



Knowledge, Skills and Vocabulary Progression (KSV): COMPUTING

Teaching and Learning area COMPUTING

What should an age-related pupil know and be able to do in each year group?

Bold-Fundamental Knowledge
Highlight - Cross curricular link

EYFS

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

E-safety

Understand that we can access activities "online" on the computer / iPad.

Explore different safe apps and programmes.

Join in a discussion about how it's important to tell an adult what we are doing "online".

Use technology safely and respectfully, keeping personal information private; identify where to go for help /support when they have concerns about content or contact on the internet or other online technologies

Use technology safely
Follow the school's Internet Safety rules

Only use search engines allowed by the school

Use the Internet for learning and communicating with other people

Make sensible choices when navigating websites

Know what to do if concerned or need help
Explore what cyber-bullying is and what to do if they encounter it

Know that they must tell a trusted adult immediately if anyone tries to meet them via the internet

Use technology safely
Begin to understand that

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Rules
Follow the school's safer Internet rules
Agree sensible e-Safety rules for the classroom
Understand the need for rules to keep them safe online
Know that copyright exists on most digital images, video and recorded music
Know that cyber-bullying is unacceptable and will be sanctioned in-line with the school's anti-bullying policy

Personal safety
Understand the need to develop an alias for some public online use

Rules
Follow the school's safer Internet rules

Agree sensible e-Safety rules for the classroom

Personal safety
Understand their own personal use of the Internet and choices they make

Understand the importance of keeping an adult informed about what you are doing online, and how to report concerns
Create strong passwords and manage them so that they remain strong

		Recognise when websites show adverts and how to ignore them Know that an adult must be told if they find something inappropriate online Begin to understand that if you create something then you own it Know that personal information should not be shared online <u>Keep personal info private</u> Log on to school network using a username and password Learn that many websites ask for info that is private and responsibly	the content on websites may not be true or accurate Choose websites that are suitable for them to visit Realise that not all websites are equally good sources of information Know that any information they put online leaves a 'digital footprint' Know that any comments must not be hurtful Know that some websites have pop-ups that take you away from the main site Know that an email should only be opened from a known person or source	Use caution when using an Internet search for images Know what to do if they find an unsuitable image Understand that personal information and passwords should be kept private Know that any personal information made available online may be seen and used by others Know how to respond if they are asked by someone for personal information Know how to report an incident of cyber-bullying Choose a secure password for age-appropriate websites <u>Communication</u> Identify when emails should not be opened Know that some attachments may not be safe Explain how to use email safely Know how to respond if they feel unsafe about the content of a message	Understand that online resources might have security settings that can be used or amended to protect the user Understand the benefits of using a nickname for online use Know that it is unsafe to arrange to meet unknown people online Know how to report anything suspicious Know what to do if they discover anything malicious or inappropriate online Understand the potential risk of sharing personal information online <u>Communication</u> Understand how to protect devices from virus threats Explore using the safe and responsible use of online communication tools such as blogs and messaging Select and use appropriate communication tools, with regard to e-Safety, to collaborate with others within and beyond the school
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		handle such requests			Understand the potential risks of using Internet communication tools, such as phishing or scamming, and how to minimise these risks Understand that some messages might be malicious, and how to deal with them Understand that they should not publish other people's pictures on the Internet without permission Know that content published online is extremely difficult to remove Understand that some malicious adults may use a variety of techniques to make contact and try to get personal information
Vocabulary It is expected that the previous years' vocab should be recapped and continued to be used	Safe, dangerous, trust, think, tell and share.	Login, Logout, Password, Username, Avatar, Notification, Tools, Save, email,	Digital Footprint, Internet, website, sharing, email, attachment, Search	Online safety, Secure Password, Personal Information, Username, Webpage, Spoof Website, Cyberbullying, Copywrite	Blog, Digital footprint, Password, PEGI, rating, Phishing, Screen time, Virus threats, malicious content
Algorithms and Programs	To know how to operate simple equipment. Give instructions to a	Understand what algorithms are; how they are implemented and programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs		Design, write and debug programs that accomplish specific goals, inc. controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	

	friend and follow instructions to move around. Describe what happens when I press buttons on a toy or electronic device.	use logical reasoning to predict the behaviour of simple programs	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.				
		Explore outcomes when buttons are pressed in sequences on a robot Physically follow and give each other instructions to move around Create a series of simple instructions – left/right Record a route Understand forwards, backwards, up, down Input two instructions into a programmable toy to control it Plan and test a programmable toy's journey Use the word 'debug' to correct any mistakes when	<u>Understand that algorithms are used on digital devices</u> Physically follow and give each other instructions to move around and turn (right angle) Program a robot with instructions, specifying distance and right angle turns <u>Write a simple program and test it</u> Articulate and algorithm to achieve a purpose Plan and enter a sequence of instructions to achieve an algorithm Debug any problems in a set of instructions – predict what will	<u>Write programs that accomplish specific goals</u> Program a floor robot to create simple polygons – draw a trail Use 90° and 45° turns Begin to type Logo commands to achieve outcomes Create an algorithm to tell a simple story or joke (Scratch) Write more complex programs Sequence pre-written lines of programming into order (Scratch) Talk about algorithms planned by others, identify problems and understand the outcome	<u>Write programs that accomplish specific goals</u> Make accurate predications Experiment with variables to control models Make turns using specific degrees Make accurate predictions about the outcome of a program they have written Simulate physical systems e.g. Use sensors to trigger an action, such as a Probot reversing if it touches something or creating a traffic light sequence in Scratch. Solve open-ended problems with a floor robot, Logo or software using	<u>Write programs that accomplish specific goals</u> Explore procedures using repeat to achieve solutions to problems with Logo/floor robot Understand that procedures are parts of a program Refine procedures to improve efficiency Use a variable to replace number of sides in a regular shape Refine and extend a program Group commands in sequence as a procedure to	<u>Write programs that accomplish specific goals</u> Explain how an algorithm works Record the steps of an algorithm required for an outcome and refer to this while programming Predict the outcome for steps in an algorithm Write a program which follows an algorithm to solve a problem for a floor robot or other model Detect errors in a program

		programming a floor robot Begin to predict what will happen for a short sequence of instructions in a program	happen and test results Understand that programs require precise instructions Use repeat commands Predict what the outcome of a simple program will be Explore outcomes when entering instructions in a simple PROBOT program Watch a PROBOT program execute Talk about similarities and differences between floor robots and on-screen programs such as LOGO Beebot App	Design a sequence of instructions, including directional instructions Give an on-screen robot instructions to change direction Explore outcomes when giving sequences of instructions in Logo software Draw regular polygons on screen using commands Use the repeat command in Logo to create a pattern Test and debug programmed sequences to improve them	procedures to create shapes and letters Create an algorithm and a program that will use a simple selection command for a game Use an algorithm sequence more complex programming into order Debug errors in a program on a device or on screen Identify bugs in programs written by others Experience a variety of resources to extend knowledge and understanding of programming Link the use of algorithms to	achieve a specific outcome Identify difficulties and Understand solutions for errors in a program Write down steps required to achieve an outcome (an algorithm) – refer to this when programming Design a sequence of instructions, including directional instructions Explore instructions to control software or hardware with an input Use if... then... commands Explore a computer model to control a	and correct them Link errors in a program to problems in the original algorithm Check and refine a sequence of instructions Design a sequence of instructions, including directional instructions Use a program to control a number of events for an external device Explore ‘what if’ questions by planning different scenarios for controlled devices Use inputs from sensors
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					solve problems in maths, science, DT and other subjects <u>Design a sequence of instructions, including directional instructions</u> Repeat instructions to draw shapes on screen using commands Give an on-screen robot direction instructions to take them from point A to point B Create and edit procedures using Logo commands, including pen up, pen down and changing the trail of the turtle	physical system (electronic and/or mechanical) – turn devices on and off Change inputs on a model to achieve different outcomes	to trigger events Understand how sensors can be used to activate a procedure or sequence
Vocabulary	Instruction, forwards, backwards, turn, on, off	Directions, Instructions, Predict, Debug, Route, Input,	Precise Instructions, Algorithm, Input, Sequence, Repeat, LOGO	Scratch, Complex instructions or Sequence, Test and Debug, Sprite, Input, Output	Variables, Selection Command, Physical Systems. Procedures,	Procedures, Selection (if /Else), Simulation,	Logical Reasoning, Sensors, Controlled devices

		Programmable Toy		Block, Command, Control			
Using IT and Digital content	To know how to operate simple equipment.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content					
	To interact with age-appropriate computer software. Take pictures using an iPad of my learning environment, work or friends. Make simple marks and shapes on a computer or interactive board - change the colour of the brush.	<u>Keyboard skills</u> Use the spacebar, backspace, enter, shift and arrow keys Use the @ key to enter an email address Use both hands on the keyboard <u>Use websites and email</u> Use a web browser to view a website <u>Recognise what an email address looks like</u> <u>Send a class email</u> Print an Internet page <u>Use a camera</u> Capture images and video with a camera	<u>Keyboard skills</u> Use a keyboard to enter text Use the return /enter key, use shift and caps lock appropriately, use delete, backspace to correct text Use a mouse and the arrow keys to insert or delete a word Highlight text and change the format B,U,I <u>Use websites and email</u> Click links in a website Print a website to use as a resource <u>Organise, retrieve and manipulate digital content and media using a</u>				

		Print a photo from a camera (with support) <u>Record sound</u> Record a sound and play it back Add a voice over to a slideshow of photos Record their own voices and play back to an audience Create sounds and simple music phrases using ICT tools <u>Create, store and retrieve digital content</u> Make a graph by entering data into a template Understand the results shown on a graph Save and retrieve a data file with support	<u>range of ICT software</u> Load programs independently Ask questions and consider how to collect information Collect data and generate graphs and charts to find answers to questions Save and retrieve data independently to show others Use an increasing variety of tools and effects in paint programs and talk about their choices Use templates to make digital books Create documents using a word processor, add text and images Create sentences, save and edit them later				
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		Use a word processor to record ideas Add text and images to a template document using an image bank Load programs with support	Make a simple slideshow using text, pictures and animations Use a camera Take photographs, videos and sound to record learning Use microscopes or other devices to capture magnified images <u>Record Sound</u> Explore the effects of sound and music in animation and video <u>Databases</u> Create paper/object decision trees and explore branching databases to investigate different types of digital data				
Vocabulary	Mark making, Drawing, Brush, Colour (Paint) Photograph,	Keyboard, Spacebar, Back Space, Enter, Shift, Arrow Keys, Text, Images, Save,	Animation, Branching Databases, Mouse, Highlight, Format, Paint Effects,				

	open, close, drag, move	Retrieve, Email, Voice Over	Paint Tools, Collect Data, Graphs and Charts, Tools, Digital Books, Slideshow				
IT in our lives	To recognise that a range of technology is used in places such as homes and schools.	Recognise common uses of information technology beyond school		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.			
	To select and use technology for specific purposes. Know that information can be retrieved from computers. Understand that the internet is a place to find information. Watch or listen to information found on the internet with my class teacher.	<u>Talk about some of the uses of IT in their own home</u> Know that email can be used to communicate with real people – within school, families and communities Recognise uses of technology in their homes and in the community Understand there are online tools to help create information and communicate	<u>Identify where technology is used in and out of school</u> Begin to understand the differences between a variety of sources of information Begin to understand what the Internet is and the purposes that it is used for	<u>Internet</u> Use different search engines to navigate the Internet Bookmark a favourite Internet page Copy an image and text from the Internet and paste it into a document Know that the outcome of Internet searches at home and school may be different Know that some information on the	<u>Internet</u> Use a search engine to find a specific website Frame questions and identify key words to search for information on the Internet Use tabbed browsing to open two or more web pages at the same time Open a link in a new browser window	<u>Internet</u> Use the Internet as a search tool competently Use knowledge of domain names and extensions to support the validation of information (.com, .ac, .sch, .org, .gov etc) Understand that some material on the Internet is copyrighted and cannot be copied or downloaded	<u>Internet</u> Understand the positive and negative impacts of the use of IT Understand why people might publish content that is not accurate and the need to be critical evaluators of content Compare information on two tabbed websites, looking for

				Internet has been copied Recognise that some information on the Internet may not be accurate, reliable or be current Recognise that some information on the Internet may be biased, may be used for manipulation or persuasion Know that different online communication tools might be used at school and at home <u>Networks and computing devices</u> Know what computer networks do Talk about the parts of a computer	Open a document online and view it, such as a PDF Consider the reliability of information and the ways it may influence you Check who the owner is before copying photos, clipart or text <u>Networks and computing devices</u> Know that work can be saved in different places Understand and use the hierarchical file system Understand the use of folders - create and name new folders	Find out who the information presented on a webpage belongs to Interpret and question the plausibility of information Use a search engine using keyword searches Decide which sections from two open webpages are appropriate to copy and paste into notes Talk about different elements on web pages <u>Networks and computing devices</u> Download a document from the Internet and	bias and perspective Describe different services provided by the Internet and how information moves around the Internet Use search engines as part of an effective research strategy Use complex searches using 'OR', '+', phrases in inverted commas Describe how search results are selected and ranked Know who resources belong to that
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				Save work on the school network and the Internet Save work on different devices – USB drives Create and name new folders with support <u>Communicating</u> Talk about games they like to play Understand making good choices – content, screen time Comment and provide positive feedback on the work of classmates or online, or the work of others online Open and send an email attachment	Talk about the school network and the different resources they can access, including the Internet <u>Communicating</u> Explain the benefits of IT to send messages and to communicate with others	save it to a device Identify different parts a computing device Identify different parts of the Internet <u>Communicating</u> Reference information sources Use instant messaging to communicate with class members Conduct a video chat in school and with another school	have been found on the Internet <u>Networks and computing devices</u> Have experience of a range of IT devices and software Describe different parts a computing device and how they connect to the Internet Connect a computing device to a keyboard, mouse or printer <u>Communicating</u> Contribute to online discussions
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				Use an email address book			Choose and combine appropriate IT tools to complete a task Conduct a video conversation with more than one person at a time
Vocabulary	Phone, telephone, kettle, microwave, oven, fridge, camera.	Communicate, Community	Internet, Sources of Information	Search Engines, Bookmark, Computer Network, Online Communication tool, Email, Attachment	Browser, Tab, Clipart, Folders,	Domain Names, Extension, Networks (Server, Router, Hardware) Devices (Monitor, PC, RAM, Hard drive, Mother Board) Keyboard) Video Chat, Complex Searches (or, +)	
Multimedia				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			
				<u>Collect and present information</u> Describe their work and explain how they used IT Use a class blog to share information	<u>Collect and present information</u> Describe their work and explain how and why they used IT	<u>Collect and present information</u> Describe their work and explain how and why they used IT	<u>Collect and present information</u> Describe and discuss their work and explain how and why they used IT

				Create a presentation that moves from slide to slide that is aimed at a specific audience Combine text, images and sounds in a presentation <u>General skills</u> Use print preview Print work using a dropdown menu Select items – use copy, cut, paste as necessary Amend text and save changes Use the SHIFT key to input characters Experiment with fonts, size, colour and alignment for effect <u>Images</u> Review images on a camera and delete unwanted images	Create a larger presentation that moves from slide to slide, aimed at a specific audience Use animation to move from slide to slide in a presentation Present data in an appropriate format for an audience Be confident in creating and modifying text and presentation documents to achieve a specific purpose <u>General skills</u> Choose an appropriate program to perform a task Plan what they are going to do and evaluate the results	Make a website homepage with links to other pages Use a range of presentation programs Make a presentation that incs sound, animation, transitions, video and navigation buttons to enhance the structure of presentations Use online tools to create and share presentations and films <u>General skills</u> Use a word count tool to check the length of a document Use bullet points and the numbering tool	Evaluate the effectiveness of their work and the work of others Use sound, images, text, transitions, hyperlinks and HTML code effectively in presentations Collect information and media from a range of sources and insert into a sophisticated presentation for a specific audience (with consideration to copyright) Understand audience, atmosphere and structure of a presentation or video <u>General skills</u>
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				Download images from a camera onto a computer Use photo editing software to crop photos and add effects Use a range of effects in art programs – brush sizes, repeat, reflections Use ‘Save picture as’ to save an image to a computer Explore the use of video, animation and green screening <u>Sound</u> Use software to create musical phrases Manipulate simple sound recordings	Use an automatic spell checker to edit spellings Explore how multimedia can create atmosphere and appeal to different audiences Use a keyboard effectively and use shortcuts Use font sizes and effects such as bullet points effectively <u>Images</u> Capture images using a webcam, screen capture, scanner and visualiser Copy images from a range of sources and paste into a desktop publishing package	Use the ‘save as’ command <u>Images</u> Work on simple film editing Capture images and video Prepare and present a simple film Consider the audience when editing a simple film Use a wide range of effects in art programs and online tools, Understand the choices made and their effectiveness <u>Sound</u> Listen to streaming audio Download and listen to a podcast	Choose an appropriate program to perform a task Identify the purpose for selecting an appropriate online tool Insert graphics into a document and use text wrapping formats <u>Images, video and sound</u> Store videos and presentations online where they can be accessed by themselves and others Present a film for a specific audience and then edit it for a different audience
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					Use art programs and online tools to modify photos for a specific purpose, using a range of effects Explore video animation and green screening for a specific purpose Sound Insert sound recordings into a multimedia presentation Use IT tools to create music phrases for a specific purpose	Produce and upload a podcast Use a sound editing program, such as Audacity, to edit a sound file Capture sounds Download open source music files and include in a presentation	
Vocabulary				Blog, Slideshow, Drop down menus, Font, Alignment, Download, Images (crop, filters, contrast, brightness) Animation, Green screening, Spell checker, Shortcuts,	Homepage, Presentations (transitions, navigation buttons, sound, animation.) word count, bullet points, Podcasts (download, produce, upload, open source)	Presentation (Hyperlinks, HTML code) Copyright, Graphics, Text Wrapping	
Data handling				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			
				<u>Collect and present information</u> Describe their work and explain how they used IT <u>General skills</u> Use print preview Print work using a dropdown menu Select items – use copy, cut, paste as necessary Amend text and save changes Use the SHIFT key to input characters <u>Data</u> Input data into a prepared database Sort and search a simple database to answer simple questions Add data to a database Use a branching database	<u>Collect and present information</u> Describe their work and explain how and why they used IT Present data in an appropriate format for an audience <u>General skills</u> Choose an appropriate program to perform a task Plan what they are going to do and evaluate the results Copy and paste a graph or bar chart into a word processor document Use a keyboard effectively and use shortcuts <u>Data</u>	<u>Collect and present information</u> Describe their work and explain how and why they used IT <u>General skills</u> Choose an appropriate program to perform a task <u>Data</u> Collect and record information using a database or spreadsheet Plan and create a database using rows, columns and fields Create a formula in a spreadsheet Check formulas for accuracy Search a database for	<u>Collect and present information</u> Describe and discuss their work and explain how and why they used IT Evaluate the effectiveness of their work and the work of others <u>General skills</u> Choose an appropriate data tool to perform a task Identify the purpose for selecting an appropriate online tool <u>Data</u> Generate, process, interpret, store and present information

				Construct a branching database Use a data logger to monitor changes and discuss the outcomes	Input data into a prepared database Plan and create a database to answer questions Sort and search a database to answer simple questions Identify inaccurate data Recognise a spreadsheet Use the terms row, column, cells Enter data into a spreadsheet Make a bar chart by selecting data Use a data logger for an investigation and interpret the findings	information using > = < and/or Identify poor quality data Create graphs and charts and copy into other documents Use a data logger appropriately for an investigation and interpret the findings	Realise the need for accuracy and check plausibility Interrogate a database, refining searches to provide answers to questions Plan investigations using the outcomes from a data logger Use a formulae bar in a spreadsheet
Vocabulary				Data, Database, (cell, column, row) Branching database, Dropdown menu,	Database, (cell, column, row, field) Search Databases (> = < and/or) Formulae bar (Yr6)		

				Data logger, Graph, Bar chart, Spreadsheet,	
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