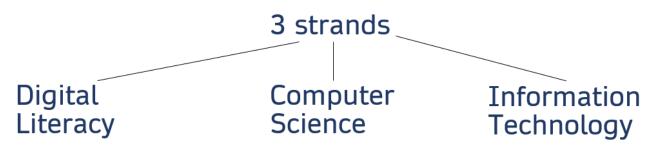
# Computing



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

	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question
Year 1	I know:	I know:	concepts	
Computational Thinking	that computational thinking is part of	instructions need to be precise and clear If my program doesn't run correctly it needs	approaches computational thinking tinkering	Can I create a simple program?
Progression	Computing	debugging	creating	Resources/staff subject knowledge:
Concepts:	what patterns look like	I know how to:	persevering collaborating	BeeBots/BlueBots
Algorithms	what algorithms are	any what is the same different and generally true	debugging	BeeBot/BlueBot app on iPads 2Code in Purple Mash
Logic	what algorithms are (NC)	say what is the same, different and generally true about a pattern	patterns same, different	Sphero
Logic	(NC)	about a pattern	true	Cubetto
Patterns	what logic means	explain what an algorithm is	algorithms logic	Robot Mouse
Decomposition	what programs are	write a simple algorithm	predict	Code-it.co.uk BeeBot planning: KS1 Turtle
Abstraction			test	Progression – code-it supported by HIAS,
Abstraction	programs need	follow an algorithm	tinker	Hampshire Inspection and Advisory Service
Evaluation	precise instructions		command program	Code.org lessons:
		improve an algorithm	programming	https://studio.code.org/s/coursea-2018
Approaches:	what debugging	must to math as a nimenta name	logical reasoning	Programming A – moving a robot planning:
Tinkering	means	put together a simple sequence	forwards,	Programming A – Moving a robot
riintoinig		predict what a program will do	backwards	(teachcomputing.org)
Collaborating		prodict what a program will do	left, right, up, down	Introduce Programming: Year 1 Programming -
Creating		input code	ion, ngin, ap, aoin	iLearn2   Primary Computing. Made Easy.
Persevering		add a sprite		Barefoot Units - BeeBot Basics, BeeBot 123,
Debugging		change a background		Spelling Rules link: Spring resources Computer Science
		program a Beebot		Consider Barefoot Units saved in EYFS folder also
		debug a Beebot		
		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:	concepts approaches	Can I debug my program?
Computational Thinking Progression	that computational thinking is part of Computing	if my program doesn't run correctly, it needs debugging	computational thinking tinkering	Resources/staff subject knowledge:  World Map Game on Scratch (mit.edu)
Concepts:	what patterns look like	I know how to:	creating persevering	Coding for Kids   What is coding for kids? VideoLink
Algorithms	what algorithms are	say what is the same, different and generally true about a pattern	collaborating debugging	https://www.scratchjr.org/teach.html http://code-it.co.uk/ks1/turtle/ks1turtle
Logic Patterns	what logic means	explain what an algorithm is	patterns same different	https://studio.code.org/s/courseb-2018 2Code in Purple Mash Algorun/Tynker Jr iPad apps
Decomposition	what programs are	write an algorithm	true algorithms	Crazy Character Algorithms
Abstraction	what repeat loops are	follow an algorithm	Logic	Sharing Sweets Algorithms World Map Logic (All Barefoot Computing lessons)
Evaluation	programs need precise instructions	improve an algorithm	test tinker	https://www.barefootcomputing.org/
Approaches:	what debugging	use logic to make predictions about algorithms	command program	resources saved here: Computing
Tinkering  Collaborating	means	create a computer program	programming logical reasoning	https://www.scratchjr.org/teach.html
Creating		use a repeat loop and when it is needed	forwards/backwards	Scratch Jr: https://www.ilearn2.co.uk/year-2-scratch-ir.html
Persevering		debug a program	left right	Scratch Jr plans: http://code-it.co.uk/scratchjrdance
Debugging		use logical reasoning to predict the behaviour of simple programs (NC)	up/down	Code-it.co.uk BeeBot planning: http://code-it.co.uk/ks1/turtle/ks1turtle
				Code.org lessons: <a href="https://studio.code.org/s/courseb-2018">https://studio.code.org/s/courseb-2018</a> 2Count, 2Graph, 2Question Develop Programming: <a href="https://www.ilearn2.co.uk/year-2-programming.html">https://www.ilearn2.co.uk/year-2-programming.html</a>

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Year 3	I know:	I know how to:	algorithm	Can I break down a problem to solve it?
Year 6	that computational thinking is part of Computing	log on independently	debug, bug, logical thinking logic process	Resources/staff subject knowledge:
Computational	pair or companing	identify repetition in everyday tasks	decision	Inspire a Girl: Minecraft   Code.org
Thinking Progression	what a pattern is	identify patterns in a sequence	pattern selection,	Computer Science Intro Minecraft   Code.org https://youtu.be/Nc31NAuiTkA
Concepts:	that tinkering means to play	tinker with a power star program to find out	program	
Algorithms	and 'have a go' that coding tells a machine	tinker with a computer program to find out what it does	outputs inputs commands wait, movement	ttps://www.bbc.co.uk/bitesize/topics/ zs7s4wx/articles/zxgdwmn
Logic	what to do	change what a sprite says	decompose	Scratch Chat Pupil Code - iLearn2   Primary
Patterns	that an algorithm is a set of instructions that must be	debug a story so that it is in the correct sequence	decomposition problem solve	Computing. Made Easy.
Decomposition	followed in the correct	Sequence	coding, tinkering	Year 3 Scratch - iLearn2   Primary Computing.
Abstraction	sequence	write a program using selection	instructions sequence	Made Easy.
Evaluation	that selection is when a program needs to make a	use logic to debug an algorithm	collaborating creating	Year 3 Scratch - iLearn2   Primary Computing. Made Easy.
Approaches:	choice	break a sequence of moves down into its parts	persevering	Spring resources Computer Science
Tinkering	that debugging is finding and			Spring resources computer science
Collaborating	fixing errors in a program	decompose a sequence		2Code in Purple Mash
Creating	that decomposition is breaking down a task into	write a simple program with text outputs, wait commands and movement		Dot and Dash robots
Persevering	smaller parts	write a program with repetition		
Debugging	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		

	Substantive knowledge – the stuff of Computing	Disciplinary knowledge – how Computing is studied.	Vocabulary	Big Question
Year 4	I know:	I know:	algorithm	How do I program an external device?
Computational	that a superitation of		bug	
Thinking	that computational thinking is part of	what decomposition is	command	
Progression	Computing	I know how to:	input, output	Resources/staff subject knowledge:
	Companing	Timow now to.	mpat, oatpat	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
	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
Patterns	that decomposition is	write a program using selection	motors	What are input and output devices? - BBC Bitesize
Pallerris	breaking down a task into smaller parts	write a program with repetition	robotics	What is debugging? - BBC Bitesize
Decomposition	into smaller parts	write a program with repetition	systems	Unit 2 Debug It! - Scratch Studio (mit.edu)
Boompoomon	what a physical	use logic to debug an algorithm	logical thinking	Onit 2 Debug it: Ociater Otadio (mit.eda)
Abstraction	system is	acc logic to dobug an algorithm	process	Getting started   micro:bit (microbit.org)
	,	write programs using different inputs: keyboard,	decision	Behind the MakeCode Hardware - LEDs on
Evaluation	that selection is when	mouse, microbit	pattern	micro:bit - YouTube
	a program needs to		selection	Behind the MakeCode Hardware - Accelerometer
Approaches:	make a choice	write a simple program with text outputs, wait	program,	on micro:bit - YouTube
Tipkoring	414	commands and movement	commands	Microbits
Tinkering	that repetition (or loops) is to repeat an	write a program that solves a problem	wait movement	Dot and Dash robots Year 4 Scratch - iLearn2   Primary Computing.
Collaborating	instruction several	write a program that solves a problem	decompose	Made Easy.
Condociding	times		problem solve	Spring resources Computer Science Bug in the
Creating			coding	Water Cycle/Fossil Formation Scratch units
			tinkering	Course D (2023) - Code.org
Persevering			instructions	
			sequence	
Debugging				
			coding	
			algorithm sequence	
			debug	
			repetition	
			input	
			output	
			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?
			collaborate	
Computational	that computational	what decomposition is	persevere	Text/Video:
Thinking	thinking is part of	what adjusting in	selection	What Most Schools Don't Teach Minecraft
Progression	Computing	what selection is	repetition	<u>Code.org</u>
Concepts:	that an algorithm is a set	what abstraction is	physical system	Changing the Face of Computer Science Minecraft
обпосры.	of instructions that must	What about action is	abstraction	Code.org
Algorithms	be followed in the correct	what repetition is	decomposition	12 year old app developer Thomas Suarez: A 12-
3	sequence	'	debugging	year-old app developer   TED Talk
Logic		I know how to:		
	what a physical system is		input, output	Resources/staff subject knowledge:
Patterns		work together with others to achieve a goal	timer	Microbits, Sphero
	that selection is when a	(collaborate)	variable	Purple Mash resources: Purple Mash by 2Simple
Decomposition	program needs to make a		Microbit	
Abstraction	choice	persevere to achieve an end goal	programming evaluation	Year 5 Scratch - iLearn2   Primary Computing.
Abstraction	that decomposition is	use a variety of software to accomplish a given	evaluation	Made Easy.
Evaluation	breaking down a task into	goal		Year 5 Text-based Programming - iLearn2   Primary
27010011011	smaller parts	900.		Computing. Made Easy.
Approaches:		solve problems by decomposing them into		Year 5 Sphero Programming - iLearn2   Primary
	that repetition (or loops) is	smaller parts		Computing. Made Easy.
Tinkering	to repeat an instruction			Year 5 Physical Systems - iLearn2   Primary
	several times	debug errors in algorithms and programs		Computing, Made Easy, Microbits
Collaborating				Movie making (iMovie) Link to English (importance
Overeller	abstraction means to	design a program to control a physical system		of ordering)
Creating	remove unnecessary detail	dobug a program that controls a physical system		Green screen movie linked to topic (Doink app)
Persevering	uetaii	debug a program that controls a physical system		Barefoot resources saved here: Spring resources
i craevering	what inputs and outputs	work with various forms of input and output		Computer Science – You're the Cyber Security
Debugging	are	Total Tarious forms of input and output		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			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	Science
		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		