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Aims:

- Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- Are responsible, competent, confident, and creative users of information and communication technology.

Early Years Framework and National Curriculum	
Nursery	**Personal, Social and Emotional Development** • Remember rules without needing an adult to remind them **Physical Development** • Match their developing physical skills to tasks and activities in the setting. **Understanding the World** • Explore how things wak.
Reception	**Personal, Social and Emotional Development** • Show resilience and perseverance in the face of a challenge. • Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'. **Physical Development** • Develop their small motor skills so that they can use a range of tools competently, safely and confidently. **Expressive Arts and Design** • Explore, use and refine a variety of artistic effects to express their ideas and feelings. **Literacy** • Engage in extended conversations about stories, learning new vocabulary. • Understand print has meaning. **Mathematics** • Continue, copy and create repeating patterns. **Communication and Language.** • Use talk to help work out problems and organise thinking and activities.
ELG- Personal, Social and Emotional Development	**Managing Self** • Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly. **Building Relationships** • Work and play cooperatively and take turns with others.

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ELG- Expressive Arts and Design	**Creating with Materials.** • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
ELG-Literacy	**Comprehension** • Understand recently introduced vocabulary during discussions about stories, non-fiction, rhymes and poems during role play.
ELG – Physical development	**Fine Motor skills** • Use a range of small tools, including scissors, paint brushes and cutlery.
ELG – Understanding the World.	**The Natural World.** • Understand some important processes and changes in the natural world around them including seasons.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Match their developing physical skills to tasks and activities in the setting.				Explore how things work.	Remember rules without needing an adult to remind them.
Reception	**Busy Bodies.** Logic, pattern and abstraction. **Awesome Autumn.** Creating, pattern and logic.	**Winter Warmers – Feed the birds.** Algorithms, decomposition, creating and collaborating.	**Colour collections – Spring sorting.** Creating, pattern and persevering.	**Spring – seed sequencing.** Algorithms and decomposition.	**Boats Ahoy.** Logic, pattern and abstraction **Character Run activity.** Algorithms, perseverance and collaborating.	**Build a rocket – Journey into Year 1.** Tinkering abstraction and creating.

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**COMPUTING SYSTEMS AND NETWORKS** **Technology around us**	**CREATING MEDIA** **Digital Painting**	**CREATING MEDIA** **Digital writing**	**DATA AND INFORMATION** **Grouping data**	**PROGRAMMING A** **Moving a robot**	**PROGRAMMING B** **Introduction to animation**
Objectives	• To identify technology. • To identify a computer and its main parts. • To use a mouse in different ways. • To use a keyboard to type. • To use the keyboard to edit text. • To create rules for using technology responsibly.	• To describe what different freehand tools do. • To use the shape tool and the line tools. • To make careful choices when painting a digital picture. • To explain why I chose the tools I used. • To use a computer on my own to paint a picture. • To compare painting a picture on a computer and on paper.	• To use a computer to write. • To add and remove text on a computer. • To identify that the look of text can be changed on a computer. • To make careful choices when changing text. • To explain why I used the tools that I chose. • To compare writing on a computer with writing on paper.	• To label objects. • To identify that objects can be counted. • To describe objects in different ways. • To count objects with the same properties. • To compare groups of objects. • To answer questions about groups of objects.	• To explain what a given command will do. • To act out a given word. • To combine forwards and backwards commands to make a sequence. • To combine four direction commands to make sequences. • To plan a simple program. • To find more than one solution to a problem.	• To choose a command for a given purpose. • To show that a series of commands can be joined together. • To identify the effect of changing a value. • To explain that each sprite has its own instructions. • To design the parts of a project. • To use my algorithm to create a program.
Vocabulary	Technology, computer, mouse, trackpad, keyboard, screen, click, drag, input device, shift, spacebar, capital letter, full stop, safely, responsibly	Paint program, tool, paintbrush, erase, fill, undo, Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool, Henri Matisse, Wassily Kandinsky, feelings, colour, brush style, George Seurat, Pointillism, prefer, dislike, like	Word processor, keyboard, keys, letters, Microsoft Word, letters, numbers, space, backspace, text cursor, toolbar, bold, italic, underline, undo, font, toolbar	Object, label, group, search, image, colour, shape, property, value, data set, less, most, fewest, the same	Forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, plan, algorithm, route, program	ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining, start, program, background, delete, reset, algorithm, predict, effect, change, value, block, instructions, appropriate, design

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Year 2	COMPUTING SYSTEMS AND NETWORKS Information technology around us	CREATING MEDIA Digital photography	PROGRAMMING A Robot algorithms	CREATING MEDIA Making music	DATA AND INFORMATION Pictograms	PROGRAMMING B Introduction to quizzes
Objectives	• To recognise the uses and features of information technology. • To identify information technology in the home. • To identify information technology beyond school. • To explain how information technology benefits us. • To show how to use information technology safely. • To recognise that choices are made when using IT	• To know what devices can be used to take photographs. • To use a digital device to take a photograph. • To describe what makes a good photograph. • To decide how photographs can be improved. • To use tools to change an image. • To recognise that images can be changed.	• To explain what a given command will do. • To act out a given word. • To combine forwards and backwards commands to make a sequence. • To combine four direction commands to make sequences. • To plan a simple program. • To find more than one solution to a problem.	• To say how music can make us feel. • To identify that there are patterns in music. • To describe how music can be used in different ways. • To show how music is made from a series of notes. • To create music for a purpose • To review and refine our computer work.	• To recognise that we can count and compare objects using tally charts. • To recognise that objects can be represented as pictures. • To create a pictogram. • To select objects by attribute and make comparisons. • To recognise that people can be described by attributes. • To explain that we can present information using a computer.	• To choose a command for a given purpose. • To show that a series of commands can be joined together. • To identify the effect of changing a value. • To explain that each sprite has its own instructions. • To design the parts of a project. • To use my algorithm to create a program.
Vocabulary	Information technology (IT), computer, barcode, scanner/scan	Device, camera, photograph, capture, image, digital, landscape, portrait, horizontal, vertical, field of view, narrow, wide, format, framing, focal point, subject, matter, flash, focus, background, foreground, editing, filter, Pixl, changed, real	Instruction, sequence, clear, unambiguous, algorithm, program, order, commands, prediction, artwork, design, route, mat, debugging	Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, notes, instrument, create, open, edit	More than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, data, tally chart, compare, count, explain, attribute, group, same, different, most popular, least popular	Sequence, command, program, run, program, start, predict, blocks, actions, sprite, modify, match, debug, features, evaluate

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Year 3	COMPUTING SYSTEMS AND NETWORKS Connecting Computers	PROGRAMMING A Sequence in music	CREATING MEDIA Desktop publishing	DATA AND INFORMATION Branching databases	CREATING MEDIA Stop frame animation	PROGRAMMING B Events and actions
Objectives	• To explain how digital devices function. • To identify input and output devices. • To recognise how digital devices can change the way we work. • To explain how a computer network can be used to share information. • To explore how digital devices can be connected. • To recognise the physical components of a network.	• To explore a new programming environment. • I can identify that each sprite is controlled by the commands I choose. • To explain that a program has a start. • To recognise that a sequence of commands can have an order. • To change the appearance of my project. • To create a project from a task description.	• To recognise how text and images convey information. • To recognise that text and layout can be edited. • To choose appropriate page settings. • To add content to a desktop publishing publication. • To consider how different layouts can suit different purposes. • To consider the benefits of desktop publishing.	• To create questions with yes/no answers. • To identify the object attributes needed to collect relevant data. • To create a branching database. • To identify objects using a branching database. • To explain why it is helpful for a database to be well structured. • To compare the information shown in a pictogram with a branching database.	• To explain that animation is a sequence of drawings or photographs. • To relate animated movement with a sequence of images. • To plan an animation. • To identify the need to work consistently and carefully. • To review and improve an animation. • To evaluate the impact of adding other media to an animation.	• To explain how a sprite moves in an existing project. • To create a program to move a sprite in four directions. • To adapt a program to a new context. • To develop my program by adding features. • To identify and fix bugs in a program. • To design and create a maze-based challenge.
Vocabulary	Digital device, input, output, process, program, connection, network, network switch, server, wireless access point (WAP)	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, event, task, design, code, run the code, order, note, chord, algorithm, bug, debug	Text, images, advantages, disadvantages, communicate, font, style, template, desktop publishing, copy, paste, layout, purpose, benefits	Attribute, value, questions, table, objects, branching databases, objects, equal, even, separate, order, organise, j2data, selecting, pictogram, information, decision tree, questions	Animation, flip book, stop frame, animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, delete, frame, media, import, transition	Motion, event, sprite, algorithm, logic, move, resize, algorithm, extension block, pen up, set up, design, action, debugging, errors, setup, test

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Year 4	CREATING MEDIA Audio editing	COMPUTING SYSTEMS AND NETWORKS The Internet	CREATING MEDIA Photo editing	DATA AND INFORMATION Data logging	PROGRAMMING A Repetition in shapes	PROGRAMMING B Repetition in games
Objectives	• To identify that sound can be digitally recorded. • To use a digital device to record sound. • To explain that a digital recording is stored as a file. • To explain that audio can be changed through editing. • To show that different types of audio can be combined and played together. • To evaluate editing choices made.	• To describe how networks physically connect to other networks. • To recognise how networked devices make up the internet. • To outline how websites can be shared via the World Wide Web. • To describe how content can be added and accessed on the World Wide Web. • To recognise how the content of the WWW is created by people. • To evaluate the consequences of unreliable content.	• To explain that digital images can be changed. • To change the composition of an image. • To describe how images can be changed for different uses. • To make good choices when selecting different tools. • To recognise that not all images are real. • To evaluate how changes can improve an image.	• To explain that data gathered over time can be used to answer questions. • To use a digital device to collect data automatically. • To explain that a data logger collects 'data points' from sensors over time. • To use data collected over a long duration to find information. • To identify the data needed to answer questions. • To use collected data to answer questions.	• To identify that accuracy in programming is important. • To create a program in a text-based language. • To explain what 'repeat' means. • To modify a count-controlled loop to produce a given outcome. • To decompose a program into parts. • To create a program that uses count-controlled loops to produce a given outcome.	• To develop the use of count-controlled loops in a different programming environment. • To explain that in programming there are infinite loops and count controlled loops. • To develop a design which includes two or more loops which run at the same time. • To modify an infinite loop in a given program. • To design a project that includes repetition. • To create a project that includes repetition.
Vocabulary	Audio, record, playback, microphone, speaker, headphones, input, output, start, stop, podcast, save, file, selection, edit, mixing, time shift, export, MP3, evaluate, feedback	Internet, network, router, network security, network switch, wireless access point (WAP), router, website, web page, web address, router, routing, route tracing, browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, accurate, honest, adverts	Image, edit, arrange, select, digital, crop, undo, save, search, copyright, composition, save, pixels, rotate, flip, adjustments, effects, colours, hue/saturation, sepia, version, illustrator, clone, recolour, magic wand, sharpen, brighten, fake, real, composite, background, foreground, retouch, paste, alter, publication, elements, original, font style, border, layer	Data, table (layout), input device, sensor, data logger, logging, data point, interval, analyse, import, export, logged, collection, analyse, review, conclusion	Program, turtle, commands, code, snippet, algorithm, design, debug, logo commands, pattern, repeat, repetition, count-controlled loop, value, decompose, procedure	Scratch, programming, sprite, blocks, code, loop, repeat, value, forever, infinite loop, count-controlled loop, animate, costume, event block, duplicate, modify, debug, refine, evaluate, algorithm

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Year 5	COMPUTING SYSTEMS AND NETWORKS Sharing information	DATA AND INFORMATION Flat-file databases	CREATING MEDIA Video editing	CREATING MEDIA Vector drawing	PROGRAMMING A Selection in physical computing	PROGRAMMING B Selection in quizzes
Objective	• To explain that computers can be connected to form systems. • To recognise the role of computer systems in our lives. • To experiment with search engines. • To describe how search engines select results. • To explain how search results ranked. • To explain why the order is important.	• To use a form to record information. • To compare paper and computer-based databases. • To outline how grouping and then sorting data allows us to answer questions. • To explain that tools can be used to select specific data. • To explain that computer programs can be used to compare data visually. • To apply my knowledge of a database to ask and answer real-world questions.	• To explain what makes a video effective. • To identify digital devices that record video. • To capture video using a range of techniques. • To create a story board. • To identify that video can improved by editing. • To consider the impact of choices when making and sharing videos. •	• To identify that drawing tools can be used to produce different outcomes. • To create a vector drawing by combining shapes. • To use tools to achieve a desired effect. • To recognise that vector drawings consist of layers. • To group objects to make them easier to work with. • To evaluate my vector drawing.	• To control a simple circuit connected to a computer. • To write a program that includes count-controlled loops. • To explain that a loop can stop when a condition is met, eg number of times. • To conclude that a loop can be used to repeatedly check whether a condition has been met. • To design a physical project that includes selection. • To create a controllable system that includes selection.	• To explain how selection is used in computer programs. • To relate that a conditional statement connects a condition to an outcome. • To explain how selection directs the flow of a program. • To design a program which uses selection. • To create a program which uses selection. • To evaluate my program.
Vocabulary	System, connection, digital, input, process, output, protocol, address, packet, chat, explore, slide deck, reuse, remix, collaboration	Database, data, information, record, field, sort, order, group, search, criteria, value, graph, chart, axis, compare, filter, presentation	Video, audio, recording, storyboard, script, soundtrack, dialogue, capture, zoom, storage, digital, tape, AV (audiovisual), videographer, video techniques, zoom, pan, tilt, angle, YouTuber, content, camera, colour, export, trim/clip, titles, end credits, timeline, transitions, soundtrack, retake/reshoot, special effects, constructive feedback	Vector, drawing tools, shapes, object, icons, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, alignment grid, handles, consistency, modify, layers, front, back, copy, paste, group, ungroup, reuse, improvement, evaluate, alternatives	Microcontroller, crumble controller, components, LED, Sparkle, crocodile clips, connect, battery box, program, repetition, infinite loop, count-controlled loop, condition, true, false, input, action, selection, motor, switch, algorithm, debug, evaluate	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement – the linking together of a condition and outcomes, algorithm, program, debug, implement, question, answer, task, input, outcomes, test, run, setup, share, evaluate, constructive

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Year 6	COMPUTING SYSTEMS AND NETWORKS Communication	CREATING MEDIA Web page creation	CREATING MEDIA 3D modelling	DATA AND INFORMATION Spreadsheets	PROGRAMMING A Variables in games	PROGRAMMING B Sensing
Objective	• To explain the importance of an internet address. • To recognise how data is transferred across the internet. • To explain how sharing information online can help people work together. • To evaluate different ways of working together. • To recognise how we communicate with technology. • To evaluate different methods of online communication.	• To review an existing website and consider its structure. • To plan the features of a web page. • To consider the ownership and use of images (copyright). • To recognise the need to preview pages. • To outline the need for a navigation path. • To recognise the implications of linking to content owned by other people.	• To use a computer to create and manipulate three-dimensional (3D) digital objects. • To compare working digitally with 2D and 3D graphics. • To construct a digital 3D model of a physical object. • To identify that physical objects can be broken down into a collection of 3D shapes. • To design a digital model by combining 3D objects. • To develop and improve a digital 3D model.	• To identify questions which can be answered using data. • To explain that objects can be described using data. • To explain that formula can be used to produce calculated data. • To apply formulas to data, including duplicating. • To create a spreadsheet to plan an event. • To choose suitable ways to present data.	• To define a 'variable' as something that is changeable. • To explain why a variable is used in a program. • To choose how to improve a game by using variables. • To design a project that builds on a given example. • To use my design to create a project. • To evaluate my project.	• To create a program to run on a controllable device. • To explain that selection can control the flow of a program. • To update a variable with a user input. • To use an conditional statement to compare a variable to a value. • To design a project that uses inputs and outputs on a controllable device. • To develop a program to use inputs and outputs on a controllable device.
Vocabulary	Search, search engine, Google, Bing, Yahoo, Swisscows, DuckDuckGo, refine. index, crawler, bot, optimisation, links, web crawlers, content creator, ranking, communication, internet, public, private, one-way, two-way, one-to-one, one-to-many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround	Website, web page, browser, media, Hypertext Markup Language (HTML), layout, header, media, purpose, copyright, fair use, evaluate, preview, device, breadcrumb, trail, navigation, hyperlink, subpage, implication, external link, embed	2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimensions, placeholder, hole, group, ungroup, modify, evaluate, improve	Spreadsheet, data, data heading, data set, cells, columns and rows, data item, format, common attribute, formula, calculation, call reference, sigma, graph, evaluate, results, comparisons, questions, software, tools, data, propose	Variable, change, name, value, set, design, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share	Micro-bit, MakeCode, input, process, output, flashing, USB, selection, condition, if… then… else, variable, random, navigation, design, task, step counter, plan, create, code, test, debug

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