Pines Primary School Curriculum - Progression of knowledge and skills

Subject: Computing

Year Group	Knowledge/Online Safety	Skills	Vocabulary/Online Safety
EY	-Begin to understand that documents are saved on the computer. -Understand that technological devices can be used to record and play back sounds. -Understand that cameras can take still and moving images (video). -Begin to understand that ICT can be used to communicate ideas in different ways. -Start to recognise simple technologies in the world around us (phones, computers, printers etc.). OS -Understand their logon to the network or Learning Platform is personal to them. -Know to tell someone if they view content they think is inappropriate or upsetting.	-Explore outcomes when individual buttons are pressed on a robot. -Play with a simple adventure programme or simulation. -Play with equipment that simulates control devices (push button toys). -With support enter text into a search engine to find specific given web sites (e.g. CBeebies). -With support use a digital microscope to look more closely at objects. -Begin to develop simple classification skills by carrying out simple sorting activities (probably away from the computer).	Control, Internet, program, information, device, search, sort, screen, mouse, keyboard, microphone
1	-Discuss different jobs that involve ICT for research (e.g. medicine, space industry, geographers etc.). OS	-Develop simple classification skills by carrying out sorting activities. -Use simple graphing programs to produce pictograms and other simple graphs. -Use a digital microscope to look more closely at objects.	Algorithm, data, debug, search, research, selection, sequence, digital image, tools, save files, open files, folder

		-Know the school Acceptable Use Policy and the SMART online rules: Safe/ Meeting/ Accepting/ Reliable/ Tell. -Start to know to keep personal information private when communicating online.	-Use appropriate buttons, menus and hyperlinks to navigate online sites. -Use software to explore sounds. -Take a digital image. -Create a picture using some simple tools in a paint package. -Use images and text in simple presentations. -Plan and devise 1-step operation e.g. fwd 5. Plan and devise 2-step operation e.g. ¼ turn right (to face target), fwd 5. Plan and devise a sequence e.g. 3 or more steps in a route/task. Predict the behaviour of a simple program. -With help save and retrieve documents in own folder. -Create/follow instructions (algorithms) to navigate programmable toys (and other children) around a course.	
2		-Understand that algorithms are a sequence of step by step instructions. -Be able to talk about their use of computer simulations (games) and compare with reality. -Know that multimedia includes sound, text and graphics and can be used to communicate in different ways. -Understand that some information is stored on single computers or devices (a hard drive), some is stored on a small network (school server) and some is stored on big servers and accessed by everyone in the world.	-Input precise algorithms into a program to create a simple shape on screen or to control a device. -Create and debug a simple program to correct errors (e.g. floor robot route). Spot the mistake in a simple algorithm, fix the mistake and test the 'fix'. Make predictions when programming devices (actual or on screen), estimating distances and turns. Use logical reasoning to explain the prediction. -Save worked documents in own folder. Locate the saved file or image, re-use and resave.	Computer networks, input, output, software, world wide web, text, font, style, edit, search engine, data, pop-up, link, communication, password, username, app/application

		-Can discuss ways 'control technology' is used in the world. OS -Know that online communication is not always confidential and that it can be monitored. -Know that you can be diverted from a website through a link to a new website, advertising or pop-up. -Respect others work stored on a shared drive of a network or presented online. 'Identify some risks presented by new technologies inside and outside school. -Know some of the school online safety rules (e.g. What to do if they view content they think is inappropriate or upsetting).	-Use sound, images and text in simple presentations. Edit font size, style and colour. -Use a range of tools in a paint package. -Take a digital image, save in own folder and edit (resizing using corners). -Record and playback sounds. -Enter text into a search engine and URL's in the address bar to find specific given web sites. Use different search engines and websites. -Use simple graphing programs to produce pictograms and other simple graphs and manipulate the way a graph displays the data (e.g. pictogram to bar chart). Recognise basic incorrect data.	
3		-Understand the Internet contains fact, fiction and opinion and begin to distinguish between them. -Know there are different search engines available. -Know the school has a computer network and the computers in school can access information outside the school via the world wide web. -Know methods of input include keyboard, mouse, touch, microphone, camera, sensors, and output may include screen, printers, speakers, switches and simulated or physical control devices. Begin to control devices using outputs only e.g. using sensors to	-Program appropriate software to create simple shapes/patterns (e.g Logo). -Use some basic features to design and write a program to change or move a character in an application (e.g. Scratch). -Be able to create a sequence of instructions or actions that are executed in order one after another. Begin to understand the need to be precise when framing and sequencing instructions. -Enter labels and numbers into a spreadsheet. Use a spreadsheet to explore simple number patterns. Make simple number sentences.	Blocks, blockly, coding, command, costume, digital content, logical reasoning, hyperlink, repetition/repeat, simulation, sprite, variables, script, fiction/fake, digital footprint, data-logging, animate, copyright

| | monitor and measure external events/switching on a light in a flow diagram control program/moving a Sprite in Scratch.

OS
-Know how to respond to unpleasant communications via mobile phone, text, IM or email, chat rooms. (Save the message and show to a trusted adult).
-Know to keep personal information and passwords private when communicating online.
-Know whenever they are online they are creating a digital footprint. | -Begin to explain the steps of their written algorithm and start to correct errors if needed.
-Develop key questions and key words to search for specific information to answer a problem (e.g. a question such as "where could we go on holiday?" would become "holiday destinations").
-Generate and compare different charts and graphs (using graphing software, database or spreadsheet) and understand that different graphs are used for different purposes.
-Investigate changes in the environment using a data-logging device to capture measurements (sound, temperature, light) continuously over time.
-Collect appropriate information, enter it into a database and use the database to answer simple questions.
-Use different font sizes, colours and effects to communicate meaning for a given audience.
-Recognise key features of layout and use design features such as text boxes, columns and borders.
Independently capture, store and retrieve a digital image or video.
-Select and record sounds and use recorded sound files in other applications. | |

		-Create a short animated sequence in simple storyboarding software to communicate a specific idea.	
4	-Know there are writing conventions for electronic communication (language, tone, accuracy). -Be aware that taking text or images from some sites may be stealing other people's work. -Know there are different computer networks (e.g. school network, internet as a network of linked computers, world wide web as a network of websites etc.). OS -Know that anyone can create a user showing any age or gender and people you meet online may not be who they say they are. -Know that the aim of many sites is to sell something or gain personal information and can be linked to from other sites.	-Create more complex shapes/patterns by breaking instructions into smaller parts (decomposing). For example, in Logo create a procedure (e.g. to draw a square) then create a sequence that draws the procedure, rotates x degrees then draws another procedure (square) and so on. -Write a simple program to achieve a specific outcome in appropriate software (e.g. Create two characters in Scratch that have a conversation). -Be able to create logically sequenced instructions or actions that are executed in order one after another. Begin to use 'selection' to include "if... then... else" type actions or statements. (E.g. in a game program, if the sprite is touching a wall then bounce back, else move forward). -Create simple flow diagrams to control physical devices (real or screen simulations) using outputs only (e.g. Flowol, or Go). Begin to use computer inputs to control the outputs (e.g. a light coming on in response to a light/movement sensor). -Create own simple scenarios (eg Make a Scratch Sprite bounce if he touches a wall). Begin to know numbers and text can be stored and referred to in programs as'	User account, theft, decomposing, procedure, if...then...else, snap-shot, layout, format, graphics, interactive, crop, resize, upload, download

| | | variables' and the value of the variable could come from user input by typing a value.
-With support test programs to detect errors and modify procedures or sequences where necessary.
-Save and retrieve accessed information through the use of Favourites, History and Save As…
-Apply some research skills by using different search engines and websites.
-Determine the data needed to solve a specific problem; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts.
-Use a data-logger to "snap shot" a series of readings in the course of an appropriate investigation.
-Raise questions of a database and translate them into search criteria (e.g How much hotter is it in July than Feb?).
-Use layout, format, graphics and illustrations for different purposes or audiences.
-Create a range of hyperlinks to produce a non-linear, interactive presentation.
-Prepare images for use (cropping, resizing, editing) or a video for editing (e.g Movie Making software).
-Edit existing sound files in sound editing software (e.g. Audacity).
-Plan and create a short animated sequence to communicate an idea, using a storyboard and timeline. | |

5	-Have an awareness of the need to check a resource has copyright. -Understand that information can be stored in different places (e.g. removable USB drive, CD/DVD, hard drive, small local network server and remote servers known as 'cloud technology'). OS -Understand the impact of an individual sending or uploading inappropriate content to a wider audience. -Understand the need for privacy settings on any social networking sites. -Recognise acceptable/unacceptable online behaviour and that online bullying is unacceptable.	-Develop more complex flow diagrams/logo algorithms for a specific purpose. Refine procedures and algorithms to improve desired outcomes. Use sub routines to decompose the problem into smaller parts. -Create a simple game or simulation (e.g. Create a game in Scratch using support sheets or instructions). -Start to create logically sequenced instructions for a specific task. Be able to use 'selection' to include "if... then... else" type actions or statements. Begin to use repetition (e.g loops of all kinds, such as repeat, for, while, until etc. (e.g. move cat 1 step forward; repeat until cat hits the wall then stop). -Create simple flow diagrams to control physical devices (real or screen simulations) using inputs and outputs (e.g. Flowol, or Go). Know numbers and text can be stored and referred to in programs as' variables' and the value of the variable could come from user input by typing a value. Create simple games in programs (eg Scratch and Kodu) using simple variables. Begin to use programming so a random variable is selected or set by programmed instructions (eg score = +1). -Enter formulae into a spreadsheet and modify the data, (use range of formulae: sum, average + - × ÷). Link formulae to other cells to test input against output.	Resource, USB, CD/DVD drive, hard drive, server, cloud, content, sub-routines, loop, formulae, spreadsheet, bias, transitions,

| | | -Explain simple logical steps of their flow diagrams in the design process. Detect and correct errors if needed.
-Develop strategies for finding information checking for bias and different viewpoints.
-Use research skills by selecting search engines for different media (e.g. Google Image Search, video, or sounds).
-Construct, refine and interpret frequency tables, bar charts with grouped discrete data and line graphs; interpret pie charts.
-Use the pre-programming features of data loggers to set up a specific data capture, perhaps overnight. Use graphical information to answer questions and solve simple problems.
-Design questions using key words, to search a large pre-prepared database. Use complex searches (and/or, is greater/less than) to search data when looking for relationships and patterns in data.
-Combine text, images sound and video to presentations.
-Develop the use of hyperlinks and use animations and transitions to produce interactive presentations or websites.
-Edit digital images in a paint program. Create a video. Save images in a range of formats for different purposes.
-Independently select, edit and combine sound files. | |

		-Create an animated sequence and add own narration or saved music	
6	-Use a range of sources to evaluate information found online, consider plausibility and develop strategies to make judgements on the sources used e.g. cross-referencing a number of websites. -Can discuss how internet search engines find, store and rank data. -Can discuss and describe computer networks and how they can provide multiple services, such as the worldwide web; and the opportunities they offer for communication and collaboration. OS -Know the importance of not uploading other people's images or content without their permission and be aware of the implications of file sharing. -Understand some malicious adults use the internet to make contact and "groom" young children. Know how to report any suspicions. -Identify a range of ways to report concerns about content and contact. -Know a digital footprint will last a lifetime and some of it can be tracked by others.	-Design own game, simulation or app and use a programming tool to create it for use by others (e.g. Scratch, Kodu). -Understand the need to be precise when framing and sequencing instructions. Able to use 'selection' to include "if... then... else" type actions or statements. Able to use repetition (e.g loops of all kinds, such as repeat, for, while, until etc. -Write control sequences which use outputs and inputs (using if... then... type commands) to control events in response to conditions. Know numbers and text can be stored and referred to in programs as' variables' and the value of the variable could come from user input, programmed instructions or by producing a random variable. -Create games in programs using a range of variables e.g. using arrow keys as input in a game, create challenges which have an assortment of scores depending on action. -Test variables within a spreadsheet to answer 'what if..?' questions by changing one cell that links to other cells. -Explain algorithms written during design process to show an understanding of the logical steps. Correct errors to debug the program where necessary. -Develop skills to question where web content might originate (by looking at web	Plausibility, cross-reference, file sharing, grooming, sensors, multimedia, composition,

| | | address, author, linked pages etc.). Question plausibility.
-Construct refine and interpret various graphs.
-Check for accuracy by checking data, using different views, search tools, and graphing. Identify and correct inaccuracies.
-Use a range of sensors (temperature, light, sound, heart rate monitors, light gates etc.) in a variety of situations in the course of scientific investigations.
-Independently select and combine text, images, video and sounds to presentations from a variety of sources (including the internet) using a range of digital devices.
-Create presentations for specific purposes, considering the appropriateness of content, transitions and animations.
-Export videos in a variety of formats and use them in multimedia presentations.
-Create their own sounds and compositions to add to their presentations, films, images and photos.
-Create an animation for a specific audience, add own narration or saved music and add titles and credits. | |