Computing Knowledge Progression

Big Idea	Aspect	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Communication	Digital technology is used at home and at school for communicating with others.	Digital technology is used in all parts of everyday life. Some technology is used to communicate with others.	Digital technology is used in all parts of everyday life, such as using a tablet to play a game or a microwave to heat food. Some of this digital technology can be used to connect with others locally, such as sharing digital work in the classroom, or globally, such as using Skype on a computer to speak to a friend overseas.		Advantages of communicating electronically are that it is available at any time, instant and global. Disadvantages include easier misunderstandings, people pretending to be someone they are not, lack of privacy (once something is published online, it cannot be removed) and a threat to personal safety (access to personal information). Concerns should be reported to a trusted adult.	Cyberbullying is bullying using technology, such as social media or gaming networks and can involve teasing, name calling, harassment, deliberate exclusion, threatening or being undermined. A trusted adult or child safety organisation should be contacted if there are any concerns or worries. A trusted adult can provide help and support or contact the police if needed.	Working online requires a level of responsibility and strategies to stay safe, including protecting private information and accounts. This enables people to protect themselves and others from potential online dangers, inappropriate behaviour and bullying. Any concerns should be reported to a trusted adult, the police or child protection organisations.	Knowing someone online is not the same as knowing them face to face. People online are not always who they say they are and may use intimate images or content inappropriately. Once something is online, it is not under the user's control and can be made public. Using offensive language can affect others negatively and is a form of bullying called 'trolling'. Privacy and personal boundaries are important when communicating with others online.
	Staying safe	Know that appropriate adults can help to keep them safe online.	Know that if they see something online that makes that sad, scared or worried, they should tell an adult straight away.	Private information includes names, addresses, dates of birth or schools and this information should not be shared online. Any concerns or worries should be reported to a trusted adult.	Some websites are not ageappropriate and so it is important to tell a trusted adult about any concerns or worries.	Images and data should not be shared online without the permission of the owner. Personal information, such as full name, age, school and address, should not be shared online.		Digital content can affect others and be available to anyone. Digital content is traceable, which means it can be tracked to the person who created it. To stay safe, it is important to discuss technology use with a trusted adult.	The benefits of devices broadcasting the user's location and passing on personal information include improved customer service, allowing organisations to analyse data and improving the quality of applications. Risks include identity theft, cyberstalking, victimisation and threat to privacy.
	Digital citizenship			When work is saved electronically, it needs to have a name that identifies it and is easily remembered.	A digital footprint is the information that exists on the internet, following a user's online activity.	As with face to face communication, online communication should be done respectfully and responsibly,	Appropriate behaviour when contributing to collaborative online projects includes consideration towards others, awareness of	Citing sources is giving credit to the person or website that created the information. Using someone else's work without citing it is	Digital content may have been edited online by anyone, and so it is important to verify content against other independent or reputable sources.

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						considering the impact on others.	copyright and keeping personal data safe.	called plagiarism and is a form of cheating.	
Processes	Physical interactions	When buttons on technological toys are pushed, they will behave in different ways.	Technological toys need instructions to operate in a particular way. Errors in instructions can be checked and fixed.	An algorithm is a sequence of steps, instructions or rules that is used to perform a specific task. Algorithms can be followed by people or digital equipment. For algorithms to achieve the end goal, instructions have to be accurate and followed sequentially. Mistakes are called bugs and finding and fixing them is called debugging.	Robots can be programmed to follow a series of instructions using algorithms.	Sequencing instructions is the step-by-step process that robots or other devices follow to achieve specific outcomes. This can be a single algorithm or series of algorithms called a program.	Computers interact with the world using input and output devices. An input device may include sensors that can detect changes, such as in temperature, light level, sound level or movement. The input then sends the information to a computer, which tells the output device to trigger an action, such as making a sound or creating a movement.	Sensors can be combined to control a physical system, such as using motion, light and sound sensors to control a road network of traffic lights and level crossings.	Input and output devices can be combined with programming software to control a physical system, such as using sensors to create a sensory station that incorporates motors, lights and buzzers.
Creativity	Creation			Software is the programs that are used by a computer, such as word processing software, presentation software or image editing software. It can be used to create and combine digital content for different audiences and purposes.	Multimedia components, such as text, images, audio and video clips, can be created, edited and combined to create content for a range of tasks.	Text, images, animation, audio and video clips can be combined using tools within a piece of software or by using a range of software. For example, an image could be inserted into a word processing document or a video could be inserted into a presentation.	Manipulating a range of text, images, sound or video clips and animation may include changing their style, size, colour, effect, shape, location or format.	Creating, selecting and combining a range of texts, images, sound clips and videos for given purposes could include creating a web page, slide show presentation, short film or an animation.	A variety of software, such as word processing software, image editing software or internet services, can be selected, used and combined to meet a goal.
Investigation	Data and computational thinking	When buttons on technological toys are pushed, they will behave in different ways.	Technological toys need instructions to achieve an outcome.	An algorithm is a sequence of steps, instructions or rules that is used to perform a specific task. Algorithms can be followed by people or digital equipment. For algorithms to achieve the end goal, instructions have to be accurate and followed sequentially.	Computers' behaviour can be predicted and the outcome tested by following the steps of an algorithm and recognising that the computer will follow instructions precisely.	Repetitions or loops can be used in programming where a computer will continue to run part of a program a number of times or until a condition is met, using the term 'repeat... until'. The given feedback can be used to identify and	A loop is a sequence of instructions that repeats continually until a certain condition is met. A program that contains a looping element is useful for a wide range of scenarios, such as controlling traffic lights.	Sequences of instructions (algorithms) that contain IF, THEN and OTHERWISE statements are called selections. The computer will complete operations based on whether the conditions of these selections are met or not.	Decomposition is breaking down a problem down into smaller parts to make it easier to process and following a sequence of instructions. Decomposition is useful for checking programs and debugging because it saves time.

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						correct any mistakes in the program.			
	Networks			When work is saved electronically, it can be stored on a hard drive, a shared drive called a server or online so that it can be opened on the same device or another device at a later time.	Computers and devices can be linked in different ways, such as through a network, the internet and Bluetooth. This allows for the sharing of resources.	When work is saved, it is stored on a storage device, such as the computer's hard drive, a USB flash drive, a shared server or online. This work can then be retrieved from another device (except if it is saved on the computer's hard drive).	A school network has computers that are connected together so they can share hardware, software and data.	Computer networks are made up of computers that are connected by cables, fibres or wireless links. Each network can only be accessed by computers within their network, such as in school or at home. The internet network can be accessed by anyone.	The positives of communicating online include the speed, low cost and ability to communicate globally. The negatives of communicating online include the threat to privacy, influencing of others, access to technology and anonymity.
Materials	Hardware	Smartphones, tablets and computers are computing hardware.	Smartphones, tablets, laptops, computers and floor robots are all types of computing hardware.	Hardware is the parts of a computer that you can touch, such as a mouse, tablet or floor robot.	Hardware, such as cameras, scanners and data loggers, can be used to collect data.	Several pieces of hardware can be used together to complete one task, such as using a camera to take a photograph, uploading it to a computer and then printing it using a printer.	Interacting regularly with hardware enables users to recognise common features and become confident in working with new or unfamiliar hardware.	Using prior knowledge and experience of computing skills can be applied to unfamiliar hardware to solve a problem successfully	Some hardware is more effective than others in particular contexts, such as using virtual reality or a touchscreen rather than a mouse to meet a specific need. Choosing the right hardware can increase creativity and productivity.
	Software	Software, including games, can be used on mobile phones, tablets and computers.	Software is the programs we use on computers and mobile devices.	Software is the programs that are used by a computer, such as word processing software, presentation software or image editing software.	Each type of software, such as word processing, presentation and image editing, can be used for different purposes, including writing reports and creating slide shows or posters.	Several pieces of software can be used together to complete one task, such as adding a video to a word processed document.	New computing software commonly has features that should be familiar to users, such as icons or terminology.	Using prior knowledge and experience of computing skills can be applied to create content using unfamiliar programs or apps.	Some software or apps are designed to help increase creativity by saving time or making tasks easier, such as being able to combine text, images, audio or video content into one place.
Nature	Real world	Computers and tablets can collect, show and store information.	Data can be collected and shown using digital technology.	Data can be collected manually or using digital technology, such as data loggers. It can be represented in different electronic forms, including charts and tables.	Software is available that can be used to represent collected data digitally, such as in a pictogram or bar chart.	Some programs or apps have special types of technology, such as a built in camera or microphone, or sensors that measure light level,	An input device receives information about the outside world, such as light level, temperature or sound level, and sends it to a computer. This	Sensing tools or apps have features that can be used for an investigation and the findings can be interpreted. For example, a sound sensor or app can be	Data handling includes databases, graphs, charts and tables. These can be used to present the findings of investigations.

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						temperature or sound level.	information can be tracked over time using a program or app.	used to investigate the pitch of instruments.	
Place and space	Digital world	People use digital devices for many reasons, including communicating and playing games.	People use digital devices for many reasons, including playing games, communicating, finding information and watching videos.	Software available online, such as email, social media platforms or blogs, can be made by individuals to communicate their ideas.	The internet is used to connect computers or devices around the world. The internet is an important part of life for many people. However some people spend too much time on devices, which can have a negative impact on people's mental and physical health.	Different software, websites and apps can be used to collaborate and communicate online. Each one has different terms and conditions that need to be followed to stay safe, such as age restrictions.		Online collaborative projects can be shared with different permission settings, such as who can view, edit or comment on the documents. Privacy settings can be restricted to those who are invited, those who have access to the link or can be made open to the public.	There are a wide variety of online communication platforms, such as social media, blogs, vlogs, email or messaging, which have different available features, including the option to comment. It is important to be aware of security settings, such as age restrictions or property rights.
	Real world	Digital technology is used at home and at school. Examples include smartphones and tablets.	Digital technology is used in all parts of everyday life. Examples include smartphones, tablets, microwaves and washing machines.	Technology is used in many ways to do different jobs, such as using an interactive whiteboard in the classroom, using a tablet to do online shopping at home or using scanners in a shop in the community.	Digital technology is used in everyday life and can be used to support learning and connect with others.	Digital technology can be used for a range of purposes in different settings, such as using a tablet in the classroom to access educational material, in the home to access entertainment and in the community to share local news.	Digital technology can be used in different ways and settings to achieve a specific goal, such as using data collection in the community and home to answer a classroom based question.	A range of technologies can be selected, used and combined, such as using different hardware and software to create a solution that will have an impact on others.	A range of technologies can be combined to achieve a particular outcome. For example, sensors (input), a computing device (hardware) and lights (hardware) can be used together to create a set of traffic lights.
Comparison	Digital searching			To search for digital content, the user needs to know the file name, file type and folder name or keywords and search terms to find the correct information.	A device is online if it is connected to the internet or a network and can communicate with other devices. A device is offline if it is not connected to the internet or network and cannot connect to other devices.	The World Wide Web is a collection of web pages that are run via the internet. The information requested can be displayed as text, images or videos.	Pop-ups or adverts are a form of online advertising that companies use to encourage users to buy something or go to another website. Some pop-ups can be malicious and lead to a virus, whereas some are helpful and give information. Pop-ups can be blocked by computer software.	Some websites have more reliable content than others and content should be verified with another independent source.	Search engines take many factors into account, such as the quality of the site, number of updates or number of matches to keywords. However, search engines do not consider whether the content is true, age-appropriate or relevant, and so users need to be aware of

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							Concerns should be reported to a trusted adult before clicking on anything.		these things when searching.