St Joseph's Catholic Primary Voluntary Academy knowledge progression grid Computing

Our curriculum is building on the skills learned in our Early Years

- Children will show resilience and perseverance in the face of a challenge.
- Children will develop their small motor skills so that they can use a range of tools competently, safely and confidently.
- Children will know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'

Skill	KS1	KS2
E-safety	To understand the different methods of communication (e.g. email, online forums etc). To know you should only open email from a known source. To know the difference between email and communication systems such as blogs and wikis. To know that websites sometimes include pop-ups that take them away from the main site. To know that bookmarking is a way to find safe sites again quickly. To begin to evaluate websites and know that everything on the internet is not true. To know that it is not always possible to copy some text and pictures from the internet. To know that personal information should not be shared online. To know they must tell a trusted adult immediately if anyone tries to meet them via the internet.	To discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family. To understand the potential risk of providing personal information online. To recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content. To be able to understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented. To be able to recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing). To understand that some material on the internet is copyrighted and may not be copied or downloaded. To understand that some messages may be malicious and know how to deal with this. To understand that online environments have security settings, which can be altered to protect the user. To understand the benefits of developing a 'nickname' for online use. To understand that some malicious adults may use various techniques to make contact and elicit personal information. To know that it is unsafe to arrange to meet unknown people online. To know how to report any suspicions. To know not to publish other people's pictures or tag them on the internet without permission. To know that content put online is extremely difficult to remove. To know what to do if they discover something malicious or inappropriate.

Programming					
Physically follow & give each other instructions to move around Explore outcomes when buttons are pressed in sequences on a robot Begin to use software to create movement & patterns on a screen Begin to identify an algorithm to achieve a specific purpose Execute a program on a floor robot to achieve an algorithm Use the word debug to correct any mistakes when programming a floor robot Begin to predict what will happen for a short sequence of instructions in a program	Physically follow and give each other forward, backward & turn (right-angle) instructions Articulate an algorithm to achieve a purpose Plan and enter a sequence of instructions to achieve an algorithm, with a robot specifying distance & turn and drawing a trail Explore outcomes when giving instructions in a simple Logo program Watch a Logo program execute & debug any problems Predict what will happen & test results Talk about similarities & differences between floor robots and logo on screen	Plan & enter a sequence of instructions on a robot specifying distance & turn to achieve specific outcomes, debug the sequence where necessary Test & improve / debug programmed sequences. Begin to type logo commands to achieve outcomes. Explore outcomes when giving sequences of instructions in Logo software Use repeat to achieve solutions to tasks Solve open-ended problems with a floor robot & Logo including creating simple regular polygons, making sounds & planning movements such as a dance Create an algorithm to tell a joke or a simple story Sequence pre-written lines of programming into order Talk about algorithms planned by others & identify any problems & the expected outcome	Create & edit procedures typing logo commands including pen up, pen down & changing the trail of the turtle Use sensors to 'trigger' an action such as turning the lights on using scratch if it 'goes through a tunnel', or reversing if it touches something Solve open-ended problems with a floor robot, Logo & other software using efficient procedures to create shapes & letters Experience a variety of resources to extend knowledge & understanding of programming. Create an algorithm & a program that will use a simple selection command for a game Begin to correct errors (debug) as they program devices & actions on screen, & identify bugs in programs written by others Use an algorithm to sequence more complex programming into order Link the use of algorithms to solve problems to work in Maths, Science & DT.	Explore procedures using repeat to achieve solutions to problems with Logo & a floor robot Talk about procedures as parts of a program Refine procedures to improve efficiency Use a variable to replace number of sides in a regular shape Explore instructions to control software or hardware with an input & using if... then... commands Explore a computer model to control a physical system Change inputs on a model to achieve different outputs Refine & extend a program Identify difficulties & articulate a solution for errors in a program Group commands as a procedure to achieve a specific outcome within a program Write down the steps required (an algorithm) to achieve the outcome that is wanted and refer to this when programming.	Record in some detail the steps (the algorithm) that are required to achieve an outcome & refer to this when programming Predict the outputs for the steps in an algorithm Increase confidence in the process to plan, program, test & review a program Write a program which follows an algorithm to solve a problem for a floor robot or other model Write a program which follows an algorithm to achieve a planned outcome for appropriate programming software Control on screen mimics & physical devices using one or more input & predict the outputs Understand how sensors can be used to measure input in order to activate a procedure or sequence & talk about applications in society Create variables to provide a score/trigger an action in a game Link errors in a program to problems in the original algorithm

Multimedia					
Record their own voices and play back to an audience Use a video or stills camera to record an activity Create sounds and simple music phrases using ICT tools Add text and images to a template document using an image & word bank Use index fingers (left and right hand) on a keyboard to build words &sentences Know when & how to use the SPACE BAR (thumbs) to make spaces between words	Use an increasing variety of tools and effects in paint programs and talk about their choices Use templates to make electronic books individually and in pairs Explore the effects of sound and music in animation and video Create own documents, adding text and images Use keyboard to enter text (index fingers left & right hand) Know when and how to use the RETURN/ ENTER key. Use SHIFT & CAPS LOCK to enter capital letters. Use DELETE & BACKSPACE buttons to correct text. Create sentences, SAVE & edit later	Explore & begin to evaluate the use of multimedia to enhance communication Create & begin to edit presentation documents & text, experimenting with fonts, size, colour, alignment for emphasis & effect Use a range of effects in art programs including brush sizes, repeats, reflections Explore the use of video, animation & green screening Use ICT tools to create musical phrases Amend text & save changes. Use individual fingers to input text & use SHIFT key to type characters Amend text by highlighting & using SELECT/ DELETE & COPY/ PASTE Look at own work & consider how it can be improved for effectiveness	Explore how multimedia can create atmosphere & appeal to different audiences Be confident in creating & modifying text & presentation documents to achieve a specific purpose Use art programs & online tools to modify photos for a specific purpose using a range of effects Explore the use of video, animation, & green screening for a specific audience Use ICT tools to create music phrases for a specific purpose Use a keyboard effectively, including the use of keyboard shortcuts Use font sizes & effects such as bullet points appropriately Know how to use a spell check Look at their own, and a friend's work & provide feedback that is constructive & specific	Select an appropriate ICT or online tool to create and share ideas. Explore the effects of multimedia (photos, video, sound) in a presentation or video and show how they can be modified Develop skills using transitions and hyperlinks to enhance the stricture of presentations Use a wide range of effects in art programs and online tools, discussing the choices made and their effectiveness Know how to use text and video editing tools in programs to refine their work Use online tools to create and share presentations and films	Identify the purpose for selecting an appropriate online tool Discuss audience, atmosphere and structure of a presentation or video Collect information and media from a range of sources (considering copyright issues) into a presentation for a specific audience Use sound, images, text, transitions, hyperlinks and HTML code effectively in presentations Store presentations and videos online where they can be accessed by themselves and shared with others Evaluate the effectiveness of their own work and the work of others

Technology in our lives					
Recognise uses of technology in their homes and in their community Understand that there are online tools that can help them create and communicate	Begin to understand there are a variety of sources of information and begin to recognise the differences Begin to understand what the Internet is and the purposes that it is used for Understand the different types of content on websites and that some things may not be true or accurate	Save work on the school network, on the Internet and on individual devices Talk about the parts of a computer Use appropriate tools to collaborate on-line Use appropriate tools to communicate on-line Use simple search tools and find appropriate websites Talk about the owner of information online	Talk about the school network & the different resources they can access, including the Internet Frame questions & identify key words to search for information on the Internet Consider reliability of information & ways it may influence you Check who the owner is before copying photos, clipart or text	Identify different parts of computing devices. Identify different parts of the Internet Choose appropriate tools for communication and collaboration and use them responsibly Use effective strategies to search with appropriate search engines Talk about the different elements on web pages Find out who the information presented on a webpage belongs to.	Describe different services provided by the Internet & how information moves around the Internet Describe different parts of a computing device & how it connects to the Internet. Connect a computing device to a keyboard, mouse or printer Identify appropriate forms of online communication for different audiences. Use search engines as part of an effective research strategy Describe how search results are selected & ranked Acknowledge who resources belong to that they have found on the internet

Data Handling						
Take photographs, video and record sound to record learning experiences Look at how data is representing digitally Contribute to and interpret a pictogram	Take and save photographs, video & record sound to capture learning Use microscopes or other devices to capture and save magnified images Ask questions and consider how they will collect information Collect data, generate graphs and charts to find answers Save & retrieve the data to show to others Create paper/ object decision trees & explore a branching database Investigate different types of digital data e.g. online encyclopaedias	Find out information from a pre-prepared database, asking straightforward questions Contribute towards a database Construct and use a branching database Record data in a variety of ways Present data for others Use a data logger to monitor changes and talk about the outcomes seen	Plan and create a database to answer questions Identify different types of data Ask questions carrying out simple searches on a database Identify inaccurate data Present data in appropriate format for an audience Use a data logger to record and compare individual readings.	Collect and record information using spreadsheets and databases Carry out complex searches (e.g. using and/or; ≤ / ≥) Solve problems and present answers using data tools Analyse information and question data Identify poor quality data. Select appropriate use of a data logger for an investigation and interpret the findings	Use the whole data process – generate, process, interpret, store, and present information – realising the need for accuracy and checking plausibility Select appropriate data tool Identify and present results Interrogate a database, refining searches to provide answers to questions Plan investigations using the outcomes from a data logger to show findings