

Computing Curriculum: In computing, we learn how technology works and how to use it safely.

Nursery			<b>Spring Light</b>	<b>Summer Remote Control Toys</b>	
			<p><b>Knowledge Category</b> – Effective use of tools</p> <p><b>Key Knowledge:</b> Technology can give us light. The distance from the light source impacts the size and form of the shadow. Technology with batteries e.g. torches needs to be switched off after use so the battery does not go flat.</p> <p><b>Skill:</b> To press buttons to control simple equipment. To use different sources of light to create effects e.g. shadows using torches</p> <p><b>Vocabulary:</b> light, dark, torch, batteries, button, on, off, shadow</p>	<p><b>Knowledge Category</b> – Programming</p> <p><b>Key Knowledge:</b> Some technology can be controlled using a remote. Buttons control motion and direction. Chargeable technology needs to be plugged in after use so the battery does not go flat.</p> <p><b>Skill:</b> To control the movement of remote control toys using buttons.</p> <p><b>Vocabulary:</b> remote, arial, charge</p>	
Reception	Autumn 1 Online Safety	Autumn 2 Programming A: Unplugged Coding	Spring Programming B: Moving a Robot	Summer 1 Seesaw: Photographs	Summer 2 Technology in the Past (History)
	<p><b>Knowledge Category-</b> Computing Systems, Safety and Security</p> <p><b>Key Knowledge:</b> Rules keep us safe when using technology.</p> <p><b>Skill:</b> To identify safe and unsafe situations when using technology.</p> <p><b>Vocabulary:</b> safe, share, information, private, passwords</p>	<p><b>Knowledge Category-</b> Computing Systems, Algorithms</p> <p><b>Key Knowledge:</b> Language needs to be precise when giving directions.</p> <p><b>Skill:</b> To create an 'algorithm' to achieve an intended outcome.</p> <p><b>Vocabulary:</b> program, command, reset, algorithm, instructions, prepositional language</p>	<p><b>Knowledge Category-</b> Algorithms, Programming</p> <p><b>Key Knowledge:</b> Robots are machines that complete tasks. Robots follow a clear, fixed command in a precise and repeatable way. Programs needs to be planned.</p> <p><b>Skill:</b> To plan short algorithms and programs for floor robots and predict program outcomes.</p> <p><b>Vocabulary:</b> forwards, backwards, turn, go, commands, left, right, instructions, directions, plan, program, algorithm, route</p> <p><b>Resources:</b> Code-a-pillars</p>	<p><b>Knowledge Category-</b> Creating Media, Effective Use of Tools</p> <p><b>Key Knowledge:</b> iPads can be used to take photographs. You need to decide what you are going to photograph before you take the photo. Digital photographs can be saved so you can find them easily and share them to other devices.</p>	<p><b>Knowledge Category-</b> Effective Use of Tools</p> <p><b>Key Knowledge:</b> Technology and the way we use it has changed over time but some things have stayed the same. Technology helps us in different ways.</p> <p><b>Skill:</b> To recognise a range of technology from the past, role playing and using working devices appropriately.</p>

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	<p><b>Resources:</b> ThinkUKNow Smartie the Penguin</p>	<p><b>Resources:</b> assault course equipment, talking buttons to record instructions</p>			<p><b>Skill:</b> To capture digital photographs and save them so they can be found easily.</p> <p><b>Vocab:</b> photograph, QR code, scan, save, folder,</p> <p><b>Resources:</b> iPads, Seesaw</p>	<p><b>Vocab:</b> button, names of old technology, screen, display</p> <p><b>Resources:</b> stopwatches, mobile phones for role play, iPods/MP3 players, a variety of headphones, cassettes and players</p>
Year 1	Autumn 1 Technology Around Us	Autumn 2 Digital Painting	Spring 1 Programming A – Moving a Robot	Spring 2 Grouping Data	Summer 1 Digital Writing	Summer 2 Programming B – Programming Animations
	<p><b>Knowledge Category-</b> Computer Systems, Algorithms, Safety and Security</p> <p><b>Key Knowledge:</b> Technology helps us in different ways. To know the main parts of a computer/iPad and what each part does. Different computers use different mice but they perform the same function. Writing on a keyboard is called typing. Rules help to</p>	<p><b>Knowledge Category-</b> Effective Use of Tools, Creating Media</p> <p><b>Key Knowledge:</b> Creating art digitally is different to non-digitally. Different paint tools do different jobs. Tools need to be chosen carefully to create desired effects.</p> <p><b>Skill:</b> To choose appropriate tools in a program to create art and compare with working non-digitally.</p> <p><b>Vocabulary:</b> paint program, tool,</p>	<p><b>Knowledge Category-</b> Algorithms, Programming</p> <p><b>Key Knowledge:</b> Robots are machines that complete tasks. Language needs to be precise when giving directions. Robots follow a clear, fixed command in a precise and repeatable way. Using the same starting position with fixed commands allows us to predict what a program will do. Finding and fixing errors in algorithms and programs is called debugging. There is more than one way to solve a problem. Programs needs to be planned.</p>	<p><b>Knowledge Category-</b> Data and Information, Algorithms</p> <p><b>Key Knowledge:</b> Computers are not intelligent and require human input. A label is a property used to describe an object.</p> <p><b>Skill:</b> To explore object labels then use them to sort and group objects by properties.</p> <p><b>Vocabulary:</b> object, label, group, search, image, property, value, data set</p>	<p><b>Knowledge Category-</b> Creating Media, Effective Use of Tools</p> <p><b>Key Knowledge:</b> Text can be created and formatted digitally. Writing digitally is different to writing on paper. Keyboard letters are all capitals and are not in alphabetical order.</p> <p><b>Skill:</b> To use a computer to create and format text before comparing to writing non-digitally.</p>	<p><b>Knowledge Category-</b> Programming, Design and Development</p> <p><b>Key Knowledge:</b> Characters on screen can be moved using commands. Programs need to be started. Blocks can be joined together. Changing a value affects a block. Each sprite has its own programming area.</p> <p><b>Skill:</b> To design and program the movement of a character on screen to tell stories.</p>

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	<p>keep us safe when using technology.</p> <p><b>Skill:</b> To recognise technology in school and use it responsibly.</p> <p><b>Vocab:</b> technology, computer, iPad, mouse, trackpad, keyboard, screen</p> <p><b>Resources:</b> iPads, Paintz</p>	<p>paintbrush, erase, fill, undo primary colours, shape tools, line tool, brush style</p> <p><b>Resources:</b> iPads, Sketchbook</p>	<p><b>Skill:</b> To write short algorithms and programs for floor robots and predict program outcomes.</p> <p><b>Vocabulary:</b> forwards, backwards, turn, clear, go, commands, left, right, instructions, directions, plan, program, algorithm, route</p> <p><b>Resources:</b> Bee-Bots</p>	<p><b>Resources:</b> labels, objects for grouping, sorting equipment</p>	<p><b>Vocabulary:</b> keys, type, Space, Backspace, text cursor, redo, undo, font, format, Caps lock, Enter</p> <p><b>Resources:</b> iPads</p>	<p><b>Vocabulary:</b> command, sprite, programming, programming area, block, run, background, delete, reset, algorithm, predict, effect, value</p> <p><b>Resources:</b> iPads, ScratchJr</p>
Year 2	Autumn 1 IT Around Us	Autumn 2 Digital Photography	Spring 1 Programming A – Robot Algorithms	Spring 2 Pictograms	Summer 1 Digital Music	Summer 2 Programming B – Programming Quizzes
	<p><b>Knowledge Category-</b> Computing Systems, Computer Networks, Safety and Security</p> <p><b>Key Knowledge:</b> IT and its responsible use improves our world in school and beyond. Devices work together. Rules help to keep us safe when using IT.</p> <p><b>Skill:</b> To identify IT. To identify the choices made when</p>	<p><b>Knowledge Category-</b> Effective Use of Tools, Creating Media</p> <p><b>Key Knowledge:</b> Many devices can be used to take photographs. Photographs can be taken in portrait and landscape formats. A photograph is composed by a photographer. Lighting affects the quality of photographs. Images can be edited and changed for a purpose. Not all images are real.</p> <p><b>Skill:</b> To capture and</p>	<p><b>Knowledge Category-</b> Algorithms, Programming</p> <p><b>Key Knowledge:</b> Computers can only follow clear and unambiguous instructions. The order of instructions affects the outcome. Logical reasoning can be used to predict the outcome of a sequence. Design in programming includes artefacts as well as code and algorithms. Finding and fixing errors in algorithms and programs is called debugging.</p> <p><b>Skill:</b> To create and debug programs and use logical</p>	<p><b>Knowledge Category-</b> Data and Information, Effective Use of Tools</p> <p><b>Key Knowledge:</b> There are different types of data collection and some are more effective than others. Objects can be organised by attribute. Information can be presented using a computer. You need to think carefully about whether to share data.</p> <p><b>Skill:</b> To collect data in tally charts and use attributes to organise</p>	<p><b>Knowledge Category-</b> Creating Media, Design and Development</p> <p><b>Key Knowledge:</b> Music generates emotions. Music is created and played by humans. Music is a sequence of notes.</p> <p><b>Skill:</b> To use an iPad as a tool to explore rhythms and melodies, before creating a musical composition.</p>	<p><b>Knowledge Category-</b> Programming, Design and Development</p> <p><b>Key Knowledge:</b> A sequence of commands has a start and an outcome. A program has to be started.</p> <p><b>Skill:</b> To design algorithms and programs that use events to trigger sequences of code to make an interactive quiz.</p> <p><b>Vocabulary:</b> sequence, command, program,</p>

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<p>using IT. To use IT responsibly for different types of activities. To explain the need to use IT in different ways.</p> <p><b>Vocabulary:</b> Information Technology, computer, barcode, scanner/scan,</p> <p><b>Resources:</b> iPads, Paintz</p>	<p>change digital photographs for different purposes.</p> <p><b>Vocabulary:</b> device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, lighting</p> <p><b>Resources:</b> digital cameras, Pixlr</p>	<p>reasoning to make predictions.</p> <p><b>Vocabulary:</b> instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition</p> <p><b>Resources:</b> Bee-Bots</p>	<p>and present data on a digital device.</p> <p><b>Vocabulary:</b> More than, less than, most, least, organise, data, object, tally chart, votes, total,</p> <p><b>Resources:</b> j2e pictogram, iPads</p>	<p><b>Vocabulary:</b> quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, notes, edit</p> <p><b>Resources:</b> iPads</p>	<p>run, start, outcome, predict, blocks, sprite, algorithm, project, modify, change, Compare, design, debug, features, evaluate</p> <p><b>Resources:</b> iPads, ScratchJr</p>
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#### Knowledge Categories:

- Algorithms — Be able to comprehend, design, create, and evaluate algorithms
- Computer networks — Understand how networks can be used to retrieve and share information, and how they come with associated risks
- Computer systems — Understand what a computer is, and how its constituent parts function together as a whole
- Creating media — Select and create a range of media including text, images, sounds, and video
- Data and information — Understand how data is stored, organised, and used to represent real-world artefacts and scenarios
- Design and development — Understand the activities involved in planning, creating, and evaluating computing artefacts
- Effective use of tools — Use software tools to support computing work
- Impact of technology — Understand how individuals, systems, and society as a whole interact with computer systems
- Programming — Create software to allow computers to solve problems
- Safety and security — Understand risks when using technology



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## Key stage 1

Pupils should be taught to:

- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- 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

## Purpose of study

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.

## Aims

The national curriculum for computing aims to ensure that all pupils:

- 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

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National Curriculum Coverage – Years 1 and 2	1.1 Technology around us	1.2 Digital painting	1.3 Moving a robot	1.4 Grouping data	1.5 Digital writing	1.6 Programming animations	2.1 Information technology around us	2.2 Digital photography	2.3 Robot algorithms	2.4 Pictograms	2.5 Making music	2.6 Programming quizzes
Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions			✓			✓			✓			✓
Create and debug simple programs			✓			✓			✓			✓
Use logical reasoning to predict the behaviour of simple programs			✓			✓			✓			✓
Use technology purposefully to create, organise, store, manipulate, and retrieve digital content	✓	✓		✓	✓		✓	✓		✓	✓	✓
Recognise common uses of information technology beyond school	✓		✓				✓	✓				
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	✓			✓	✓		✓	✓	✓	✓		

