Computing programmes of study: KS 1 and 2

What do we aim to achieve? (Our intent)

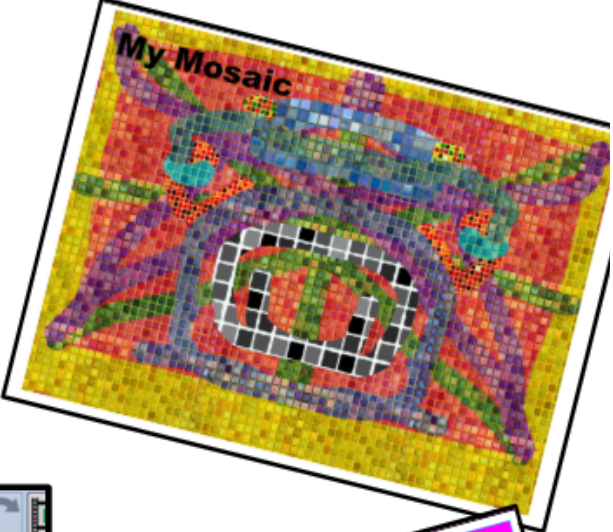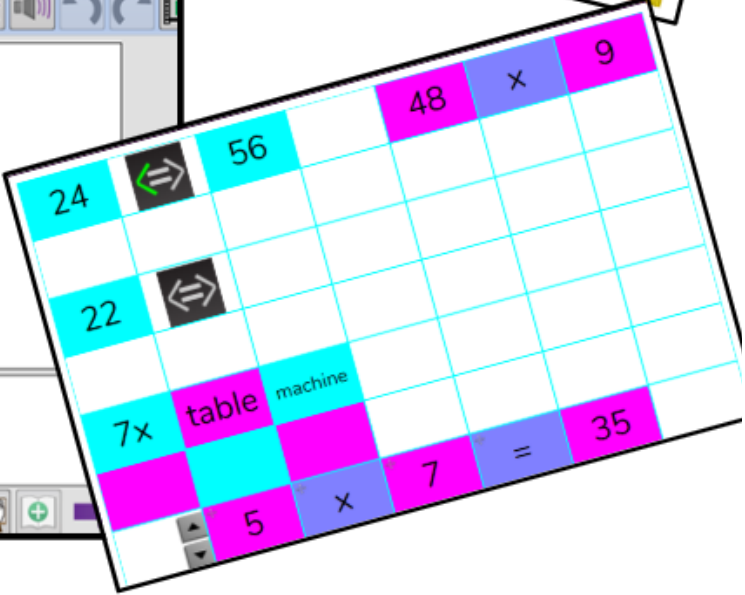Through our Computing programme of study we want our pupils to develop **computational thinking and creativity** and become **digitally literate.** We want them to be able to **use, express themselves and develop their ideas** through information and communication technology so that they can become **active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

Our children will:
- Use technology, and the internet, safety 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

Computing programmes of study: KS 1 and 2

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** – programing. **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 (Yr 1 & 2)	**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 1.6** **Animated Story Books** *2Create A Story* Use technology purposefully to create, organise, store, manipulate and retrieve digital content - create own ebooks with moving content	**Unit 1.7** **Coding** *2Code* Algorithms: Children write a program that controls how a character will move and interact. Use logical reasoning.	**Unit 1.8** **Spreadsheets** *2Calculate* Use technology purposefully to create, organise, store, manipulate and retrieve digital content - navigate and use a spreadsheet **Unit 1.9** **Technology outside school** Recognise common uses of information technology beyond school
	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.	**Unit 2.5** **Effective Searching** *Browser* Recognise common uses of information technology beyond school Create a leaflet to consolidate knowledge of effective Internet searching.	**Unit 2.6** **Creating Pictures** *2PaintAPicture* Create, organise, store, manipulate and retrieve digital contentCreate art based upon a range of styles: Impressionist; Pointillist; Surrealist; in the style of Mondrian & Morris	**Unit 2.7** **Making music** *2Sequence* Make music digitally. Create own tune using the sounds uploaded and created. **Unit 2.8** **Presenting Ideas** Create, organise, store, manipulate and retrieve digital content Make a quiz about a story/class topic; a fact file on a non-fiction topic & a class presentation.
	ROTTEN ROMANS		AMAZING ANGLO-SAXONS		INCREDIBLE INDIA	
KS2 (Yr 3 & 4)	**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 3.5** **Email** *(including Email safety)* *2Email, 2Connect, 2DIY* Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. Children can read and respond to a series of email communications. Children can attach files appropriately and use email communication to explore ideas.	**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.
	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.	**Unit 4.2** **Online Safety** *2Connect (Mind Map)* *2Publish Plus Display boards* Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a	**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 4.4** **Writing for different audiences** *Writing Templates 2Simulate 2Connect (Mind Map) 2Publish Plus* Select, use and combine a variety of software Explore how font size and style affect the impact of a text; Use a simulated scenario to produce a	**Unit 4.5** **Logo** *2Logo (text-based coding)* Design, write and debug programs Use sequence, selection and repetition in programs (create	**Unit 4.7** **Effective Search** *2Quiz; 2Connect (Mind Map)* Use search technologies effectively. Understand computer networks, including the Internet.

| Use logical reasoning and detect and correct errors | range of ways to report concerns about content and contact.
Understand computer networks, including the Internet. | | news report: Use a simulated scenario to write for a community campaign. | 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. | 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. |

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

Foundation Stage Profile	Personal, Social and Emotional Development	Managing Self	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.
	Expressive Arts and Design	Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, form and function.

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** – programing. **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* – Gingerbread 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.

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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 1.6** __Animated Story Books__ *2Create A Story* Use technology purposefully to create, organise, store, manipulate and retrieve digital content - create own ebooks with moving content	**Unit 1.7** __Coding__ *2Code* Algorithms: Children write a program that controls how a character will move and interact. Use logical reasoning.	**Unit 1.8** __Spreadsheets__ *2Calculate* Use technology purposefully to create, organise, store, manipulate & retrieve digital content - navigate and use a spreadsheet **Unit 1.9** __Technology outside school__ Recognise common uses of information technology beyond school
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Theme	TOMB RAIDERS		DISAPPEARING RAINFORESTS		WE'LL MEET AGAIN (WW2)	

KS2 (Yr 3 & 4)	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 3.5 **Email** *(including Email safety)* *2Email, 2Connect, 2DIY* Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. Children can read and respond to a series of email communications. Children can attach files appropriately and use email communication to explore ideas	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.
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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.