

## Computing Overview

### **Computing intent:**

Through our computing at Thameside we aim to give pupils the life-skills that will enable them to embrace and utilise new technology in a socially responsible and safe way. We want our pupils to be able to operate in the 21<sup>st</sup> century workplace and to know the career opportunities that will be open to them if they have strong computing skills and knowledge. We want children to become autonomous, independent users of computing technologies, gaining confidence and enjoyment from their activities. Children will have gained key knowledge and skills in the three main areas of the computing curriculum: algorithm and programming, information and technology and digital literacy. It is important for children to understand and use the different computing vocabulary so they can access the content of the curriculum. We want the use of technology to support learning across the entire curriculum and to ensure that our curriculum is accessible and challenging to every child. Not only do we want them to be digitally literate and competent end-users of technology but through our computer lessons we hope to develop creativity, resilience, problem-solving and critical thinking skills. The school will provide our pupils with a breadth of experience to develop their understanding of themselves as individuals within their community but also as members of a wider global community and as responsible digital citizens. It is important that the development of children's computing is a partnership between school and home, where parents and children have a good understanding and communicate about keeping safe online.

# EYFS

Development Matters 2021 Nursery Understanding the World	Development Matters 2021 Reception Understanding the World	National Curriculum Computing KS1 Programme of Study
<p>Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them.</p> <p><b>Physical Development</b></p> <ul style="list-style-type: none"> <li>-Match their developing physical skills to tasks and activities in the setting.</li> <li>-Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel. Use one-handed tools and equipment, for example, making snips in paper with scissors.</li> </ul> <p><b>Understanding the World:</b></p> <ul style="list-style-type: none"> <li>-Provide equipment to support these investigations. Suggestions: magnifying glasses or a tablet with a magnifying app.</li> <li>-Explore how things work</li> </ul> <p><b>Expressive Arts and Design:</b></p> <ul style="list-style-type: none"> <li>-Explore different materials freely, in order to develop their ideas about how to use them and what to make.</li> </ul>	<p><b>Reception Personal, Social and Emotional Development</b> --Show resilience and perseverance in the face of a challenge.</p> <p><b>Physical Development</b></p> <ul style="list-style-type: none"> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>-Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'.</li> </ul> <p><b>Expressive Arts and Design</b></p> <ul style="list-style-type: none"> <li>-Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul> <p><b>Understanding the World:</b></p> <ul style="list-style-type: none"> <li>-Use images, video clips, shared texts and other resources to bring the wider world into the classroom. Listen to what children say about what they see</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>-understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>-create and debug simple programs</li> <li>-use logical reasoning to predict the behaviour of simple programs</li> <li>-use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>-recognise common uses of information technology beyond school</li> <li>-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about material on the internet or other online technologies</li> </ul>

## ELGs

### Personal, Social and Emotional Development

- Managing Self • Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.

### Expressive Arts and Design

– Creating with Materials • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function

	Autumn		Spring		Summer	
	LtL: Perseverance Noticing		LtL: Making Links Managing Distractions		LtL: Collaboration -	
1	<p><b>T1 Year 1 units Computing systems and networks – Technology around us (E-safety):</b> Technology around us, Using technology, Developing mouse skills, Using a computer keyboard, Developing keyboard skills, Using a computer responsibly.</p> <p><b>Laptop</b> <a href="https://paintz.app/">https://paintz.app/</a> <b>E-safety</b> <a href="#">Digiduck</a> <b>Big Decision</b></p>	<p><b>T2 Year 1 units (Creating media – Digital Painting):</b> How can we paint using computers? Using shape and lines, Making careful choices, Why did I choose that? Painting all by myself, Comparing computer art and painting.</p> <p><b>Laptop</b> <b>Microsoft Paint</b></p>	<p><b>T3 Year 1 units (Creating media – Digital writing):</b> Exploring the keyboard, Adding and removing text, Exploring the toolbar, Making changes to text, Explaining my choices, Compare writing on a computer with writing on paper.</p> <p><b>Laptop</b> <b>Google Docs</b> or <b>Microsoft Word</b> <b>E-safety</b> <a href="#">Jessie and Friends</a> (Yr1)</p>	<p><b>T4 Year 1 units (Programming - Moving a robot):</b> Buttons, Directions, Forward and backwards, Four directions, Getting there, Routes.</p> <p><b>Bee-Bot</b></p>	<p><b>T5 Year 1 units (Databases – Grouping data):</b> To label objects, To identify that objects can be counted, Describe an object, Making different groups, Comparing groups, Answering questions about a group of objects.</p> <p><b>Laptop</b> <b>Google Slides</b> or <b>Microsoft PowerPoint</b></p>	<p><b>T6 Year 1 units (Programming - Introduction into animation):</b> Comparing tools, Joining blocks, Making changes, Adding sprites, Project design, Following a design. <b>Tablet</b> <a href="https://www.scratchjr.org/">https://www.scratchjr.org/</a> <b>E-safety</b> <a href="#">Smartie the penguin (book 1)</a></p>
2	<p><b>T1 Year 2 units (Computing systems and networks – Technology around us (E-safety):</b> What is information technology? Where have we seen information technology in the home? Where have we seen information technology in the world? How does IT improve our world? Demonstrate safe use of information technology, Using information technology responsibly.</p> <p><b>Laptop</b> <b>Google Slides</b> or <b>Microsoft PowerPoint</b> <b>E-safety</b> <a href="#">Digiduck</a> <b>Big Decision</b> <b>Detective Digiduck</b></p>	<p><b>T2 Year 2 units (Creating media- Digital painting):</b> Taking photographs, Landscape or portrait? What makes a good photograph? Lighting, Effects, Is it real?</p> <p><b>Laptop</b> <b>Digital camera</b></p>	<p><b>T3 Year 2 units (Creating Media - Making music):</b> How music makes us feel, Rhythms and patterns How music can be used, Notes and tempo, Creating digital music, Reviewing and editing music.</p> <p><b>Laptop</b> <b>Chrome Music Lab</b> <a href="https://musiclab.chromeexperiments.com/">https://musiclab.chromeexperiments.com/</a> <b>E-safety</b> <a href="#">Jessie and Friends</a> (Yr2)</p>	<p><b>T4 Year 2 units (Programming - Robot algorithms):</b> Giving instructions, Changing instructions, Making predictions, Routes, Algorithm and design, Debugging.</p> <p><b>Bee-Bot</b></p>	<p><b>T5 Year 2 units (Databases – Pictograms):</b> Counting and comparing, Entering data, Creating pictograms, Select objects by attribute and make comparisons, Collecting data, Presenting information.</p> <p><b>Laptop</b> <b>J2Data</b> <a href="https://www.j2e.com/jit5#pictogram">https://www.j2e.com/jit5#pictogram</a></p>	<p><b>T6 Year 2 units (Programming quizzes):</b> Scratch recap, Outcomes, Using a design, Changing a design, Designing and creating a program, Evaluation.</p> <p><b>Tablet</b> <b>Scratch</b> <a href="https://www.scratchjr.org/">https://www.scratchjr.org/</a> <b>E-safety</b> <a href="#">Smartie the penguin (book 2)</a></p>
3	<p><b>T1 Year 3 units (Computing systems and networks – Technology around us (E-safety):</b> Explain how digital devices function, Input and output devices, How digital devices help us, Computer networks, Digital device</p>	<p><b>T2 Year 3 units (Creating media - Desktop publishing):</b> Words and pictures, Editing, Page settings, Adding content, Layouts, Benefits of publishing.4</p> <p><b>Laptop</b> <b>Adobe Spark</b></p>	<p><b>T3 Year 3 units (Creating media - Stop-frame animation):</b> Sequencing of drawings, Framing, Planning animations, Reviewing sequencing and editing, Review and improve, Adding media.</p> <p><b>Tablet</b> <b>iMotion (app for iOS)</b></p>	<p><b>T4 Year 3 units (Programming - Sequence in music):</b> Introduction to Scratch, Programming sprites, Sequences, Ordering commands, Sequencing commands, Making an instrument.</p>	<p><b>T5 Year 3 units (Data and information - Branching databases):</b> Creating questions, Making groups, Creating a branching database, Structuring a branching database, Using a branching</p>	<p><b>T6 Year 3 units (Programming - Events and actions ):</b> Moving a sprite, Creating a moving sprite, Drawing lines, Adding features, Debugging movement, Making a project.</p>

	connections, Physical components of a network. <b>Laptop</b> <a href="#">Painting program (any)</a> <a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>	<a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>	<a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>	<b>Laptop</b> <b>Scratch</b> <a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a> <a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>	database, Presenting information. <b>Laptop</b> <b>J2Data</b> <a href="https://www.j2e.com/j2data/">https://www.j2e.com/j2data/</a> <a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>	<b>Laptop</b> <b>Scratch</b> <a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a> <a href="#">E-safety The Smart Crew – Childnet (One lesson per term)</a>
4	<b>T1 Year 4 units (Computing systems and networks – Technology around us):</b> Connecting networks, Networked devices, Sharing information on the internet, Websites, Creating websites, Evaluate unreliable content. <b>Laptop</b> <a href="#">Various websites</a> <a href="#">E-safety Recap L6 Yr 3 The Smart Crew – Childnet (One lesson)</a>	<b>T2 Year 4 units (Creating media - Photo editing):</b> Changing digital images, Changing the composition of images, Changing images for different uses, Retouching images, Fake images, Making and evaluating a publication. <b>Laptop</b> <a href="#">Paint.NET</a> <a href="#">E-safety Password Power up</a>	<b>T3 Year 4 units (Creating media - Audio editing):</b> Digital recording, Recording sound, Creating a podcast, Editing digital recordings, Combining audio, Evaluating podcasts. <b>Laptop/Tablet</b> <a href="#">Audacity</a> <a href="#">E-safety Digital etiquette</a>	<b>Year 4 units (Programming - Repetition in shape):</b> Programming a screen turtle, Programming letter, Patterns and repeats, Using loops to create shapes, Breaking down tasks, Creating a program. <b>Laptop/Tablet</b> <a href="#">FMSLogo</a> <a href="#">E-safety Trust me(L1)</a>	<b>Year 4 units (Data and information - Data logging):</b> Answering questions, Data collections, Logging, Analysing data, Data for answers, Answering my question. <b>Laptop</b> <b>Data logger</b> <a href="#">E-safety All about Explorers</a>	<b>T6 Year 4 units (Programming - Repetition in games):</b> Using loops to create shapes, Explain and modify different loops, Animating names, Modifying a game, Designing a game, Creating a game. <b>Laptop</b> <b>Scratch</b> <a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a> <a href="#">E-safety Is seeing believing?</a>
5	<b>T1 Year 5 units (Computing systems and networks - Sharing information):</b> Systems, Computer systems and Transferring information, Sharing information, us Creating an online-shared project, Evaluating working online. <b>Laptop</b> <a href="#">Google Slides</a> <a href="#">E-safety Trust me(L2)</a>	<b>T2 Year 5 units (Creating media – Vector drawing):</b> Drawing tools, Creating a vector drawing, Layers, Manipulating objects, Designing. <b>Laptop</b> <a href="#">Google Drawings</a> <a href="#">E-safety Clickbait</a>	<b>T3 Year 5 units (Creating media - Video editing):</b> Moving pictures and audio, Identifying devices, Using a device, Features of an effective video, Importing and editing video, Video evaluation. <b>Laptop</b> <a href="#">Microsoft Photos (for Microsoft Windows 10)</a> <a href="#">E-safety All about Explorers</a>	<b>T4 Year 5 units (Programming - Selection in physical computing):</b> Connecting Crumbles, Combining output devices, Controlling with conditions, Selection, Drawing designs, Writing and testing algorithms. <b>Laptop</b> <b>Crumble controller + starter kit + motor</b> <a href="#">E-safety Lesson on copyright</a>	<b>T5 Year 5 units (Data information - Flat file databases):</b> Creating a paper-based database, Computing databases, Using a database, Using search tools, Comparing data, and Real life databases. <b>Laptop/Tablet</b> <b>J2Data</b> <a href="https://www.j2e.com/j2data/">https://www.j2e.com/j2data/</a> <a href="#">E-safety Media Smart body image and advertising</a> <a href="#">Is it Cyberbullying?</a>	<b>T6 Year 5 units (Programming - Selection in quizzes):</b> Exploring conditions, Selecting outcomes, Asking questions, Planning a quiz, Testing a quiz, Evaluating a quiz. <b>Laptop</b> <b>Scratch</b> <a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a> <a href="#">E-safety Caught in the web</a> <a href="#">Keeping games fun and friendly</a>
6	<b>T1 Year 6 units (Computing systems and networks Communication):</b> Searching the web, Selecting search results, Search results ranking, Search results influences, Technology, Communicating responsibly.	<b>T2 Year 6 units (Creating media - 3D Modelling):</b> Creating and manipulating 3D digital objects, Comparison of 2D and 3D, Rotation and position, Physical objects and 3D	<b>T3 Year 6 units (Creating media - Web page creation):</b> Reviewing a website, Plan features of a website, Copyright, Previewing, Navigation path, Website linking. <b>Laptop</b> <a href="#">Google Sites</a>	<b>T4 Year 6 units (Programming - Variables in games):</b> Introducing variables, Variables in programming, Improving a game, Designing a game, Design a project, Evaluating a project. <b>Laptop</b> <b>Scratch</b>	<b>T5 Year 6 units (Data information - Introduction to spreadsheets):</b> Questions and data, Modifying spreadsheets, Formulas, Calculating and duplicating, Event planning, Presenting data. <b>Laptop/Tablet</b>	<b>T6 Year 6 units (Programming - Sensing):</b> The micro:bit, Selection, Sensing inputs, Comparing a variable to a value, Designing a step counter, Making a step counter. <b>Laptop/Tablet</b>

	<p>Laptop E-safety <a href="#">Don't feed the phish</a></p>	<p>shapes, Planning a 3D model, Making a 3D model. Laptop/Tablet Tinkercad E-safety <a href="#">Clickbait</a></p>	<p>E-safety <a href="#">Let's fight it together</a></p>	<p><a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a> E-safety <a href="#">Is it Cyberbullying?</a></p>	<p>Google Sheets or Microsoft Excel E-safety <a href="#">All about Explorers</a></p>	<p>micro:bit or crumble Microsoft MakeCode E-safety <a href="#">Just a joke?</a></p>
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	Key Stage 1	Lower Key Stage 2		Upper Key Stage 2	
<b>PROGRAMMING AND ALOGORITHMS</b>					
<u><b>Year 1</b></u> I can create a series of instructions. I can plan a journey for a programmable toy	<u><b>Year 2</b></u> I can use a range of instructions (e.g direction, angles, turns). I can test and amend a set of instructions. I can find errors and amend. (debug) I can write a simple program and test it. I can predict what the outcome of a simple program will be (logical reasoning). I understand that algorithms are used on digital devices. I understand that programs require precise instructions.	<u><b>Year 3</b></u> I can design a sequence of instructions, including directional instructions. I can write programs that accomplish specific goals. I can work with various forms of input. I can work with various forms of output.	<u><b>Year 4</b></u> I can experiment with variables to control models. I can give an on-screen robot specific instructions that takes them from A to B. I can make an accurate prediction and explain why I believe something will happen (linked to programming).	<u><b>Year 5</b></u> I can combine sequences of instructions and procedures to turn devices on and off. I can use technology to control an external device. I can design algorithms that use repetition and 2-way selection.	<u><b>Year 6</b></u> I can design a solution by breaking a problem up. I recognise that different solutions can exist for the same problem. I can use logical reasoning to detect errors in algorithms. I can use selection in programs. I can work with variables. I can explain how an algorithm works. I can explore 'what if' questions by planning different scenarios for controlled devices.
<b>DIGITAL LITERACY</b>					
<u><b>Year 1</b></u> I can use technology safely. I can keep personal information private.	<u><b>Year 2</b></u> I use technology respectfully. I know where to go for help if I am concerned. I know how technology is used in school and outside of school.	<u><b>Year 3</b></u> I use technology respectfully and responsibly. I know different ways I can help if I am concerned. I understand what computer networks do and how they provide multiple services. I can discern where it is best to use technology and where it adds little or no value.	<u><b>Year 4</b></u> I recognise acceptable and unacceptable behaviour using technology.	<u><b>Year 5</b></u> I understand that you have to make choices when using technology and that not everything is true and/or safe.	<u><b>Year 6</b></u> I can discuss the risks of online use of technology. I can identify how to minimise risks.
<b>INFORMATION TECHNOLOGY</b>					
<u><b>Year 1</b></u> I can create a digital content. I can store digital content. I can retrieve digital content. I can use a web site. I can use a camera. I can record sound and play back.	<u><b>Year 2</b></u> I can organise digital content. I can retrieve and manipulate digital content. I can navigate the web to complete simple searches.	<u><b>Year 3</b></u> I can use a range of software for similar purposes. I can collect information. I can design and create content. I can present information. I can search for information on the web in	<u><b>Year 4</b></u> I can select and use software to accomplish given goals. I can collect and present data. I can produce and upload a pod cast.	<u><b>Year 5</b></u> I can analyse information. I can evaluate information. I understand how search results are selected and ranked. I can edit a film.	<u><b>Year 6</b></u> I can select, use and combine software on a range of digital devices. I can use a range of technology for a specific project.

different ways.  
I can manipulate and improve digital images.

**Skills**

**Year 1**

- Recognise a range of digital devices.
- Select a digital device to fulfil a specific task, e.g. to take a photo
- .-Name a range of digital devices, e.g. laptop, phone, games console.
- Log on to the school computer / unlock the school tablet with support.
- Identify the basic parts of a computer, e.g. mouse, keyboard, screen.-Use a suitable access device (mouse, keyboard, touchscreen, switch) to access and control an activity on a computer
- .-Open key applications independently
- .-Save and open files with support.
- Add an image to a document from a given folder/source with support.

**Year 2**

- Recognise what a computer is (input > process > output)
- .-Recognise that a range of digital devices contain computers, e.g. phone, games console, smart speaker
- .-Explain what the basic parts of a computer are used for
- .-Identify and use input devices, e.g. mouse, keyboard; and output devices, e.g. speakers, screen.
- Open key applications independently.
- Save and open files to/from a given folder.
- Add an image to a document from a given folder/source.
- Resize an image in a document.
- Highlight text and use arrow keys.
- Capture media independently (e.g. take photos, record audio).

**Year 3**

- Describe what a computer is (input > process > output)
- .-Explain the difference between input and output devices on a computer
- .-Know where to save and open files (e.g. in-shared folder).
- Save files with appropriate names.
- Use a keyboard effectively to type in text.
- Use left-, right-and double-click on the mouse.
- Add an image to a document from the internet.
- Resize and move an image in a document.
- Use a search engine to find simple information
- .-Recognise that school computers are connected.

**Year 4**

- Recognise that you can organise files using folders.
- Explain what a good file name would look like.
- Delete and move files.
- Use key parts of a keyboard effectively, e.g. shift, arrow keys, delete)
- .-Know how to copy and paste text or images in a document.
- Crop an image and apply simple filters.
- Use a search engine to find specific information
- .-Recognise that school computers are connected together on a network.

**Year 5**

- Type using fingers on both hands.
- Use common keyboard shortcuts, e.g. ctrl C (copy), ctrl V (paste).
- Explain what makes a strong password
- .-Use folders to organise files.
- Know how to mute and unmute audio on a computer or tablet.
- Recognise that there is more than one search engine, and they may produce different results.
- Use a search engine effectively to find information and images
- .-Know how to search for an application on a computer/tablet.

**Year 6**

- Type efficiently using both hands.
- Use a range of keyboard shortcuts.
- Recognise that different devices may have different operating systems
- .-Organise files effectively using folders and files names.
- Use the advanced search tools when using a search engine to find specific information and images.
- Explain the basic function of an operating system.
- Recognise common file types and extensions e.g. jpeg, png, doc, wav-
- Recognise a range of Internet services, e.g. email, VOIP (e.g. Skype, FaceTime), World Wide Web, and what they do.

## Vocabulary

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world</p> <p>Digital Content- images or videos</p> <p>Instructions – information about how something should be done.</p>	<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world.</p> <p>De-Bug - is checking the code in a computer program to ensure it works and changing it if it doesn't.</p>	<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world.</p> <p>De-Bug - is checking the code in a computer program to ensure it works and changing it if it doesn't.</p> <p>Input- Information that goes into the computer.</p> <p>Output-Information that comes out of the computer.</p> <p>Network-Computers linked within a building or area</p>	<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world.</p> <p>De-Bug - is checking the code in a computer program to ensure it works and changing it if it doesn't.</p> <p>Input- Information that goes into the computer</p> <p>Output-Information that comes out of the computer.</p>	<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world.</p> <p>De-Bug - is checking the code in a computer program to ensure it works and changing it if it doesn't.</p> <p>Input- Information that goes into the computer.</p> <p>Output-Information that comes out of the computer.</p> <p>Repetition- when part of a program repeats itself. For example, in animation you may repeat the movements of a character to make it look like it's moving along.</p>	<p>Algorithm –Set of instructions used to achieve a specific goal.</p> <p>Internet- A network of computers linked all over the world.</p> <p>De-Bug - is checking the code in a computer program to ensure it works and changing it if it doesn't.</p> <p>Input- Information that goes into the computer.</p> <p>Network-Computers linked within a building or area.</p> <p>Variable- is a piece of information in a program that we want to store, but able to change.</p>