

Provision in Early Years to consider the following and plan for opportunities to develop each area through play.

### LOGICAL REASONING

Future computer programmers need to be able to identify and fix problems (bugs) in theirs and others' code. Logical reasoning involves being able to think logically – for instance, identifying patterns, making generalisations and making predictions.

### DECOMPOSITION

This means breaking things down into more manageable steps or stages. In computing this is important because programmers need to devise systems that can tackle large tasks and solve complicated problems.

### ALGORITHMIC THINKING

This is the ability to use your knowledge of sequences and rules to solve problems. Algorithms transfer knowledge of rules to different but similar situations. They are used to tackle the same or similar tasks over and over again.

### ABSTRACTION

Abstraction means to simplify a problem so that it is easier to think about and tackle. Computer programs are designed to tackle problems by deciding what details they need to consider and what they need to ignore.

### EVALUATION

Evaluation involves considering whether something has worked or not. It is about asking whether something is any good at serving the purpose for which it was intended. Computer programs are designed for specific purposes. Programmers need to be able to evaluate programs and decide whether they need improvement and in what way they should be improved.

## COMPUTING CURRICULUM OVERVIEW

Key	Computer Science		Information Technology		Digital literacy	
Term	Aut 1	Aut 2	Spring 1	Spring 2	Summer 1	Summer 2

<b>N</b>	<p>Technology role play – technology in the home corner</p> <p>Abstraction – sorting &amp; classifying</p>	<p>Mini Mash – iPads</p> <p>Decomposition – build a brick model with one group and take photographs. Use the photographs to enable other children to recreate the model</p>	<p>Algorithmic thinking – make visual patterns out of objects of different sizes, colours, shapes</p> <p>Logical Reasoning – testing materials eg make a parachute, test the gradient of a ramp</p>
<b>R</b>	<p>iPads – Mini Mash</p> <p>Algorithmic thinking – create a set of instructions eg to build a model from Lego</p> <p>Algorithmic thinking – make visual patterns out of objects of different sizes, colours, shapes</p>	<p>Beebots – link to learning on maps. Support with Beebots app on iPad.</p> <p>Decomposition – plan a picnic. Plan each stage and take photographs eg decide what to eat, shopping list, prepare food. Break preparation into different stages eg make sandwiches, decorate cakes.</p> <p>Logical Reasoning – testing materials and decide on most suitable material</p>	<p>Computer suite – in small groups, introduce computer suite and logging in to the school network. Mouse control skills, Mini Mash through a browser.</p> <p>Evaluation – which material is most suited for making a bubble blower? Which work best and why?</p>

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Year 1	Introduction to school systems	How do the seasons impact on what we do?	How have important people changed the way we travel around Manchester?	Gingerbread Man	Introduction to algorithms – what is an algorithm?	Why are humans not like tigers?
	<p>Mouse control.</p> <p>iPads – introduce username/password and how to log in to Numbots &amp; Purple Mash</p> <p>Computer suite – log in to school network, transfer log in skills to desktop computer.</p>	<p>Mouse control.</p> <p>Creating pictograms. Link to Science (hours of daylight in each season) to create a Pictogram</p>	<p>Beebots – direction and travel linked to transport topic</p>	<p>Create animated stories based on traditional tales read in class</p>	<p>Algorithms – giving and following instructions</p>	<p>Scratch Jnr – introduction to Scratch Jnr and basic functions (creating a character, adding a background, adding movement in two directions) Use animal themed characters and backgrounds, linking to Science</p>
Purple Mash Units	Purple Mash Unit 1.1 – Online safety	Purple Mash Unit 1.3 – Pictograms		Purple Mash Unit 1.6 – Animated Stories	Purple Mash Unit 1.4 – Lego Builders	

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Year 2	Effective searches	How are Manchester and Nairobi the same and different?	Where the Wild Things Are	WRM – Money (Spr unit 1)	Scratch Jnr	How could you be the next Marcus Rashford?
	Effective searches – look at a range of search engines, search terms. How can we trust our search results?	Create pictograms, binary question trees and non-binary question trees	Stop-motion animation to retell elements of the story	Revise and introduce simple vocabulary linked to spreadsheets  Create a spreadsheet to add up the cost of mixed coins/differently priced items	Use the six-step objectives from Purple Mash within Scratch Jnr to create a short animation – algorithm, collision detection, timer, diff object types, buttons, debugging	Introduce presentation software inc PowerPoint for more able.  Create a presentation based on this term’s learning in Science.
Purple Mash Units	Unit 2.5 – Effective searches and introduction to email (Unit 2.1)	Unit 2.4 – Questioning		Unit 2.3 - Spreadsheets	Unit 2.1 - Coding	Unit 2.8 – Presenting ideas



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Year 3	Purple mash touch typing	What causes earthquakes and volcanic eruptions?	How can Usain Bolt move so quickly?	Purple Mash Email	How does blossom become an apple?	What caused the Industrial Revolution in Manchester?
	Purple Mash – Touch typing unit	PPT – What makes the Earth angry. Create a presentation. Search websites to find facts and important information	Scratch – Design a race between two characters.	Purple mash – 2 publish Pupils can open an email and respond to it. Pupils have sent emails to other pupils in the class.	2Animate – Create an animation on how a flower grows	Kodu – intro Children to design a game based on the industrial revolution using Kodu
Purple Mash Units	Unit 3.4 Touch Typing	Unit 3.9 Presenting (with Microsoft PowerPoint)	Unit 3.1 Coding Main Programs – Scratch	Unit 3.5 Email (including email safety) Weeks – 3 Programs – 2Email	Unit- 4.6 Animation	Unit 3.1 Coding Main Programs – Kodu



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Year 4	How is my life different to the life of a Victorian child?	Christmas Newsletter	Quiz -Times Tables	How did the Roman Empire change life in Britain?	What is different and the same about North West England and Cataluña in Spain?	Stop motion
	PPT- On what it was like for Rich and Poor children in Victorian times	Publisher – Create the Christmas Newsletter for the school.	Scratch – Create a quiz using the program scratch.	Minecraft- Explore an Ancient Roman city.	MS Excel to create different spreadsheets and present data. (Excel)	2 animate- Explore using animation programs. Stop Motion – Children make their own Stop Motion movies
Purple Mash Units	Unit 4.7 Effective Search Programs – Browser	Unit 4.4 Writing for an audience Programs – Publisher	Unit 4.1 Coding Programs - Scratch	Programs – Minecraft Edu – Roman Coliseum	4.3 Spreadsheets Programs – Excel	Unit- 4.6 Animation Programs – Stop Motion (iPad)
	Unit 3.9 PowerPoint Presenting					



Old Moat  
Primary School

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Year 5	How is time different around the world?	Will we ever send another human to the moon?	Scratch game design.	What was significant about how Ancient Egyptians lived?	What significant contribution did Alan Turing make to the world?	What caused WW2 and what were the consequences?
	<b>Spreadsheets</b> – Use effective searching to find different time zones. Create and understand formula to convert time zones.	<b>Block bench</b> – Design a rocket use the 3D printers to print off their designs.	<b>Scratch</b> – Children to design a game and get a chance to play each other's game.	<b>Minecraft Edu</b> Explore and create in Ancient Egypt (create their own pyramid – Use effective research)	<b>Scratch-</b> Binary decoding on worksheets first and then create a binary decoder in Scratch.	<b>MS – Create a war time recipe in MS word.</b> Research the recipe using effective searching skills.
Purple Mash Units	<b>Unit 5.3 Spreadsheets</b>	<b>Unit 5.6 3D Modelling</b>	<b>Unit 5.5 Game creator</b>	<b>Unit 5.6 3D Modelling</b>	<b>Unit 5.1 Coding – Scratch planning</b>	<b>Unit 5.8 Word Processing</b>
	<b>Unit 4.7 Effective Search</b>			<b>Unit 5.2 Online safety</b>	<b>Unit 6.8 Binary</b>	

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Year 6	Letters to Mr Kerr	Scratch game design	How did the Vikings and Anglo Saxons change Britain?	What is the difference between a whale and a shark?	Where is the highest mountain in the world?	
	<b>Online safety</b> - consent, Cookies, fake news and privacy online <b>Microsoft office</b> – using and understanding office. Write a letter to Mr Kerr	<b>Scratch 2</b> - create a game from the plan. Use <b>Makey – Makey</b> from Scratch game	<b>Minecraft Education</b> – Building a Viking village– coding using Minecraft Education <b>Explore Minecraft coding</b>	<b>Sketchup</b> - Create an Art Gallery 3D printer Research Art galleries	<b>Spreadsheet</b> – Create a spreadsheet comparing Nepal and UK climates. Create tables using simple formulas.	<b>Purple Mash</b> – email Presentation – Difference between www and the internet. Presentation continued. Network components
Purple Mash Units	5.8 Word processing	Unit 6.1 Coding		UNIT 6.5 Text Adventures	Unit 6.9 Spreadsheets - Excel	6.6 Networks
	Unit 6.2 Online Safety Unit					Email – Continue from 3.5



## **Computer Science**

Computer science is the knowledge of computers and computation. It includes concepts such as data, system architecture, algorithms and programming.

- Computer science is the core of computing and underpins the whole subject: it should therefore form a substantial part of the computing curriculum.
- Programming relies upon a secure body of knowledge - it is not just a skill. Research shows that it is easy for pupils to develop misconceptions in programming if this knowledge is not secure. The curriculum must set out this knowledge clearly.
- It is also important that the curriculum sets out the knowledge pupils need to build a mental model of programming.
- Programming languages should be chosen to meet curriculum goals, rather than because of price or availability.

These may include block-based languages, such as Scratch, or text-based languages.

- Computational thinking (CT) and problem-solving is a set of specific skills that should be defined within the curriculum as well as taught, and assessed, through specific instruction and activities. These skills include:
  - logic and logical thinking;
  - algorithms and algorithmic thinking;
  - patterns and pattern recognition;
  - abstraction and generalisation;
  - evaluation;
  - automation

## **Information Technology**

Information technology is the context for how computers are used in society. It includes how they are used in different sectors, as well as the creation of digital artefacts, such as presentations, spreadsheets and videos.

- The curriculum to teach pupils how to create digital artefacts should be underpinned by specified declarative and procedural knowledge.

- Pupils' schemata of computing are built through new and repeated encounters with contexts to build a breadth and depth of knowledge. These contexts include the history of computers as well as modern uses.

## **Digital literacy**

Digital literacy is the knowledge and skills needed to use computer technology safely, effectively and with discernment.

- Teachers should not assume that because pupils have grown up in a world of technology, they know how to use it wisely and safely.
- The curriculum should clearly identify the knowledge and skills required for using computing devices.
- The curriculum should sequence knowledge related to e-Safety to ensure that subject content is appropriate for pupils at each stage of their education.