Knowledge Progression: Computing

Year group	Autumn A	Spring A	Summer A	Autumn B	Spring B	Summer B
Year 1	**Topic: Improving Mouse Skills** - "log in" and "log out" means to begin and end a connection with a computer - A computer and mouse can be used to click, drag, fill and select. - Passwords are important for security and to keep us safe. **Topic: Programming Bee Bots** - To understand some of the basic functions of a Bee-Bot. - To know that you can use a camera/tablet to make simple videos. - To know that algorithms move a Bee-Bot.	**Topic: Algorithms Unplugged** - To understand that an algorithm is an instructions. - To understand that to solve problems we break them into smaller chunks. - To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. **Topic: Digital Imagery** - To understand that holding the camera or device still and considering angles and light are important to take good pictures. - To know that you can edit, crop and filter photographs. - To know how to search safely for images online.	**Topic: Rocket to the Moon** - To know that when we create something on a computer it can be more easily saved and shared than a paper version. - To know some of the simple graphic design features of a piece of online software. -To know that data can be sorted using a computer. **Topic: Online Safety** - To know what to do if you feel unsafe or worried online – tell a trusted adult. - To know that people you do not know on the internet (online) are strangers and are not always who they say they are. - To know that to stay safe online it is important to keep personal information safe.	**Topic: What is a Computer?** - To recognise a computer in their surroundings. - To know computers can be given instructions to achieve goals. - To know you can work together on a computer. **Topic: Word Processing** - To know that practicing typing makes you quicker. - To know that there are different font styles, sizes and colours. - To know that you can "copy and paste".	**Topic: Scratch Jr.** - To know that computers use a special language. - To understand that the character in ScratchJr can be is controlled. - To know that you can write a program to make things happen on screen. **Topic: Algorithms and Debugging** - To understand that machines can learn. To know that you can set an instructions (or instructions). To know that we can solve programming problems.	**Topic: Stop Motion** - To understand that an animation is made up of a sequence of photographs. - To know the pictures are called frames. - To know that software can help make animations. **Topic: Online Safety** - To understand is it important to be safe online. -To understand the difference between online and offline. - To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.'
Year 2	**Topic: Improving Mouse Skills** - To know that logging in and out safety is important - A computer and mouse can be used to add backgrounds, text, layers, shapes and clip art. - Passwords are used to protect important information. **Topic: Programming Bee Bots** - To understand all the basic functions of a Bee-Bot. - To know explain what is happening in a video they have recorded. - To know that accurate algorithms will move a Bee-Bot to a chosen destination.	**Topic: Algorithms Unplugged** - To understand that an algorithm is followed in the exact order they are written. - To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. - The term computer "bug" was inspired by a real insect. **Topic: Digital Imagery** - To understand that holding the camera or device still and considering angles and light are important to take good pictures. - To know that you can edit, crop and filter photographs. - To know how to search safely for images online.	**Topic: Rocket to the Moon** - To know that devices that are connected to the internet. - To control the mouse by clicking and resizing of images to create different effect. -To know that a spreadsheet is an electronic 'table' for sorting data. **Topic: Online Safety** - To know that personal information should not be shared publicly. - To know that the internet is many devices connected to one another. - To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.	**Topic: What is a Computer?** - To know the difference between a desktop and laptop computer. - To know some input devices that give a computer an instruction about what to do (output). - To know that computers often work together. **Topic: Word Processing** - To know that touch typing is the fastest way to type. - To know that I can make text a different style, size and colour. - To know that "copy and paste" is a quick way of duplicating text.	**Topic: Scratch Jr.** - To know that coding is writing in a special language so that the computer understands what to do. - To understand that the character in ScratchJr is controlled by the programming blocks. - To know that you can write a program to create a musical instrument or tell a joke. **Topic: Algorithms and Debugging** - To understand what machine learning is and how it enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem.	**Topic: Stop Motion** - To understand that longer animation require more frames. - To know that small changes in my frames will create a smoother looking animation. - To understand what software creates simple animations and some of its features e.g. onion skinning. **Topic: Online Safety** - To understand what information I should not post online. - To know how to create a strong password. - To understand that not everything I see or read online is true.

Year 3	**Topic: Video Trailers** - To know that there are different types of camera shots. - To know that I can edit photos and videos using film editing software. - To understand that I can add text to my video. **Topic: Journey Inside a Computer** - To know the roles that inputs and outputs play on computers. - To know that computers are made of components and that hey work together. - To know what a tablet is.	**Topic: Comparison Cards Databases** - To know that a database is a collection of data stored in a logical, structured and orderly manner. - To know that computer databases can be useful for sorting and filtering data. - To know that different visual representations of data can be made on a computer. **Topic: Programming Scratch** - Scratch is a programming language and some of its basic functions. - How to use loops to improve programming. - How decomposition is used in programming. - That you can remix and adapt existing code.	**Topic: Networks** - To understand that a network is a group of interconnected devices. - To know that a server is central to a network and responds to requests made. - To know that the internet connects all the networks around the world. **Topic: Online Safety** - That not everything on the internet is true. - The internet can affect people's moods and feelings. - Privacy settings limit who can access important personal information, such as names, ages, gender etc.	**Topic: Collaborative learning** - To understand the benefits of working collaboratively online. - To know what type of comments and suggestions on a collaborative document can be helpful. - To know that you can use images, text and transitions in presentation slides. **Topic: Further Coding with Scratch** - That a variable is a value that can change. - Know what an 'if' block is used with variables. - That variables are integral to programming.	**Topic: Website Design** - To know that website are information that exists online. - To know that websites are similar to information books. - To know that websites effective websites are fun and engaging. **Topic: Investigating Weather** - To know that computers can be connecting to the real world. - To know that a weather machine is an automated machine that respond to sensor data.	**Topic: Computational Thinking** - To know that solving a problem may require more than one skill. - To understand that code may be written in patterns. - To understand that algorithms can be used for a number of purposes e.g. animation, games design etc. **Topic: Online Safety** - To understand people often use online to make purchases. - To understand that technology can be a distraction. - To understand what behaviours are appropriate in order to stay safe and be respectful online.
Year 4	**Topic: Video Trailers** - To know different types of camera shots can make my photos or videos look more effective. - To know that I can edit photos and videos using film editing software. - To understand that I can add transitions to my video. **Topic: Journey Inside a Computer** - To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive. - To know how a tablet is different from a laptop/desktop computer.	**Topic: Comparison Cards Databases** - To know that a database is a collection of data stored in a logical, structured and orderly manner. - To know that computer databases can be useful for sorting and filtering data. - To know that different visual representations of data can be made on a computer. **Topic: Programming Scratch** - Scratch is a programming language and some of its basic functions. - How to use loops to improve programming. - How decomposition is used in programming. - That you can remix and adapt existing code.	**Topic: Networks** - To know the components that make up a network (Wireless access point/WAP, Network switch, Router, Server and devices). - To know that a server is central to a network and responds to requests made. - To know what a packet is and why it is important for website data transfer. **Topic: Online Safety** - To understand that people share facts, beliefs and opinions online. - To understand what social media is. - That that age restrictions apply to online activities.	**Topic: Collaborative learning** - To understand that software can be used collaboratively online to work as a team. - To know how to leave digital comments on collaborative work. - To know that you can use animations in presentation slides. **Topic: Further Coding with Scratch** - That a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. - What a conditional statement is in programming. - That using variables can help you to create a quiz on Scratch.	**Topic: Website Design** - To know that a website is a collection of pages that are all connected. - To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. - To know that websites should be informative and interactive. **Topic: Investigating Weather** - To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data'). - To know that a weather machine can sense wind speed, rainfall and other data. - To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	**Topic: Computational Thinking** - To know that combining computational thinking skills can help you to solve a problem. - To understand that pattern recognition means identifying patterns to help them work out how the code works. - To name some programs that uses require algorithms. **Topic: Online Safety** - To understand some of the methods used to encourage people to buy things online. - To understand that technology can be designed to act like or impersonate living things. - To identify when someone might need to limit the amount of time spent using technology.

Year 5	**Topic: Online Safety** - Identifying possible dangers online. - Evaluating the pros and cons of online communication. - Learning what to do if they experience bullying online. **Topic: Micro:bit** - To know that a Micro:bit is a programmable device. - To know that Micro:bit uses a block coding language similar to Scratch. - To understand and recognise coding structures.	**Topic: Search Engines** - To know how search engines work. - To understand that anyone can create a website and therefore we should take steps to check the validity of websites. **Topic: Programming Music** - That a soundtrack is music for a film/video. - How to adapt their music while performing.	**Topic: Mars Rover 1** - To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. - To know what numbers using binary code look like. - To understand that RAM is Random Access Memory and acts as the computer's working memory. **Topic: Stop Motion Animation** - To know that decomposition of an idea is important when creating stop-motion animations. - To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. - Clips are segments of audio/video segments that make up a digital movie.	**Topic: Bletchley Park** - To understand the importance of having a secure password. To understand what "brute force hacking" is. - To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. - To know about some of the historical figures that contributed to technological advances in computing. - To understand what techniques are required to create a presentation using appropriate software. **Topic: AI** - To know that AI is artificial intelligence and is used in everyday life. - To know that AI can be used to generate written content. - To know that AI can be used to create visual content like pictures.	**Topic: Big Data 1** - To know that data contained within barcodes and QR codes can be used by computers. - To know that infrared waves are a way of transmitting data. - To know that data is often encrypted so that even if it is stolen it is not useful to the thief.	**Topic: Intro to Python** - To know that there are text-based programming languages such as Logo and Python. - To know that nested loops are loops inside of loops. **Topic: Online Safety** - To know that a digital footprint means the information that exists on the internet as a result of a person's online activity. - To understand what it means to have a positive online reputation.
Year 6	**Topic: Online Safety** - Learning how to stay safe from online dangers. - Recognising that information on the Internet might not be true or correct and learning ways of checking validity. - Learning to use an online community safely. **Topic: Micro:bit** - To understand and recognise variables. - To know what techniques to use to create a program for a specific purpose (including decomposition).	**Topic: Search Engines** - To know that web crawlers are computer programs that crawl through the internet. - To understand what copyright is. **Topic: Programming Music** - One way of composing soundtracks is on programming software. - How to adapt their music while performing.	**Topic: Mars Rover 1** - Identify how messages can be sent in binary. - To understand that RAM is Random Access Memory and acts as the computer's working memory. - To know what simple operations can be used to calculate bit patterns. **Topic: Stop Motion Animation** - Sometimes edits can be misleading and even unethical. - To know that editing is an important feature of making and improving a stop motion animation.	**Topic: Bletchley Park** - To know about some of the historical figures that contributed to technological advances in computing. - To understand what techniques are required to create a presentation using appropriate software. **Topic: AI** - To know that AI is trained on data to recognise patterns and generate outputs. - To know that AI can help generate basic HTML code to create the structure and layout of a website. - To know that there are ethical issues surrounding AI, including data privacy, bias and responsible use	**Topic: Big Data 2** - To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'. - To know that devices or that are not updated are most vulnerable to hackers. - To know the difference between mobile data and WiFi.	**Topic: Intro to Python** - To understand the use of random numbers and remix Python code. - Python is used to teach computers how to think, this is sometimes called AI. **Topic: Online Safety** - To know what steps are required to capture bullying content as evidence. - To understand that it is important to manage personal passwords effectively. - To know some common online scams.