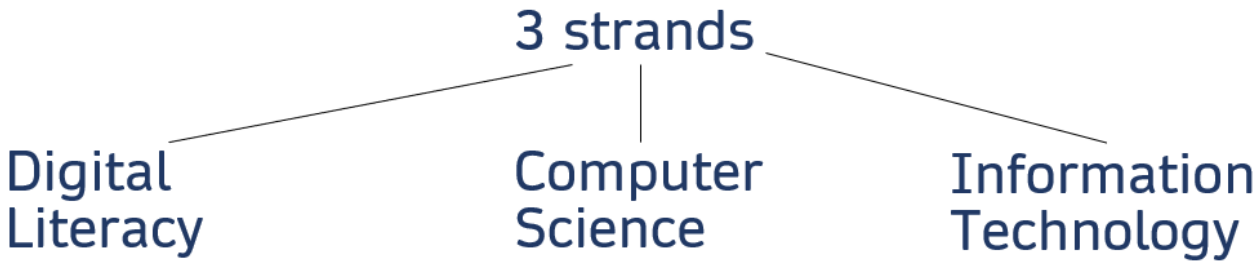
Computing



Digital Literacy	Computer Science	Information Technology
How to sum it up - how devices can be used effectively, safely and responsibly	**How to sum it up - how computers work**	**How to sum it up - how computers are used purposefully**
Key aspects: - how to use the device (computer, iPad, programmable toy) - searching and selecting information - online safety	**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.	**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

Autumn 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 What happens when….?
EYFS –	**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 Algorithms, decomposition, creating, tinkering, logic, patterns, abstraction, collaborating	**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-programming---early-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** Can I create a simple program?
Year 1	**I know:** that computational thinking is part of Computing what patterns look like **what algorithms are (NC)** what logic means what programs are programs need precise instructions what debugging means	**I know:** Instructions need to be precise and clear If my program doesn't run correctly it needs debugging **I know how to:** say what is the same, different and generally true about a pattern explain what an algorithm is write a simple algorithm follow an algorithm improve an algorithm Put together a simple sequence Predict what a program will do Input code Add a sprite Change a background Program a Beebot Debug a Beebot Log onto Purple Mash using my own logon card **Create and debug simple programs (NC)**	Concepts, approaches, computational thinking, tinkering, creating, persevering, collaborating, debugging, patterns, same, different, true, algorithms Logic, predict, test, tinker, command, program, programming, logical reasoning Forwards, backwards, left, right, up, down	**Resources/staff subject knowledge:** BeeBots/BlueBots BeeBot/BlueBot app on iPads 2Code in Purple Mash Sphero Cubetto Robot Mouse Code-it.co.uk BeeBot planning: KS1 Turtle Progression – code-it supported by HIAS, Hampshire Inspection and Advisory Service Code.org lessons: https://studio.code.org/s/coursea-2018 Programming A – moving a robot planning: Programming A – Moving a robot (teachcomputing.org) Introduce Programming: Year 1 Programming - iLearn2 | Primary Computing. Made Easy. Barefoot Units - BeeBot Basics, BeeBot 123, Spelling Rules link: Spring resources Computer Science Consider Barefoot Units saved in EYFS folder also

	Substantive knowledge – the stuff of Computing	**Disciplinary knowledge – how Computing is studied.**	**Vocabulary**	**Big Question** Can I debug my program?
Year 2	**I know:** that computational thinking is part of Computing what patterns look like what algorithms are what logic means what programs are what repeat loops are programs need precise instructions what debugging means	**I know:** If my program doesn't run correctly, it needs debugging **I know how to:** say what is the same, different and generally true about a pattern explain what an algorithm is write an algorithm follow an algorithm improve an algorithm use logic to make predictions about algorithms create a computer program use a repeat loop and when it is needed debug a program **Use logical reasoning to predict the behaviour of simple programs (NC)**	Concepts, approaches, computational thinking, tinkering, creating, persevering, collaborating, debugging, patterns, same, different, true, algorithms Logic, predict, test, tinker, command, program, programming, logical reasoning Forwards, backwards, left, right, up, down	**Resources/staff subject knowledge:** World Map Game on Scratch (mit.edu) Coding for Kids |What is coding for kids? ... - VideoLink https://www.scratchjr.org/teach.html http://code-it.co.uk/ks1/turtle/ks1turtle https://studio.code.org/s/courseb-2018 2Code in Purple Mash Algorun/Tynker Jr iPad apps Crazy Character Algorithms Sharing Sweets Algorithms World Map Logic (All Barefoot Computing lessons) https://www.barefootcomputing.org/ resources saved here: Computing https://www.scratchjr.org/teach.html Scratch Jr: https://www.ilearn2.co.uk/year-2-scratch-jr.html Scratch Jr plans: http://code-it.co.uk/scratchjrdance Code-it.co.uk BeeBot planning: http://code-it.co.uk/ks1/turtle/ks1turtle Code.org lessons: https://studio.code.org/s/courseb-2018 2Count, 2Graph, 2Question Develop Programming: https://www.ilearn2.co.uk/year-2-programming.html

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

	Substantive knowledge – the stuff of Computing	**Disciplinary knowledge – how Computing is studied.**	**Vocabulary**	**Big Question** How do I program an external device?
Year 4	**I know:** That computational thinking is part of Computing That an algorithm is a set of instructions that must be followed in the correct sequence that decomposition is breaking down a task into smaller parts what a physical system is that selection is when a program needs to make a choice that repetition (or loops) is to repeat an instruction several times	**I know:** What decomposition is **I know how to:** tinker with a computer program to find out what it does decompose a sequence write a program using selection write a program with repetition use logic to debug an algorithm write programs using different inputs: keyboard, mouse, microbit write a simple program with text outputs, wait commands and movement write a program that solves a problem	Algorithm, Bug, Command, Control, Input, Output, Object, Repeat, Selection, Timer, Physical system, motors, robotics, systems Logical thinking, Process, decision, pattern, selection, Program, commands, wait, movement, decompose, problem solve, coding, tinkering, instructions, sequence coding, algorithm, sequence, debug, repetition, input, output, variable	**Resources/staff subject knowledge:** **Inspire a Girl:** Minecraft | Code.org **Computer Science Intro** Minecraft | Code.org All about algorithms - BBC Bitesize What is decomposition? - BBC Bitesize What is logical reasoning? - BBC Bitesize What are input and output devices? - BBC Bitesize What is debugging? - BBC Bitesize Unit 2 Debug It! - Scratch Studio (mit.edu) Getting started | micro:bit (microbit.org) Behind the MakeCode Hardware - LEDs on micro:bit - YouTube Behind the MakeCode Hardware - Accelerometer on micro:bit - YouTube Microbits Dot and Dash robots Year 4 Scratch - iLearn2 | Primary Computing. Made Easy. Spring resources Computer Science Bug in the Water Cycle/Fossil Formation Scratch units Course D (2023) - Code.org

	Substantive knowledge – the stuff of Computing	**Disciplinary knowledge – how Computing is studied.**	**Vocabulary**	**Big Question** Can I work with different outputs and inputs?

Year 5	**I know:** That computational thinking is part of Computing That an algorithm is a set of instructions that must be followed in the correct sequence what a physical system is that selection is when a program needs to make a choice that decomposition is breaking down a task into smaller parts that repetition (or loops) is to repeat an instruction several times abstraction means to remove unnecessary detail what inputs and outputs are	**I know:** What decomposition is What selection is What abstraction is What repetition is **I know how to:** Work together with others to achieve a goal (collaborate) Persevere to achieve an end goal Use a variety of software to accomplish a given goal Solve problems by decomposing them into smaller parts Debug errors in algorithms and programs Design a program to control a physical system Debug a program that controls a physical system Work with various forms of input and output	Algorithm, collaborate, persevere, selection, repetition, physical system, abstraction, decomposition, debugging, input, output, timer, Variable, Microbit, programming	**Text/Video:** What Most Schools Don't Teach Minecraft | Code.org Changing the Face of Computer Science Minecraft | Code.org 12 year old app developer Thomas Suarez: A 12-year-old app developer | TED Talk **Resources/staff subject knowledge:** Microbits, Sphero Purple Mash resources: Purple Mash by 2Simple Year 5 Scratch - iLearn2 | Primary Computing. Made Easy. Year 5 Text-based Programming - iLearn2 | Primary Computing. Made Easy. Year 5 Sphero Programming - iLearn2 | Primary Computing. Made Easy. Year 5 Physical Systems - iLearn2 | Primary Computing. Made Easy. Microbits Movie making (iMovie) Link to English (importance of ordering) Green screen movie linked to topic (Doink app) Barefoot resources saved here: Spring resources Computer Science – You're the Cyber Security Expert, Classroom Sound Monitor, Logical Number Sequences

	Substantive knowledge – the stuff of Computing	**Disciplinary knowledge – how Computing is studied.**	**Vocabulary**	**Big Question**

Year 6	**I know:** That computational thinking is part of Computing what a physical system is that selection is when a program needs to make a choice that decomposition is breaking down a task into smaller parts abstraction means to remove unnecessary detail what inputs and outputs are	**I know:** What decomposition is What selection is What abstraction is What repetition is **I know how to:** Work together with others to achieve a goal (collaborate) Design a program (using a variety of software) to accomplish a given goal Persevere to achieve an end goal Design a program to control a physical system Debug errors in algorithms and programs Debug a program that controls a physical system Solve problems by breaking them into smaller parts (decomposition) Work with various forms of input and output Use logical reasoning to explain how algorithms work Use sequence, selection and repetition in programs	Action, alert, algorithm, bug, code, design, command, control, debug, event, function, input, if/else, input, output, repeat, sequence, selection, timer, variable, collaborate, persevere, repetition, physical system, abstraction, decomposition, debugging, Crumble programming	**Videos:** **Careers in Tech My Name is Tess** Careers in Tech: My Name is Tess - Michigan Learning Channel **Careers in Tech My Name is Brina** Careers in Tech: My name is Brina - YouTube **Resources/staff subject knowledge:** Crumble kits Unit of work on variables in games: Programming A – Selection in physical computing (teachcomputing.org) Unit of work on sensing movement: Programming B - Sensing movement (teachcomputing.org) Programming with Scratch: Year 6 Scratch - iLearn2 | Primary Computing. Made Easy. HTML Activity Pack: Year 6 HTML - iLearn2 | Primary Computing. Made Easy. Logical Reasoning/Bug in the Water Cycle/Code Cracking units saved here: Spring resources Computer Science Purple Mash Coding unit: Purple Mash by 2Simple