Holme Community School – Long Term Curriculum Planning

Subject	Computing	Cycle	B

What themes/ golden threads weave through the curriculum?	• **Computing Systems and Networks** • **Programming** • **Creating Media** • **Data Handling** • **Online Safety** • **Skills Showcase**
Why were these themes chosen?	The key five threads ensure a broad and balanced coverage of the national curriculum requirements across Digital Literacy, Information Technology and Computer Science. In addition, our 'Skills showcase' units provide pupils with the opportunity to learn and apply transferable skills.
What are the overall aims of this curriculum?	Our high-quality computing education equips our pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Year Group		**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
EYFS	**Topic Heading**	**Using a computer (Computing Systems & Networks)**	**All about instructions (Programming)**	**Exploring Hardware (Computing Systems & Networks)**	**Introduction to data (Data Handling)**	**Programming Bee-Bots (Programming)**	
	What are the building blocks for this subject to ensure children are KS1 ready?	**Physical Development** Develop their small motor skills so that they can use a range of tools competently, safely and confidently. **Literacy** Spell words by identifying the sounds and then	**Communication and Language** Understand how to listen carefully and why listening is important. Describe events in some detail. Use talk to help work our problems and organise thinking and activities, and	**Communication and Language** Learn new vocabulary. Use new vocabulary throughout the day. Ask questions to find out more and to check they understand what has been said to them.	**Communication and Language** Articulate their thoughts and ideas in well-formed sentences. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.	**Personal, Social and Emotional Development** **ELG**: Managing Self> Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. **Mathematics** Count objects, actions and sounds. Link the number symbol (numeral) with its cardinal number value. Count beyond 10.	

		writing the sounds with letter/s. Re-read what they have written to check that it makes sense. **Mathematics** Link the number symbol (numeral) with its cardinal number value	to explain how things work and why they might happen. **Personal, Social and Emotional Development** **ELG**: Self-Regulation> Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions. **ELG**: Managing Self> Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. **ELG**: Building Relationships> Work and play cooperatively and take turns with others.	Articulate their thoughts and ideas in well-formed sentences. Use talk to help work out problems and organise thinking and activities and to explain how things work and why they might happen. **Personal, Social and Emotional Development** See themselves as a valuable individual. Physical Development Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Confidently and safely use a range of large and small apparatus indoors and outside, alone and in a group. **Literacy** Spell words by identifying the sounds and then writing the sounds with letter/s. Write short sentences with known letter-	**ELG**: Listening, Attention and Understanding> 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. **ELG**: Listening, Attention and Understanding> Make comments about what they have heard and ask questions to clarify their understanding. **ELG**: Speaking> Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. **Mathematics** **ELG**: Numerical Patterns> Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	

			Physical Development Know and talk about the different factors that support their overall health and wellbeing. Further develop the skills they need to manage the school day successfully	sound correspondences using a capital and full stop. **Understanding the World** Describe what they see, hear and feel whilst outside	Count objects, actions and sounds. Subitise. Count beyond 10. Compare numbers. Understand the 'one more than/ one less than' relationship between consecutive numbers. Continue, copy and create repeating patterns. Compare length, weight and capacity		
Year 1/2	**Topic Heading**	**Word Processing**	**BeeBots**	**Algorithms Unplugged**	**Algorithms & Debugging**	**Rocket to the Moon**	**What is a computer?**
	Link to themes/key concepts	**Computer Systems & Networks** To know that touch typing is the fastest way to type. To know that I can make text a different style, size and colour. To know that "copy and paste" is a quick way of duplicating text.	**Programming** To know the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a Bee-Bot accurately to a chosen destination.	**Programming** To know that an algorithm is when instructions are put in an exact order. To know that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm	**Programming** To know what machine learning is and how it enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the	**Skills Showcase** To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software. To know that a spreadsheet is an electronic 'table' for sorting data.	**Computer Systems & Networks** To know the difference between a desktop and laptop computer. To know that people control technology. To know some input devices that give a computer an instruction about what to do (output). To know that computers often work together.

				'bugs' and fixing these 'debugging'.	removing of unnecessary detail to help solve a problem.		
	National Curriculum Objectives to be covered	Use technology purposefully to create, organise, store, manipulate and retrieve digital content. 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.	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.	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.	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.	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Recognise common uses of information technology beyond school.
	Key Subject Specific Vocabulary to be taught **(Please note: This section includes new vocabulary to be taught and builds upon vocabulary taught in previous topics)**	Copy Home screen Image Import Copyright Keyboard Layout Text effects Touch typing Word processing	Algorithm Bee-Bot Code Debug Demonstration Instructions Precise Predict Program Video recording	Bug Chunks Decomposition Input Instructions Manageable Output Problem Sequence Solution	Abstraction Artificial intelligence Clear Correct Data Error Key features Loop Predict Unnecessary	Annotate Cells Components Data Designing Digital content E-document Evaluate Software Spreadsheet	Battery Buttons Camera Computer Device Electricity Invention Monitor Mouse Technology

	Core Activities	Begin to learn to touch type. Understand how to use a word processor. Add images to a text document. Create a poetry book using sources from the internet. To create a digital piece of writing.	explore a new device. create a demonstration video. plan and follow a precise set of instructions. program a device. create a program that tells a story.	Dressing doll activity Play the body parts game Virtual assistant activity Decomposition comic strip activity Maps with landmarks and paths activity	Decompose a game and predict the algorithms that are used. Building block activity Mazing activity Making map activity Building a robot activity	Explore a graphic editing programme. design a rocket using a graphics editing programme. sequence a set of instructions. build a rocket. test a design and record data.	Draw a diagram of a computer Robot design activity Technology Safari Create a design for an invention. Real world Roleplay
	Assessment	To create a digital piece of writing. Word Processing Quiz	create a program that tells a story. BeeBot Quiz	Create and debug an algorithm Algorithms unplugged Quiz	Create and debug an algorithm Algorithms & Debugging Quiz	Build and test a rocket Rocket to the Moon Quiz	What is a computer Quiz
Year 3/4	**Topic Heading**	**Scratch**	**Computational Thinking**	**iMovie Book Trailers (iPads)**		**Online Safety**	**Investigating Weather (Greenscreen)**
	Link to themes/ key concepts	**Programming** To know that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To know that using variables can	**Programming** To know that combining computational thinking skills can help you to solve a problem. To know that pattern recognition means identifying patterns to help them work out how the code works.	**Creating Media** To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To know that I can add transitions and text to my video.		**Online Safety** To know that not everything on the internet is true: people share facts, beliefs and opinions online. To know the internet can affect people's moods and feelings. To know privacy settings limit who can access important personal information, such as names, ages, gender etc.	**Data Handling** To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data'). To know that a weather machine is an automated machine that respond to sensor data. To know that weather forecasters use specific

		help you to create a quiz on Scratch.	To know that algorithms can be used for a number of purposes e.g. animation, games design etc.		To know what social media is and that age restrictions apply.	language, expression and pre-prepared scripts to help create weather forecast films.
	National Curriculum Objectives to be covered	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. Use search technologies effectively,	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. Select, use and combine a variety of software (including	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.	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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. 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.

		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.	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.			
	Key Subject Specific Vocabulary to be taught	animation application code block game interface loop predict repetition code review sprite	abstraction algorithm code computational thinking decomposition logical reasoning pattern-recognition script sequence variable	cross blur cross fade cross zoom dip to black directional wipe edit film graphics time code voiceover	accurate age restrictions belief fact fake news hoax opinion online emotions permission reliable	Backdrop Collaboration Pinwheel Presenter Satellite Script Sensitive Sensor data Tablet/Digital camera Weather forecast

	Core Activities	explore Scratch use repetition (a loop) in a program program an animation program a story program a game	Explore the 4 strands of computational thinking (decomposition, pattern recognition, abstraction & Algorithm design) Scratch decomposition activity Scratch pattern recognition game Design a square activity Bebras – Coding challenge	plan a book trailer take photos or videos that tell a story edit a video add text and transitions to a video evaluate video editing	'facts, opinions or beliefs' quiz Asking Permission Activity Online activities and emotions Activity Create a visual mini-guide booklet of digital devices Role Play activity	Log data taken from online sources in a spreadsheet. Design a weather station. Design an automated machine to respond to sensor data.
	Assessment Activity	Create a program in scratch Scratch Quiz	Complete a Bebras Coding Challenge Computational Thinking Quiz	Create a book trailer iMovie Book Trailer Quiz	Create a visual mini-guide booklet of digital devices Online Safety Quiz	Use tablets or digital cameras to present a weather forecast. Investigating Weather Quiz
Year 5/6	**Topic Heading**	**Coding: Bletchley Park**		**Lego We-Do**	**Sonic Pi (Music)**	**Introduction to Python**
	Link to themes/ key concepts	**Computing Systems & Networks** To know the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.		**Programming** To know how robots can be used to inspect narrow spaces To know how to create and program a robot to move on a surface and avoid obstacles To know how to test a program to make sure that it can detect walls, holes, a cave and objects	**Programming** To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. To know that loops can make the process of	**Programming** To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops.

		To know about some of the historical figures that contributed to technological advances in computing. To know what techniques are required to create a presentation using appropriate software.	To know how to collaborate effectively sharing programming and ideas	writing music simpler and more effective. To know how to adapt their music while performing.	To know the use of random numbers and remix Python code.
	National Curriculum Objectives to be covered	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.	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. 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.	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. 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	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. 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

				collecting, analysing, evaluating and presenting data and information.	that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
	Key Subject Specific Vocabulary to be taught	Acrostic Code Brute force hacking Caesar cipher Cipher Combination Date shift cipher Nth Letter Cipher Pigpen cipher Scrambled Trial and error	Autonomous Collaboration Conditional Statement Debugging Engineering and Design Iteration Optimisation Loop Mathematical Terms Team Collaboration	basic commands loop mind map pitch program language repeat rhythm soundtrack tempo timbre	Command Design Indentation Instructions Loop Patterns Random Remix Repeat Shape
	Core Activities	Code and decode messages using different types of encryption. Create an algorithm designed to hack a password. Research historical figures relating to computing Create a presentation about Bletchley Park	Explore Phase – tinker with LegoWeDo Kits Plan Phase – design a robot capable of navigating in a confined space Create Phase – create and program a robot to move on a surface and avoid obstacles Test Phase - test a program to make sure that it can detect walls, holes, a cave and objects Evaluate Phase - sharing programming and ideas to improve designs	Tinker with Scratch music elements. Create a program that plays themed music. Plan a soundtrack program. Program a soundtrack. Program music for a specific purpose.	Tinker with a new piece of software. Use loops when programming. Use random numbers within programming.
	Assessment	Create a Presentation about Bletchley Park Bletchley Park Quiz	Create, program and test a robot to move on a surface and avoid obstacles	Program music for a specific purpose. Sonic Pi Quiz	Use Trinket to create a piece of art inspired by Mondrian Intro to Python Quiz