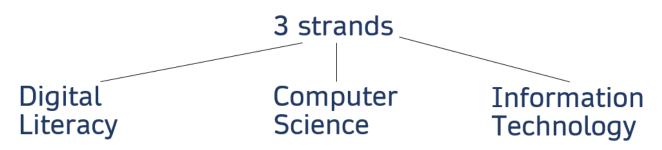
# Computing



## **Digital Literacy**

How to sum it up - how devices can be used effectively, safely and responsibly

#### **Key aspects:**

- how to use the device (computer, iPad, programmable toy)
- searching and selecting information
- online safety

## **Computer Science**

How to sum it up - how computers work

#### **Key aspects:**

- computation, algorithms and programming, data (input, process, output), systems
- -Knowledge of programming is hierarchical and sequential. Begin with a secure base.
- -Give children practical programming experience that begins with tinkering in EYFS and at the start of a new unit/program.
- -Our pupils have told us they find coding hard, so they need time to learn by exploring first.

## **Information Technology**

How to sum it up - how computers are used purposefully

#### **Key aspects:**

- The creation of digital artefacts (anything created on a device) presentations, videos, animations, spreadsheets
- Understanding computing contexts how computing is used in various ways; how and what technology underpins those uses

**Spring Medium Term Plan Hollinswood Primary School and Nursery** 

Computing – Computer Science					
	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied	Vocabulary	Big Question	
EYFS –  Computational Thinking Progression  Concepts:  Logic Patterns  Approaches:  Tinkering  Creating  Persevering  Collaboration  (These concepts and approaches are introduced but the vocab may not be made explicit)	I know:  when I press a button or switch, something happens  I need to press forwards/backwards/arrows to make the cars move  what tinkering is	I know:  I should do things one step at a time  I should learn from mistakes and not give up (Perseverance)  I know how to:  explore how things work (UOW)  use my small motor skills so that I can use a range of tools competently, safely and confidently (PD)  show resilience and perseverance in the face of a challenge (PSED)  be confident to try new activities and show independence (PSED)  follow instructions to make something  play and work with others (Collaboration)  make things, check and fix things (Creating)  play and explore (Tinkering)  plan a route for a Beebot/Rabbit etc	button switch forwards backwards on off left right up down  Coding: program code input instructions forward backwards left right up down  creating tinkering logic patterns	What happens when?  Resources/staff subject knowledge:  Open Door activities: BeeBots/BlueBots (tinkering – not structured activity) Remote Control Cars Torches Cubetto Robot Mouse Noisy Things Beep Beep Sphero  Click here for: Spring resources Computer Science  Purple Mash 2Code (summer term YR) Nursery: Computer Discovery activities 1 - 3 Computer Discovery - Early Years - iLearn2   Primary Computing. Made Easy. YR: Mouse and Keyboard Skills Activities 1 - 7 https://www.ilearn2.co.uk/eyfsyear-1-mouse-and-keyboard-skills.html YR: Early Programming https://www.ilearn2.co.uk/early-programmingearly-years.html	
				Barefoot Computing units: Boats Ahoy (4 lessons N/YR), Junk Scarecrows (1/2 lessons N/YR), Rabbit Run (YR), Seed Sequencing (N/YR)	

	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question
Year 1	I know:	I know:	creating debugging	Can I create a simple program?
Computational Thinking Progression	that computational thinking is part of Computing	instructions need to be precise and clear If my program doesn't run correctly it needs debugging	patterns same, different true	Resources/staff subject knowledge:
Concepts:	what patterns look like	I know how to:	algorithms logic	BeeBots/BlueBots
Algorithms			predict	BeeBot/BlueBot app on iPads
Logic	what algorithms are (NC)	say what is the same, different and generally true about a pattern	test tinker command	2Code in Purple Mash Sphero Cubetto
Patterns	what logic means	explain what an algorithm is	program programming	Robot Mouse
Approaches:	what programs are	write a simple algorithm	logical reasoning	Code-it.co.uk BeeBot planning: KS1 Turtle
Tinkering	programs need	follow an algorithm	forwards,	Progression – code-it supported by HIAS, Hampshire Inspection and Advisory Service
Creating	precise instructions	improve an algorithm	backwards left, right, up, down	Code.org lessons: https://studio.code.org/s/coursea-2018
Debugging	what debugging means	predict what a program will do		Programming A – moving a robot planning: Programming A – Moving a robot
		input code		(teachcomputing.org)
		add a sprite		Introduce Programming: Year 1 Programming - iLearn2   Primary Computing. Made Easy.
		change a background		Barefoot Units - BeeBot Basics, BeeBot 123,
		program a Beebot		Spelling Rules link: Spring resources Computer Science
		debug a Beebot		Consider Barefoot Units saved in EYFS folder also
		log onto Purple Mash using my own logon card		
		create and debug simple programs (NC)		
	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question

Year 2	I know:	I know:	tinkering	Can I debug my program?
			creating	3 71 3
Computational	that computational	if my program doesn't run correctly, it needs	collaborating	Resources/staff subject knowledge:
Thinking	thinking is part of	debugging	debugging	
Progression	Computing		patterns	World Map Game on Scratch (mit.edu)
Concepts:		I know how to:	same	Coding for Kids   What is coding for kids?
Concepts.	what patterns look like		different	<u>VideoLink</u>
Algorithms		say what is the same, different and generally true	true	https://www.scratchjr.org/teach.html
0	what algorithms are	about a pattern	algorithms	http://code-it.co.uk/ks1/turtle/ks1turtle
Logic			Logic	https://studio.code.org/s/courseb-2018
<b>5</b>	what logic means	explain what an algorithm is	predict	2Code in Purple Mash
Patterns			test	Algorun/Tynker Jr iPad apps
	what programs are	write an algorithm	tinker	
Approaches:			command	Crazy Character Algorithms
, the cast is a	what repeat loops are	follow an algorithm	program	Sharing Sweets Algorithms
Tinkering			programming	World Map Logic (All Barefoot Computing lessons)
	programs need	improve an algorithm	logical reasoning	
Collaborating	precise instructions			https://www.barefootcomputing.org/
Over estimate	and at all the continue	use logic to make predictions about algorithms	forwards/backwards left	resources saved here: Computing
Creating	what debugging			
Debugging	means	create a computer program	right up/down	https://www.scratchjr.org/teach.html
_ 0.0 0.999		use a repeat loop and when it is needed	up/down	
		use a repeat loop and when it is needed		Scratch Jr: https://www.ilearn2.co.uk/year-2-scratch-
		debug a program		jr.html
		debug a program		Scratch Jr plans: http://code-it.co.uk/scratchjrdance
		use logical reasoning to predict the behaviour of		
		simple programs (NC)		Code-it.co.uk BeeBot planning: http://code-
		cimple programe (ivo)		it.co.uk/ks1/turtle/ks1turtle
				Code and because by the collection of the code and the code
				Code.org lessons: https://studio.code.org/s/courseb-
				2018 20 cupt 20 caph 20 upstion
				2Count, 2Graph, 2Question Develop Programming:
				https://www.ilearn2.co.uk/year-2-programming.html
				intps://www.ilearriz.co.uk/year-z-programming.ntml

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Year 3	I know:	I know how to:	algorithm debug, bug,	Can I break down a problem to solve it?
Computational Thinking	that computational thinking is part of	log on independently	logical thinking logic process	Resources/staff subject knowledge:
Progression	Computing	identify repetition in everyday tasks	decision pattern	Inspire a Girl: Minecraft   Code.org
Concepts:	what a pattern is	identify patterns in a sequence	selection,	Computer Science Intro Minecraft   Code.org https://youtu.be/Nc31NAujTkA
Algorithms	that tinkering means to play	tinker with a computer program to find out	program outputs	ttps://www.bbc.co.uk/bitesize/topics/
Logic	and 'have a go'	what it does	inputs commands wait, movement	zs7s4wx/articles/zxgdwmn
Patterns	that coding tells a machine what to do	change what a sprite says  debug a story so that it is in the correct	decompose decomposition	Scratch Chat Pupil Code - iLearn2   Primary Computing. Made Easy.
Approaches:	that an algorithm is a set of	sequence	problem solve	Year 3 Scratch - iLearn2   Primary Computing.
Tinkering	instructions that must be followed in the correct	write a program using selection	coding, tinkering instructions	Made Easy.
Collaborating	sequence	use logic to debug an algorithm	sequence collaborating	Year 3 Scratch - iLearn2   Primary Computing.
Persevering	that selection is when a program needs to make a	break a sequence of moves down into its	creating persevering	Made Easy.
Creating	choice	parts	persevering	Spring resources Computer Science
Debugging	that debugging is finding and	decompose a sequence		2Code in Purple Mash
Decomposition	fixing errors in a program	write a simple program with text outputs, wait		Dot and Dash robots
	that decomposition is breaking down a task into	commands and movement		
	smaller parts	write a program with repetition		
	what a simple computer program looks like	write programs using different inputs: keyboard, mouse and touch screen		
	that repetition (or loops) is to repeat an instruction several times	write a program that solves a problem		

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Year 4	I know:	I know:	algorithm	How do I program an external device?
			bug	
Computational	that computational	what decomposition is	command	
Thinking	thinking is part of		control	
Progression	Computing	I know how to:	input, output	Resources/staff subject knowledge:
				Inspire a Girl: Minecraft   Code.org
Concepts:	That an algorithm is a	tinker with a computer program to find out what it	object	Computer Science Intro Minecraft   Code.org
A.1. 241	set of instructions that	does	repeat	
Algorithms	must be followed in		selection	All about algorithms - BBC Bitesize
	the correct sequence	decompose a sequence	timer	What is decomposition? - BBC Bitesize
Logic			physical system	What is logical reasoning? - BBC Bitesize
<b></b>	that decomposition is	write a program using selection	motors	What are input and output devices? - BBC Bitesize
Patterns	breaking down a task		robotics	What is debugging? - BBC Bitesize
	into smaller parts	write a program with repetition	systems	
Decomposition				Unit 2 Debug It! - Scratch Studio (mit.edu)
	what a physical	use logic to debug an algorithm	logical thinking	
A	system is		process	Getting started   micro:bit (microbit.org)
Approaches:		write programs using different inputs: keyboard,	decision	Behind the MakeCode Hardware - LEDs on
<del></del>	that selection is when	mouse, microbit	pattern	micro:bit - YouTube
Tinkering	a program needs to		selection	Behind the MakeCode Hardware - Accelerometer
Oallah anatina	make a choice	write a simple program with text outputs, wait	program,	on micro:bit - YouTube
Collaborating		commands and movement	commands	Microbits
Onestina	that repetition (or		wait	Dot and Dash robots
Creating	loops) is to repeat an	write a program that solves a problem	movement	Year 4 Scratch - iLearn2   Primary Computing.
Dahaanina	instruction several		decompose	Made Easy.
Debugging	times		problem solve	Spring resources Computer Science Bug in the
			coding	Water Cycle/Fossil Formation Scratch units
			tinkering	Course D (2023) - Code.org
			instructions	
			sequence	
			coding	
			algorithm	
			sequence	
			•	
			debug repetition	
			input	
			output	
			variable	
			variable	

	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question
Year 5	I know:	I know:	algorithm	Can I work with different outputs and inputs?
0	that commutational	what decements in	collaborate	Touthfiles
Computational Thinking	that computational thinking is part of	what decomposition is	persevere selection	Text/Video:
Progression	Computing	what selection is	repetition	What Most Schools Don't Teach Minecraft
1 10910331011	Computing	What selection is	repetition	Code.org
Concepts:	that an algorithm is a set	what abstraction is	physical system	Changing the Face of Computer Science Minecraft
•	of instructions that must		abstraction	<u>  Code.org</u>
Algorithms	be followed in the correct	what repetition is	decomposition	12 year old app developer Thomas Suarez: A 12-
	sequence		debugging	year-old app developer   TED Talk
Logic		I know how to:	l	
Dottorno	what a physical system is	work together with others to achieve a goal	input, output	Resources/staff subject knowledge:
Patterns	that selection is when a	work together with others to achieve a goal (collaborate)	timer variable	Microbits, Sphero
Decomposition	program needs to make a	(Collaborate)	Microbit	Purple Mash resources: Purple Mash by 2Simple
Booompoomon	choice	persevere to achieve an end goal	programming	Year 5 Scratch - iLearn2   Primary Computing.
Abstraction		, and a second s	evaluation	Made Easy.
	that decomposition is	use a variety of software to accomplish a given		Year 5 Text-based Programming - iLearn2   Primary
	breaking down a task into	goal		
Approaches:	smaller parts			Computing. Made Easy.
Tipkoring	that rangition (or loops) is	solve problems by decomposing them into		Year 5 Sphero Programming - iLearn2   Primary
Tinkering	that repetition (or loops) is to repeat an instruction	smaller parts		Computing. Made Easy.
Collaborating	several times	debug errors in algorithms and programs		Year 5 Physical Systems - iLearn2   Primary
Condocrating		according and programs		Computing. Made Easy. Microbits
Creating	abstraction means to	design a program to control a physical system		Movie making (iMovie) Link to English (importance
	remove unnecessary			of ordering) Green serven movie linked to tonic (Doink ann)
Persevering	detail	debug a program that controls a physical system		Green screen movie linked to topic (Doink app) Barefoot resources saved here: Spring resources
				Computer Science – You're the Cyber Security
Debugging	what inputs and outputs	work with various forms of input and output		
	are	evaluate my own and others' work		Expert, Classroom Sound Monitor, Logical Number
		evaluate my own and others work		Sequences

	Substantive knowledge – the	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question
	stuff of Computing			
Year 6	I know:	I know:	action	Can I design and program my own device?
			alert	
Computational	that computational	what decomposition is	algorithm	
Thinking	thinking is part of		bug	Videos:
Progression	computing	what selection is	code	Careers in Tech My Name is Tess Careers in Tech: My
			design	Name is Tess - Michigan Learning Channel
Concepts:	what a physical system	what abstraction is		Careers in Tech My Name is Brina Careers in Tech: My
	is		command	name is Brina - YouTube
Algorithms		what repetition is	control	
	that selection is when a		debug	Resources/staff subject knowledge:
Logic	program needs to make	I know how to:	event	Crumble kits
_	a choice		function	Unit of work on variables in games: Programming A –
Patterns		work together with others to achieve a goal (collaborate)	input	Selection in physical computing (teachcomputing.org)
	that decomposition is		if/else	Unit of work on sensing movement: Programming B -
Decomposition	breaking down a task	design a program (using a variety of software) to	input	Sensing movement (teachcomputing.org)
	into smaller parts	accomplish a given goal	output	
Abstraction	l		repeat	Programming with Scratch: Year 6 Scratch - iLearn2
	abstraction means to	persevere to achieve an end goal	sequence	Primary Computing. Made Easy.
Evaluation	remove unnecessary		selection	HTML Activity Pack: Year 6 HTML - iLearn2   Primary
	detail	design a program to control a physical system	timer	Computing. Made Easy.
Approaches:			variable	Logical Reasoning/Bug in the Water Cycle/Code
	what inputs and outputs	debug errors in algorithms and programs	collaborate	Cracking units saved here: Spring resources Computer
Tinkering	are		persevere	<u>Science</u>
		debug a program that controls a physical system		
Collaborating			repetition	Purple Mash Coding unit: Purple Mash by 2Simple
		solve problems by breaking them into smaller parts	physical system	
Creating		(decomposition)	abstraction	
			decomposition	
Persevering		work with various forms of input and output	debugging	
			crumble programming	
Debugging		use logical reasoning to explain how algorithms work		
		use sequence, selection and repetition in programs		
		evaluate my own and others' work		