

# Computing Progression of knowledge



## Intent

- To provide a high-quality computing education which is fully inclusive and accessible to every child.
- To equip the children to become digitally literate in order to participate in the rapidly changing world, whereby work and leisure are increasingly transformed by technology.
- To gain secure knowledge and skills which will encourage the children to use ICT to develop ideas, express themselves, solve problems and become digital thinkers.
- To develop the children’s computer skills to enable them to become confident, creative and inquisitive learners who are able to be critical and challenge themselves.
- To provide the children with the knowledge and skills to be safe online.

Development Matters		National Curriculum KS1
Development matters 3-4 <ul style="list-style-type: none"> <li>• To explore how things work.</li> </ul>	. Development matters – Reception <ul style="list-style-type: none"> <li>• Children recognise that a range of technology is used in places such as homes and schools.</li> <li>• Children select and use technology for particular purposes.</li> </ul>	<b>Computing NC –</b>  <b>Pupils should be taught to:</b> <ul style="list-style-type: none"> <li>• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</li> <li>• Create simple programs.</li> <li>• Use logical reasoning to predict the behaviour of simple programs.</li> <li>• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</li> <li>• Recognise common uses of information technology beyond school.</li> <li>• 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.</li> </ul>

# Computer science

## Key Vocabulary

Element	Early Years	Year 1	Year 2
<b>Computational thinking</b>	Instruction, follow, first, next,	Algorithm, sequence, order, bug, fix, precise	Decomposition, debug, reason, detail, breakdown, task
<b>Coding and programming</b>	Mouse, touch screen, move, command, device	Digital, program, follow, code, bugs, fix, order, ScratchJr	Precise, logical reasoning, prediction, debug, sequence
<b>Artificial intelligence</b>	Machine, Computer, Robot	Program, algorithm, data, AI, technology, voice assistant, text, recognise	Input, output, artificial intelligence, voice assistant, text, recognise

## Knowledge progression

	Early Years	Year 1	Year 2
<b>Computational thinking</b>	<ul style="list-style-type: none"> <li>I begin to understand an algorithm is a sequence of instructions or set of rules to get things done. (Algorithms)</li> <li>I can follow a simple algorithm by responding to oral instructions. (Algorithms)</li> <li>I can begin to make my own simple algorithms by sequencing actions. (Algorithms)</li> <li>I can start to explain my thought process and justify my decisions. (Logical reasoning)</li> <li>I can explain what is the same and what is different (Pattern)</li> </ul>	<ul style="list-style-type: none"> <li>I understand what algorithms are</li> <li>I know how to write simple algorithms</li> <li>I understand the sequence of algorithms is important</li> <li>I know how to debug simple algorithms</li> </ul>	<ul style="list-style-type: none"> <li>I know how to write algorithms for everyday tasks</li> <li>I know how to use logical reasoning to predict the outcome of algorithms</li> <li>I understand decomposition is breaking objects/processes down</li> <li>I know how to debug algorithms</li> </ul>
<b>Coding and programming</b>	<ul style="list-style-type: none"> <li>I can learn how digital toys and apps work through exploration (Tinkering)</li> <li>I can input more than one command into a programmable toy or simple app</li> <li>I can input a sequence of commands into a programmable toy or simple app</li> <li>I fix things through trial and error (Debugging)</li> <li>I can fix things and explain my approach (Debugging)</li> </ul>	<ul style="list-style-type: none"> <li>I know how to create a simple program on a digital device e.g. Bee Bot or tablet</li> <li>I know how to use sequence in programs</li> <li>I know how to locate and fix bugs in my program</li> </ul>	<ul style="list-style-type: none"> <li>I understand programs follow precise instructions</li> <li>I know how to create programs using different digital devices E.g. Bee Bot or ScratchJr on a tablet</li> <li>I know how to debug programs of increasing complexity</li> </ul>

			<ul style="list-style-type: none"> <li>• I know how to use logical reasoning to predict the outcome of simple programs</li> </ul>
<b>Artificial intelligence</b>	<ul style="list-style-type: none"> <li>• I know that machines and computers can be used to perform tasks.</li> <li>• I know interact with simple AI such as Siri and dictation.</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to use simple AI technology and can talk about what it does</li> <li>• I know that data is used by computers to store and process information</li> </ul>	<ul style="list-style-type: none"> <li>• I can explain some advantages and disadvantages of using simple AI technology</li> <li>• I know that artificial intelligence can be used to simulate human-like abilities in a computer</li> </ul>

# Information Technology

## Key Vocabulary

Element	Early Years	Year 1	Year 2
<b>Word processing</b>	Computer, Keyboard, Device, Tablet, Dictate, type	Space Bar, Delete, Return Key, Enter, Mouse, Trackpad, arrow keys, cursor, select	Cut, copy, paste. Caps Lock, Insert, Image, Save, clipboard, editing, header, highlight
<b>Data handling</b>	Chart, sort, data, count, list	Columns, category, tally chart, pictograms, explain,	Venn diagrams, carroll diagrams, bar charts, database, table
<b>Presentations</b>	Record, image, digital, collage, move, resize, pinch	Labels, order, storyboard, sequence, spider diagram, text box, style	Voice labels, import, tag, add to, right click, layout, format,
<b>Animation</b>	Animation, character, record	Filters, stickers, scene	Stop motion, ghosting, timing, cartoon
<b>Video creation</b>	Photography, video, record, camera roll, play, pause, microphone	Voiceover, highlight, zoom, countdown, playback, delete, pause, rewind, fast forward	Teleprompter, pace, rate, effects, titles, Greenscreen, layer, masking, drag
<b>Photography</b>	Photograph, digital, paint, capture	Edit, drawing, cut, layer, mark up, erase,	Crop, filters, fill, export, JPEG, zoom, flash, undo
<b>Augmented reality</b>	Scan, image, 360, digital image,	Surroundings, objects, interact	Markers, Augmented Reality, trigger
<b>Sound</b>	Record, sound, microphone, echo	Sequence, instruments, short, long, effects	Sound effects, loops

## Knowledge progression

	Early Years	Year 1	Year 2
Word processing	<ul style="list-style-type: none"> <li>• I know how to play on a touch screen game and use computers/keyboards/mouse in role play</li> <li>• I know how to type letters with increasing confidence using a keyboard and tablet.</li> <li>• I know how to dictate short, clear sentences into a digital device</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to confidently type words quickly and correctly on a digital device.</li> <li>• I know how to use the space bar to make space and delete to delete letters/ words</li> <li>• I know how to make a new line using enter/return</li> <li>• I know how to dictate into a digital device more accurately and with punctuation.</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to use the space bar only once between words and use touch to navigate to words letter to edit</li> <li>• I know how to copy and paste images and text</li> <li>• I know how to use caps locks for capital letters.</li> <li>• I know how to add images alongside text in a word-processed document.</li> <li>• I know how to dictate longer passages into a digital device with accurate punctuation</li> </ul>
Data handling	<ul style="list-style-type: none"> <li>• I know how to identify a chart.</li> <li>• I know how to sort physical objects, take a picture and discuss what I have done.</li> <li>• I know how to present simple data on a digital device.</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to sort images or text into two or more categories on a digital device.</li> <li>• I know how to collect data on a topic.</li> <li>• I know how to create a tally chart and pictogram.</li> <li>• I know how to record myself explaining what I have done and what it shows me</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to sort digital objects into a range of charts such as Venn diagrams, Carroll diagrams and bar charts using different apps and software.</li> <li>• I know how to orally record myself explaining what the data shows me.</li> <li>• I know how to create a branching database using questions</li> </ul>
Presentations	<ul style="list-style-type: none"> <li>• I know how to record my voice over a picture.</li> <li>• I know how to create a simple digital collage.</li> <li>• I know how to move and resize images with my fingers or mouse.</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to add labels to an image</li> <li>• I know how to order images to create a simple storyboard.</li> <li>• I know how to create a simple spider diagram.</li> <li>• I know how to sequence a series of pictures to explain my understanding of a topic.</li> </ul>	<ul style="list-style-type: none"> <li>• I know how to add voice labels to an image.</li> <li>• I know how to add a voice recording to a storyboard.</li> <li>• I know how to add speech bubbles to an image to show what a character think.</li> <li>• I know how to import images to a project from the web and camera roll</li> </ul>

			<ul style="list-style-type: none"> <li>I know how to use some build in animations in presentation software</li> </ul>
<b>Animation</b>	<ul style="list-style-type: none"> <li>I know how to animate a simple image to speak in role</li> <li>I know how to create a simple animation to tell a story including more than one character.</li> </ul>	<ul style="list-style-type: none"> <li>I know how to add filters and stickers to enhance an animation of a character.</li> <li>I know how to create an animation to tell a story with more than one scene.</li> <li>I know how to add my own pictures to my story animation.</li> </ul>	<ul style="list-style-type: none"> <li>I know how to create multiple animations of an image and edit these together.</li> <li>I know how to create a simple stop motion animation.</li> <li>I know how to explain how an animation/flip book works</li> </ul>
<b>Video creation</b>	<ul style="list-style-type: none"> <li>I know the difference between a photography and video.</li> <li>I know how to record a short film using the camera</li> <li>I know how to record and play a film</li> <li>I know how to watch films back</li> </ul>	<ul style="list-style-type: none"> <li>I know how to record a film using the camera app.</li> <li>I know how to select images and record a voiceover.</li> <li>I know how to highlight and zoom into images as I record.</li> </ul>	<ul style="list-style-type: none"> <li>I know how to write and record a script using a teleprompter tool.</li> <li>I know how to use tools to add effects to a video</li> <li>I know how to begin to use green screen techniques with support</li> </ul>
<b>Photography</b>	<ul style="list-style-type: none"> <li>I know how to take a photograph</li> <li>I know how to take a photograph and use it in an app</li> <li>I know how to use a painting app and explore the paint and brush tools</li> </ul>	<ul style="list-style-type: none"> <li>I know how to edit a photo with simple tools</li> <li>I know how to use a paint/drawing app to create a digital image</li> <li>I know how to begin to cut out an image to layer on another image</li> </ul>	<ul style="list-style-type: none"> <li>I know how to edit a photo (crop, filters, mark up etc)</li> <li>I know how to select and use tools to create digital imagery - controlling the pen and using the fill tool</li> <li>I know how to cut images with accuracy to layer on other images.</li> </ul>
<b>Augmented reality</b>	<ul style="list-style-type: none"> <li>I know how to scan a QR code.</li> <li>I know how to explore a 360 image.</li> <li>I know how to talk about AR objects in my class</li> </ul>	<ul style="list-style-type: none"> <li>I know how to explore an interactive 360 image.</li> <li>I know how to scan a trigger image to begin a AR experience.</li> <li>I know how to pretend to interact with AR objects</li> </ul>	<ul style="list-style-type: none"> <li>I know how to draw my own 360 image and explore it in VR.</li> <li>I know how to bring objects into my surroundings using Augmented Reality.</li> <li>I know how to create my own QR code</li> </ul>
<b>Sound</b>	<ul style="list-style-type: none"> <li>I know how to record sounds with different resources</li> <li>I know how to find ways to change your voice (tube, tin can, shouting to create an echo)</li> <li>I know how to record sounds/voices in storytelling and explanations</li> </ul>	<ul style="list-style-type: none"> <li>I know how to create a sequence of sounds (instruments, apps/software)</li> <li>I know how to explore short and long sounds.</li> <li>I know how to record my voice and add different effects.</li> </ul>	<ul style="list-style-type: none"> <li>I know how to create a musical composition using software</li> <li>I know how to record my own sound effects.</li> <li>I know how to record my voice over a composition to perform a song</li> </ul>

# Digital Literacy

## Key Vocabulary

Element	Early Years	Year 1	Year 2
<b>Online safety</b>	Online, offline, communicate, internet, information, feelings, rules	Trust, permission, video call, kind, respect, trusted adult, search engines, Google, personal information, password, accounts,	Online gaming, sharing, pressure, accept, consent, bullying, home, forward, links, tabs, sections, Siri, untrue, wellbeing, private, AI, comments,

## Knowledge progression

	Early Years	Year 1	Year 2
<b>Self image and identity</b>	<ul style="list-style-type: none"> <li>I can recognise that I can say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' to somebody who asks me to do something that makes me feel sad, embarrassed or upset.</li> <li>I can explain how this could be either in real life or online.</li> </ul>	<ul style="list-style-type: none"> <li>I can recognise that there may be people online who could make me feel sad, embarrassed or upset.</li> <li>If something happens that makes me feel sad, worried, uncomfortable or frightened I can give examples of when and how to speak to an adult I can trust</li> </ul>	<ul style="list-style-type: none"> <li>I can explain how other people may look and act differently online and offline.</li> <li>I can give examples of issues online that might make someone feel sad, worried, uncomfortable or frightened; I can give examples of how they might get help</li> </ul>
<b>Online relationships</b>	<ul style="list-style-type: none"> <li>I can recognise some ways in which the internet can be used to communicate.</li> <li>I can give examples of how I (might) use technology to communicate with people I know.</li> </ul>	<ul style="list-style-type: none"> <li>I can give examples of when I should ask permission to do something online and explain why this is important</li> <li>I can use the internet with adult support to communicate with people I know (e.g. video call apps or services).</li> <li>I can explain why it is important to be considerate and kind to people online and to respect their choices.</li> <li>I can explain why things one person finds funny or sad online may not always be seen in the same way by others.</li> </ul>	<ul style="list-style-type: none"> <li>I can give examples of how someone might use technology to communicate with others they don't also know offline and explain why this might be risky. (e.g. email, online gaming, a pen-pal in another school / country).</li> <li>I can explain who I should ask before sharing things about myself or others online.</li> <li>I can describe different ways to ask for, give, or deny my permission online and can identify who can help me if I am not sure.</li> <li>I can explain why I have a right to say 'no' or 'I will have to ask someone'. I can explain who can help me if I feel under pressure to agree to something I am unsure about or don't want to do.</li> <li>I can identify who can help me if something happens online without my consent.</li> <li>I can explain how it may make others feel if I do not ask their permission or ignore their</li> </ul>

			<p>answers before sharing something about them online.</p> <ul style="list-style-type: none"> <li>I can explain why I should always ask a trusted adult before clicking 'yes', 'agree' or 'accept' online</li> </ul>
<b>Online reputation</b>	<ul style="list-style-type: none"> <li>I can identify ways that I can put information on the internet.</li> </ul>	<ul style="list-style-type: none"> <li>I can recognise that information can stay online and could be copied.</li> <li>I can describe what information I should not put online without asking a trusted adult first</li> </ul>	<ul style="list-style-type: none"> <li>I can explain how information put online about someone can last for a long time.</li> <li>I can describe how anyone's online information could be seen by others.</li> <li>I know who to talk to if something has been put online without consent or if it is incorrect</li> </ul>
<b>Online bullying</b>	<ul style="list-style-type: none"> <li>I can describe ways that some people can be unkind online.</li> <li>I can offer examples of how this can make others feel.</li> </ul>	<ul style="list-style-type: none"> <li>I can describe how to behave online in ways that do not upset others and can give examples.</li> </ul>	<ul style="list-style-type: none"> <li>I can explain what bullying is, how people may bully others and how bullying can make someone feel.</li> <li>I can explain why anyone who experiences bullying is not to blame</li> <li>I can talk about how anyone experiencing bullying can get help</li> </ul>
<b>Managing information online</b>	<ul style="list-style-type: none"> <li>I can talk about how to use the internet as a way of finding information online.</li> <li>I can identify devices I could use to access information on the internet.</li> </ul>	<ul style="list-style-type: none"> <li>I can give simple examples of how to find information using digital technologies, e.g. search engines, voice activated searching).</li> <li>I know / understand that we can encounter a range of things online including things we like and don't like as well as things which are real or make believe / a joke.</li> <li>I know how to get help from a trusted adult if we see content that makes us feel sad, uncomfortable worried or frightened</li> </ul>	<ul style="list-style-type: none"> <li>I can use simple keywords in search engines.</li> <li>I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections).</li> <li>I can explain what voice activated searching is and how it might be used, and know it is not a real person (e.g. Alexa, Google Now, Siri).</li> <li>I can explain the difference between things that are imaginary, 'made up' or 'make believe' and things that are 'true' or 'real'.</li> <li>I can explain why some information I find online may not be real or true</li> </ul>
<b>Health, Wellbeing and Lifestyle</b>	<ul style="list-style-type: none"> <li>I can identify rules that help keep us safe and healthy in and beyond the home when using technology.</li> <li>I can give some simple examples of these rules.</li> </ul>	<ul style="list-style-type: none"> <li>I can explain rules to keep myself safe when using technology both in and beyond the home.</li> </ul>	<ul style="list-style-type: none"> <li>I can explain simple guidance for using technology in different environments and settings e.g. accessing online technologies in public places and the home environment.</li> <li>I can say how those rules / guides can help anyone accessing online technologies</li> </ul>
<b>Privacy and Security</b>	<ul style="list-style-type: none"> <li>I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location).</li> <li>I can describe who would be trustworthy to share this information with; I can</li> </ul>	<ul style="list-style-type: none"> <li>I can explain that passwords are used to protect information, accounts and devices.</li> <li>I can recognise more detailed examples of information that is</li> </ul>	<ul style="list-style-type: none"> <li>I can explain how passwords can be used to protect information, accounts and devices.</li> <li>I can explain and give examples of what is meant by 'private' and 'keeping things private'</li> <li>I can describe and explain some rules for</li> </ul>

	<p>explain why they are trusted.</p>	<p>personal to someone (e.g where someone lives and goes to school, family names).</p> <ul style="list-style-type: none"> <li>I can explain why it is important to always ask a trusted adult before sharing any personal information online, belonging to myself or others.</li> </ul>	<p>keeping personal information private (e.g. creating and protecting passwords).</p> <ul style="list-style-type: none"> <li>I can explain how some people may have devices in their homes connected to the internet and give examples (e.g. lights, fridges, toys, televisions).</li> </ul>
<p><b>Copyright and Ownership</b></p>	<ul style="list-style-type: none"> <li>I know that work I create belongs to me.</li> <li>I can name my work so that others know it belongs to me.</li> </ul>	<ul style="list-style-type: none"> <li>I can explain why work I create using technology belongs to me.</li> <li>I can say why it belongs to me (e.g. 'I designed it' or 'I filmed it').</li> <li>I can save my work under a suitable title / name so that others know it belongs to me (e.g. filename, name on content).</li> <li>I understand that work created by others does not belong to me even if I save a copy</li> </ul>	<ul style="list-style-type: none"> <li>I can recognise that content on the internet may belong to other people.</li> <li>I can describe why other people's work belongs to them.</li> </ul>