HELMDON PRIMARY SCHOOL – Progression in Computing

Strand		National Curriculum	Year 1	Year 2	National Curriculum	Year 3	Year 4	Year 5	Year 6
Computer Science	PROGRAMMING	*Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions*	• Begin to understand an algorithm is a set of instructions to achieve a specific purpose • Combine forwards and backwards commands to make a sequence • Combine four direction commands to make sequences • Understand that we control computers by giving them instructions • Choose a command for a given purpose • Show a series of commands can be joined together • Understand that the order of instructions in an algorithm is important	• Describe a series of instructions as a sequence • Explain that a sequence of commands has an outcome • Combine four directions commands to make increasingly more complex sequences • Understand that computers have no intelligence and we have to program them to do things • Explain that a sequence of commands has a start • Explain what happens when we change the order of commands • Explain what happens when we change the order of commands • Understand that instructions in an algorithm need to be in order, clear and unambiguous	*Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems*	• Create a sequence of commands using a block language to produce a given outcome • Debug errors to accomplish specific goal	• Plan a program using a block language which includes loops to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal	• Plan a program which includes selection to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal	• Plan a program which includes variables to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal
					Solve problems by decomposing them into smaller parts	• Work with others to decompose a problem into smaller steps in planning a project	• Independently decompose a problem into smaller steps in planning a project	• Plan a solution to a problem using decomposition	• Solve problems using decomposition, tackling each part separately
					Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	• Explain the order (**sequence**) of commands can affect the outcome (same commands, different order -> same or different outcome) • Identify different **sequences** can achieve the same outcome	• Identify patterns (**repetition)** in a sequence • Understand repetition in programming is also called looping • Identify a loop in a program • Understand, identify and justify when to use 'infinite' or 'count-controlled' loops • Explain the importance in instruction order in a loop	• Define that conditional statements (**selection**) are used in computer programs • Explain a loop can stop when a condition is met (number of times or event) • Explain a that program flow can branch according to a condition • Use a condition in an *if…then…* statement to produce a given outcome	• Define '**variable**' as something that is changeable • Explain that a variable has a name and a value Identify a variable in an existing program • Use a variable in a conditional statement to control the flow of a program
		Create and debug simple programs	• Give a sequence of instructions to a floor robot (length of programs increasing over the course of the year) • Begin to debug instructions when floor robot does not reach the intended destination	• Create a simple program on screen, correcting any errors, with a particular goal or purpose in mind • Use the word debug to correct mistakes in an algorithm • Evaluate the success of an algorithm	*Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs*	• Explain simple, sequence -based algorithm independently • Use logical reasoning to detect errors in programs	• Explain an algorithm using sequence and repetition independently • Use logical reasoning to detect and correct errors in programs	• Explain an algorithm using sequence, repetition and selection independently • Use logical reasoning to detect errors in increasingly complex programs	• Clearly and concisely explain algorithms using sequence, repetition, selection and variables independently • Use logical reasoning to detect errors in increasingly complex programs

		Use logical reasoning to predict the behaviour of simple programs	• Begin to predict what will happen for a short sequence of instructions in a program • Understand that we control computers by giving them instructions	• Predict the outcome of a sequence • Compare prediction to the program outcome					
	COMPUTING, SYSTEMS & NETWORKS	*Recognise common uses of information technology beyond school*	• Recognise common uses of information technology beyond school • Identify a computer and its main parts • Use a mouse in different ways	• Identify information technology in the home • Identify information technology beyond school • Explain how information technology benefits us • Recognise the uses and features of information technology • Continue to practise mouse skills independently	*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*	• Explain how a computer network can be used to share information • Explore how digital devices can be connected • Recognise the physical components of a network • Explain how digital devices function • Identify input and output devices	• Describe how networks physically connect to other networks • Recognise how networked devices make up the internet • describe how content can be added and accessed on the World Wide Web • Recognise how the content of the WWW is created and shared by people • Describe the current limitations of World Wide Web media	• Explain that computers can be connected together to form systems • Recognise the role of computer systems in our lives • Recognise how information is transferred over the internet • Explain how sharing information online lets people in different places work together • Contribute to a shared project online • Evaluate different ways of working together online	*(Continue to develop online searching skills to enhance online communication and collaboration)*
Information Technology	CREATING MEDIA **Text**	*Use technology purposefully to create, organise, store, manipulate and retrieve digital content*	• Identify and find keys on a keyboard • Add and remove text using basic typing skills (including use of space bar, backspace to delete and basic, age-appropriate punctuation) • Save work to the appropriate location (hard drive and Google Drive) • Begin to print, retrieve and edit work, with support	• Identify and find keys on a keyboard with increased confidence and speed • Type capital letters • Change font, style (bold, italic and underline) and size of text • Save, print, retrieve and edit work from appropriate location (hard drive and Google Drive) independently • Upload images or movies to appropriate place (hard drive and Google Drive), with support	*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*	• Combine text and images to share a message • Consider how different layouts can suit different purposes • Type with increased confidence and speed using age-appropriate punctuation • Use return to create paragraphs • Change orientation of text • Wrap text around an image • Recognise a document can be formatted with placeholders	*(Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3)*	*(Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3)*	• Recognise components of a webpage layout • Create a webpage including text, images, hyperlinks and embedded content • Understand the need for a navigation path
	Image		• Create/edit a drawing using a range of 'tools' such as brushes, pens, eraser, stamps and shapes, and set the size, colour and shape; • Explain why tools were chosen and used	• Add and resize images (including insert clip art/copy & paste an image) • Capture/edit photograph using a range of 'tools'		• Change orientation of images	• Use a computer to (further) manipulate images • Recognise images can be changed for different purposes • Use the most appropriate tool for a particular purpose • Consider the impact of changes made on the quality of the image	• Recognise an image is comprised of separate objects • Add, remove, modify and combine objects to create graphical drawing on a computer • Recognise objects are layered • Recognise that objects can be modified in groups • Consider the impact of choices made	• Create 3D graphical objects on a computer • Alter the view of a 3D space • Modify 3D objects • Combine 3D objects to create desired effect • Apply blank 3D objects as placeholders to create holes

	Multimedia			• Use software to create and edit digital music for a purpose • Explain and begin to justify why tools were chosen and used		• Understand animation is a sequence of drawings or photographs • Relate animated movement with a sequence of images • Plan an animation • Review and improve an animation • Evaluate the impact of adding other media to an animation	• Press/tap buttons to start and stop recordings • Recognise recorded audio is stored as a file • Edit and alter recorded audio • Layer sounds • Save/export an audio file • Consider the results of editing choices made	• Identify the features of a good video • Plan a video production using a story board • Use a computer to make a video • Recognise a video can be improved through editing • Consider the impact of changes made on the quality of the video	*(Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 5)*
	DATA & INFORMATION		• Label objects • Identify that objects can be counted • Count objects with same properties • Compare groups of objects • Describe objects in different ways	• Recognise that objects can be counted and compared using tally charts • Select objects by attribute and make comparisons • Recognise objects can be represented as pictures • Create a pictogram • Explain that information can be presented using a computer	*Collecting, analysing, evaluating and presenting data and information*	• Identify object attributes needed to collect relevant data • Create a branching database • Identify objects using a branching database • Compare information shown in a pictogram with a branching database • Explain that data can be used to answer questions	• Collect data using a digital device • Recognise that a sensor can be used as an input device for data collection • Use a larger data set to find information • Use a computer program to sort data by one attribute • Export information and present data in a table and a graph	• Use a form to collect information • Navigate a flat-file database • Apply knowledge of a database to ask and answer real-world questions • Design a structure for a flat-file database • Choose tools to select and analyse data to answer questions • Select an appropriate graph to visually compare data • Choose suitable ways to present information	• Identify questions that can be answered using data • Create a spreadsheet for a purpose • Apply a formula that can be used to produce calculated data • Recognise data can be calculated using different operations • Evaluate results in comparison to the question asked • Choose suitable ways to presents data
Digital Literacy	ONLINE SAFETY	*Use technology safely and respectfully*	*We use ProjectEvolve resources & Jigsaw PSHE to deliver the Education for a Connected World curriculum*		*Use technology safely, respectfully and responsibly*	*We use ProjectEvolve resources & Jigsaw PSHE to deliver the Education for a Connected World curriculum*			
		Keeping personal information private			*Recognise acceptable/ unacceptable behaviour*				
		Know where to get help when worried about online content or contact			*Identify a range of ways to report concerns about content and contact.*				
	DIGITAL RESEARCH				*Use search technologies effectively, know how results are selected & ranked, be discerning in evaluating digital content*	• Search for information in a single site • Understand that search engines select pages according to keywords found in the content	• Use a standard search engine to find information • Understand that search engines rank pages according to relevance.	• Use filters to make more effective use of a standard search engine • Understand that search engines use a cached copy of the crawled web to select and rank results	• Use of a range of search engines appropriate to finding information that is required • Understand that search engines rank pages based on the number and quality of in-bound links