



Computer Science Curriculum Long Term Planning

Throughout computer Science we interleave Computational Thinking (CT) with Principles of Computer Science (P)

CT – Computational Thinking (skills interleaved throughout curriculum inc. Programming).

P – Principles of Computer Science (theory interleaved throughout curriculum).

YEAR 9 (2h p/week)			HT1	HT2	HT3	HT4	HT5	HT6
COMPUTER SCIENCE	Big Idea(s)	CT:	What are the Computational Thinking Fundamentals? <i>Pupil Knowledge:</i> Introduction to programming, Decomposition, algorithms, Data types, variables, Input and integer functions, debugging tools, Flowcharts		How can I program complex scenarios? <i>Pupil Knowledge:</i> String manipulation, string methods, if, if else, relational operators, readability, Boolean operators, Repetition (while)		How can I add efficiency to my programming? <i>Pupil Knowledge:</i> One-dimensional lists, for loops, range function, Procedures, Functions, Subprograms, Parameter passing	
		P:	What do I know about Data and Negative Number Representation? <i>Pupil Knowledge:</i> Course introduction, Binary Unsigned integers Binary arithmetic, Sign & magnitude, Two's complement 1		How can I use advanced arithmetic with Binary Numbers? <i>Pupil Knowledge:</i> Two's complement 2, Logical binary shifts, Arithmetic binary shifts, Hexadecimal, ASCII		What are the processes and hardware involved in Computers and their functionality? <i>Pupil Knowledge:</i> Stored program concept, Fetch-decode-execute 1, Fetch-decode- execute 2, CPU, Secondary storage 1, Secondary storage 2.	
	Application of Knowledge		Assessment Cycle 1 Low Stakes Quizzes SLOP* – Homework (SMART REVISE) Programming Homework's on REPL.it		Low Stakes Quizzes SLOP* – Homework (SMART REVISE) Programming Homework's on REPL.it		Assessment Cycle 2 Low Stakes Quizzes SLOP* – Homework (SMART REVISE) Programming Homework's on REPL.it	
	Application of Knowledge Intent		To measure outcome and tailor teaching to specific classes (and individual pupils) to meet their needs based on outcome. To give plenty of opportunity to apply knowledge gained. Using REPL.it to enable all pupils with internet connection to access python programming examples. *SHEDS LOADS OF PRACTISE - SLOP					
	Wider Curriculum Links		SMSC – Problem solving, desirable skills for employment. Debugging skills. Resilience. Developing discussion skills with ABC Oracy.		SMSC – Software to make lives easier. Software for change. Debugging skills. Resilience.		SMSC – How majority of all computers still work. But will it forever? Quantum Computing? Data storage where and how on different devices. Efficient readable code, Debugging skills. Resilience.	



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YEAR 10 (3h p/week)			HT1	HT2	HT3	HT4	HT5	HT6
COMPUTER SCIENCE	Big Idea(s)	CT:	Data Structures and Search Algorithms. <i>Pupil Knowledge:</i> string.format(), Two-dimensional lists, Validation, Linear search (one-dimensional), Linear search (two-dimensional)	Sorting algorithm & File handling <i>Pupil Knowledge:</i> Merge sort, reading files, String processing, Writing files, Authentication	Drawing in Python using Turtle. <i>Pupil Knowledge:</i> Turtle introduction, pens, lines, movement, coordinates, polygons, colours, filling, and circle Turtle combining subprograms, layers	Modular programming & problem-solving practices <i>Pupil Knowledge:</i> Intro to programming, Subprograms, Local, global, Maths, time, Problem solving	Trace Table and searching & sorting some more. <i>Pupil Knowledge:</i> Trace tables, Errors, Bubble sort, Binary search, Problem solving	Retrieval practice for Data types / structures. <i>Pupil Knowledge:</i> Data types, string manipulation, validation, Data structures, Trace tables, Errors Problem solving
		P:	Operating Systems <i>Pupil Knowledge:</i> Operating system, OS: File management, OS: Process management, OS: Peripheral & user management, Utility software	Intro to Cyber Security <i>Pupil Knowledge:</i> Malware & anti-malware, Hackers, Social engineering, Data level protection, Robust software	Networks and connections <i>Pupil Knowledge:</i> LANs & WANs, Networks, speed, Connectivity, Wired v. wireless, Network topologies	What is a computer and TCP/IP Stack? <i>Pupil Knowledge:</i> Embedded systems, The Internet of Things, Packet switching, TCP/IP	Issues and Impact of computer science. <i>Pupil Knowledge:</i> Environmental impact; manufacture & use, e-waste, Low - high-level languages, Translators, Intellectual Property	Data representation of images and sound. <i>Pupil Knowledge:</i> Bitmaps, Sound, Sound Compression
	Application of Knowledge		Application of Knowledge 04 Low Stakes Quizzes SLOP* – Homework (SMHW) 2x Programming Homework's on REPL.it			Application of Knowledge 05 Low Stakes Quizzes SLOP* – Homework (SMHW) Practice exam Question Homework 2x Programming Homework's on REPL.it		MOCK ASSESSMENT PAPER 1(sports hall) PAPER 2 (on-screen test) Low Stakes Quizzes Revision Strategies (SMHW)
	Application of Knowledge Intent		To measure outcome and tailor teaching to specific classes (and individual pupils) to meet their needs based on outcome. To give plenty of opportunity to apply knowledge gained. * = Shed Loads of Practice. Using REPL.it to enable all pupils with internet connection to access python programming examples.					Mock exams will help identify gaps in knowledge for us to work on during Y11 (tailored teaching to specific classes (and individual pupils) to meet their needs based on outcome.) Baseline to identify target pupils.
	Wider Curriculum Links		SMSC – Problem solving, desirable skills for employment. Debugging skills. Resilience. Developing discussion skills with ABC Oracy.			SMSC – Networking in industries and businesses, what is the internet and WWW? How does it work? Debugging skills. Resilience. Efficient programs.		SMSC – E-Waste and the environment. Sustainable? Debugging skills. Resilience. Well tested. Efficient programs.



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YEAR 11 (3h p/week)			HT1	HT2	HT3	HT4	HT5	HT6
COMPUTER SCIENCE	Big Idea(s)	CT:	Retrieval practice of Problem solving and Modular programming. <i>Pupil Knowledge:</i> Data structures (two-dimensional) Subprograms (local, global, procedures, functions) Problem solving, Trace tables, errors, Problem solving, testing with data.	PAPER 1 MOCK <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	Knowledge gap identification and filling <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	Knowledge gap identification and filling <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	COURSE FINISHED	COURSE FINISHED
		P:	AI and Ethics of Computer Science <i>Pupil Knowledge:</i> AI, machine learning & robotics, Personal data, Privacy & ownership, Data protection legislation	PAPER 2 MOCK <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	Knowledge gap identification and filling <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	Knowledge gap identification and filling <i>Pupil Knowledge:</i> Putting into practice the key skills of each question and focusing on making progress through self/ peer and teacher assessment and feedback	COURSE FINISHED	COURSE FINISHED
	Application of Knowledge		Revision Homework set using Revision Guides. Low Stakes Quizzes Practice exam Question Homework	WALKING-TALKING MOCK PAPER 1 & PAPER 2 (in class) Revision Homework set using Revision Guides. Low Stakes Quizzes Practice exam Question Homework	Revision Homework set using Revision Guides & Workbooks. Practice exam Question Homework	Revision Homework set using Revision Guides. Practice exam Question Homework GCSE ASSESSMENT PAPER 1(sports hall) PAPER 2 (on-screen test)	COURSE FINISHED	COURSE FINISHED
	Application of Knowledge Intent		To measure outcome and tailor teaching to specific classes (and individual	Measure outcome and progress levels in first mock. Data collection and tailoring	Recap both CT and P knowledge, continuing to create a picture of performance in final exams. Identifying gaps in		COURSE FINISHED	COURSE FINISHED



		pupils) to meet their needs based on outcome. To give plenty of opportunity to apply knowledge gained.	lessons to suit class weaknesses and inform next steps teaching. Developing good habits and exam technique.	knowledge, tailoring lessons to suit class weaknesses and inform next steps teaching.	COURSE FINISHED COURSE FINISHED	
Wider Curriculum Links		SMSC – Algorithmic Bias, racism, sexism, real-life examples. Developing discussion skills with ABC Oracy.	SMSC – Exam techniques and steps to success. Resilience & Problem solving. Developing discussion skills with ABC Oracy.	SMSC – Revision skills and steps to success. Resilience & Problem solving.		