Computing Progression Map

This progression map outlines how pupils develop both **substantive knowledge** and **disciplinary knowledge** in Computing from Nursery through to the end of Key Stage 2. It ensures that learning is carefully sequenced, cumulative, and progressive, so that pupils build secure foundations in language learning and increasingly communicate with confidence, accuracy and independence.

In the Early Years Foundation Stage, computing is embedded through play-based learning and adult-guided activities, primarily within the areas of Understanding the World and Expressive Arts and Design. Children explore technology, create digital content, give simple instructions and organise information in age-appropriate ways, providing strong foundations for future learning.

From Years 1 to 6, Computing is taught as a discrete subject using the Teach Computing curriculum, developed by the National Centre for Computing Education. Components are selected and sequenced to ensure clear progression across the four strands of computing, with key knowledge and skills revisited and built upon year on year.

At Ordsall, we define knowledge in Computing as follows:

Substantive knowledge: The facts, concepts and vocabulary pupils are taught and expected to remember in computing, including:

- Computers and digital devices
- Networks and the internet
- Algorithms, programs, variables and loops
- Data, databases and spreadsheets
- Media types, tools and copyright
- Online safety and responsible use

Disciplinary knowledge: An understanding of how computing works and how computer scientists think including:

- Designing, writing and debugging algorithms and programs
- Using logical reasoning to predict and explain outcomes
- Evaluating digital systems and content
- Organising, analysing and interpreting data
- Applying safe, responsible and ethical behaviours online

Threads

In Computing, key threads run throughout the curriculum, providing continuity and coherence as pupils move through each year group. These recurring strands help pupils make connections between components of learning, revisit and embed prior learning, and deepen their understanding of computing concepts. We have identified the following core threads within our Computing curriculum:

Computing Systems and Networks: Understanding what computers are, how they work, how they connect and how information is shared safely and responsibly.

Creating Media: Using digital tools to create, edit and evaluate media such as images, audio, video and webpages for different purposes.

Programming: Designing, writing, testing and debugging programs to solve problems using algorithms, repetition, selection and variables.

Data and Information: Collecting, organising, analysing and presenting data to answer questions and represent real-world situations.

Disciplinary Knowledge

Across all components, pupils are supported to develop the following disciplinary approaches:

Understanding Digital Systems	Recognising how hardware, software and networks work together and how digital systems are used in the wider world.
Algorithmic Thinking	Breaking problems down into steps, creating algorithms, predicting outcomes and refining solutions.
Programming and Debugging	Creating programs, identifying errors, testing solutions and improving efficiency and accuracy.
Data Handling and Interpretation	Collecting data, identifying patterns, organizing information and using digital tools to answer questions.
Evaluating and Using Technology Responsibly	Evaluating digital content and systems, considering audience and purpose, and applying online safety principles.

Progression Model (Teach Computing)

Computing at Ordsall follows the Teach Computing progression model, ensuring that learning increases in complexity, independence and abstraction as pupils move through school.

- **Early Years** – exploring technology through play, curiosity and real-world experiences.
- **Key Stage 1** – building foundational understanding of technology, algorithms and data.
- **Lower Key Stage 2** – developing structured programming, networks and data handling.
- **Upper Key Stage 2** – applying computing concepts independently, including variables, databases and collaborative systems.

Knowledge is deliberately revisited so pupils can connect new learning to prior understanding.

Coverage Map

Thread	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing Systems and Networks	**Technology in Our World** Exploring everyday technology and learning that digital devices are used by adults and children.	**Using Technology Purposefully** Using digital devices to support learning, and beginning to understand how to use technology safely and responsibly.	**Technology Around Us** Recognising technology in school and using it responsibly.	**Information Technology Around Us** Identifying IT and how its responsible use improves our world in school and beyond.	**Connecting Computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	**The Internet** Recognising that the internet is a network of networks including the world wide web, and why we should evaluate online content.	**Systems and Searching** Recognising IT systems in the world and how some can enable searching on the internet.	**Communication and Collaboration** Exploring how data is transferred by working collaboratively online.
Creating Media	**Digital Mark-Making** Exploring simple digital tools to make marks, images or sounds.	**Creating Digital Content** Using digital tools to draw, take photographs and make simple recordings to represent ideas and learning.	**Digital Painting and Digital Writing** Using digital tools to create artwork and text, making choices about tools and comparing digital creation with non-digital methods.	**Digital Photography and Making Music** Capturing, editing and evaluating digital photographs, and using technology to create and organise music for different purposes.	**Stop-frame Animation and Desktop Publishing** Capturing and editing digital media to create animations, and combining text and images to communicate information effectively.	**Audio Production and Photo Editing** Capturing, editing and evaluating audio and images, considering audience, purpose and responsible use of digital media.	**Video Production and Vector Graphics** Planning, creating and editing videos and digital graphics, making purposeful design choices for different audiences.	**Webpage Creation and 3D Modelling** Designing and creating digital content including webpages and 3D models, considering usability, appearance and audience.

Thread	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programming	**Giving Instructions** Giving simple instructions to people or toys and exploring sequences through play.	**Sequencing and Predicting** Creating simple sequences of instructions, predicting outcomes and making changes when things do not work, including adult-led use of programmable toys.	**Moving a Robot and Programming Animations** Creating and debugging simple programs, using sequences of commands to control floor robots and on-screen objects.	**Robot Algorithms and Programming Quizzes** Designing, creating and debugging programs, using algorithms, events and outcomes to create interactive quizzes and solve problems.	**Sequencing Sounds and Events & Actions in Programs** Creating programs using sequences, events and actions, and developing understanding of how programs respond to inputs.	**Repetition in Shapes and Repetition in Games** Using repetition in programs to create shapes and games, developing efficiency and understanding of loops.	**Selection in Physical Computing and Selection in Quizzes** Using selection and conditions within programs, including controlling physical devices and creating interactive quizzes.	**Variables in Games and Sensing** Using variables, inputs and sensing to design and develop increasingly complex and responsive programs.
Data and Information	**Sorting Objects** Sorting and grouping objects by simple properties such as colour or type.	**Comparing and Grouping Information** Grouping objects and talking about patterns, similarities and differences.	**Grouping Data** Exploring object labels, then using them to sort and group objects by properties.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer.	**Branching Databases** Building and using branching databases to group objects using yes/no questions.	**Data Logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	**Flat-file Databases** Using a database to order data and create charts to answer questions.	**Introduction to Spreadsheets** Answering questions by using spreadsheets to organise and calculate data.

Vocabulary Progression

Thread	Computing Systems and Networks	Creating Media	Programming	Data and Information
Nursery	technology, device	picture, photograph, sound, music	instruction, follow, sequence	sort, group
Disciplinary Vocabulary	Explore – To look at, try out and find out how something works. Use – To work with a device, tool or program to complete a task. Choose – To decide which option is best.			
Reception	technology, computer, digital	image, photograph, record	instruction, command, sequence, program	group, category, compare
Disciplinary Vocabulary	Identify – To spot and name something. Create – To make something new.			
Year 1	computer, keyboard, mouse, screen, technology	paint, image, text, font, colour	command, instruction, algorithm, program, route	object, label, group, data, search
Disciplinary Vocabulary	Compare – To say how things are the same and different. Select – To choose something for a purpose. Create – To make something new.			
Year 2	information technology (IT), device, barcode, scanner	photograph, camera, rhythm, pitch, edit	sequence, algorithm, debug, code, predict	pictogram, tally, compare, data, attribute
Disciplinary Vocabulary	Predict – To make a sensible guess about what might happen. Test – To try something out to see if it works. Debug – To find and fix mistakes.			
Year 3	input, process, output, network, connection	animation, frame, layout, template, orientation	event, sprite, block, sequence, debug	attribute, value, database, branch, decision tree
Disciplinary Vocabulary	Design – To plan what something will look like or how it will work. Create – To make something new. Debug – To find and fix mistakes. Evaluate – To think about what worked well and what could be improved.			
Year 4	internet, router, website, browser, web page	audio, podcast, edit, layer, record	repetition, loop, pattern, procedure, algorithm	sensor, data logger, dataset, analyse, conclusion

Thread	Computing Systems and Networks	Creating Media	Programming	Data and Information
Disciplinary Vocabulary	Test – To try something out to see if it works. Refine – To make something better by improving it. Analyse – To look carefully at information to find patterns or answers. Evaluate – To think about what worked well and what could be improved.			
Year 5	system, storage, search engine, algorithm, ranking	video, storyboard, vector, graphic, layer	selection, condition, input, output, microcontroller	database, record, field, filter, criteria
Disciplinary Vocabulary	Implement – To put a plan into action. Decompose – To break a problem into smaller parts to make it easier to solve. Refine – To make something better by improving it. Evaluate – To think about what worked well and what could be improved.			
Year 6	protocol, IP address, DNS, communication, packet	webpage, HTML, hyperlink, navigation, 3D model	variable, sensing, condition, microcontroller, accelerometer	spreadsheet, cell, formula, chart, calculation
Disciplinary Vocabulary	Analyse – To look carefully at information to find patterns or answers. Communicate – To share ideas or information with others. Collaborate – To work together with others to achieve a goal. Evaluate – To think about what worked well and what could be improved.			

End of Key Stage 2 Outcomes

By the end of Year 6, pupils at Ordsall will:

- Understand how computers, networks and digital systems operate
- Design, write and debug programs using repetition, selection and variables
- Create purposeful digital media for different audiences
- Collect, analyse and present data using appropriate digital tools
- Use technology safely, responsibly and respectfully

Progression in Knowledge

Detailed information about the progression of learning can be found within the Teach Computing Curriculum Maps.