KNOWLEDGE PROGRESSION YEAR GROUP OVERVIEW – Computing

Features
• At EYFS, the knowledge progression takes full account of the Early Learning Goals of: ○ Listening, attention and understanding

• At key stage 1, the knowledge progression takes full account of the national curriculum's strands of:
  ○ Algorithms
  ○ Creating Programs
  ○ Reasoning
  ○ Using Technology
  ○ Uses of IT beyond school
  ○ Being Safe

• At key stage 2, the knowledge progression takes full account of the national curriculum's strands of:
  ○ Creating Programs
  ○ Developing Programs
  ○ Reasoning
  ○ Networks
  ○ Search Engines
  ○ Using Programs
  ○ Being Safe

• Skills are dependent on specific knowledge. A skill is the capacity to perform and in order to perform a deep body of knowledge needs to be acquired and retained.
• These knowledge statements should be what pupils retain for ever. In other words, this knowledge is within their long-term memory and will be retained.
• When considering pupils' improvement in subject specific vocabulary, pupils could be provided with a knowledge organiser which contains all words used for computing for their age group.

EYFS and National Curriculum Subject Content – End of Key Stage expectations	
Strand	**Listening, attention and understanding**
EYFS	**• Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions;** **• Make comments about what they have heard and ask questions to clarify their understanding**

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Strand	Algorithms	Reasoning	Creating Programs	Using Technology	Uses of IT beyond school	Safe use
Key Stage 1	• *Pupils should be taught to understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions*	• *Pupils should be taught to use logical reasoning to predict the behaviour of simple programs*	• *Pupils should be taught to create and debug simple programs*	• *Pupils should be taught to use technology purposefully to create, organise, store, manipulate and retrieve digital content*	• *Pupils should be taught to recognise common uses of information technology beyond school*	• *Pupils should be taught to use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies*

Strand	Reasoning	Creating Programs	Developing Programs	Using programs	Networks	Search Engines	Safe use
Key Stage 2	• *Pupils should be taught to use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs*	• *Pupils should be taught to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts*	• *Pupils should be taught to use sequence, selection, and repetition in programs; work with variables and various forms of input and output*	• *Pupils should be taught to 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*	• *Pupils should be taught to - 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*	• *Pupils should be taught to use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content*	• *Pupils should be taught to use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact*

Strand	Nursery	Vocabulary	Reception	Vocabulary
Listening, attention and understanding	To know how to operate some ICT or mechanical toys. To know how to switch ICT or mechanical toys on and off. To know how to explore vocabulary related to technology. To know how to sort objects. To know how to start to use the internet with adult support. To know how to ask for help when using technology. **To know how to operate some technology and show understanding of the remote controls**	on off computer laptop Ipad buttons safe	To know how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. To know what a keyboard is and how to locate relevant keys. To know what a mouse is and develop basic mouse skills such as moving and clicking. To know how to operate, technology, computer, pc, monitor, mouse, keyboard, devices To know how to represent data through sorting and categorising objects in unplugged scenarios and through the use of pictograms. To know how to use the internet alongside an adult, or independently and what to do if they come across something that worries them or makes them feel uncomfortable. To know how to use the internet, with adult supervision, to find and retrieve information of interest to them To know how to access, understand and interact with a range of technologies, developing digital literacy skills	log in log out technology electrical equipment online safety report internet website online data search, tools sort

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	To know how to show interest in other technological items		To know how to complete a simple program on a computer **Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions** **Make comments about what they have heard and ask questions to clarify their understanding**	categorise

Strand	Year 1	Year 2	Strand	Year 3	Year 4	Year 5	Year 6
Algorithms	To know how to create a series of instructions and plan a journey for a programmable toy **To know that an algorithm is a set of instructions used to solve a problem or achieve an objective.** **To know that an algorithm written for a computer is called a program.**	To know that algorithms are used on digital devices To know how to identify and correct some errors in their programs. To know how to identify the parts of a program that respond to specific events and initiate specific actions. To know how to control a range of digital devices. **To know that an algorithm is used on digital devices and is a simple set of steps designed to complete a task**	**Reasoning**	To know how to make logical, achievable steps and absorbing new knowledge of coding structures To know how to use logical reasoning to explain how some simple algorithms work To know how to discern when it is best to use technology and where it adds time or no value **To know that computer simulation can represent real life situations.** **To know that variables can be used to store information while a program is executing.**	To know how to make an accurate prediction To know how to explain why they believe something will happen (linked to programming) **To know variables can be used to store information while a program is executing.** **To know that 'if statements' are available for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs.**	To know how to analyse and evaluate information reaching a conclusion that helps with future developments **To know about code structure, how to debug and interpret code (e.g. the use of tabs to organise code and the naming of variables)**	To know how to design algorithms that use repetition and 2-way selection To know how technology works; how computers process instructions and commands, including the use of coding languages. To know how to evaluate the effectiveness of their own algorithms. **To know that programs can be interpreted in parts and logical attempts to put the separate parts of a complex algorithm together can explain the program as a whole.**
	Robots, patterns, programme, algorithm, purpose, online tools, data	*Sprites, coding, sequence, debug, predict*		*Mechanical systems, coordinates, variables, broadcast, sequence debugging, sequence programming, alignment*	*Logical reasoning, command, 3D game, debug algorithms, layering, decomposing, input, output, process, critically evaluate*	*Software, hardware, motherboard, hard drive, RAM, ROM, CPU, GPU, operating systems, refinement*	*Augmented reality, generate, operators, array, arithmetic operators, loops, manipulating, conditional, multitask, concurrently, interpret*
Reasoning	To know how to interpret what will happen at different stages of a program.	To know how to predict what the outcome of a simple program will be (logical reasoning) To know how to identify the parts of a program that respond to specific actions. For example, writing a cause and effect sentence of what will happen in a program.					

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		To know that you can predict what the outcome of a simple program will be (logical reasoning).					
Creating Program	To know how to create a simple program and test it	To know how to create and debug a simple program that achieves a specific purpose **To know that programs require precise and unambiguous instructions**	**Creating Programs**	To know how to write programs that accomplish specific goals	To know how to create a program which accomplishes a specific goal in a simulated environment (e.g. give an 'on-screen' robot specific instructions that takes them from A to B)	To know how to turn complex real-life situations into algorithms for a program by deconstructing it into manageable parts To know how to write a program to control an external device To know how to change inputs to achieve different outputs	To know how to write a program that combines more than one variable and various forms of inputs and outputs
			Developing Programs	To know how to design and debug a sequence of instructions, including directional instructions To know how to detect errors within programs	To know how to experiment with variables to control models To know how to detect and correct errors in programs	To know how to develop a program that has specific variables identified To know how to test and debug a program as they go To know how to use logical methods to detect and correct errors	To know how to develop a sequenced program that has repetition and variables identified To know how to solve problems by decomposing them into smaller parts
			Using Programs	To know how to collect and present information **To know that you can use a range of software for similar purposes**	To know how to select and use software to accomplish given goals To know how to create linked content using a range of software **To know to make informed software choices when presenting information and data**	To know how to combine a variety of software on a range of digital devices to design and create content to accomplish given goals To know how to use several ways of sharing digital content To know how to analyse, evaluate and present data and information when creating content	To know how to select and use a variety of software, on a range of digital devices to design and create a range of programs and systems To know how to consider the audience when designing and creating digital content **To know that you can present the data collected in a way that makes it easy for others to understand**
Using Technology	To know how to use a website and a camera To know how to record sound and play back To know how to create, edit and store purposeful,	To know that programs require precise instructions To know how to organise, retrieve and manipulate digital content purposefully	**Networks**	To know how to navigate the web to complete simple searches **To know what computer networks do and how they provide multiple services**	To know how to search for specific information **To know which information is useful and which is not** **To know that computer networks can provide**	**To know the value of computer networks but are also aware of the main dangers**	**To know the difference between the internet and the World Wide Web**

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	simple digital content (e.g. children can name, save and retrieve their work and follow simple instructions to access online resources) **To know other uses for ICT outside of school and discuss examples of other ICT uses.** **To know what they create on a computer or tablet device can be shown to others via another device (e.g. printer, projector, Apple TV).**	To know how to create, name, save and retrieve content including photos, text and sound To know how to effectively retrieve relevant, purposeful digital content using a search engine. **To know that folders are used to organise files on a computer.** **To know how to improve the presentation of a piece of work by changing the font size, colour and style and develop basic editing skills e.g. shift key for upper case, question marks, spaces after punctuation.**			**opportunities for communication and collaboration**		
			Search engines	To know how to navigate the web to complete simple searches To know how to use search technology effectively **To know that to search for digital content, they are connecting to the internet and using a search engine.**	To know how to select and use software to accomplish given goals To know how to search for specific information and know which information is useful and which is not To know how to appraise selected webpages for credibility and information at a basic level. **To know the function, features and layout of a search engine.**	To know how to identify credible webpages To know how search results are selected and ranked	To know how to apply filters when searching for digital content. To know how to compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. To know how to use critical thinking skills in everyday use of online communication. **To know that some search engines may provide misleading information** **To know in detail how credible a webpage is and the information it contains.**
Uses of IT beyond school	To know how to make a distinction between objects that use modern technology **To know about some of the IT uses in their own home**	To know how technology is used in school and outside of school					
Safe use	To know how to use technology safely and respectfully To know how to keep personal information (such as passwords) private To know how to save work to designated private space	**To know the implications of inappropriate online searches** **To know where to go for help if concerned**	**Safe use**	To know how to use technology respectfully and responsibly **To know different ways they can get help if concerned** **To know the negative implications of failure to keep passwords safe and secure**	To know how to recognise acceptable and unacceptable behaviour using technology **To know a range of ways of reporting inappropriate content and contact**	To know how to make choices when using technology and that not everything is true and/or safe	To know how to compare a range of digital content sources and rate them in terms of content quality and accuracy To know how to recognise the value in preserving privacy when online for their own and other people's safety

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	website, rules, online, email, private information, space bar, online tools, shut down,	appropriate, inappropriate, cyber-bullying, sites, digital footprint, word process, frames, select tool, cursor		E-safety rules, log on, personal information, private, import, alignment, copy, paste,	search engine, reporting, secure, copyright, validate, lasso tool, enhance, critically evaluate		**To know the potential dangers in using aspects of IT and know when to alert someone if feeling uncomfortable**