Key Stage 3 Overview: Computer Science Year 8

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Year 8	**University Challenge:** Creative Engineering	**University Challenge:** Theatre	**University Challenge:** Recycling	**University Challenge:** Brunel	**University Challenge:** Extreme Re-design	**University Challenge:** Community/Charity
	Context: **Computer Systems:** The students design a network ready digital device.	**Context:** **Software Engineering:** The students design a ticket booking system for a theatre.	**Context:** **Software Engineering:** The students design a recycling guidance system.	**Context:** **Data:** The students design a puzzle to teach binary and hexadecimal numbers.	**Context:** **Software Engineering:** The students revisit the town they helped with resource management and help them with their latest issues.	**Context:** **Problem Solving:** The students use problem solving techniques to design solutions to local problems.
	Skills: Explain what a network is. Describe the main types of networks. Discuss the benefits and risks of using networks. Discuss the difference between wired and wireless networks. Compare the benefits and risks of using wired and wireless networks. Describe different network topologies. Explain the difference between the Internet and the World Wide Web. Explain what hardware is. Describe different hardware components. Categorise different hardware components. Explain what software is. Discuss the relationship between hardware and software. Explain the difference between systems software and application software. Identify different types of application software.	**Skills:** Create programs that store data in variables. Create programs that store data in variables and constants. Describe pseudo-code notation. Design algorithms using pseudo-code notation. Describe flow charts symbols. Design algorithms using flow chart symbols. Explain the purpose of the selection structure. Describe the relational operators. Design algorithms that use one way selection structures. Create programs that use the if structure. Design algorithms that use multi-way selection structures. Create programs that use the if-else structure. Create programs that use the if-elseif-else structure.	**Skills:** Explain the purpose of the iteration structure. Describe the three types of the iteration structure. Design algorithms that use pre-condition iteration. Create programs that use pre-condition iteration. Design algorithms that use post-condition iteration. Create programs that use post-condition iteration. Design algorithms that use definite iteration. Create programs that use definite iteration. Design algorithms that use nested iteration. Create programs that use nested iteration.	**Skills:** Identify numbers systems used by computers. Explain the process of converting denary numbers into binary. Convert denary numbers into binary. Explain the process of converting binary numbers into denary. Convert binary numbers into denary numbers. Explain the process of converting binary numbers into hexadecimal. Convert binary numbers into hexadecimal numbers. Explain the process of converting hexadecimal numbers into binary. Convert hexadecimal numbers into binary. Explain the process of converting denary numbers into hexadecimal. Convert denary numbers into hexadecimal. Explain the process of converting hexadecimal numbers into denary.	**Skills:** Design and create programs that manipulate strings. Design and create programs that utilise random numbers. Design and create programs that validate data input by users. Design and create programs that authenticate user names and passwords.	**Skills:** Explain what a problem is. Explain what a computational problem is. Explain what a solution is. Identify the stages of the systems development life cycle. Describe the stages of the systems development life cycle. Identify alternatives to the systems development life cycle. Discuss the differences between different development life cycles. Identify possible solutions to a problem. Describe possible solutions to a problem. Compare possible solutions to a problem. Justify the selection of a solution to solve a problem. Explain what an environmental impact is. Explain what an ethical impact is.

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	Identify different types of systems software. Identify the functions of an operating system. Discuss the functions of an operating system. Identify devices that could be considered computers.	Create programs that use the select-case structure. Design algorithms that use nested selection structures. Create programs that use nested selection structures. Describe the Boolean operators. Design algorithms that use conditional statements with Boolean operators. Create programs that use conditional statements with Boolean operators.		Convert hexadecimal numbers into denary.		Explain what a legal impact is. Explain what a social impact is. Explain what a cultural impact is. Identify different environmental impacts for computer systems Identify different ethical impacts for computer systems. Identify different legal impacts for computer systems. Identify different social impacts for computer systems. Identify different cultural impacts for computer systems. Discuss different environmental impacts for computer systems. Discuss different ethical impacts for computer systems Discuss different legal impacts for computer systems. Discuss different social impacts for computer systems. Discuss different cultural impacts for computer systems.