

KOP science and non core subject progression documents

Subject: Computing

Year group	Progression of skills	Progression in knowledge	Key vocabulary and essential experiences
Pre school	<ul style="list-style-type: none"> - Explore how things work. 	<p><i>Support children in exploring the control technology of toys, e.g. toy electronic keyboard.</i></p> <p><i>Talk about screen time/ technology, what it does, what they can do with it and how to use it safely</i></p>	<p>Louder Quieter Turn off Turn on</p>
Nursery	<ul style="list-style-type: none"> - Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones. - Show resilience and perseverance in the face of a challenge. - Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. <p><i>Teach and encourage children to click on different icons to cause things to happen in a computer program.</i></p>	<ul style="list-style-type: none"> - Knows how to operate simple equipment, e.g. turns on CD player and uses remote control. - Knows that information can be retrieved from computers <p><i>Encourage children to speculate on the reasons why things happen or how things work</i></p>	<p>CD CD player Remote control Camera Mobile phone Ipad Tablet</p>
Reception	<ul style="list-style-type: none"> -Show resilience and perseverance in the face of a challenge -Completes a simple program on a computer. -Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time' -Interacts with age appropriate computer software. -Open a website, -open a game app 	<p>Safely use, explore and recognise that a range of technology is used in places such as homes and schools.</p> <p><i>Support children to coordinate actions to use technology, for example, call a telephone number.</i></p>	<p>Information Programme Computers Software</p> <p>Google Technology Skip Computer Mouse Keyboard Bee-bot Torches Knobs Pulleys</p>
End of EYFS	<ul style="list-style-type: none"> ● taking a photograph with a camera or tablet ● searching for information on the internet- being safe ● playing games on the interactive whiteboard ● exploring an old typewriter or other mechanical toys ● using a Beebot programming ● watching a video clip ● listening to music 		
Year 1	<p><i>-Useful websites to find information.</i> <i>-Using safe search features</i> <i>-Using a search engine.</i></p> <p>use logical reasoning to predict the behaviour of simple programs <i>-Control the nature of events, loops, single events and add and delete features.</i> create and debug simple programs <i>-Give commands one at a time to control the direction and movement. (^v<>)</i></p>	<p>recognise common uses of information technology beyond school <i>-Recognise what technology is used for.</i> <i>-Recognising good websites for their age.</i></p> <p>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</p>	<p>algorithm create command organise sequence software store program digital content digital devices computer network personal</p>

	<p><i>-give a set of instructions to follow and predict what will happen.</i> <i>-improve/change their sequence of commands by debugging.</i></p> <p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p><i>-Use the mouse and keyboard</i> <i>-Open, retrieve and save work.</i> <i>-Use paint tools-brushes, rubber, stamps, shapes, text.</i> <i>-Add text boxes and images.</i> <i>- Typing using the keyboard.</i></p>	<p>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.</p> <p><i>- Online rules</i> <i>What is personal information?</i> <i>What is appropriate/ inappropriate?</i> <i>Where can we get help online?</i> <i>How do we communicate effectively?</i></p>	<p>information world wide web</p>
Year 2	<p><i>-Making comments/ blogging.</i> <i>-Using a search engine.</i> <i>- using links to get information.</i></p> <p>use logical reasoning to predict the behaviour of simple programs</p> <p>create and debug simple programs</p> <p><i>-Give commands one at a time to control the direction and movement. (^v<>)</i> <i>-give a set of instructions to follow and predict what will happen.</i> <i>-improve/change their sequence of commands by debugging.</i></p> <p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p><i>-Use the mouse and keyboard</i> <i>-Open, retrieve and save work.</i> <i>-Use paint tools-brushes, rubber, stamps, shapes, text.</i> <i>-Add text boxes and images.</i> <i>- Typing using the keyboard.</i> <i>-use software to record sound.</i></p>	<p>recognise common uses of information technology beyond school</p> <p><i>-Recognise what technology is used for.</i> <i>-Follow instructions to get to a specific website.</i> <i>-Useful websites to find information.</i> <i>-Using safe search features</i> <i>-Recognising good websites for their age.</i> <i>-Making comments/ blogging.</i> <i>-Using a search engine.</i> <i>- using links to get information.</i></p> <p>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</p> <p>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.</p> <p><i>-What things are personal information?</i> <i>-Passwords</i> <i>-Inappropriate and appropriate behaviour</i> <i>-Online safety rules.</i> <i>-What is our digital footprint?</i> <i>-Where to get help when online.</i> <i>- To know if a website is child appropriate.</i> <i>-How to go onto the internet and leave websites.</i></p>	<p>algorithm blocks command debug execute manipulate organise scripted sequence software sprite store predict program retrieve reverse engineer data digital content digital devices network password personal information private world wide web</p>
End of KS1	<ul style="list-style-type: none"> • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • 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. 		
Year 3	<p>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p><i>-Give a set of instructions to follow and predict what will happen</i> <i>-Keep testing a program and recognise when it needs to be debugged.</i></p>	<p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p> <p><i>-Identify what is appropriate and inappropriate behaviour.</i> <i>-recognising the term cyber bullying.</i> <i>- Agree and follow sensible online safety rules</i></p>	<p>algorithm block language command debug execute input output loops manipulate organise program repetition</p>

	<p><i>-Write a program putting commands into a sequence to achieve a specific outcome.</i> <i>-Use one ended problem by breaking it up into smaller parts.</i> <i>- Use variables to create an effect eg repetition, if, when.</i></p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content <i>-Add websites to favourites list.</i></p> <p>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 <i>-Create different effects with different technological tools, demonstrating control.</i> <i>-Use applications and devices in order to communicate ideas and work.</i> <i>-Insert a text/picture etc from the internet into a file. --Use keyboard commands to amend the text on a device.</i> <i>-Save retrieve, evaluate and amend work</i> <i>-Use software to record, create and edit sounds and capture stills.</i> <i>-change recorded sounds, volume, duration and pauses.</i> <i>-use software to capture video for a purpose.</i> <i>-crop and arrange clips to create a short film.</i> <i>-plan an animation and move each animation for playback.</i></p>	<p><i>-Reflect on their own digital footprint and behaviour online.</i> <i>-Seek help from an adult when they see something unexpected or worrying.</i> <i>- Agree and follow sensible online safety rules (Recap and adjust)</i> <i>-Reflect on their own digital footprint and behaviour online.</i> <i>-Demonstrate understanding of age appropriate websites and adverts.</i> <i>- Agree and follow sensible online safety rules (Recap and adjust)</i> <i>-Reflect on their own digital footprint and behaviour online.</i> <i>-being a digital citizen</i></p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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 <i>-Explain ways to communicate with others online.</i> <i>-Use search tools to find and use appropriate websites and content.</i> <i>-Describe the wide web as part of the internet that contains websites.</i> <i>-Use strategies to improve results when searching online.</i></p>	<p>scripted sequence simulation sprite software store program physical system repetition retrieve reverse engineer data digital content digital devices network safe search mode search technologies software command evaluating digital content password personal information private world wide web</p>
<p>Year 4</p>	<p>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 <i>-Create different effects with different technological tools, demonstrating control.</i> <i>-Use applications and devices in order to communicate ideas and work.</i> <i>-Insert a text/picture etc from the internet into a file. --Use keyboard commands to amend the text on a device.</i> <i>-Save retrieve, evaluate and amend work.</i> <i>-Use software to record, create and edit sounds and capture stills.</i> <i>-change recorded sounds, volume, duration and pauses.</i> <i>-use software to capture video for a purpose.</i> <i>-crop and arrange clips to create a short film.</i> <i>-plan an animation and move each animation for playback.</i> <i>-Talk about different ways data can be organised</i> <i>- sort and organise information to use in other ways.</i></p>	<p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. <i>-Identify what is appropriate and inappropriate behaviour.</i> <i>-recognising the term cyber bullying.</i> <i>- Agree and follow sensible online safety rules</i> <i>-Reflect on their own digital footprint and behaviour online.</i> <i>-Seek help from an adult when they see something unexpected or worrying.</i> <i>- Agree and follow sensible online safety rules (Recap and adjust)</i> <i>-Reflect on their own digital footprint and behaviour online.</i> <i>Understanding their own voice and plagiarism.-Demonstrate understanding of age appropriate websites and adverts.</i> <i>- Agree and follow sensible online safety rules (Recap and adjust)</i> <i>-Reflect on their own digital footprint and behaviour online.</i> <i>-being a digital citizen</i></p> <p>use logical reasoning to explain how some</p>	<p>algorithm block language command collaboration debug encrypted execute HTTP input output loops manipulate organise program repetition scripted selection sequence simulation sprite software store packets of data program physical system repetition retrieve reverse engineer URL cached collecting data digital content digital devices</p>

	<p><i>-search a readymade database to answer questions.</i></p> <p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p><i>-design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</i></p> <p><i>-use sequence, selection, and repetition in programs; work with variables and various forms of input and output</i></p> <p><i>-Give a set of instructions to follow and predict what will happen</i></p> <p><i>-Keep testing a program and recognise when it needs to be debugged.</i></p> <p><i>-Write a program putting commands into a sequence to achieve a specific outcome.</i></p> <p><i>-Use one ended problem by breaking it up into smaller parts.</i></p> <p><i>- Use variables to create an effect eg repetition, if, when.</i></p>	<p>simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p> <p><i>-Explain ways to communicate with others online.</i></p> <p><i>-Use search tools to find and use appropriate websites and content.</i></p> <p><i>-Describe the wide web as part of the internet that contains websites.</i></p> <p><i>-Use strategies to improve results when searching online.</i></p> <p><i>-Add websites to favourites list.</i></p>	<p>network safe search mode search technologies server software acceptable/unacceptable behaviours command evaluating digital content password personal information private world wide web</p>
<p>Year 5</p>	<p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p><i>-design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</i></p> <p><i>-use sequence, selection, and repetition in programs; work with variables and various forms of input and output</i></p> <p><i>-use external triggers and infinite loops to demonstrate control</i></p> <p><i>-use conditional statements and edit variables.</i></p> <p><i>-decompose a problem into smaller parts to design an algorithm for a specific outcome and use them to write a program</i></p> <p><i>-follow a sequence of instructions eg flowchart</i></p> <p><i>-keep testing a program to recognise when it needs to be debugged.</i></p> <p>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</p> <p><i>-Use the skills already developed to create content using unfamiliar technology</i></p> <p><i>-select and use and combine technology tools to create effects.</i></p> <p><i>-review and improve their own work and support</i></p> <p><i>-save, retrieve and evaluate their work making amendments.</i></p> <p><i>-Insert a resource from the internet or personal life.</i></p>	<p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p> <p><i>-protect their passwords and personal information.</i></p> <p><i>-judge what sort of privacy setting might be relevant to reducing different risks.</i></p> <p><i>-identify inappropriate content including spam/junk.</i></p> <p><i>-be a good online citizen and friend.</i></p> <p><i>-discuss scenarios involving online risk.</i></p> <p><i>-seek help from an adult when they see something that is unexpected and worrying.</i></p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p> <p><i>-search information using appropriate websites and advanced search functions within google</i></p> <p><i>-use strategies to check the reliability of information</i></p> <p><i>-talk about the way search results are selected and ranked</i></p> <p><i>-Tell you about copyright and acknowledge the sources of information.</i></p> <p><i>-check the reliability of a website including photos on site</i></p>	<p>algorithm block language command control collaboration debug decomposition encrypted execute HTTP input output loops manipulate organise program repetition scripted selection sequence simulation sprite software store packets of data program physical system repetition retrieve reverse engineer URL variables cached collecting data digital content digital devices evaluating network safe search mode search technologies server software acceptable/unacceptable behaviours command encryption evaluating</p>

	<p>-collect audio from a variety of resources including internet clips. -use a digital device to record sounds and audio -trim, arrange and edit audio levels to improve quality -publish their animation and use a movie editing package to edit and refine.</p>		<p>digital content password personal information private world wide web</p>
Year 6	<p>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 -Use the skills already developed to create content using unfamiliar technology -select and use and combine technology tools to create effects. -review and improve their own work and support -save retrieve and evaluate their work making amendments. -insert a resource from internet or personal life. -collect audio from a variety of resources including internet clips. -use a digital device to record sounds and audio -trim, arrange and edit audio levels to improve quality -publish their animation and use a movie editing package to edit and refine. -Construct data on the most appropriate application -know how to interpret data, including spotting inaccurate data and comparing data/ -use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets. -add data to existing databases.</p> <p>-design, write and debug programs that accomplish specific goals, including 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 -use external triggers and infinite loops to demonstrate control -use conditional statements and edit variables. -decompose a problem into smaller parts to design an algorithm for a specific outcome and use them to write a program -follow a sequence of instructions eg flowchart -keep testing a program to recognise when it needs to be debugged.</p> <p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p>	<p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. -judge what sort of privacy setting might be relevant to reducing different risks. -identify inappropriate content including spam/junk. -discuss scenarios involving online risk. -seek help from an adult when they see something that is unexpected and worrying. -be a good online citizen and friend.</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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 -search information using appropriate websites and advanced search functions within google -use strategies to check the reliability of information -talk about the way search results are selected and ranked -Tell you about copyright and acknowledge the sources of information. -check the reliability of a website including photos on site</p>	<p>algorithm block language command control collaboration debug decomposition encrypted execute hardware HTTP input IP address output loops manipulate organise program repetition scripted selection sequence simulation sprite software store packets of data program physical system repetition retrieve reverse engineer URL variables acceptable/una cceptable behaviours command detect encryption evaluating digital content password personal information private responsibility world wide web</p>
End of KS2	<ul style="list-style-type: none"> design, write and debug programs that accomplish specific goals, including 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 use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 		

	<ul style="list-style-type: none"> • 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 • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 		
Year 7	<p>- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p>- use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions</p> <p>- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</p> <p>- create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</p> <p>- understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.</p>	<p>- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <p>- understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]</p> <p>- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</p> <p>- understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits</p>	<p>Acceptable use policy, file types, naming conventions, file management, backup, social networking, cyberbullying, privacy, password, identify theft, phishing, search engine, cookies. Network, hub, server, router, ISP, protocol, URL, mainframe, wired, wireless, bandwidth, bit, megabit, gigabit, broadband, buffering, packet, IP address, packet header, packet payload, Transmission Control Protocol, Internet Protocol, VoIP, security, web server, HTTP , HTTPS.</p>