

Progression of skills, knowledge & vocabulary: COMPUTING

INTENT

In computing, we aim:

- to promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
- to promote confidence and competence with devices and programs, including those that are unfamiliar to children, evaluating these analytically to solve problems;
- to use new technologies to enhance learning across the curriculum;
- to encourage children to choose and use appropriate applications with confidence and a sense of achievement;
- to develop practical skills in the use of new technologies and to be able to apply these skills to the solving of relevant and worthwhile problems including the understanding and application of the fundamental principles and concepts of computer science;
- to understand the capabilities and limitations of new technologies;
- to understand the implications, risks and consequences of using new technologies;
- to understand the importance of new technologies in everyday life;
- to analyse problems in computational terms, and have repeated practical experiences of writing computer programs to solve such problems
- to be able to begin to discuss different hardware and software and its purpose for tasks with the aim of digital literacy.

Ongoing skills

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ol style="list-style-type: none"> 1. To recognise a range of technology is used in places such as homes and schools. (ELGs) 2. To share their experiences of technology and engage in conversations about how to use it. 3. To use a range of simple devices and applications appropriately with increasing independence. 4. To select and use technology for a particular purpose. (ELGs) 5. To use various keyboards (onscreen and physical), increasingly able to locate and type letters and numbers. 	<ol style="list-style-type: none"> 1. Recognise uses of information technology both within and beyond school. 2. Use an extended range of devices 3. To develop typing skills through regular use of Keyboards, mouse, keypad and touch screens and games. 	<ol style="list-style-type: none"> 1. Recognise uses of information technology both within and beyond school. 2. Use an extended range of devices 3. To develop typing skills through regular use of Keyboards, mouse, keypad and touch screens and games. 	<ol style="list-style-type: none"> 1. Develop understanding of how a computer and technology works, focusing on computational thinking. 2. To develop confidence in using a range of devices and to justify their choice for a specific purpose. 3. Develop understanding of shared documents. To be able to create, contribute to and edit these documents being aware that that they are visible to all users. 4. To build on developing typing speed. 	<ol style="list-style-type: none"> 1. Develop understanding of how a computer and technology works, focusing on computational thinking. 2. To develop confidence in using a range of devices and to justify their choice for a specific purpose. 3. Develop understanding of shared documents. To be able to create, contribute to and edit these documents being aware that that they are visible to all users. 4. To build on developing typing speed. 	<ol style="list-style-type: none"> 1. Continue to develop computational thinking in different aspects of the curriculum. 2. To be able to justify their choice of technology or computational software. 	<ol style="list-style-type: none"> 1. Continue to develop computational thinking in different aspects of the curriculum. 2. To be able to justify their choice of technology or computational software.

Progression of skills, knowledge & vocabulary: COMPUTING

Programming: using a range of programming software and external output devices involving real world situations, games and quizzes.

Early Years	Year 1	Year 2	Years 3	Year 4	Year 5	Year 6
<p>1. To complete a simple program on a computer.</p> <p>2. To use computing hardware to interact with age appropriate software.</p> <p>3. To know that technology can make things happen and to coordinate actions accordingly – eg click on icon, touch screen, use a mouse</p> <p>4. To select and use technology for a particular purpose. (ELGs)</p>	<p>1. To combine commands to make a sequence in order to create, test and debug a simple program.</p> <p>2. To join a series of commands together to create and run a program</p> <p>3. To combine a test the effectiveness of their algorithms within a program.</p>	<p>1. To understand the need for clear and unambiguous instructions in order to reach a desired outcome.</p> <p>2. To know that program can contain codes, algorithms, artwork and audio</p> <p>3. To design, create, debug and evaluate the effectiveness of a program.</p>	<p>1. To explore ways of starting a program and apply principles of design to create a project</p> <p>2. To implement an algorithm as a code</p> <p>3. To create, adapt and develop a program across different contexts and with multiple features.</p>	<p>1. To explore the need for accuracy in programming</p> <p>2. To use text based language to create, implement and debug an algorithm</p> <p>3. To use a range of more complex instructions in their algorithms.</p>	<p>1. To use computer programming to control outputs on an external circuit.</p> <p>2. To design a program to control external outputs in a sequence of actions.</p> <p>3. To create, test, implement, debug and evaluate an algorithm against a design related to real world programming.</p>	<p>1. To understand how variables can enhance a program.</p> <p>2. To use variables within their algorithms.</p> <p>3. To create a program to run on a controllable device</p> <p>4. To control the flow of program with directed statements</p>

Vocabulary

<p>Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.</p> <p>Scratch Jr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.</p>	<p>instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition</p> <p>sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.</p>	<p>Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.</p> <p>motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.</p>	<p>Logo (programming, environment), program, turtle, commands, code, snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled, loop, value, trace, decompose, procedure</p> <p>Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block. duplicate, modify, design, algorithm, debug, refine, evaluate</p>	<p>microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer</p> <p>Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator</p>	<p>variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare</p> <p>Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.</p>
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Progression of skills, knowledge & vocabulary: COMPUTING

Data and Information: collecting and presenting data in graphs and charts; databases; data logging; spreadsheets

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>1. To know that information can be saved onto and retrieved from computers</p> <p>2. To explore simple programs where they can input and view data in a range of ways – text, graph, image</p>	<p>1. To understand that computers need to be given instructions to perform tasks.</p> <p>2. To understand that computers can group, sort and present information.</p>	<p>1. To know what data is.</p> <p>2. To collect, input and present data on a computer.</p> <p>3. To be able to present the same data in a variety of ways.</p>	<p>1. To know that a branching database can be used to separate objects/data</p> <p>2. To create a branching database to separate data.</p> <p>3. To understand that different information needs to be presented in different ways</p>	<p>1. To know that data can be collected over time and used to answer questions.</p> <p>2. To be able to use a digital device to collect data automatically, over time.</p> <p>3. To use collected data to answer questions</p>	<p>1. To know that data can be organised into records and held on a database.</p> <p>2. To create a database on which to collect and store data.</p> <p>3. To search, sort, order and answer questions about data collected.</p> <p>4. To create graphs and charts from their data.</p>	<p>1. To know that a spreadsheet can produce calculated data using a formula.</p> <p>2. To be able to organise data to create a data set with applied formulae.</p> <p>3. To use a spreadsheet to answer questions, create graphs and make comparisons.</p>
Vocabulary						
	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	data, table, layout, input, device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.,	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Progression of skills, knowledge & vocabulary: COMPUTING

Information technology: understanding computers and networks

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ol style="list-style-type: none"> To select and use technology for particular purposes. (ELGs) To create a piece of digital work (image or text) and save it. To know that technology can be used to find out about things. To know that technology can be used to communicate with others. 	<ol style="list-style-type: none"> To know that technology can help us. To be familiar with the different components of a computer. To develop their keyboard and mouse skills 	<ol style="list-style-type: none"> To know that technology is used at home, school and the wider community To suggest how technology improves our world. To explore the idea of a network and relate to logging on, saving and retrieving files. 	<ol style="list-style-type: none"> To begin to understand how digital devices function. To explain components of a network and how they are connected. To understand the benefits of a digital network. 	<ol style="list-style-type: none"> To understand that the internet is a series of networks. To know that the World Wide Web is part of the internet To know how to evaluate online content for honesty, accuracy and reliability. 	<ol style="list-style-type: none"> To understand how information is transferred between systems and devices. To explore and explain a variety of real-world systems. To complete a collaborative online project 	<ol style="list-style-type: none"> To know that the World Wide Web is a communication tool. To explain how search engines work. To investigate and evaluate different methods of internet-based communication.
Vocabulary						
	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	Information technology (IT), computer, barcode, scanner/scan	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, one-way, two-way, one-to-one, one-to-many.

Progression of skills, knowledge & vocabulary: COMPUTING

Digital literacy & Creating Media: digital art; digital writing; digital photography; music/audio editing; animation/video editing; desktop publishing; 3d modelling; web page creation

Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ol style="list-style-type: none"> To select and use technology for particular purposes. (ELGs) To explore how technology can be used to create and capture writing, drawing, pictures, sound and video To begin to explore basic editing of their work. To explore digital texts To discuss similarities and differences in using digital and non-digital media and share what they have discovered. 	<ol style="list-style-type: none"> To use a range of tools to create and edit digital art. To create text and to manipulate it with changes in font and capitalisation. To become confident in using a keyboard and mouse. To explore digital texts. 	<ol style="list-style-type: none"> To know that different devices can be used to capture a photograph. To recognise that images can be changed. To know how to capture, edit and improve photos. To use a computer to create a musical pattern 	<ol style="list-style-type: none"> To create stop frame animation that includes music and text. To use a range of tools to edit and improve a document. To use publishing software to create a document with careful consideration to layout and style. To explain how publishing is used in the real world. 	<ol style="list-style-type: none"> To be able to identify input and output devices used in audio. To create a podcast that has been edited with multiple tracks. To know how to open, create and save audio files. To show how a digital image can be changed in a range of ways, resaved and reused. 	<ol style="list-style-type: none"> To use drawing tools in a range of ways to produce different outcomes. To be able to create more complex vector images by combining layers of shapes or pixels. To use digital device and linked software to capture, edit and manipulate video. To evaluate different features of an effective video and identify how to improve through reshooting and editing. 	<ol style="list-style-type: none"> To compare 2D and 3D graphics. To construct a digital 3D model of a physical object. To design, develop and improve a digital 3D model. To review the purpose and effectiveness of different web pages. To identify and suggest different features to be used on their web page. To explain the implications of ownership and copyright

Vocabulary

<p>paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers</p> <p>word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.</p>	<p>music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.</p> <p>device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting, editing.</p>	<p>text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.</p> <p>animation, flip book, stop-frame, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.</p>	<p>audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.</p> <p>image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.</p>	<p>vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection</p> <p>video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.</p>	<p>website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.</p> <p>TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.</p>
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Progression of skills, knowledge & vocabulary: COMPUTING

Online safety

Early Years	Years 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>1. To be able to say who to tell if something they see makes them worried or uncomfortable.</p> <p>2. To understand they should ask permission when capturing an image or recording a sound of others.</p> <p>3. To take sensible pictures.</p>	<p>1. Develop e-safe practices.</p> <p>2. Use technology safely and respectfully.</p> <p>3. Understand the need to keep personal information safe and private.</p> <p>4. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p> <p>5. Understand the need to check their research results.</p> <p>6. Begin to respect copyright and ownership.</p>	<p>1. Develop e-safe practices.</p> <p>2. Use technology safely and respectfully.</p> <p>3. Understand the need to keep personal information safe and private.</p> <p>4. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p> <p>5. Understand the need to check their research results.</p> <p>6. Begin to respect copyright and ownership.</p>	<p>1. Use technology safely, respectfully and responsibly.</p> <p>2. Understand the importance of keeping personal information safe and private.</p> <p>3. Identify a range of ways to report concerns about content and contact.</p> <p>4. To recognise safe websites and know the signs of an unsafe website.</p> <p>5. Respect copyright and ownership.</p>	<p>1. Use technology safely, respectfully and responsibly.</p> <p>2. Understand the importance of keeping personal information safe and private.</p> <p>3. Identify a range of ways to report concerns about content and contact.</p> <p>4. To recognise safe websites and know the signs of an unsafe website.</p> <p>5. Respect copyright and ownership.</p>	<p>1. Recognise what acceptable/unacceptable behaviour may look like across the use of a range of devices.</p> <p>2. Understand the importance of keeping personal information safe and private.</p> <p>3. Identify a range of ways to report concerns about content and contact.</p> <p>4. To apply copyright rules in their work</p>	<p>1. Recognise what acceptable/unacceptable behaviour may look like across the use of a range of devices.</p> <p>2. Understand the importance of keeping personal information safe and private.</p> <p>3. Identify a range of ways to report concerns about content and contact.</p> <p>4. To apply copyright rules in their work</p>
Vocabulary						