



# Computing



## Early Learning Goals

Although not a strand within the EYFS curriculum, there are lots of other learning opportunities that arise from delivering a well-planned computing scheme. Our computing lessons are largely cross-curricular with strong links to communication and language, PSED, mathematics, physical development and the characteristics of effective learning in particular. Repeated and varied opportunities to explore and play with varied technology items such as: cameras, computers, ipads, interactive whiteboards, programmable toys, laptops, listening centres and tinkering around with old equipment eg, typewriters and telephones, allows children to develop proficiency, control and confidence.

	Before starting Reception, children should:	During Reception, the children will learn to:	By the end of Reception, children should:
Personal, Social and Emotional Development	<ul style="list-style-type: none"> <li>Remember rules without needing an adult to remind them.</li> <li>Select and use activities and resources, with help when needed.</li> </ul>	<ul style="list-style-type: none"> <li>Show resilience and perseverance in the face of a challenge.</li> <li>Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time'.</li> </ul>	<p><b>Self-Regulation</b></p> <ul style="list-style-type: none"> <li>Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</li> </ul> <p><b>Managing Self</b></p> <ul style="list-style-type: none"> <li>Explain the reasons for rules, know right from wrong and try to behave accordingly</li> </ul>
Physical Development	<ul style="list-style-type: none"> <li>Match their developing physical skills to tasks and activities in the setting.</li> </ul>	<ul style="list-style-type: none"> <li>Begin to develop their small motor skills so that they can use a growing range of tools.</li> </ul>	<p><b>Fine Motor Skills</b></p> <ul style="list-style-type: none"> <li>Develop their fine motor skills so that they can use a wider range of tools competently, safely and confidently</li> </ul>
Expressive Arts and Design	<ul style="list-style-type: none"> <li>Explore how things work.</li> </ul>	<ul style="list-style-type: none"> <li>Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<p><b>Creating with Materials</b></p> <ul style="list-style-type: none"> <li>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</li> </ul>

## National Curriculum Expectations:

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

	By the end of Year 2	By the end of Year 4	By the end of Year 6
	<p>Pupils should be taught to:</p> <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 and debug 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>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts;</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output;</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs;</li> <li>understand computer networks including the internet; how they can provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration;</li> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information;</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	

<p style="text-align: center;"><b>Multimedia Text and Images</b></p>	<ul style="list-style-type: none"> <li>• add text strings, text boxes and show and hide objects and images, manipulating the features;</li> <li>• use various tools, such as brushes, pens, eraser, stamps and shapes, and set the size, colour and shape;</li> <li>• use applications and devices in order to communicate ideas, work, messages and demonstrate control;</li> <li>• save, retrieve and organise work;</li> </ul> <p>Key vocabulary: paint, colour, brush, tools, settings, undo, redo, text, image, size, poster, launch, application, software, window, minimise, restore, size, move, screen, close, click, drag, log on, log off, keyboards, keys, mouse, click, button, double click, drag, present.</p>	<ul style="list-style-type: none"> <li>• create different effects with different technological tools, demonstrating control;</li> <li>• use appropriate keyboard commands to amend text on a device;</li> <li>• use applications and devices in order to communicate ideas, work, and messages;</li> <li>• save, retrieve and evaluate work, making amendments;</li> <li>• insert a picture/text/graph/hyperlink from the internet or a personal file;</li> </ul> <p>Key vocabulary: draw, object, shape, line, line colour, fill colour, group, ungroup, font, size, text box, format, image, wrap text, plan, link, image, object, link, hyperlink, minimise, restore, size, move, screen, split, create, organise, file, folder, close, exit, search, print, password, screenshot, snipping tool, shift, undo, redo, menu, dictionary, highlight, cursor, toolbar, spellcheck.</p>	<ul style="list-style-type: none"> <li>• use the skills already developed to create content using unfamiliar technology;</li> <li>• select, use and combine the appropriate technology tools to create effect;</li> <li>• review and improve their own work and support others to improve their work;</li> <li>• save, retrieve and evaluate their work, making amendments;</li> <li>• insert a picture/text/graph/hyperlink from the internet or personal file;</li> </ul> <p>Key vocabulary: window, layout, text, font, colour, format, heading, hyperlink, 2D shape, 3D shape, orbit, pan, zoom, eraser, dimension, measurement, guide.</p>
<p style="text-align: center;"><b>Multimedia Sound and Motion</b></p>	<ul style="list-style-type: none"> <li>• use software to record sounds;</li> <li>• change sounds recorded;</li> <li>• save, retrieve and organise work;</li> </ul> <p>Key vocabulary: commands, add sound.</p>	<ul style="list-style-type: none"> <li>• use software to record, create and edit sounds and capture still images;</li> <li>• change recorded sounds, volume, duration and pauses;</li> <li>• use software to capture video for a purpose;</li> <li>• crop and arrange clips to create a short film;</li> <li>• plan an animation and move items within each animation for playback;</li> </ul> <p>Key vocabulary: audio, sound, video, movie, embed, link, file format, animate, animation, still image, thaumatrope, zoetrope, zoopraxiscope, stereoscope, flip book, frame, onion skinning, loop, frame rate, record, stop, play, stop motion, stop frame.</p>	<ul style="list-style-type: none"> <li>• collect audio from a variety of resources including own recordings and internet clips;</li> <li>• use a digital device to record sounds and present audio;</li> <li>• trim, arrange and edit audio levels to improve quality;</li> <li>• publish their animation and use a movie editing package to edit/refine and add titles;</li> </ul> <p>Key vocabulary: audio, record, edit, play stop, skip, waveform, input, output, record, edit, play podcast, digital content, downloadable, backing track, voiceover, mute, gain, production, post-production, documentary, project, evaluation, screening, ceremony, upload.</p>
<p style="text-align: center;"><b>Handling Data</b></p>		<ul style="list-style-type: none"> <li>• talk about the different ways data can be organised;</li> <li>• sort and organize information to use in other ways;</li> <li>• search a ready-made database to answer questions;</li> </ul> <p>Key vocabulary: Google Docs, insert, table.</p>	<ul style="list-style-type: none"> <li>• construct data on the most appropriate application;</li> <li>• know how to interpret data, including spotting inaccurate data and comparing data;</li> <li>• use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets;</li> <li>• add data to an existing database;</li> </ul> <p>Key vocabulary: Google Docs, insert, table, spreadsheet, cell, row, column, formula/formulas, calculate, format, edit, insert, ascending, descending.</p>

<b>Technology in Our Lives</b>	<ul style="list-style-type: none"> <li>recognise ways that technology is used in the home and community, e.g. taking photos, blogs, shopping;</li> <li>use links to websites to find information;</li> <li>recognise age-appropriate websites;</li> <li>use safe search filters;</li> </ul> <p>Key vocabulary: filter, Google, search engine, image, keyboard, email, internet, subject, address, communicate, sender, safe, secure.</p>	<ul style="list-style-type: none"> <li>explain ways to communicate with others online;</li> <li>describe the world wide web as the part of the internet that contains websites;</li> <li>add websites to a favourites list;</li> <li>use search tools to find and use an appropriate website and content;</li> <li>use strategies to improve results when searching online;</li> </ul> <p>Key vocabulary: filter, Google, search engine, image, keyboard, email, subject, address, communicate, sender, safe, secure, internet, world wide web, social media.</p>	<ul style="list-style-type: none"> <li>search for information using appropriate websites and advanced search functions within Google;</li> <li>use strategies to check the reliability of information (cross-check with another source such as books);</li> <li>talk about the way search results are selected and ranked;</li> <li>check the reliability of a website, including the photos on site;</li> <li>tell you about copyright and acknowledge the sources of information;</li> </ul> <p>Key vocabulary: world wide web, search, search engine, advanced search, results, Google, browser, terms of use, bias, authority, citation, plagiarism, source, website, secure, https, site, domain, website, browser, address bar.</p>
<b>Coding and Programming</b>	<ul style="list-style-type: none"> <li>give commands one at a time to control direction and movement, including straight, forwards, backwards, turn;</li> <li>control the nature of events: repeat, loops, single events and add and delete features;</li> <li>give a set of instructions to follow and predict what will happen;</li> <li>improve/change their sequence of commands by debugging;</li> </ul> <p>Key vocabulary: algorithm, instruction, order, debug, program, turn, left, right, clockwise, anticlockwise, blocks, sequence, project, repeat, repeat forever, invisible, grow, shrink.</p>	<ul style="list-style-type: none"> <li>to solve an open-ended problem by breaking it up into smaller parts;</li> <li>write a program, putting commands into a sequence to achieve a specific outcome;</li> <li>give a set of instructions to follow and predict what will happen;</li> <li>keep testing a program and recognise when it needs to be debugged;</li> <li>use variables to create an effect, e.g. repetition, if, when, loop;</li> </ul> <p>Key vocabulary: decompose, decomposing, logical sequence, flowchart, sprite, block, command, algorithm, answer, correct, errors, program, algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable.</p>	<ul style="list-style-type: none"> <li>use external triggers and infinite loops to demonstrate control;</li> <li>follow a sequence of instructions, e.g. in a flowchart and modify a flowchart using symbols;</li> <li>use conditional statements and edit variables;</li> <li>decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program;</li> <li>keep testing a program and recognise when it needs to be debugged;</li> </ul> <p>Key vocabulary: flowchart, algorithm, control, output, symbol, start, stop, delay, process, decision, loop, backdrop, script, block, repeat, commentary, sequence, consequence, debug, program, Kodu, world, object, tool palette, program environment, smooth, flatten, raise.</p>
<b>Online Safety</b>	<ul style="list-style-type: none"> <li>identify what things count as personal information;</li> <li>identify what is appropriate and inappropriate behaviour on the internet;</li> <li>agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;</li> <li>seek help from an adult when they see something that is unexpected or worrying;</li> <li>demonstrate how to safely open and close applications and log on and log off from websites;</li> </ul> <p>Key vocabulary: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, key, question, tell, safe, share, stranger, danger, internet.</p>	<ul style="list-style-type: none"> <li>reflect on their own digital footprint and behaviour online;</li> <li>identify what is appropriate and inappropriate behaviour on the internet, recognising the term cyberbullying;</li> <li>agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;</li> <li>seek help from an adult when they see something that is unexpected or worrying;</li> <li>demonstrate understanding of age-appropriate websites and adverts;</li> </ul> <p>Key vocabulary: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, internet, world wide web, communicate, message, social media, email, password, cyberbullying/bullying, plagiarism, profiles, account, private, public.</p>	<ul style="list-style-type: none"> <li>protect their password and other personal information;</li> <li>be a good online citizen and friend;</li> <li>judge what sort of privacy settings might be relevant to reducing different risks;</li> <li>seek help from an adult when they see something that is unexpected or worrying;</li> <li>discuss scenarios involving online risk;</li> </ul> <p>Key vocabulary: spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, secure, safe, account, online, private, social media, adverts, cyberbullying, reporting, anonymous, victim, fraud/fraudulent, policy, private/personal.</p>