctica. -Stop-frame animation: an Egyptian adventure. -Sequencing in music. -Events and actions in programs.	-Audio editing: a Saxon podcast. -The internet. -Photo editing. -Data logging. -Repetition in games. -Repetition in shapes.	-The Internet. -Photo Editing. -Data Logging. -Flat file databases. -Repetition in games. -Selection in quizzes (extreme weather focus).	-Sharing information. -Video editing. -Vector drawing. -Flat file databases. -Selection in physical computing. -Selection in quizzes (Greek focus).	-Internet communication. -Webpage creation: where does our energy come from? -Introduction to spreadsheets. -3D modelling. -Variables in gaming. -Sensing.	
Tier 3 Vocabulary (new terms introduced progressively and revisited regularly).	On Off Battery Power Mouse Screen Icon App Drag Click		Algorithm Attribute Code Code snippet Command Computer Data Debugging Information Information technology Object Program Property Run Technology		Algorithm Attribute Browser Code Code snippet Command Computer Computer network Computer system Condition Condition-controlled loop Count-controlled loop Data Data set Debugging Decompose Digital device Domain name Execute (run) Hardware HTML (Hyper Text Mark-up Language) Hyperlink Infinite loop Information Input Input device Internet Loop Loop (condition-controlled)			Loop (count-controlled) Loop (infinite) Network Object Output Output device Procedure Process Program Repetition Router Run (execute) Selection Server Software Stored Subroutine Switch (network switch) URL (Uniform Resource Locator) Variable Web Web address Web browser Web page Website Wi-Fi WAP (Wireless Access Point) WWW (World Wide Web)	

Computer Systems and Networks	-Turn on an operate some digital equipment. -Take an interest in real objects (cameras, mobile phones, tablets). -Begins to recognise that information can be retrieved from digital devices and the internet. -Recognise icons from apps. -Begins to navigate apps and websites using drop down menus.	-Begin to interact with age-appropriate computer software. (Paint). -Use the internet with adult supervision to retrieve information of interest.	-Identify technology. -Identify a computer and its main parts. -Use a mouse in different ways. -Use a keyboard to type and edit text. -Create rules for using technology responsibly.	-Identify common uses of technology beyond the school (shops, hospitals and libraries) and how they benefit us. -Show how to use information technology safely. -Recognise that choices are made when using information technology.	-Explain how digital devices function. -Recognise how digital devices can change the way we work. -Identify input and output devices. -Explain how a computer network can be used to share information. -Explore how digital devices can be connected (wireless access points and switches). -Name the physical components of a network.	-Describe how networks physically connect to other networks. -Recognise how networked devices make up the internet. -Outline how websites can be shared via the World Wide Web. -Describe how content can be created, added and accessed on the World Wide Web. -Evaluate the consequences of unreliable content.	-Describe how networks physically connect to other networks. -Recognise how networked devices make up the internet. -Outline how websites can be shared via the World Wide Web. -Describe how content can be created, added and accessed on the World Wide Web. -Evaluate the consequences of unreliable content.	-Recognise the role of computer systems in our lives. -Explain that computers can be connected together to form systems. -Identify how information is transferred over the internet. -Identify how sharing information online lets people in different places work together. -Contribute to a shared project online (Scratch). -Evaluate different ways of working together online.	-Understand computer networks, including the internet, and how they can provide multiple services such as the World Wide Web. -Use a search engine effectively. -Explore how search engines select results and how they are ranked. -Recognise why the order of results is important, and to whom. -Recognise how we communicate and collaborate using technology. -Evaluate eight different methods of online communication (e.g. SMS, email and video call).	-Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. -Understand several key algorithms that reflect computational thinking (for example, ones for sorting and searching). Use logical reasoning to compare the utility of alternative algorithms for the same problem. -Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures (for example, lists, tables or arrays) and design and develop modular programs that use procedures or functions.

Creating Media	-Enjoys drawing on touch screen technology. -Shows an interest in illustrations and words in digital books. -Enjoys digital books independently.	-Create content such as a video recording, stories and/or drawing a picture on a screen.	-Describe what different freehand tools do. -Use the shape and line tools. -Explore how the look of text can be changed on a computer. -Add and remove text on a computer. -Make careful choices when changing text and painting a digital picture. -Explain choices for tools used in painting software. -Use a computer independently to write and paint a picture. -Compare writing and painting a picture on a computer and on paper.	-Know what devices can be used to take photographs. -Use a digital device to take, store and retrieve a photograph. -Identify positioning, framing and the subject as the components of a good photograph. –Explore lighting and focus as tools to manipulate and improve photographs. -Use Pixlr tools to adjust lighting to change an image. -Express how music can make us feel. -Identify that there are patterns in music. -Experiment with sound using a computer. -Identify that music is made from a series of notes. -Purposely create digital music that represents an animal. -Review and refine computer work.	-Explain that animation is a sequence of drawings or photographs. -Relate animated movement with a sequence of images and use to plan an animation. -Identify the need to work consistently and carefully. -Review and improve an animation. -Evaluate the impact of adding other media to an animation. -Recognise how text and images convey information. -Recognise that text and layout can be edited. -Choose appropriate page settings. -Add text and images to create a magazine cover. -Consider how different layouts can suit different purposes. -Consider the benefits of desktop publishing (e.g. newspapers, selling a house or a birthday card).	-Identify that sound can be digitally recorded. -Use Audacity to record sound. -Explain that a digital recording is stored as a file. -Explain that audio can be changed through editing. -Show that different types of audio can be combined and played together. -Evaluate editing choices made. -Identify that digital images can be changed. -Change the composition of an image. -Explore cloning and cropping as tools for changing images for different uses. -Make good choices when selecting different tools. -Recognise that not all images are real. -Evaluate how changes can improve an image.	-Identify that digital images can be changed. -Change the composition of an image. -Explore cloning and cropping as tools for changing images for different uses. -Make good choices when selecting different tools. -Recognise that not all images are real. -Evaluate how changes can improve an image.	-Recognise video as moving pictures, which can include audio. -Identify digital devices that can record video. -Capture video using a digital device. -Recognise the features of an effective video (e.g. framing). -Identify that video can be improved through reshooting and editing. -Consider the impact of the choices made when making and sharing a video. -Identify that drawing tools can be used to produce different outcomes. -Create a vector drawing by combining shapes. -Use tools to achieve a desired effect. -Recognise that vector drawings consist of layers. -Group objects to make them easier to work with. -Evaluate my vector drawing.	-Review an existing website and consider its structure. -Plan the features of a web page (e.g. name, logo and header). -Consider acceptable and unacceptable use, and the ownership and use of images (copyright). -Recognise the need to preview pages. -Identify how navigation paths help to keep track of where you have been on a website. -Recognise the implications of linking to content owned by other people. -Use a computer to create and manipulate three-dimensional (3D) digital objects. -Compare working digitally with 2D and 3D graphics. -Construct a digital 3D model of a physical object. -Identify that physical objects can be broken down into a collection of 3D shapes. -Design a digital model to accomplish a given goal by combining 3D objects. -Develop, analyse, evaluate	-Understand simple Boolean logic (for example, AND, OR and NOT) and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers (for example, binary addition, and conversion between binary and decimal). -Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems. -Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits. -Undertake creative projects that involve selecting, using, and combining

									and improve a digital 3D model.	multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users. -Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.
Data and information			-Label and identify objects that can be counted around the classroom. -Describe objects in different ways. -Count objects with the same properties (e.g. colour). -Compare groups of objects. -Answer questions about groups of objects.	-Practise counting and comparing objects using tally charts. -Recognise that objects can be represented as pictures. -Use technology purposely to create a pictogram. -Select objects by attribute and make comparisons. -Understand that people can be described by attributes. -Purposely organise and present data using a computer (Just2Data).	-Create questions with yes/no answers. -Identify the object attributes needed to collect relevant data. -Create a branching database. -Identify objects using a branching database. -Explain why it is helpful for a database to be well structured. -Compare the information shown in a pictogram with a branching database.	-Explain that data gathered over time can be used to answer questions. -Use a data logger to collect data automatically. -Identify that a data logger collects 'data points' from sensors over time. -Use data collected over a long duration to find information (e.g. light over the period of a day). -Identify the data needed to answer questions. -Use collected data to answer questions.	-Explain that data gathered over time can be used to answer questions. -Use a data logger to collect data automatically. -Identify that a data logger collects 'data points' from sensors over time. -Use data collected over a long duration to find information (e.g. light over the period of a day). -Identify the data needed to answer questions. -Use collected data to answer questions.	-Use a form to record information. -Compare paper and computer-based databases. -Outline how grouping, and then sorting, data allows us to answer questions. -Explain that tools can be used to select specific data. -Explain that computer programs can be used to compare data visually. -Apply knowledge of a database to ask and answer real-world questions.	-Identify and collect questions which can be answered using data. -Explain that objects can be described using data. -Explain that formula can be used to produce calculated data. -Apply formulas to data, including duplicating. -Create a spreadsheet using formulas to plan an event. -Choose suitable ways to present data and information (e.g. pie charts, tables or charts).	-Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns.

Programming			-Explain what a given command will do. -Act out a given word. -Combine forwards and backwards commands to make a sequence. -Combine four direction commands to make sequences. -Plan a simple program. -Find more than one solution to a problem. -Choose a command for a given purpose. -Show that a series of commands can be joined together. -Identify the effect of changing a value. -Explain that each sprite has its own instructions. -Design the parts of a project. -Use an algorithm to create a program.	-Use Beebots to describe a series of instructions as a sequence. -Explain what happens when we change the order of instructions. -Use logical reasoning to predict the outcome of a simple program (series of commands). -Explain that programming projects can have code and artwork. -Design an algorithm. -Create and debug a simple program. -Explain that a sequence of commands has a start and an outcome. -Create a program using a given (and then own) design. -Manipulate a given design. -Decide how a project can be improved.	-Use Scratch to explore a new programming environment. -Identify that each sprite is controlled by chosen commands. -Explain that a program has a start. -Recognise that a sequence of commands can have an order. -Change the appearance of a created project. -Create a project from a task description. -Explain how a sprite moves in an existing project. -Create a program to move a sprite in four directions. -Adapt a program to a new context. -Develop a program by adding features (eg. line colour and thickness). -Identify and fix bugs in a program. -Design and create a maze-based challenge.	-Identify that accuracy in programming is important. -Create a program in text-based language. -Use the repeat command in a count-controlled loop. -Modify a count-controlled loop to produce a given outcome. -Decompose a program into parts. -Create a program that uses count-controlled loops to produce a given outcome. -Develop the use of count-controlled loops in a different programming environment. -Identify that in programming there are infinite loops and count controlled loops. -Develop a design which includes two or more loops which run at the same time. -Modify an infinite loop in a given program. -Design and create a project that includes repetition.	-Develop the use of count-controlled loops in a different programming environment. -Identify that in programming there are infinite loops and count controlled loops. -Develop a design which includes two or more loops which run at the same time. -Modify an infinite loop in a given program. -Design and create a project that includes repetition. -Control a simple circuit connected to a computer. -Write a program that includes count-controlled loops. -Explain how simple algorithms work, and that a loop can stop when a condition is met (eg. number of times). -Conclude that a loop can be used to repeatedly check whether a condition has been met. -Design a physical project that includes selection. -Create a controllable system that includes selection. -Detect and correct errors in algorithms and programs.	-Control a simple circuit connected to a computer. -Write a program that includes count-controlled loops. -Explain how simple algorithms work, and that a loop can stop when a condition is met (eg. number of times). -Conclude that a loop can be used to repeatedly check whether a condition has been met. -Design a physical project that includes selection. -Create a controllable system that includes selection. -Detect and correct errors in algorithms and programs. -Explain how selection is used in computer programs. -Relate that a conditional statement connects a condition to an outcome. -Explain how selection directs the flow of a program. -Design and create a program which uses selection.	-Define a 'variable' as something that is changeable. -Explain why a variable is used in a program. -Work with variables, and various forms of input and output, to solve problems and improve a game. -Design a project that builds on a given example to achieve a specific goal. -Solve problems by decomposing into smaller parts. -Use own design to create a project that controls or simulates physical systems. -Evaluate own project. -Create a program to run on a controllable device. -Explain that sequence, selection and repetition can control the flow of a program. -Update a variable with a user input. -Use a conditional statement to compare a variable to a value. -Design and develop a project that uses inputs and outputs on a controllable device.	

							algorithms and programs.		-Use technology safely, respectfully and responsibly. -Recognise acceptable/ unacceptable behaviour and identify a range of ways to report concerns about content and contact.	