Computing KS3 Curriculum Map

Domains of Knowledge & Application to Key Concepts:	The 5Cs and their application in Computer Science:
Computational Thinking supports learners to create and present solutions to problems using algorithms, logic and precision. *Programming* helps learners to understand the common constructs of programming languages and to appreciate the contribution that Computer Scientists make to our lives. *Managing Data* encourages learners to reflect on how computers store and analyse data on an ever-increasing scale. *Networks and Digital Communication* shows how computers and other machines communicate with each other across networks and how the networks are created through a combination of hardware and data transmission protocols. *Computer Systems* helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.	Computer science can serve as a powerful tool for cultivating and promoting important values such as **community, compassion, creativity, confidence,** and **challenge**. Through computer science education, students can engage in collaborative projects that foster a sense of **community**, encouraging them to work together, share ideas, and learn from one another. The use of technology can also provide opportunities for demonstrating **compassion** by developing applications that address societal issues and empower marginalised communities. Additionally, computer science nurtures **creativity** by encouraging students to think outside the box, explore innovative solutions, and express their ideas through coding and programming. As students tackle complex problems and overcome coding challenges, they develop **confidence** in their abilities, learning to persevere, problem-solve, and adapt in the face of adversity. Ultimately, computer science education provides a platform for instilling these values, equipping students with the skills and mindset necessary to positively impact the world around them

Assessment	Assessment in Computing is ongoing throughout the year and will focus on the ability and command of the Domains and Key Concepts

	Year 7	Year 8	Year 9
Term 1	**Unit 7.1 Algorithms, flowcharts and sub-routines**	**Unit 7.3 Programming and system development**	**Unit 7.5 Computer Systems**
Topic and Content	1. Continue to follow and understand algorithms that are represented as flowcharts 2. Begin making changes and corrections to flowcharts 3. Follow flowcharts that make use of selection 4. Create flowcharts of their own that use sequence and selection.	1. Create and run a text-based program 2. Output data and messages 3. Take text input from the user 4. Store data in variables 5. Use arithmetic operators.	1. Consider how binary numbers can be used to represent a range of data including how a bitmap image is stored in binary 2. Explore how computers are created using logic gates and circuits 3. Evaluate Boolean logic statements including AND, OR and NOT.
Domains & Concepts in Topic	***Computational Thinking*** *supports learners to create and present solutions to problems using algorithms, logic and precision.* ***Computer Systems*** *helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.*	***Programming*** *helps learners to understand the common constructs of programming languages and to appreciate the contribution that Computer Scientists make to our lives.* ***Managing Data*** *encourages learners to reflect on how computers store and analyse data on an ever-increasing scale.*	***Computational Thinking*** *supports learners to create and present solutions to problems using algorithms, logic and precision.* ***Computer Systems*** *helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.*
Modifications to adapt to students' needs	1. Develop strategies to support their understanding and following of algorithms represented as flowcharts. This may include providing visual cues, simplifying complex flowcharts, or using interactive and multisensory approaches. 2. Offer additional support and guidance to help students with special needs make changes and corrections to flowcharts. Provide step-by-step	1. Adapt the learning outcomes to focus on understanding and observing text-based programs rather than creating and running them independently. Provide guided examples and visual aids to help students identify and interpret different components of a text-based program. 2. Simplify the task of outputting data and messages by using pre-written templates or fill-in-the-blank exercises. This allows students to practise recognising and	1. Simplify the learning outcome of considering how binary numbers represent different types of data. Focus on concrete examples and provide visual aids to help students understand the basic concept of binary representation, such as using manipulatives or colour-coded charts to demonstrate how binary numbers are used to store data, including bitmap images. 2. Break down the concept of how computers are created using logic gates and circuits into

	instructions, visual aids, or one-on-one assistance to ensure they can actively participate and engage in the modification process.	matching appropriate data and messages to specific program outputs.	smaller, more manageable steps. Provide simplified explanations, visual representations, or interactive simulations to help students grasp the fundamental idea of how logic gates combine to create computers.
Methods of Assessment	Formative feedback on the skills taught.	Formative feedback on the skills taught.	Formative feedback on the skills taught.
Term 2	**Unit 7.1 Algorithms, flowcharts and sub-routines**	**Unit 7.3 Programming and system development**	**Unit 7.5 Computer Systems**
Topic and Content	1. Continue to follow and understand algorithms that are represented as flowcharts 2. Begin making changes and corrections to flowcharts 3. Follow flowcharts that make use of selection 4. Create flowcharts of their own that use sequence and selection.	1. Create and run a text-based program 2. Output data and messages 3. Take text input from the user 4. Store data in variables 5. Use arithmetic operators.	1. Consider how binary numbers can be used to represent a range of data including how a bitmap image is stored in binary 2. Explore how computers are created using logic gates and circuits 3. Evaluate Boolean logic statements including AND, OR and NOT.
Domains & Concepts in Topic	***Computational Thinking*** *supports learners to create and present solutions to problems using algorithms, logic and precision.* ***Computer Systems*** *helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.*	***Programming*** *helps learners to understand the common constructs of programming languages and to appreciate the contribution that Computer Scientists make to our lives.* ***Managing Data*** *encourages learners to reflect on how computers store and analyse data on an ever-increasing scale.*	***Computational Thinking*** *supports learners to create and present solutions to problems using algorithms, logic and precision.* ***Computer Systems*** *helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.*
Modifications to adapt to students' needs	1. Provide scaffolding and visual supports to help students follow flowcharts that involve selection. Use	1. Provide alternative methods for text input, such as using visual or symbolic representations instead of relying solely	1. Adapt the learning outcome of evaluating Boolean logic statements to focus on basic concepts and simple examples. Use visual

	colour-coding, highlighting, or simplified language to help them identify different paths or conditions within the flowchart. 2. Offer differentiated activities or modified assignments that allow students with special needs to create their own flowcharts using sequence and selection. Provide templates or guided prompts to assist them in organising their ideas and ensure they can successfully demonstrate their understanding and creativity.	on written input. This allows students to participate and demonstrate their understanding through alternative means, such as selecting options or using picture cards. 2. Focus on the concept of storing information rather than directly using variables. Introduce concrete examples or visual organisers where students can manipulate and organise information without the requirement of explicitly using variables.	aids, such as logic gate diagrams or simplified truth tables, to help students understand the basic operations of AND, OR, and NOT. 2. Provide concrete examples and real-world scenarios where Boolean logic statements are applied. Use simplified language, visual cues, or hands-on activities to help students evaluate and identify the logical outcomes of simple statements.
Methods of Assessment	Formative feedback on the skills taught.	Formative feedback on the skills taught.	Formative feedback on the skills taught.
Term 3	**Unit 7.2 Networks**	**Unit 7.4 Modelling and databases**	***Unit 7.6 End of Stage Projects***

Topic and Content	1. Explore specific examples of wireless data transmission to identify the range and bandwidth
	2. Explore how websites are accessed through the use of URLs and IP addresses, and how these are translated
	3. Extend their understanding of network security to include:
	   a. how encryption is used to protect data transmissions
	   b. how to check whether a website is secure.
		1. Develop a proficient understanding of data software, including spreadsheets and databases.
		2. Apply conditional formatting to cells in a spreadsheet.
		3. Recognize the importance of a unique identifier in database tables and determine suitable primary keys.
		4. Implement searches in databases using a single table and a single criterion.
		5. Explore the use of simulations to model real-life systems and analyse their purpose in different scenarios.
			Project 1: Flowchart 'how-to' guide
			Project 2: Scratch to Python
			Project 3: Artificial Intelligence

Domains &	***Networks and Digital Communication*** *shows how computers and other machines*	***Managing Data*** *encourages learners to reflect on how computers store and analyse data on an*	***Computational Thinking*** *supports learners to create and present solutions to problems using algorithms,*

Concepts in Topic	communicate with each other across networks and how the networks are created through a combination of hardware and data transmission protocols.	ever-increasing scale. **Computer Systems** helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.	logic and precision. **Computer Systems** helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.
Modifications to adapt to students' needs	1. Provide concrete and relatable examples of wireless data transmission to help them understand the concepts of range and bandwidth. Use visual aids, real-world scenarios, or hands-on activities to demonstrate the practical application of wireless data transmission. 2. Break down the topic of website access and the use of URLs and IP addresses into smaller, manageable steps. Provide simplified explanations, visual cues, or interactive materials to help students grasp the concept and understand how these addresses are translated.	1. Simplify the learning outcomes by focusing on basic functionalities and concepts of data software, such as navigating through spreadsheets and databases, identifying different types of data, and recognizing common elements like rows and columns. 2. Break down the activity of applying conditional formatting into smaller, manageable steps. Provide step-by-step instructions, visual cues, and simplified formatting options to help students apply basic formatting rules to cells in a spreadsheet.	Suggested alternative Project 1: "Step-by-Step Guide: Creating a Flowchart for Everyday Tasks"
Methods of Assessment	Formative feedback on the skills taught.	Formative feedback on the skills taught.	Formative feedback on the skills taught.
Term 4	**Unit 7.2 Networks**	**Unit 7.4 Modelling and databases**	***Unit 7.6 End of Stage Projects***
Topic and Content	1. Explore specific examples of wireless data transmission to identify the range and bandwidth 2. Explore how websites are accessed through the use of URLs and IP addresses, and how these are translated	4. Develop a proficient understanding of data software, including spreadsheets and databases. 5. Apply conditional formatting to cells in a spreadsheet.	Project 1: Flowchart 'how-to' guide Project 2: Scratch to Python Project 3: Artificial Intelligence

	3. Extend their understanding of network security to include:
	   c. how encryption is used to protect data transmissions
	   d. how to check whether a website is secure.
		6. Recognize the importance of a unique identifier in database tables and determine suitable primary keys.
		7. Implement searches in databases using a single table and a single criterion.
		8. Explore the use of simulations to model real-life systems and analyse their purpose in different scenarios.	

Domains & Concepts in Topic	***Networks and Digital Communication*** *shows how computers and other machines communicate with each other across networks and how the networks are created through a combination of hardware and data transmission protocols.*	***Managing Data*** *encourages learners to reflect on how computers store and analyse data on an ever-increasing scale.* ***Computer Systems*** *helps learners to understand that computers follow precise sets of instruction to process inputs that are given by humans, to make decisions and produce outputs.*	***Computational Thinking Programming*** ***Managing Data****.* ***Networks and Digital Communication*** ***Computer Systems***
Modifications to adapt to students' needs	1. Focus on the fundamental concept of network security by explaining encryption in simple terms. Use visual representations, analogies, or simplified explanations to highlight how encryption safeguards data during transmission. Offer practical examples or demonstrations to reinforce understanding. 2. Provide step-by-step instructions or visual checklists to guide students in checking the security of a website. Break down the process into clear, sequential steps and use simplified criteria for assessing website security. Offer support and clarification as needed to ensure students can independently evaluate website	1. Focus on the foundational concept of unique identifiers in database tables rather than determining suitable primary keys. Provide concrete examples and visual representations to help students understand why unique identifiers are important in organising and accessing data. 2. Simplify the activity of implementing searches in databases by focusing on basic search operations using a single table and a single criterion. Provide clear instructions and visual prompts to guide students in executing simple searches and retrieving specific data subsets.	

	security.		
Methods of Assessment	Formative feedback on the skills taught.	Formative feedback on the skills taught.	Formative feedback on the skills taught.
End of Key Stage	**Built of the English National curriculum Key Of Key Stage Points and Linked to 5Cs:** **Confidence**: Upon completion of the Computing course aligned with the Cambridge Computing, students will exhibit enhanced confidence in utilising a diverse range of technical tools and applications. They will demonstrate proficiency in operating hardware components, software applications, and networking systems, empowering them to navigate digital environments with self-assurance and efficiency. **Compassion**: The Computing course will foster a sense of compassion as students develop an understanding of the ethical and social implications of technology. They will engage in discussions and activities that promote responsible digital citizenship, emphasising the importance of respecting privacy, intellectual property rights, and cultural diversity. Students will demonstrate empathy towards individuals facing digital challenges and develop strategies to mitigate digital inequalities. **Community**: Through collaborative projects and interactive platforms, students will cultivate a strong sense of digital community. They will employ networking protocols and establish secure connections to facilitate effective communication and knowledge sharing among peers. The Computing course will equip students with the skills to engage constructively in online forums, virtual communities, and social media platforms, emphasising the significance of active participation and respectful interaction. **Challenge**: The Computing course will present students with challenging tasks designed to develop their problem-solving and critical-thinking skills. Students will explore complex programming concepts, algorithms, and data structures, enabling them to analyse and devise innovative solutions to technological problems. They will engage in hands-on experimentation with emerging technologies, such as artificial intelligence, cybersecurity, or cloud computing, preparing them to tackle the dynamic and evolving challenges of the digital landscape. **Creativity**: Students will unleash their creative potential through the Computing course by leveraging technical tools to express innovative ideas. They will develop skills in multimedia creation, website design, or digital content production, employing programming languages, graphic design software, and multimedia authoring tools. Encouraged to think outside the box, students will engage in algorithmic thinking and computational creativity, empowering them to design unique digital solutions and explore inventive avenues within the field of technology.		