[Year]

Computer Science

CURRICULUM OVERVIEW – KS3 & KS4

Maximise our potential, to be the best we can be, every day.

Curriculum Overview

Subject: Computer Science

Year group	Topic and length *Put in the order you will be studying them*	Key Words	Key Skills	Knowledge	Assessments	Cultural Capital	Links to NC and Spec
7	HT1. Baseline assessment & SHORT presentation on Health and Safety and E-Safety	Grooming Malware Phishing Viruses Trojan Privacy	Using PowerPoint to create slideshow about E Safety	Dangers of the Internet and how to deal with them. How to design for audience	**MINI PROJECT**: A. baseline knowledge. B. e-safety, health & safety and PowerPoint	E Safety Health and Safety Data privacy Social Media	**POS8:** **POS9:POS10:**
7	HT2. Spreadsheets and modelling	Formula Function Cell Reference Formatting Column Row IF statement	Using formulas and functions in Microsoft Excel	What spreadsheets are used for. How a spreadsheet models a real-world situation	**ONE LESSON PROJECT:** Create a spreadsheet for a small business	How businesses use spreadsheets to gauge operational viability	**POS1:** POS4:
7	HT3. Programming in Scratch	Forever loop Sensing Looks Variable Visual programming Abstraction Decomposition Algorithm	Program a game in Scratch using key constructs of variables, IF statements and loops	How graphic based programming is used in the real-world. The 3 main programming constructs.	**ONE LESSON PROJECT:** Create a game in Scratch given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3**
7	HT4. Programming in Small Basic (Basic).	Variable Programming Abstraction	Program usually a calculator in Small Basic	How text based programming	**ONE LESSON PROJECT:** Use of key	The UK has a successful industry of game	**POS1: POS3:**

		Decomposition Algorithm Input Output Iteration Integer String	using key constructs of variables, IF statements and loops	is used in the real-world. The 3 main programming constructs.	constructs in programming given a design brief	developers and programmers	
7	HT5. a. Binary to Denary conversion And data representation	Binary Denary Conversion Pixel Sampling Bit depth ASCII Character Set	Convert Binary to Denary and vice-versa Understand how binary can be used to represent images, sound and text.	How all computers are based on base 2 and why.	**ONE LESSON TEST:** Convert Binary to Denary and vice-versa. Demonstrate basic understanding of binary representation	Modern lifestyles rely heavily on binary technology	**POS4: POS6:**
7	HT6. BBC Mircobits	Iteration Selection Variable Visual programming Abstraction Decomposition Algorithm	Program a sequence of instructions using a visual coding language having been given a design brief	Why national cooperations support and invest in building coding skills	**ONE LESSON PROJECT:** Use of key constructs in programming given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3:**
8	HT1. Programming in Small Basic (Medium).	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration	Program an adventure game in Small Basic using key constructs of variables, IF statements, nested IF	Reinforce and refine how text based programming is used in the real-world. The 3 main programming	**ONE LESSON PROJECT:** Use of key constructs in programming given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3:**

		Integer Sub Program Graphics	statements and loops	constructs, while loops and graphics.			
8	HT2. Computational Thinking	Decomposition Abstraction Flowchart Pattern Recognition Algorithm	Students will be able to create flow charts and understand how to algorithms work.	Will understand computational thinking is a way of breaking a problem down into smaller parts in order to find a solution Will know that decomposition is the first stage of computational thinking I will be able to take a large problem and help to break it down into smaller tasks.	***MINI PROJECT****:. Completing workbook throughout the term*	This unit allows the student to problem solve in the real world as well as computers.	**POS3: POS9: POS7:** POS10
8	HT3. Hardware and software and website creation	Hardware | Software | Input device | Output device | Microphone | Keyboard |	To be able to understand how computers work and what components are	Understand what a computer actually is	**ONE LESSON TEST:** Create a website which includes all the details learnt	Creating a website unlocks students potential of expanding their knowledge to	**POS4: POS6:**

		Speakers | Storage device | Application software	inside a computer.	Understand what hardware means. To create a basic presentation	about hardware and software.	learning other computing languages.	
8	HT4. Binary	Binary Denary Conversion Pixel Sampling Bit depth ASCII Character Set	Convert Binary to Denary and vice-versa Understand how binary can be used to represent images, sound and text.	How all computers are based on base 2 and why.	**ONE LESSON TEST:** Convert Binary to Denary and vice-versa. Demonstrate basic understanding of binary representation.	Modern lifestyles rely heavily on binary technology	**POS4: POS6:**
8	HT5. Programming in Python#1	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration Integer casting	Program usually a calculator Python using key constructs of variables IF statements and loops	Reinforce and refine how text-based programming is used in the real-world. The 3 main programming constructs, loops and indentation.	**ONE LESSON PROJECT:** Use of key constructs in programming given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3:**
8	HT6. Cyber Security	Privacy | Data | Information | Permission | Virus | firewall | Anti-Virus	Pupils to recognise the effects of virus and firewall and	Recap and refine how graphic based programming is used in the	**ONE LESSON ASSESSMENT**	Students will learn about the digital world and help protect themselves	**POS1: POS3:**

			what we can do to protect	real-world. The 3 main programming constructs.			
9	HT1. Programming in Python #2.	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration Integer casting functions	Program usually an adventure game Python using key constructs of variables, IF statements, functions and loops	Reinforce and refine how text based programming is used in the real-world. The 3 main programming constructs, loops, functions and indentation.	**ONE LESSON PROJECT:** Use of key constructs in programming given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3: POS4:**
9	HT2.Networking	1. LAN 2. WAN 3. Client Server 4. Peer to peer 5. Standalone computer 6. Star Topology 7. Mesh Topology 8. IP address 9. The cloud 10. Hosting	This unit of work will introduce students to the concept of networking and build on an understanding of internet safety. The context of the unit will be centred around setting up a network, using networked applications and		Students' self and peer assess the e-book responses to the questions within the lessons and a piece of work after lesson 6 on a topic of internet / network safety. Students will complete a formal	Complete eBook and will be assessed at the inter	

			getting the pupils to reflect on how safe they are online.		written assessment of the work covered during the academic year		
9	HT3.The Internet	1. The history of the internet 2. The development of the internet 3. The nature of protocols 4. Peer to Peer or Client Server networks 5. Website timeline building 6. Website timeline building 7. Network topologies 8. Legal Issues and Encryption	students will understand the nature of the internet and how devices. connect to the web. Pupils will understand the hardware on the internet and the protocols used.		The unit will be self-assessed, peer assessed and finally, teacher assessed. The students will create an online timeline of the internet in a website format that explains the key theoretical concepts they have covered around networks.	1. The history of the internet 2. The development of the internet 3. The nature of protocols 4. Peer to Peer or Client Server networks 5. Website timeline building 6. Website timeline building 7. Network topologies 8. Legal Issues and Encryption	
9	HT4.Flash /Photoshop	Fade Amplitude Export Import Alpha Transparency Key Frame	Key skills in image, sound editing to create an advanced animation advertise a business	How multiple pieces of software could support a business in bot advertising and operation.	**THIRD OF LONG-TERM PROJECT:** Assessed on key skills in image and sound editing	Modern lifestyles rely heavily on information being delivered in mixed-media packages.	**POS1: POS 7: POS8: POS 9: POS 10:**

					used in an animation	Multiple career paths can spring from these studies	
9	HT5. Spreadsheets 2	Formula Function Cell Reference Formatting Column Row IF statement	Using formulas and functions in Microsoft Excel	What spreadsheets are used for. How a spreadsheet models a real-world situation	**ONE LESSON PROJECT:** Create a spreadsheet for a small business	How businesses use spreadsheets to gauge operational viability	**POS1:** POS4:
9	HT6. Python 2	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration Integer casting functions	Program usually an adventure game Python using key constructs of variables, IF statements, functions and loops	Reinforce and refine how text based programming is used in the real-world. The 3 main programming constructs, loops, functions and indentation.	**ONE LESSON PROJECT:** Use of key constructs in programming given a design brief	The UK has a successful industry of game developers and programmers	**POS1: POS3: POS4:**
10	HT1 and 2 NEA preparation/start	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration Integer casting functions	Complete tasks and mini assessments to build programming key skills confidence ready for the NEA	Recap and refine multiple constructs of programming.	Pupils assessed by completion of a set number of tasks and mini-assessments	The UK has a successful industry of game developers and programmers	**AO3**

		arrays					
10	HT3 NEA continue	Variable Programming Abstraction Decomposition Algorithm Input Output Iteration Integer casting functions arrays Testing Pseudo code	Complete tasks outlined in the NEA brief	Recap and refine multiple constructs of programming.	Pupils work to be assessed externally at the end of Year 11	The UK has a successful industry of game developers and programmers	**AO3:**
10	HT4 Finish NEA Unit 1.1 and Unit 1.2	Computer Components Data representation Binary Hexadecimal Bitmap Sampling Pixel Sampling Bit depth ASCII Character Set Extended ASCII UNICODE Boolean		Key Knowledge in all aspects of Computer Components and Data Representation	Assessed through exam style questions, mini-tests and mini-mock after each unit	Modern lifestyles rely heavily on digital technology. These topics provide an understanding of how these technologies work including how computers display mixed media and with what hardware.	**AO1: AO2:**
10	HT5 Unit 1.3 and recap 1.1/1.2	Computer Networks		Key Knowledge in	Assessed through exam	Modern lifestyles rely	**AO1: AO2:**

		Switch Hub Server Topology Virtual networks Protocols Internet Virus Trojan Client server Peer to peer		all aspects of Networks, and network security	style questions, mini-tests and mini-mock after each unit	heavily on digital technology. These topics provide an understanding of how these technologies work and how we are all connected digitally. Also help pupils avoid malicious digital attacks.	
10	HT6 Unit 1.4 recap 1.1/1.2	Ethical Cultural Digital Divide Legislation Environmental Surveillance		Key Knowledge in all aspects of Environmental, legal and cultural issues.	Assessed through exam style questions, mini-tests and mini-mock after each unit. QLA on Y10 Mock 1	Environmental issues from Technology are at the forefront of many emerging technologies and future careers.	**AO1: AO2: AO3:**
11.	HT1 Unit 2.1	Algorithms Bubble sort Merge Sort Insertion Sort Linear Search Binary Search Abstraction Decomposition Pseudocode		Key Knowledge in all aspects of Pseudocode and algorithmic computation.	Assessed through exam style questions, mini-tests and mini-mock after each unit	Modern lifestyles rely heavily on information being sorted and searched through. These topics draws a link between Computer Science and	**AO1: AO2: AO3:**

						every-day experiences.	
11	HT2 Unit 2.2 and Y11 Mock 1	Programming techniques Constant Variable Iteration Selection Boolean Strings Integer Float/Real File handling Functions Parameters Arguments		Key Knowledge in all aspects of Programming and it's key constructs.	Assessed through exam style questions, mini-tests and mini-mock after each unit. QLA on Y11 Mock 1 (paper 1)	The UK has a successful industry of game developers and programmers	**AO1: AO2:**
11	HT3 Unit 2.3 Defensive Design, Testing and IDES	IDEs Testing Alpha and Beta Structured Robust Translator Interpreter Trace table Comments Runtime Debugger		Key Knowledge in Defensive Design, Testing and IDES	Assessed through exam style questions, mini-tests and mini-mock after each unit.	The UK has a successful industry of game developers and programmers	**AO1: AO2: AO3:**
11	HT4 Revision of Unit 1 and Unit 2	Components of a computer Computer networks		Key Knowledge in all aspects of Unit 1 and Unit 2	Assessed through exam style questions, mini-tests and	Modern lifestyles rely heavily on digital technology and algorithmic	**AO1: AO2: AO3:**

		Environmental issues of Technology Algorithmic thinking Programming Testing and IDEs Data Representation			mini-mock after each unit. QLA of Y11 Mock 2 (paper 1 and paper 2)	thinking. These topics provide an understanding of every aspect of this.	
11	HT5 Revision of Unit 1 and Unit 2	Components of a computer Computer networks Environmental issues of Technology Algorithmic thinking Programming Testing and IDEs Data Representation		Key Knowledge in all aspects of Unit 1 and Unit 2	Assessed through Q & A and QLA of previous assessments	Modern lifestyles rely heavily on digital technology and algorithmic thinking. These topics provide an understanding of every aspect of this	**AO1: AO2: AO3:**