COMPUTING AT THONGSLEY FIELDS

Growing hearts and minds through **STEM.**

Our Computing curriculum is ambitiously constructed to engage, inspire, challenge and develop logical thinking, awareness of digital issues and confidence and competence in using a range of tools to support learning across the curriculum.

A high-quality computing education should equip our children to think critically, logically, creatively and safely in their use of technology. As pupils progress through the curriculum, they should develop increasing confidence and the skills that will underpin their economic and mental wellbeing in an increasingly technological and global world.

BIG IDEAS

Technology is everywhere and will play a pivotal part in our students' lives, therefore, we want:

- our pupils to know how to use technology positively, responsibly and safely.
- to ensure our pupils are not just consumers, but also potential creators.
- to help our pupils to understand that there is always a choice with using technology and to model positive use.
- to provide opportunity for pupils to apply their knowledge creatively and to ensure staff try and embed computing across the whole curriculum.
- our pupils to be fluent with a range of tools to best express their understanding and have the independence and confidence to choose the best tool to fulfil the task and challenge set by teachers.

CONTENT & SEQUENCING

- **Knowledge and skill development**
  In order to support teachers, in what is a highly technical area, to provide a high quality computing curriculum we have chosen to broadly follow a scheme of work using 2Simple's 'Purple Mash' which provides a good, progressive curriculum coverage across all year groups, as well as provision for mixed year classroom settings. In addition, the skills learnt, combined with the resources available, are expected to be implemented across the broader curriculum as a means of both learning through investigation and of providing a record of learning.
- **Quality assurance**
  Periodic planning and 'walk-in' lesson scrutinies will be used within and across year groups to ensure high quality planning and teaching is taking place.
  Progress will be demonstrated through the ability of pupils to be able to use and apply a range of software and hardware to complete age appropriate tasks and to talk, using computational language, about how they achieved their end results and why they chose specific tools and methods.
- **Equality**
  All pupils will have access on a class by class basis to the resources required to teach the computing curriculum. In addition, as above, opportunities will arise for all children to demonstrate their skills through the use of IT in other subject areas. All children will be taught about the safe and respectful use of the internet and communication tools in an age appropriate manner.

DIRECT INSTRUCTION

- A range of hardware and software to be used including Laptops, tablets and other recording devices using Purple Mash, Microsoft and Apple based software and a range of appropriate design, recording and editing apps.
- Lessons are led by teachers (or suitably competent adults) with **learning focussed**, progressive activities.
- Feedback is predominantly 'in the moment' and explicit.

RETRIEVAL PRACTISE

- "Can you still…?" tasks are systematically included in teaching *sequences through utilisation of technology in other subject areas.*
- Cross year group links are made explicitly in order to refer to and build on prior learning.
- Important concepts and vocabulary e.g. specified vocabulary is taught, used, expected and tested regularly.

PROGRESS

- Units of work that are carefully sequenced so that prior knowledge, concepts and skills are built upon#.
- Our curriculum follows a progressive model that also allows for development through cross-curricular use of skills gained.
- Organising, developing and connecting big ideas through the effective use of hardware, software and appropriate apps to link with other subjects.
- End of unit saved pieces of work.

SUPPORT

- Everyone has equitable access to units of work.
- Structured questions and **sentence stems** are used to support children's progress.
- Quality, guided instruction and explicit modelling are used for all.

Excellence for all - a **curriculum** to be **proud** of.

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STEM: Science, Technology & Computing

Year Group	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cycle (A or B)	FS1	FS2	Year 1/2 A	Year 1/2 B	Year 3/4 A	Year 3/4 B	Year 5/6 A	Year 5/6 B

Computing

Key Themes:
Coding & computational thinking
Spreadsheets, Databases & Graphing
Online Safety
Art, Design & Music
Writing & Presenting
Communication & Networks

Children's learning will include an age- appropriate introduction to e-safety and the protection of personal information (**in red**).
All modules can be found on Purple Mash with the plan numbers indicated **in bold** below.
Outcomes will focus on the understanding of key concepts and the application of learning to achieve outcomes within computing and applied across other subject areas.

	Cycle A **Photographs and real life** Taking digital photographs to record learning. Photos now and then. **Programmable toys and Beebots.** Investigating the development of technology in relation to toys through time. **Cycle B** **Photographs and real life** Taking digital photographs to record learning. Photos now and then. **There is a dinosaur in the classroom!** Using green screens to create digital fact files about dinosaurs. Watching weather reports for the UK and Eastern region.	**Coding and Computational thinking** Following and creating simple instructions on a computer. PM1.4 Sorting using a range of criteria. PM1.2 Using code blocks to perform actions. PM1.7	**Coding and Computational thinking** Changing and extending algorithms PM1.5 Understanding algorithms PM2.1	**Coding and Computational thinking** Using flowcharts PM3.1	**Coding and Computational thinking** Using 'variables' PM4.1 Logo PM4.5	**Coding and Computational thinking** Making games PM5.1	**Coding and Computational thinking** Design, Code, Test, Debug PM6.1 Mapping and creating text adventures PM 6.5
			Spreadsheets, Databases and Graphing Handling Data, Answering questions PM2.4 Using Pictograms PM1.3 Counting machines and graphs PM2.3	**Spreadsheets, Databases and Graphing** Handling Data, Answering questions II PM3.8 Formatting, Formulas and Wizards PM4.3		**Spreadsheets, Databases and Graphing** Handling Data, Answering questions III PM5.4 Modelling and answers PM6.3	
		Internet & email Searching PM2.5	**Internet & email** Searching and sharing Digital footprints PM2.2	**Internet & email** Blogging, truth and safety PM3.2 Emails PM3.5	**Internet & email** Identity theft, Copying and online wellbeing PM4.2 Truth and reliability PM4.7	**Internet & email** Impacts and Responsibilities PM5.2	**Internet & email** Sharing, Caring and what you Leave Behind PM6.2
		Art and Design Digital Painting, Impressionism, Pointillism - William Morris PM2.6	**Art and Design** Stories with Sound and Motion PM1.6		**Art and Design** Animation PM4.6	**Art and Design** Game environments PM5.5 Computer Aided Design PM5.6	
			Writing and presenting Stories, Fact-files and Presentations PM2.8		**Writing and presenting** In the News PM4.4	**Writing and presenting** Concept maps and visuals PM5.7	**Writing and presenting** Blogging PM6.4 Quizzes PM6.7
		Communication and networks Logging in, Logging out Keeping ourselves safe PM1.1 Technology everywhere.PM1.9	**Communication and networks** Logging in, Logging out Keeping ourselves safe PM1.1	**Communication and networks** Simulations PM3.7			**Communication and networks** What has the internet ever done for us? PM6.6

Skill Development

Year Group	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cycle (A or B)	FS1	FS2	Year 1/2 A	Year 1/2 B	Year 3/4 A	Year 3/4 B	Year 5/6 A	Year 5/6 B
Coding & computational thinking		**Understand what algorithms as instructions, design and follow unambiguous instructions.** Children can explain that an algorithm is a set of instructions to complete a task – move a Beebot. **Create simple programmes** -Children can create a simple program that achieves a specific purpose e.g. moving a Beebot. **Use logical reasoning to predict the behaviour of simple programs** Children can identify the instructions that may have been used to initiate specific actions, counting the number of steps.	• **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.** Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code. • **Create and debug simple programs.** Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors. Their program designs display a growing awareness of the need for logical, programmable steps. • **Use logical reasoning to predict the behaviour of simple programs** Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.	• **Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.** Children's designs show an understanding of the task set and an understanding of how to accomplish it in code. • **Use sequence, selection and repetition in programs; work with variables and various forms of input and output.** Children use timers to achieve repetition effects. They understand 'if statements' for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. • **Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.** Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures.	• **Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.** Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. • **Use sequence, selection and repetition in programs; work with variables and various forms of input and output.** Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions. • **Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.** Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.
Spreadsheets, Databases & Graphing		**Use technology purposefully to create, organise, manipulate and retrieve digital content –** digital photographs on tablets, interacting with SMART board as a touch screen and use of the pen tool.	• **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** Children demonstrate an ability to organise data using, for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. They are confident when creating, naming, saving and retrieving content. They use a range of media in their digital content including photos, text and sound.	• **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.** Children can collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database or using spreadsheet software to create graphs. Children can consider what software is most appropriate for a given task a create purposeful 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.** Children objectively review solutions from others and are able to collaboratively create content and solutions using digital features within software. They are able to use several ways of sharing digital content.
Online Safety		**Reading** and discussing age-appropriate stories regarding online safety e.g. Clickin Chicken, safe use of images shared on Tapestry.	• **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.** Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons.	• **Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.** Children can explore key concepts relating to online safety. They can help others to understand the importance of online safety. They know a range of ways of reporting inappropriate content and contact.	• **Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.** Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities. They recognise the value in preserving their privacy when online for their own and other people's safety.

Art, Design & Music	•	•	• **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** Children are able to edit more complex digital data such as music compositions within. They are confident when creating, naming, saving and retrieving 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.** Children make informed software choices when presenting information and data. They create linked content using a range of software and are able to share digital content within their community	• **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.** Children make clear connections to the audience when designing and creating digital content. They are able to design and create their own blogs and are able to evaluate the quality of digital content, identify improvements and make some refinements.
Writing & Presenting	•	**There is a dinosaur in the classroom!** Using green screens to create digital fact files about dinosaurs. Weather reports - for the UK and Eastern region, watching and then making our own.	• **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** Children use a range of media in their digital content including photos, text and sound. They are confident when creating, naming, saving and retrieving 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.** Children make informed software choices when presenting information and data. They create linked content using a range of software and are able to share digital content within their community	• **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.** Children make clear connections to the audience when designing and creating digital content. They are able to design and create their own blogs and are able to evaluate the quality of digital content, identify improvements and make some refinements.
Communication & Networks	•		•	• **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.** Children recognise the main component parts of hardware which allow computers to join and form a network. They can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails (using 2Email). They can describe appropriate email conventions when communicating in this way.	• **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.** Children understand and can explain in some depth the difference between the internet and the World Wide Web. They know what a WAN and LAN are and can describe how they access the internet in school. They understand the value of computer networks but are also aware of the main dangers. They can select the most appropriate form of online communications contingent on audience and digital content.