Aston and Cote Church of England School- Progression Map- Computing

Computing Intent:

Computing at Aston & Cote C of E Primary School intends to develop 'thinkers of the future' through a modern, ambitious and relevant education in computing. We want to equip pupils to use computational thinking and creativity that will enable them to become active participants in the digital world. It is important to us that the children understand how to use the ever-changing technology to express themselves, as tools for learning and as a means to drive their generation forward into the future.

Whilst ensuring they understand the advantages and disadvantages associated with online experiences, we want children to develop as respectful, responsible and confident users of technology, aware of measures that can be taken to keep themselves and others safe online.

Our aim is to provide a computing curriculum that is designed to balance acquiring a broad and deep knowledge alongside opportunities to apply skills in various digital contexts. Beyond teaching computing discreetly, we will give pupils the opportunity to apply and develop what they have learnt across wider learning in the curriculum.

EYFS- There will be occasions when children are exposed to ICT in Early Years, however, this will happen across the academic year and built into provision appropriately; responding to the needs and understanding of the children. When working with technology, children will be working towards meeting the following early learning goals;

ELG- Managing Self • Be confident to try new activities and show independence, resilience and perseverance in the face of challenge; when using technology. • Explain the reasons for rules, know right from wrong and try to behave accordingly; when using technology.

ELG- Creating with materials • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; including technology.

Substantive Concept/ Strand- Computer Science						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic						
National Curriculum Objective	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into

	following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	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. 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.	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. 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.	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. 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	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. 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
Sticky Knowledge/ Retrieval	Children understand that an algorithm is a set of instructions used to solve a	Children can explain that an algorithm is a set of instructions to complete a task.	Children can turn a simple real-life situation into an algorithm for a program by	When turning a real-life situation into an algorithm, the children's design shows that they are thinking of the	Children may attempt to turn more complex real-life situations into algorithms for a program by	Children are able to turn a more complex programming task into an algorithm by identifying the

	problem or achieve an objective. They know that a computer program turns an algorithm into code that the computer can understand Children can work out what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash and can write their own simple algorithm, e.g. Colouring in a Bird activity. Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code, e.g. Bubbles activity in 2Code. When looking at a program, children can read code one line at a time and	When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code. Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. Debug Challenges: Chimp. Children's program designs display a growing awareness of the need for logical, programmable steps. Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect	deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it. Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command	required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs. Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. They understand 'IF statements' for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs such as 'print to screen'. e.g. 2Code. Children's designs for their programs show that	deconstructing it into manageable parts. Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code. Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design. When children code, they are beginning to think about their code structure in terms of the ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of	important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs.Children test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem. Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures, including nesting structures within each other. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs

	make good attempts to envision the bigger picture of the overall effect of the program. Children can, for example, interpret where the turtle in 2Go challenges will end up at the end of the program.	sentence of what will happen in a program.	when creating repetition effects. Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, repetition and use of timers. They make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this. e.g. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately. Children can list a range of ways that the Internet can be used to provide	they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, 'IF' statements, repetition and variables. They can trace code and use step-through methods to identify errors in code and make logical attempts to correct this. In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately. Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the Internet can be used to provide different methods of communication is improving.	variables. Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications contingent on audience and digital content, e.g. 2Blog, 2Email, Display Boards.	from the user of the program such as button clicks and the value of functions. Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole. Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the internet in school.

			different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email. They can describe appropriate email conventions when communicating in this way.			
Skill						
Vocabulary	sort criteria describe more than less than equal groups activities instructions algorithm <a variety of prepositional language>" program machine computer recipe debugging	instruction algorithm event object action command scene background properties scale click events collision detection predict interaction collision detection event collision detection action image	algorithm background object implement predict run flowchart properties when clicked when key timer sequence nested repeat input command button right-angle degrees	background button object properties code block predict event debugging action selection if statement decision command coordinate flowchart repeat until if/else statement inputs execute	event key press collision object action variable selection if/else statements coordinates simplify efficient computer generated variable simulation physical system algorithm properties decomposition abstraction	algorithm action output selection variables repeat timer launch command debug alert string x and y properties coordinates decomposition object event algorithm action output

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	code sequence " direction forwards backwards left right keys challenge undo rewind route delete command Unit algorithm debug "instructions algorithm code programmer coding software code blocks object action 2Do command Design View Code view debug\ debugging run	implement timer interval sequence output" properties turtle object when key event when swiped event when clicked event button object name text bug debugging test	Nesting test debug actions object type alert actions object type alert	variable number variable alert prompt 2Logo grid run speed Logo commands (e.g. FD BK RT LT) prediction Pen up Pen down multi line mode debugging Repeat Procedure SETPC SETPS hardware software components peripherals motherboard CPU RAM hard drive graphics card network card monitor mouse keyboard input output	friction function predict string variables values tabs text variable collision when key random output concatenation print to screen tabs 'if' statement 'if/else' statement	selection variables repeat timer launch command debug alert string x and y properties coordinates decomposition object event function turtle object text object execute function call tabs flowchart simulation procedure input concatenation text adventure input decimal binary integer denary base 10 base 2 transistor microprocessor chip

	event click sound when clicked output execute background scale scene properties plan					nanotechnology bit nibble byte kilobyte megabyte gigabyte tetrabyte sequence switch remainder game states variable text adventure sprite link functions selection variables repeat" functions selection variables repeat debugging QR code
Substantive Concept/ Strand- Information technology						
		Year 2	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic						
National Curriculum Objective	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Use search technologies effectively, appreciate how results are selected and	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select,	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select,	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select,

			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 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 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 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
Sticky Knowledge/ Retrieval	Children are able to sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting	Children demonstrate an ability to organise data using, for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such	Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet and using a search engine such as Purple Mash search or internet-wide search engines.	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level. . Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains. Children are able to make appropriate improvements to digital solutions based on feedback received and	Children readily apply filters when searching for digital content. They are able to explain in detail how credible a webpage is and the information it contains. They compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. Children use critical thinking skills in

	shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count.	as music compositions within 2Sequence. Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.	Children can collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database (2Question), using software such as 2Graph. Children can consider what software is most appropriate for a given task. They can create purposeful content to attach to emails, e.g. 2Respond.	information and data. They create linked content using a range of software such as 2Connect and 2Publish+. Children share digital content within their community, i.e. using Virtual Display Boards.	can confidently comment on the success of the solution. e.g. creating their own program to meet a design brief using 2Code. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email.	everyday use of online communication. Children make clear connections to the audience when designing and creating digital content. The children design and create their own blogs to become a content creator on the internet, e.g. 2Blog. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements
Skill						
Vocabulary	Login password private home screen work area avatar icon typing saving logout alert notification communication	row column cell toolbox drag image value count tool speak tool cut copy paste total price	pie chart data table bar graph Spinner tool More than, less than & equal tool advanced mode cell address Quiz tool posture typing keys	formula wizard percentages decimal place format cell average equal tool random number tool spinner tool timer line graph data chart resize	formula formulae conversion advanced mode copy and paste advanced mode 'How many?' tool Variable perimeter area modelling text variables cell format	count tool dice tool chart Formula wizard computational model percentage format move tool budget Advanced mode profit expenses profit

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	device	coins	spacebar	budget	totalling tool	expenses
	search	equals	data	totals	budget	blog
	filter	addition	database	calculatons	profit	vlog
	shared folders	equals tool	branching	place value	database	archive
	filename	data	database	'is equals to' tool	search	blog post
	Topic Area	table	binary tree	set image	record	collaborate
	writing template	block graph	debugging	genre	field	nodes
	textbox	label	debugging	format	sort	connections
	toolbar	pictogram	simulation	font	group	commenting
	menu	data	modelling	reporter	arrange	approval
	think about box	information	advantages	viewpoint	statistics	Internet
	Purple Mash Tools	sort	disadvantages	opinion	reports	World Wide Web
	Button	avatar	point-of-view	reporter	charts	website
	data	question	solution	viewpoint	avatar	network
	pictogram	binary tree	realistic	opinion	collaborative	web server
	visual	database	unrealistic	campaign	evaluation	web page
	title	record	analysis	animation	theme	hosting
	collect data	field	decision	frame	scene	data
	record results	search	evaluation	fps (frames per second)	textures	LAN
	compare	Art	graph	pause	images	WAN
	totals	Impressionism	chart	onion skinning	screenshot	WLAN
	e-book	palette	title	stop motion	quest	router
	sound	style	sort	pulse	instructions	switch
	eraser	Pointillism	axis	rhythm	feedback	hub
	undo	dilute	data	tempo	promotion	ethernet
	redo	line	row	pitch	net	Wi-Fi
	paint tools	fill	column	texture	template	search engine
	text	vertical	investigation	melody	3D view	ip address
	save	horizontal	tally chart	dynamics	pattern fill"	ISP
	overwrite	repeating pattern	survey	bpm	points	DNS
	animation	parallel	textbox	synth	design brief	quiz
	play mode	diagonal	presentation	harmonious	3D Printing	audience
	sound effect	rotated	font formatting		concept	copy\paste
	voice recording	symmetry	WordArt		node	selfie
	drop-down menu	Surrealism	media		connections	undo\redo

~ Aspiring to be the people God created us to be by growing the talents He gave us ~

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	category background clip-art gallery font copy paste features edit spreadsheet data row column cell delete calculations button clip-art image move cell lock cell select count tool speak tool value"	e-collage stamps clip-art tune compose note speed beats volume tempo sound effect repeat bars soundtrack e-book mind map node quiz multiple-choice fiction non-fiction fact file presentation	slide editing audio transition preview sound effect duration timing textbox presentation font formatting media slide editing slide video layer transition font formatting media slide theme presentation design border weight border dash fill colour layer		story mode heading sub-heading collaborate presentation mode Word Processing Tool document front screen zoom selecting\highlighting font formatting page orientation copy and paste copyright creative commons attributing image editing cropping image transparency text wrapping styles bulleted list numbered list drop capital text box caption hyperlink WordArt merge cells column row distributing columns grammar check spell check	audio clipart image image filter preview case-sensitive clone preview case-sensitive cloze database record field statistics spreadsheet cell cell reference data column row workbook sheet categories ribbon formula formulae calculation formula bar series computational model template budget expense formatting currency delimiter

					template columns Word Processing Tool document front screen caps lock cursor selecting\highlighting font formatting page orientation copyright creative commons attributing cropping text wrapping image editing text styles bulleted lists numbered lists text boxes captions breaks hyperlinks editor options sharing merge cells column row template spell check grammar check	sorting flash fill auto-fit filter average minimum maximum graph chart horizontal axis vertical axis conditional formatting budget profit spreadsheet cell cell reference data column row workbook sheet formula formulae calculation formula bar series computational model template budget expense formatting currency delimiter flash fill

						auto-fit filter graph chart horizontal vertical axis\axes formatting budget profit
Substantive Concept/ Strand- Digital literacy						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic						
National Curriculum Objective	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	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	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact

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Sticky Knowledge/ Retrieval	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair. Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash.	Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template. Children make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs. Children know the implications of inappropriate online searches. Children begin to understand how things are shared electronically such as posting work to the Purple Mash	Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash. They know more than one way to report unacceptable content and contact.	Children can explore key concepts relating to online safety using concept mapping such as 2Connect. They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact	Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.	Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities. They recognise the value in preserving their privacy when online for their own and other people's safety

		display board. They develop an understanding of using email safely by using 2Respond activities on Purple Mash and know ways of reporting inappropriate behaviours and content to a trusted adult				
Skill						
Vocabulary	technology computer	search filter internet sharing display board email attachment reply personal information private information digital footprint protection identifying secure Internet World Wide Web network device web page	password personal information blog permission vlogs appropriate Internet website spoof verify reputable source Inappropriate Permission communication mind mapping node link email compose address book	report SMART rules Spam attachment phishing digital footprint malware software virus AdFly ransomware cookies plagiarism watermark citation copyright collaborating data analysis collaborative database search engine results page	responsibility SMART rules encrypt critical thinking image manipulation avatar citation validity reliability plagiarism bibliography copyright creative commons licence communication	secure websites location sharing spoof websites phishing password PEGI digital footprint inappropriate print screen screen time data analysis

		browser website domain web address URL search engine Digital Footprint	inbox trusted contact personal information password Save to draft attachment CC - carbon copy BCC - blind carbon copy	Internet key words reliability easter eggs balanced view		

Other strands covered throughout units

Coding
Collecting and combining information
Communicating Effectively
Connecting Responsibly