Computing
Concepts, Knowledge and Skills

Intent:

At Longthorpe, our curriculum aims to empower children to learn how to learn effectively, whilst developing resilience through productive struggle and reflection as part of the learning journey, improving their ability to think critically and creatively. Learning, particularly that of Computing, happens through a 'Learning to Learn' approach that incorporates relevant questions of enquiry and the **6Cs (Character, Citizenship, Collaboration, Communication, Critical and Creative thinking**). We believe that Computing is a vital part of the curriculum to enable the children to access the technological world in which they are growing up. We develop the skills needed by the children to draw upon and develop their own social and technological awareness, using their personal knowledge and experience to do so. Children are encouraged to ask questions about the technological world around them and have an awareness of the impact of this; exploring, investigating and evaluating ways to solve them through the use of different programs and computing equipment. These skills will give the children the tools to tackle the ever-changing world around them. We recognise that within our local context we should particularly consider pupil background/heritage e.g. Pakistani heritage, SEND, Pupil Premium Financial difficulties limiting access to Computing resources. Our resources provide access to the internet and a pathway to develop critical and creative thinking e.g. coding. The elements of the National Curriculum for Computing (Purpose of Study) are vital for our children in order to give them a successful start in their subject learning and in the acquisition of pertinent cultural capital. We provide a high quality Computing education which will inspire pupils to have a curiosity and fascination about the world and its technology that will remain with them for the rest of their lives. Teaching should equip pupils with knowledge about E Safety, information and computation, how digital systems work, programming, creating systems and a range of content. As pupils progress, their growing knowledge about computing should help them deepen their understanding of the key concepts and how integral they are to life in the twenty-first century. At Longthorpe, we believe that this will prepare them as successful citizens throughout their ongoing education and adult life.

Implementation:

At Longthorpe, we offer a rich, varied, imaginative and progressive Computing curriculum to all students, irrespective of their attainment. This will ensure that they are equipped with skills to be prepared for the ever changing world. Computing is taught as a key focus throughout the academic year, with a focus on the key skills and knowledge, as outlined in the National Curriculum and the Computing Curriculum Plan. Teachers will ensure that students are provided with purposeful and real life experiences. Our entire Computing curriculum is designed so that key concepts are revisited with increasing complexity to ensure a deeper understanding.

Key Concepts: `Character` `Citizenship` `Collaboration` `Communication` `Critical Thinking` `Creative Thinking`

In order to do this, teachers use and follow the Computing curriculum map, ensuring there is an equal coverage and focus on the key knowledge and key skills. Accompanying this, teachers will cover additional skills (these have been mapped out), which support and develop the key areas. At the start of every Computing lesson, to ensure pupils are aware of the subject and the skills they will need teachers show children the agreed symbol (a digital tree). At the start of all lessons, children spend a few minutes recapping what Computing is, what an information technician is and what skills they will need, using the agreed rhymes and actions. Every lesson will include a reminder about E Safety and the importance of keeping safe online. This will also be covered in depth as a separate topic twice during the year. Teachers will ensure that within their teaching, key vocabulary is taught within the relevant strands; children have opportunities to master and apply this in their learning. Teachers ensure that a knowledge organiser (Learning to Learn) is utilised and that a cycle of lessons clearly plans for progression.

Intended Impact:

- Children will have a secure knowledge of what Computing is and what skills are needed to be a successful information technician.
- Children will succeed in acquiring and applying key Computing skills and knowledge.
- Children will be taught to use and build upon their prior Computing skills and knowledge to deepen and progress their understanding.
- Children will have a good knowledge of the key concepts covered across the school.
- Children will be able to draw upon their knowledge to understand and successfully use a range of devices (computers, laptops, ipads, virtual reality sets, beebots, learnpads, digital cameras).
- Children will be confident in applying their knowledge of specific Computing terms through an exposure of rich, relevant vocabulary.
- All children will be provided with the opportunity to challenge their Computing understandings, as well as given support where necessary.
- Children will apply their Computing knowledge within writing which is for a range of different purposes, contexts and audiences.

Key Concepts

EYFS	Essential Knowledge	Essential Skills	Additional Knowledge	Additional Skills
Digital Literacy	Recognise when something is 'unusual'/different within an app and seek help/guidance to deal with this (e.g. pop ups or in-app purchasing). Recognise or query when something doesn't 'seem right', makes you sad or is inappropriate and knows who to speak to about this. Know what to do and who to speak to if someone you dont know or someone says something mean to you online. Know that not everything on the internet is true. Know how to use (get out and put away) electronic equipment safely.	To identify what is appropriate and what is inappropriate	Know how to remove pop-ups from within an app Use own knowledge to check if a source is reliable (e.g. if you know polar bears live in the cold, if the internet says they don't, is this reliable?)	Apply own knowledge to question whether something is true.
Computer Science	Understand that actions happen as a result of something else. Understand there are different forms of technology.	To give a sequence of directions (Beebot/Roamer) Identify different technologies in their homes and school.		
Information Technology	Be aware of the Qwerty keyboard, particularly spacebar, delete and enter	Select and use technology for particular purposes and explain what it would be used for. Listen and record on talking tins Navigate a simple website Open and close an app on a tablet Take pictures using a tablet		

Key Vocabulary	**E Safety** Private Personal information Internet Safe Inappropriate Trusted adult Website **Creating and following instructions** Program Create Instructions Store Action Sequence **Using technology** Log on Log off Shut down Password User name Save Delete Spacebar Keyboard Website App Tablet **Technology in our lives** Laptop, Camera, Ipad, Learn pad, Virtual reality, Keyboard, Mouse, App
Key Resources	**Smarty The Penguin ppt**

Key Stage 1	Essential Knowledge	Essential Skills	Additional Knowledge	Additional Skills
Digital Literacy	Recognise when something is 'unusual'/different within an app, game or online and seek help/guidance to deal with this (e.g. pop ups or in-app purchasing). Recognise or query when something doesn't 'seem right', makes you sad or is inappropriate (communication with others or content) and knows who to speak to about this. Use own knowledge and other sources to know that not everything on the internet is true. Understand what is meant by 'public' and 'private' information. Know not to share any personal information online (PSHCE - Trusted Adult) Know their username and password to appropriate apps and websites used in school	Apply knowledge of how to use technology safely (apps, internet, gaming) Keep personal information private Explain why it is important to keep personal information private Log on their individual username and password	Know that not everyone on the internet is who they say they are	

Computer Science	Understand that algorithms are used on digital devices Understand that programs require precise instructions Know some of the IT uses in their own home/school and how they are used.	Create a series of instructions and plan a journey for a programmable toy (Beebot) Write a simple programme and test it Create, store and retrieve digital content Explain why they use technology	Know that programming can go wrong and that this will need fixing.	Predict what the outcome of a simple programme will be Watch a program execute and spot where it goes wrong, then debug it Use links to websites to find information Talk about the differences between the internet and things in the physical world
Information Technology	Know which equipment is going to be most suited to their desired use/outcome. Be familiar with the Qwerty keyboard, including: spacebar, enter, delete and shift (to make capitals). Know what different icons within word/ppt do (font size and font colour change)	Use the shift key to make capitals Use the keyboard to add, delete and space text for others to read Manipulate text - font size and colour. Save information in a known/sensible place and retrieve it again Take a picture using a device Record sound on an iPad and play it back Use a website to retrieve information Navigate the web to perform simple searches Use technology to create and present ideas Log off and shut down correctly		Use technology to create and present ideas in different ways Manipulate text - font size and colour, bold and underline.
Key Vocabulary	**E Safety** Private Personal information Internet Safe Usual/Unusual Pop-up App In-app purchase Inappropriate/Appropriate Internet Website Public **Programming** Program Predict Debug Create Instructions Store Retrieve Algorithm Sequence Input Output Data **Using technology** Log on Log off Shut down Password Username Shift key Save Retrieve Delete Font Text Search Navigate Keyboard Icon **Technology in our lives** Browser Computer Laptop Printer Device Ipad Learnpad Tablet			

Lower Key Stage 2	Essential Knowledge	Essential Skills	Additional Knowledge	Additional Skills
Digital Literacy	Know different ways they could get help if concerned by something they see or hear Know ways to protect self and friends from harm online Know not to share any personal information online (PSHCE - Trusted Adult) Know why different apps/games/sites are given an age certificate Know their username and password to websites used in school and how to solve issues logging in. (The school network, Google Classroom, TTRS, SPAG, Maths.co.uk) Think about and question the reliability of information found on the World Wide Web	Use technology respectfully and responsibly Recognise and explain the difference between acceptable and unacceptable behaviour using technology Know how to keep personal information private and explain how this can be done Know how to check who owns photos, text or clipart	Knowing anything shared online can be seen by others	Using the safety features of websites Make good choices about how long to spend online
Computer Science	To put together a sequence of actions to caused a desired action (Scratch) To understand networks and how they are connected. To understand how a computer network works to share information.	Give an 'on-screen' (Scratch) robot specific instructions that takes them from A to B Make an accurate prediction and explain why they believe something will happen Detect a problem in an algorithm and debug it Navigate the web to search for specific information - know which information is useful and which is not		Experiment with variables to control models Organise data in different ways

		To be able to explain input and output processes and the role of a switch.		
Information Technology	Know how to use (get out, put away, log off, shut down, close apps) electronic equipment safely.

Know which equipment (including non-ICT) is going to be most suited to their desired use/outcome.

Discern what is the best technology and where it adds little or a lot of value

Know how using technology would help/hinder a desired outcome/job

Be familiar with the Qwerty keyboard, particularly space bar, enter, escape, delete, shift, backspace and right/left click.

Know what different icons within word/ppt do (font size, font colour change, bold, underline) | Create different effects with different technology tools

Combine a mixture of text, graphics and sound to share ideas and learning

Change the appearance of text to increase its effectiveness

Evaluate work and improve its effectiveness

Download photos from camera/ipad

Take a picture using a device and use this within another document/piece of work/app

Save information in a given place and retrieve it again

Manipulate text - font size, font colour change, bold and underline

Know which words are 'key' to an online search

Save and retrieve work on the school network

Create a hyperlink to a resource on the World Wide Web

To apply own/background knowledge to decipher a website's reliability | Use links to websites to find information
Talk about the differences between the internet and things in the physical world | Use an appropriate tool to share work online

Give constructive feedback to others to help them improve their work

Know how to be most efficient with searching and which words are not needed, e.g.
Q = How old is the oldest male to live on planet earth?
Search = Oldest man ever
Select and use technology for particular purposes

Navigate a simple website

Take pictures and know how to focus them using a tablet |

Key Vocabulary	**E Safety** Trust, Private Personal information Internet Safe Usual/Unusual Pop-up App In-app purchase Inappropriate/Appropriate Internet Website Public Age certificate Respectful Responsible **Programming** Variables Control Condition Algorithm Debugging Sequence selection repetition Instructions Problem Solution **Using technology** Graphics Wireless Download Hyperlink Website Technology Tools Efficient Effective Feedback **Technology in our lives** Computational thinking Logical thinking Reliability World Wide Web Outcome Hyperlink Website

Upper Key Stage 2	Essential Knowledge	Essential Skills	Additional Knowledge	Additional Skills
Digital Literacy	Understand that they have to make choices when using technology and that not everything is true and/or safe Make good choices (using knowledge about the effects) about how long to spend online Explain the consequences of spending too much time on line or on games Knowing anything shared online can be seen by others and it leaves a digital footprint - forever Know the ages of different apps/games/websites Explain the consequences of sharing too much about themselves online Know their username and password to websites used in school and how to solve issues logging in. (The school network, Google Classroom, TTRS, SPAG, Maths.co.uk) Know which resources on the internet	Know when and how to alert someone if feeling uncomfortable Choosing a secure password and screen name and keep it private Use safety features (blocking/reporting) of websites as well as reporting concerns to an adult Know how to screenshot to share concerns if needed Recognise and evaluate different types of information found on the World Wide Web	Know websites use data to make money and target their advertising	Protect their computer or device from harm on the internet

	can be downloaded and used **Know how search results are selected and ranked**			
Computer Science	**Use of Excel to present data in different ways (tables, charts, graphs etc)** **Use of simple codes within a spreadsheet, e.g. SUM=(click on each cell)** **To understand how computer networks are connected and how they are used to share information**	**Beebots- Scratch** **Use technology to control and external device** **Write a program that combines more than one attribute** **Develop a sequenced program that has repetition, 2-way selection and variables identified** **Solve problems by decomposing them into smaller parts** **Interpret and present data collected in an appropriate way** **Explain how computer networks work, including the internet, input and output, switches**		**Use logical reasoning to explain how increasingly complex algorithms work and to detect and correct errors in algorithms and programs efficiently** **Identify their own opportunities for datalogging and carry out their own experiments**
Information Technology	**Be familiar with the Qwerty keyboard, particularly space bar, enter, escape, delete, shift, backspace and right/left click.** **Know which equipment (including non-ICT) is going to be most suited to their desired use/outcome.** **Know what different icons within word/ppt do (font size, font colour change, bold, underline)**	**Use text, photo, sound and video editing tools to refine work** **Select and appropriate online or offline tool to create and share ideas Talk about audience, atmosphere and structure when planning a particular outcome** **Confidently identify the potential of unfamiliar technology to increase creativity**	**Know where particular (which are used frequently - spacebar, numbers, enter etc) keys are without looking - touch typing**	**Select an appropriate tool to communicate and collaborate online**

Key Vocabulary	**E Safety** Trust, Private Personal information Internet Safe Usual/Unusual Pop-up App In-app purchase Inappropriate/Appropriate Internet Website Public Age certificate Respectful Responsible Secure Screen name Reporting Digital footprint Privacy settings Identity
	Programming Variables Control Condition Algorithm Debugging Sequence selection repetition Instructions Problem Solution Attributes Sequence Selection Repetition Variable Interpret Present Data logging
	Using technology Graphics Wireless Download Hyperlink Website Technology Tools Efficient Effective Feedback Audience Purpose
	Technology in our lives Computational thinking Logical thinking Reliability World Wide Web Outcome Hyperlink Website