

Computing programmes of study: KS 1 and 2

What do we aim to achieve? (Our intent)

Through our Computing programme of study we want our pupils to develop **computational thinking and creativity** and become **digitally literate**. We want them to be able to **use, express themselves and develop their ideas** through information and communication technology so that they can become **active participants in a digital world**.

Our children will:

- Use technology, and the internet, safely and with respect.
- Understand algorithms and how they are used.
- Understand the internet and the opportunities it offers.
- Design and create their own programs and debug them.
- Use technology in order to create, organise, save, manipulate and retrieve digital content.
- Use logical reasoning to predict what might happen.
- Recognise technology in and out of school.

How do we do it? (Our implementation)

The children will develop these skills over our two year rolling programme. They will use practical activities as starting points before learning specific programming skills. They will explore a range of equipment, from walkie-talkies and cameras, to BeeBot programmable toys. They will use a variety of software on a range of digital devices, such as iPads, Chrome books, and class desktops.

Our key software is Purple Mash (including Mini Mash) and Discovery Expresso. The children will also use the internet. Purple Mash is available for use at home.

What happens as a result of this learning? (Our impact)

The impact of our programme of study is that 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 confidently to create programs, systems and a range of content. They know how to keep themselves safe, and how to seek help if they are concerned.

Look at what our pupils have created

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YEAR A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme	All About Me	Winter Wonderland	Superheroes	Minibeasts	Around the World in 30 Days	On the Farm
EYFS	2Paint: Paint project – draw and label a happy face. Paint project – draw and label your body. Paint project – alphabet tracing, number tracing. 2Paint tools - spinner, swirly, slice.	Drag & drop: Mini-Mash - measuring. Simple city – number/alphabet jigsaws. Purple Mash – Writing gift labels (Christmas). Paint project – create a winter scene.	2Count & 2Go: 2Count – Data handling. Create a pictogram. 2Go – programming. Programming BeeBots. Using iPads to take photos of “super” friends. Using walkie talkies	2Beat: 2Beat – create a sequence of sounds to accompany a familiar story. Purple Mash – The lifecycle of a butterfly. Paint project – Minibeast. Using cameras to observe/record the life cycle of a hen/butterfly.	Keyboard skills: Purple Mash – Write a postcard about your time in the rainforest. Paint project –snake, monkey. Watching videos/ pictures of other countries. Making a video using iPads - our school.	2Create a Story: 2Create a story – children create stories written in Literacy. Simple city – On the farm (link to school trip). Purple Mash – farm puzzles.

What does each lesson cover and how does it link together over time? NC aims for Key Stages 1 (Years 1 and 2) and 2 (Years 3-4)

C1: can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation

C2: can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems

C3: can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

C4: are responsible, competent, confident and creative users of information and communication technology.

Theme	TOYS	HOUSES AND HOMES	TRAVEL THE WORLD
KS1	Unit 1.1 Online Safety & Exploring Purple Mash; Use technology safely and respectfully, keeping personal information private; where to get help Unit 1.2 Grouping & Sorting 2DIY create, organise, store, manipulate and retrieve digital content - sort various items online	Unit 1.3 Pictograms 2Count create, organise, store, manipulate and retrieve digital content: class pictogram Unit 1.4 Lego Builders 2DIY Introduction to understanding what algorithms are & order recipe instructions and “debug”	Unit 1.5 Maze Explorers 2Go Understanding algorithms; programming an object in a maze to following precise and unambiguous instructions. Use logical reasoning
	Unit 2.2 Online Safety Exploring Purple Mash; Use technology safely and respectfully, keeping personal information private; where to get help Unit 2.1 Coding 2Code Understand algorithms, create & debug; use logical reasoning	Unit 2.3 Spreadsheets 2Calculate Use technology purposefully to create, organise, store, manipulate and retrieve digital content - cut and paste; to add amounts; to create a table and block graph	Unit 2.4 Questioning 2Question 2Investigate Use technology purposefully to create, organise, store, manipulate and retrieve digital content Use a binary tree and database to answer search questions.
KS2	Coding 3.1 2Code Design, write and debug programs Use variables and a timer. Explore repeat commands. Use logical reasoning and detect and correct errors	Unit 3.2 Online Safety 2Connect (Mind Map) 2Blog (Blogging) Writing Templates Display boards Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Unit 3.3 Spreadsheets 2Calculate Design and create a range of programs Children can use a spreadsheet program to automatically create charts and graphs from data. Unit 3.4 Touch Typing 2Type Design and create a range of programs Children can use two hands to type the letters on the keyboard.
	Unit 3.6 Branching Databases 2Question (Binary Databases) Design and create a range of programs Create a branching database of their choice.	Unit 3.7 Simulations 2Simulate 2Publish Design and create a range of programs Children know that a computer simulation can represent real and imaginary situations. Children can recognise patterns within simulations and make and test predictions Unit 3.8 Graphing 2Graph Design and create a range of programs Solve an investigation and present the results in graphic form.	

How does all this build on their learning from the Early Years?

Early Learning Goal	Understanding the World	Technology	To recognise that a range of technology is used in places such as homes and schools. To select and use technology for particular purposes.
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YEAR B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme	All about Me	Fabulous Festivals	Dinosaurs	Traditional Tales	Transport	Pirates/ Under the Sea
EYFS	2Paint: Paint project – draw and label a happy face. Paint project – draw and label your body. Paint project – alphabet tracing, number tracing. 2Paint tools - spinner, swirly, slice.	Drag & drop: Mini-Mash - measuring. Simple city – number/alphabet jigsaws. Purple Mash – Writing gift labels (Christmas). Paint project - create firework pictures/rangoli patterns.	2Count & 2Go: 2Count – Data handling. Create a pictogram. 2Go – programming. Programming BeeBots. Paint project - create own dinosaurs using scaly felt tips. Purple Mash - writing dinosaur captions.	2Beat: 2Beat – create a sequence of sounds to accompany a traditional tale. Purple Mash – The lifecycle of a butterfly. Paint project – Gingebread man. Use camera on iPads to observe/record the life cycle of a hen/butterfly.	2Create a Story: 2 Create a Story - Children create stories written in Literacy (steam train, rocket) Simple City - Garage. Watch videos, create a bus using drag & drop. Paint project - bus, car, boat etc.	Keyboard skills Purple Mash – Write a postcard about your time by the sea. Google docs - write about your memories from Reception. Simple city – On the farm (link to school trip). Purple Mash – farm puzzles.

What does each lesson cover and how does it link together over time? NC aims for Key Stages 1 (Years 1 and 2) and 2 (Years 3-4)

C1: can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation

C2: can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems

C3: can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

C4: are responsible, competent, confident and creative users of information and communication technology.

Theme	FAMOUS PEOPLE WHO CHANGED OUR LIVES	LONDON	EXPLORE THE WORLD
KS1 (Yr 1 & 2)	Unit 1.1 Online Safety & Exploring Purple Mash; Use technology safely & respectfully, keeping personal information private; where to get help Unit 1.2 Grouping & Sorting 2DIY create, organise, store, manipulate & retrieve digital content - sort various items online	Unit 1.3 Pictograms 2Count create, organise, store, manipulate and retrieve digital content: class pictogram Unit 1.4 Lego Builders 2DIY Introduction to understanding what algorithms are & order recipe instructions and "debug"	Unit 1.5 Maze Explorers 2Go Understanding algorithms; programming an object in a maze to following precise and unambiguous instructions. Use logical reasoning
	Unit 2.2 Online Safety Exploring Purple Mash; Use technology safely and respectfully, keeping personal information private; where to get help Unit 2.1 Coding 2Code Understand algorithms, create & debug; use logical reasoning	Unit 2.3 Spreadsheets 2Calculate Use technology purposefully to create, organise, store, manipulate and retrieve digital content - cut and paste; to add amounts; to create a table and block graph	Unit 2.4 Questioning 2Question 2Investigate Use technology purposefully to create, organise, store, manipulate and retrieve digital content Use a binary tree and database to answer search questions.
KS2 (Yr 3 & 4)	Coding 4.1 2Code Design, write and debug programs Use sketch or storyboard to represent a program design and algorithm. To know what decomposition and abstraction are. Use logical reasoning and detect and correct errors	Unit 4.2 Online Safety 2Connect (Mind Map) 2Publish Plus Display boards Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. Understand computer networks, including the Internet.	Unit 4.3 Spreadsheets 2Calculate Select, use and combine a variety of software Use formula wizard to add formulae & format cells; timer and spin; budgeting and exploring place value
	Unit 4.5 Logo 2Logo (text-based coding) Design, write and debug programs Use sequence, selection and repetition in programs (create letters, shapes and 'flowers') Use logical reasoning and detect and correct errors Unit 4.6 Animation 2Animate Select, use and combine a variety of software Create a simple animation using stop motion ideas.	Unit 4.7 Effective Search 2Quiz; 2Connect (Mind Map) Use search technologies effectively. Understand computer networks, including the Internet. Analyse contents of a web page for clues about the credibility of the information Unit 4.8 Hardware Investigators 2Quiz; 2Connect (Mind Map) Writing Templates Understand computer networks, including the Internet. Create a leaflet to show the function of computer parts.	
Theme	TOMB RAIDERS	DISAPPEARING RAINFORESTS	WE'LL MEET AGAIN (WW2)

What do they go on to learn about in Year 5 and 6?

Computing is taught as a dedicated subject across all year groups. They explore a wide range of programs to research and present their ideas, as well as developing and creating solutions to problems in a variety of programming languages and environments. Pupils also develop the ability to deal with large data sources efficiently and effectively to find relevant information and present this in a way which is appropriate to the needs of the user or target audiences. All pupils develop their knowledge of Online Safety and how to keep themselves, and others, safe when using technology.

How does it all link with the National Curriculum?

Key Stage 1: Subject content

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.

Key Stage 2: Subject content

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- 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
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 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
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.