Computing - Progression of Knowledge and Skills

Key

Must be integrated cross circularly.

Optional lesson on Maestro.

Journey	Area	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Communication	Knowledge	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.	Digital technology, such as email, social media platforms or blogs, can be used by individuals to communicate and connect with others but should be used appropriately, including using language that is not hurtful or disrespectful to others, having adult supervision or following the school's acceptable use policy.	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.
	Skills	Explain that digital technology is used in the home and at school for communication.	Explain simply that digital technology can be used to connect with others locally and globally.	Use digital technology appropriately to communicate and connect with others locally and globally.	Explain the advantages and disadvantages of communicating electronically and strategies for preventing issues.	Explain actions to report and prevent cyberbullying.	Demonstrate appropriate online behaviour and apply a range of strategies to protect themselves and others from potential online dangers, inappropriate behaviour and bullying.	Recognise that sending intimate images and content and using offensive language online is a risk, has a permanent online trail (digital footprint) and is not appropriate behaviour.
	Timescale		Y1 Computing	Y2 Computing	Y3 Computing		Y5 Computing	Y6 Computing

Journey	Area	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Staying Safe	Knowledge	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 age-appropriate 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.	Technology can have positive influences on health, such as enabling people to hear using a hearing aid or helping doctors to diagnose or treat illnesses using special machines. Both mental and physical health can be negatively influenced by technology. Technology can have positive influences on the environment, such as using systems to monitor and control energy usage. Negative influences on the environment include contributing to pollution by travelling and using a lot of power.	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.
	Skills	Describe what they would do if they saw something online that made them sad, scared or worried.	Recognise that some websites ask for private information and discuss how to handle these requests and where to go for help and support.	Stay safe online by choosing websites that are appropriate to visit (based on the confidence you have in the author(s) of the website) and know where to go for help and support when they have concerns about content or contact on the internet and other online technologies.	Describe simple rules for sharing images and data safely.	Identify the positive and negative influences of technology on health and the environment and how to protect themselves.	Discuss the impact that digital content can have and why it is important to discuss their use of technology with an adult.	Identify the benefits and risks of devices broadcasting the user's location and of giving personal information to different organisations.
	Timescale		Y1 Computing	Y2 Computing T3 Magnificent Monarchs	Y3 Computing		Y5 Computing	Y6 Computing
Digital Citizenship	Knowledge		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, considering the impact on others.	Appropriate behaviour when contributing to collaborative online projects includes consideration towards others, awareness of copyright and keeping personal data safe.	Citing sources is giving credit to the person or website that created the information. Using someone else's work without citing it is called plagiarism and is a form of cheating.	Digital content may have been edited online by anyone, and so it is important to verify content against other independent or reputable sources.
	Skills	Ask to use digital devices to create work in a safe and responsible way.	Recognise that work they have created belongs to them.	Recognise that information put online leaves a digital footprint.	Compose clear and appropriate messages in online communities.	Identify appropriate behaviour when contributing to collaborative online projects for learning.	Cite all sources when researching and explain why sources should be provided.	Recognise that digital content can be edited online.
	Timescale		Y1 Computing	Y2 Computing	Y3 Computing		Y5 Computing	Y6 Computing

Journey	Area	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Physical Interactions	Knowledge	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.
	Skills	Input simple instructions to make technological toys operate, including floor robots and onscreen sprites.	Observe and explore outcomes when buttons are pressed in sequences on a robot and identify and debug a simple algorithm.	Plan and enter a sequence of instructions using a robot, specifying distance and angle of turn.	Design, write and enter a sequence of instructions using a robot or other device to achieve specific outcomes, debugging if necessary.	Use sensors to 'trigger' an action, such as sound or movement.	Use a range of sensors to control a physical system.	Design, write and debug a program to control a physical system, which may include output devices, such as motors, lights and buzzers.
	Timescale	T3 Animal Safari	Y1 Computing T2 Bright Lights, Big City	Y2 Computing	Y3 Computing			Y6 Computing
Creation	Knowledge		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.
	Skills	Use age-appropriate software to create images and record sounds and videos.	Select appropriate software to complete given tasks using text, images, audio and video clips.	Create and edit multimedia components for a range of tasks.	Combine a range of text, images, animation and audio and video clips for given purposes.	Manipulate a range of text, images, sound or video clips and animation for given purposes.	Create, select and combine a range of texts, images, sound clips and videos for given purposes.	Select, use and combine a variety of software, including internet services, to meet a goal.
	Timescale	T1 Me and My Community T1 Winter Wonderland T2 Dangerous Dinosaurs T2 Puddles and Rainbows T3 Moving On T3 Animal Safari T3 On the Beach	Y1 Computing	Y2 Computing	Y3 Computing		Y5 Computing	T2 Electrical Circuits and Components T2 Environmental Artists

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Data & Computational Thinking	Knowledge	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 correct any mistakes in the program.	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.
	Skills	Input simple instructions to technological toys, including floor robots and onscreen sprites.	Follow a sequence of steps to solve a problem and create instructions that others can follow (for floor robots or onscreen sprites).	Create a simple solution that tests an idea, predict the outcome and test and debug the solution to ensure that it works.	Identify and use repetitions or loops in a program sequence, predicting outcomes and noticing and correcting any mistakes.	Describe and demonstrate a simple program that contains a looping element and how part of a program may need repetition.	Design, write and debug simple sequences of instructions (algorithms), including IF, THEN and OTHERWISE commands, to decide if something is true or false.	Demonstrate how programs run in an exact order by following a sequence of instructions, and test and debug programs.
	Timescale	T1 Me and My Community T2 Starry Night T2 Dangerous Dinosaurs T3 Animal Safari T3 Creep, Crawl and Wriggle T3 On the Beach	Y1 Computing	Y2 Computing	Y3 Computing	Y4 Computing	Y5 Computing	Y6 Computing T2 Electrical Circuits and Components
Networks	Knowledge		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.
	Skills	Recognise that digital work can be saved, shared and accessed from other devices.	Show awareness that work they create and save on a computer or tablet can be shown to others using another device.	Recognise that computers can be linked to share resources and digital content can be stored, organised and retrieved.	Recognise that saved work can be retrieved from another device on the same network.	Recognise that the school network links computers to allow the sharing of resources.	Compare the ways in which work can be shared on a school network with the ways work is shared at home or in the wider world.	Name some of the positives and negatives of communicating with others online.
	Timescale		Y1 Computing	Y2 Computing		Y4 Computing	Y5 Computing	

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Hardware	Knowledge	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.
	Skills	Explore how to use different computing hardware.	Use a range of computing hardware for different purposes.	Use computing hardware in different ways to collect data.	Use familiar computer hardware to successfully complete a task.	Use new and unfamiliar computing hardware.	Apply computing skills using unfamiliar hardware to solve a problem successfully.	Identify how using different hardware can increase creativity and productivity.
	Timescale		Y1 Computing T2 Bright Lights Big City T2 Rain and Sunrays T3 Streetview	T3 Animal Survival			Y5 Computing	Y6 Computing
Software	Knowledge	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.
	Skills	Use age-appropriate software independently.	Begin to use a range of software for different purposes.	Use different types of software and identify their purposes.	Use a range of different software to successfully complete a project.	Apply computing skills to use new computing software.	Apply computing skills to create content using unfamiliar programs or apps.	Identify how a new piece of software or an app can increase creativity.
	Timescale	T1 Me and My Community T2 Dangerous Dinosaurs T3 Animal Safari T3 On The Beach	Y1 Computing T1 Childhood T2 Bright Lights Big City T2 Rain and Sunrays	T1 Movers and Shakers T3 Magnificent Monarchs T3 Portraits and Poses	T1 Through the Ages T2 Rocks, Relics and Rumbles T2 Ammonite T3 Emperors and Empires	Y4 Computing T2 Vista	Y5 Computing	T2 Electrical Circuits and Components T2 Environmental Artists
Real World - Nature	Knowledge	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, temperature or sound 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 information can be tracked over time using a program or app.	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 used to investigate the pitch of instruments.	Data handling includes databases, graphs, charts and tables. These can be used to present the findings of investigations.
	Skills	Notice how data can be collected and represented electronically.	Observe how collected data can be represented electronically.	Use data handling skills to represent data digitally.	Log light level, temperature or sound level using a program or app.	Log light level, temperature or sound level using a program or app, over a period of time.	Use sensing tools or apps for an investigation and interpret the findings.	Plan data handling investigations and use the outcomes from data collection to show the findings.
	Timescale		Y1 Computing T1 Everyday Materials	Y2 Computing T1 Movers and Shakers				

Journey	Area	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital World	Knowledge	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.	There are various forms of online communication, such as email, blogging, vlogging and video chatting. Online communication should be used responsibly, remembering that online actions affect other people and there are rules that need to be followed.	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.
	Skills	Talk about things that people do on digital devices, such as playing games, communicating with others and watching online videos.	Understand that there are online tools that can help people to create content and communicate.	Recognise some uses of the internet, in simple terms and some of its benefits and drawbacks.	Use appropriate tools (software, websites and apps) to collaborate and communicate safely online.	Exchange online communications with other learners, adding and responding to comments, such as in a blog.	Create an online collaborative project for a specific purpose, sharing documents and appropriately setting permissions for other group members.	Exchange online communications, making use of a growing range of available features and being aware of security settings.
	Timescale	T2 Dangerous Dinosaurs		T3 Magnificent Monarchs	T2 Rocks, Relics and Rumbles			
Real World – Places & Spaces	Knowledge	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.
	Skills	Talk about and use digital technology with confidence and independence, giving examples of how it is used in the home, at school and beyond.	Recognise the ways digital technology can be used in the classroom, home and community.	Recognise why digital technology is used in the classroom, home and community.	Use digital technology in different ways in the classroom, home and community.	Use digital technology in different ways in the classroom, home and community to achieve a set goal.	Select, use and combine appropriate technology to create a solution that will have an impact on others.	Combine a range of technology to achieve a particular outcome.
	Timescale		T1 Childhood T2 Bright Lights Big City T2 Seasonal Changes T3 School Days	Y2 Computing	T2 Ammonite		Y5 Computing	Y6 Computing

Journey	Area	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital Searching	Knowledge		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. Concerns should be reported to a trusted adult before clicking on anything.	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 these things when searching.
	Skills	Navigate to find digital content, in digital folders and online, with supervision.	Search for or retrieve digital content, including images and information, in digital folders and online, with supervision.	Recognise and demonstrate that some information can be found online and some offline.	Explain that the World Wide Web contains lots of web pages about different subjects that can be searched.	Explain that when searching online, some web pages may contain adverts or pop-ups that encourage people to click on them.	Discern where web content might originate from and recognise that this gives clues to its authenticity, reliability and security.	Critically evaluate search engine results and identify factors that may affect ranking, such as how long the site has existed, the number of links to the site and whether the organisation has paid to have their site promoted.
	Timescale	T2 Dangerous Dinosaurs T3 Animal Safari	Y1 Computing T2 Bright Lights Big City	T1 Movers and Shakers	Y3 Computing T2 Ammonite			Y6 Computing