Preston & Wingham Primary Schools Federation

Learning together, we grow kind hearts and healthy minds.

Skills and Knowledge Progression: Computing

Year	Digital literacy & Online Safety	Computational Thinking	Computers and Hardware
EYFS	**Understanding the World-**Knows how to operate simple equipment. Shows an interest in technical toys with knobs or pulleys, or real objects such as cameras or mobile phones. Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. Knows information can be retrieved from computers. Completes a simple program on a computer. Uses ICT hardware to interact with age appropriate computer software.		
1	• Use a keyboard to type and reformat text. • Use upper and lower case letters. • Use the Shift key to create a capital letter. • Use the space bar. • Use the Return key. • Understand how to use the delete/backspace key if they have mistyped or repeated a letter. • Print work using the Print icon. • Use both hands on the keyboard. • Load/Save/Retrieve programs with support. • Talk about how they are using ICT using appropriate ICT vocabulary • Move the cursor and insert text. • Independently log onto the school network. • Use a range of tools to create different effects. • Use drag and drop to resize and reposition objects/tools in a simple paint program. • Edit photos to improve them - cropping, resizing and adding colour filters. • Plan and create a pictorial story. • Recognise that a collage means several photos on a page. • Understand that they need to keep safe when using IT. • Recognise that information found or transmitted online can be seen by others.	• Instruct a programmable toy using forward /backwards/go commands • Create simple sequence of instructions. • Make informed predictions when using programmable equipment. • Write clear algorithms, considering the different steps required. • Explain what an algorithm is. • Identify and correct mistakes in any given algorithm. • Explain what inputs and outputs are.	• Explore and tinker with hardware to find out how it works. • Understand (through practical experience) computers need information to be presented in a clear and simple way.
2	• Select text to make it bold or italics. • Know the home row keys, use spacebar and backspace correctly. • Import graphics into a document. • Modify text within a document. • Use keyboard shortcuts • Copy and paste from one document to another. • Use different text styles and editing tools. • Understand how text can be saved and retrieved. • Change the font style/size/colour. • Use the cursor (arrow) keys for simple on screen editing. • Talk about websites they have visited. • Explore a website by clicking on buttons, arrows, menus and hyperlinks. • Navigate 'back' by clicking on the 'back' button. • Use an appropriate search engine under the supervision of adults.	• Use Scratch Junior and be able to explain how it works. • Create an animation using programming blocks to represent movement. • Recognise a loop within programming. • Program code to run 'on tap' • Understand the importance of sequencing. • Explain the role of each of the blocks in their program. • Plan and use code to create an algorithm	• Name the key parts of a computer and explain what they do. • Retrieve digital content from an interactive map. Know a computer can be used to monitor data. • Understand the role of sensors, read a sensor that records temperature and interpret the data.

	• Interpret data from a spreadsheet and record findings. • Understand what stop motion animation is. Create a short animation, making small changes to make the animation smoother • Plan a storyboard for a stop motion animation, design and create a character for the animation and decompose the story into smaller parts. • Evaluate features of animations and identify possible improvements. • Understand that some information is private and should not be shared online. • Recognise that images and work found online belongs to the person who created it and should not be copied without the person's permission. • Know what to do if they find anything upsetting or inappropriate online.	(e.g growing a plant in space).	
3	• Identify (with support) appropriate ICT equipment/software for different purposes. • Create and name new folders, with support. • Print work using the drop down menu. • Make changes to work and save it. • Consolidate keyboard skills. • Select text and use Bold and Underline icons. • Confidently use the cursor (arrow) keys for simple editing. • Use the scroll bars to view different parts of the document. • Justify/align text. • Import graphics and add text independently. • Search the web efficiently to find data and record this accurately. • Understand the terminology around databases - explain what is meant by field, record and data. • Compare paper and computerised databases. • Explain what databases are used for. • Sort and filter data for a specific purpose. • Put values into a spreadsheet, sort, filter by a particular value, interpret that data and create questions that can be answered by the data • Represent data in different ways:- graph/charts • Understand how weather forecasts are predicted and created. • Explain the use of sensors. • Insert permitted images into a web page to change the content • Create a video which uses chroma-keying. • Understand that not all information shared online is safe or exists for positive reasons. • Know how to email safely • Begin to be aware of need to show respect for others online. • Discuss what behaviour is/ is not acceptable online.	• Explain what a loop is and its role within a program. • Include a loop within their program and explain what it's doing. • Program Sonic Pi. • Explain the function of the basic commands: play/sleep/2.times • Explore a programming application independently, predict what the code will do and explain what they found. • Program an animation, decompose a project; plan what is going to happen and select the blocks to make it happen. • Make informed suggestions of additional blocks to enhance a program. • Explain which blocks/features have been used in a program. Recognise where something on screen is controlled by code. • Use a systematic approach to find bugs.	• Understand what a network is by naming its key parts: server/ router/network switch. • Identify some connections and know networks connected together make the internet • Know some connections are wired and others are wireless. • Know that there are wires under the ground and sea that connect everyone. • Understand that computers have to locate websites which are files saved on a computer. • Understand networks connect to the internet via a router. • Explain parts of the journey a website goes through to reach a computer. • Understand the role of packets, how websites are split into small pieces to be sent via the internet and that packets are encoded with information to get to the right place.
Year			
4	• Choose an appropriate program, with support. • Create and name new folders, independently. • Use Print Preview. • Understand that work can be saved in different places (e.g. network, USB, external hard drive). • Import graphics and use the Picture Toolbar to choose the text wrapping. • Use the spell checker.	• Understand computational thinking is made up of four key strands: decomposition/ pattern recognition/ abstraction/algorithm design.	•

	• Use Page Setup to choose portrait or landscape page as appropriate. • Insert and use a simple table. • Use the Zoom menu to view the whole page. • Use word art. • Type in a URL to find a website. • Add websites to favourites. • Use a search engine to find a range of media (e.g. images, text). • Use the print screen function to capture an image. • Edit pictures using various tools in paint or photo-manipulation software. (Sketch up) • Create and import a picture from a paint program. • Move/rotate clipart around the page. • Create a program that plays themed music with the use of Sonic Pi's basic commands • Plan a soundtrack program. • Programme a soundtrack using a range of commands • Use a live loop and explain its function. • Use samples effectively to enhance music. • Code a piece of music that combines a variety of structures. • Recognise social networking sites and social networking features built into other things (e.g. online games and handheld consoles). • Make judgements in order to stay safe, whilst communicating with others online. • Identify dangers when presented with scenarios, social networking profiles etc. • Articulate examples of 'good' and 'bad' behaviour. •	• Understand the terms: pattern recognition and abstraction. • Create a Scratch program which draws a square and at least one other shape. • Use pattern recognition to modify a script to draw different shapes. • Understand how computational thinking can help to solve problems. • Apply computational thinking to problems.	
5	• Independently select an appropriate program to perform a task. • Understand and use the hierarchical file system. • Combine information from various sources. • Change the layout of a document using centering and justification. • Use the tab key to format a list. • Import, position and manipulate graphics into a word processing document. • Move, resize and reshape text and graphics on a page. • Generate appropriate search terms to interrogate the web. • Judge what sort of privacy settings might be relevant to reducing different risks. • Judge when to answer a question online and when not to. • Know how to be a good online citizen and friend, not a digital bystander. • Articulate what constitutes good behaviour online. • Find and cite the web address for any information or resource found online. • Use different sources to double check information found.	• Clip blocks together and predict what will happen. • Make connections with previous programming interfaces used, eg: Scratch • Recognise blocks used previously, identifying inputs and outputs used. Make predictions about how variables work. • Create a program by recognising code blocks. • Break a program down into smaller steps. Suggest appropriate blocks and match the algorithm to the program.	• Identify how and why data is collected. • Understand the challenge of transmitting data over large distances. • Identify how messages can be sent using binary code. • Read and calculate numbers using binary code. • Read numbers in binary, up to eight bits. • Identify binary as the most basic way computers communicate • Understand each one or zero is referred to as a bit. • Identify how sensors are used in everyday life. • Explain how the size of RAM affects the processing of data. • Represent binary as text and recall that binary is the main means of all data transfer.

			• Know that data transfer needs a common language. • Relate binary signals (Boolean) to a simple character based language, ASCII. • Know what a search engine is. • Understand how search engines work.
6	• Critically evaluate the fitness for purpose of work as it progresses. • Annotate work samples using prompt questions. • Split cells in a table. • Merge cells in a table. • Insert/delete cells in a table. • Use Find, Search and Replace as appropriate. • Recall the meaning of 'Big Data'. • Know how encoding keeps data safe. • Take real time data and enter it effectively into a spreadsheet. • Present data findings. Recognise the value of analysing real time data. • Sort data within an Excel spreadsheet by inserting a table. Recall how RFID can be used in data transfer. • Compare, analyse and evaluate data across columns using Freeze Panes • Explain how data can be safely transferred, corrupted within a network and that data sent in 'packets' is more robust. • Understand the need to update devices and software. • Recognise differences between mobile data and WiFi. • Compare and identify high-use data activities and low-use data activities. • Explain ways that Big Data or IOT principles could be used to solve a problem or improve efficiency. • Evaluate and recall methods of data transfer. • Explore sound by using sound recording software. • Record, edit and add sound effects to their work. • Find 'report' and 'flag' buttons in commonly used sites and name sources of help (Childline, Cybermentors etc). • Identify 'click-CEOP' button and explain what it is for. • Discuss scenarios involving online risk. • State the source of information found on the internet. • Act as a role model for younger pupils.	• Explain that codes can be used for a number of different reasons including decoding messages. • Understand and explain there are different types of and why codes might be valuable. • Understand the importance of having a secure password, how to ensure it is secure and how this works. • Explain why a longer password is more secure than a shorter one. • Understand the development of coding over time and its effect on modern Britain. • Explore Python software/Logo. Understand and explain nested loops. • Create a program using Python and demonstrate an understanding of what their code does. • Recognise that computers can choose random numbers; decomposing the program into an algorithm and modifying a program to personalise it.	• Identify and explain how barcodes and QR codes work and know their limitations. • Know how infrared waves transmit data and understand that infrared can be blocked easily. • Recognise the uses of RFID to transmit data and the importance of encoding. • Explain the importance of historical figures and their contribution towards computer science • Understand and identify how computers have changed and the impact this has had on the modern world. • Know that computers have made a significant contribution to the world. • Understand how computers work by recognising its components and why they are important. Describe all of the features that we'd expect a computer to have including RAM, ROM, hard drive and processor, but of a higher specification than currently available.