



CHS South Curriculum Intent

SUCCESSFUL: An education where imagination, curiosity and resilience enable us to ignite our learning.

CREATIVE: A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe, and inclusive community.

HAPPY: Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

CHS South Curriculum Area Framework for Learning – Year 10

SUBJECT	Computer Science
INTENT	<p>In Computer Science students will develop knowledge and understanding of key computing topics that will prepare them for their future studies in Computing. During Year 10 students will:</p> <ul style="list-style-type: none"> • Develop a range of programming skills which they will use to design and create working programs for a range of given scenarios. • Develop a knowledge of units of data and be able to calculate the file sizes of different documents. • Be able to effectively convert numbers between binary, denary and hexadecimal. • Develop a knowledge and understanding of how characters, images and sound are represented in a computer system. • Develop a knowledge and understanding of networks topologies and the hardware required for this type of network. • Develop a knowledge and understanding of wired and wireless networks including the protocols and layers. • Develop a knowledge and understanding of network threats and the different methods of prevention. • Develop a knowledge and understanding of ethical, legal, environmental and privacy issues. • Develop a knowledge and understanding of computer legislations. • Develop and refine their exam techniques



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Year Group	10					
Rationale/ Narrative	<p>In Year 9 students focused on and developed knowledge of Computer Systems (component 1) focusing on systems architecture, memory and storage, networks, and system software. A significant part of the GCSE course requires students to be able to design and create programs using high level programming language (component 2). Students will start year 10 by focusing on developing their programming skills and be able to effectively design programs for a given scenario. In the spring term students will study elements of component 1 to ensure that students are developing a broad knowledge of the topics. In the summer term students will return to programming skills and continue to develop their skills to be able to write in high level programming language for given scenarios.</p> <p><u>Year 10 Computer Science</u></p> <p>2.2 Programming fundamentals – students will learn the practical use of techniques in a high-level language within the classroom.</p> <p>1.2 Memory and Storage - - students will learn the basics of how computers represent different information including numbers, characters, images, and sound.</p> <p>1.3 Computer networks, connections, and protocols – Following on from networks in year 9 students will develop their knowledge further and examine the network layers.</p> <p>1.4 Network Security – students will learn about the different threats posed to devices/systems and understand how we can limit these threats.</p> <p>1.6 Ethical, cultural, legal and environmental concerns: students will have the opportunity to learn about and discuss different issues in computing.</p> <p>2.3 Producing robust programs – students will learn how to design and test programs including defensive design</p>					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
KNOWLEDGE	<p>2.2 – Programming fundamentals</p> <p>2.2.1 Programming fundamentals</p> <ul style="list-style-type: none"> Use of variables, constants, operators, inputs, outputs and assignments' 	<p>2.2 – Programming fundamentals</p> <p>2.2.1 Programming fundamentals</p> <ul style="list-style-type: none"> Use of variables, constants, operators, inputs, outputs and assignments' 	<p>2.2.3 Additional programming techniques</p> <ul style="list-style-type: none"> Basic string manipulation Basic file handling operations: <ul style="list-style-type: none"> Open Read Write Close 	<p>2.2.3 Additional programming techniques</p> <ul style="list-style-type: none"> Basic string manipulation Basic file handling operations: <ul style="list-style-type: none"> Open Read Write Close 	<p>1.6 Ethical, legal, cultural, and environmental impacts of digital technology</p> <p>1.6.1 Ethical, legal, cultural, and environmental impact</p> <ul style="list-style-type: none"> Ethical issues Legal issues Cultural issues 	<p>1.3.1 Computer networks, connections, and protocols</p> <p>1.3.1 Networks and topologies</p> <ul style="list-style-type: none"> Types of network – LAN and WAN Factors that affect performance Client -server and peer to peer network Network Hardware



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	<ul style="list-style-type: none"> Basic programming constructs used to control the flow of a program: <ul style="list-style-type: none"> Sequence Selection Iteration (count- and condition-controlled loops) Common arithmetic operators Common Boolean operators AND, OR and NOT 2.2.2 Data types <ul style="list-style-type: none"> Integer Real Boolean Character and string Casting 	<ul style="list-style-type: none"> Basic programming constructs used to control the flow of a program: <ul style="list-style-type: none"> Sequence Selection Iteration (count- and condition-controlled loops) Common arithmetic operators Common Boolean operators AND, OR and NOT 2.2.2 Data types <ul style="list-style-type: none"> Integer Real Boolean Character and string Casting <ul style="list-style-type: none"> 	<ul style="list-style-type: none"> The use of records to store data The use of SQL to search for data Arrays (one-dimensional and two-dimensional) Sub programs (functions and procedures) to produce structured code. 	<ul style="list-style-type: none"> The use of records to store data The use of SQL to search for data Arrays (one-dimensional and two-dimensional) Sub programs (functions and procedures) to produce structured code. 	<ul style="list-style-type: none"> Environmental issues Privacy issues <p>Legislation relevant to Computer Science:</p> <ul style="list-style-type: none"> The Data protection Act 2018 Computer Misuse Act 1990 Copyright, Design and Patent Act 1988 Software Licenses <ul style="list-style-type: none"> Open source Proprietary 	<ul style="list-style-type: none"> The internet as a worldwide collection of computer networks <p>1.3.2 Wired and Wireless network, protocols, and layers</p> <ul style="list-style-type: none"> Modes of connections Encryption IP and MAC addressing Standards Common protocols Concept of layers <p>1.4 Network Security</p> <p>1.4.1 Threats to computer systems and networks</p> <ul style="list-style-type: none"> Forms of attack <ul style="list-style-type: none"> Malware Social engineering Brute force attack DoS Data Inception SQL injection <p>1.4.2 Identifying and preventing vulnerabilities.</p> <ul style="list-style-type: none"> Common prevention methods: <ul style="list-style-type: none"> Penetration testing Anti-malware software Firewalls User Access levels Passwords
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						<ul style="list-style-type: none"> ○ Encryption ○ Physical security
SKILLS	<ul style="list-style-type: none"> • Metacognitive practice • Exam technique • Identifying and selecting information • Breaking down key information • Programming skills: • Identifying and using variables • Using different types of data appropriately • Using operators • Using inputs • Using outputs • Using sequence • Using selection • Using iteration (for loops) • Using iteration (while loops) 	<ul style="list-style-type: none"> • Evaluation skills • Metacognitive practice • Identifying and selecting information • Breaking down key information • Exam technique • Programming skills: • Using basic string manipulation • Using records to store data • Using SQL to search for data. • Using arrays (one-dimensional and two dimensional) • Using sub programs (functions and procedures) • Using random number generation 	<ul style="list-style-type: none"> • Evaluation skills • Metacognitive practice • Exam technique • Identifying and selecting information • Breaking down key information 	<ul style="list-style-type: none"> • Evaluation skills • Metacognitive practice • Exam technique • Identifying and selecting information • Breaking down key information 	<ul style="list-style-type: none"> • Evaluation skills • Metacognitive practice • Exam technique • Identifying and selecting information • Breaking down key information 	<ul style="list-style-type: none"> • Evaluation skills • Metacognitive practice • Exam technique • Identifying and selecting information • Breaking down key information
ASSESSMENTS	<ul style="list-style-type: none"> • Baseline Assessment: To check student's knowledge and understanding of key concepts from Year 9. This will allow us to identify key areas to revisit in home learning tasks. • OCR GCSE Computer Science 	<ul style="list-style-type: none"> • Autumn Progress test (Paper 1 and Paper 2) with exam questions based on Algorithms/Programming Fundamentals and Year 9 topics Autumn term Key Assessed piece of work 2 • OCR GCSE Computer Science Paper 2 Past questions \OCR GCSE Computer Science Paper 2 Past questions\2.2 	<ul style="list-style-type: none"> • OCR GCSE Computer Science Paper 1 Past questions on Memory, units and data storage – Spring term Key Assessed piece of work 1 • End of topic assessment 	<ul style="list-style-type: none"> • Spring Progress test (Paper 1 and Paper 2) with exam questions • End of topic assessment Spring term Key Assessed piece of work 2. • OCR GCSE Computer Science Paper 1 Past questions on Computer Networks, connections and protocols – Spring 	<ul style="list-style-type: none"> • OCR GCSE Computer Science Paper 1 Past questions on Ethical, legal, cultural, environmental and privacy issues/Computer Legislation – Summer term Key Assessed piece of work 1 • End of topic assessment 	<ul style="list-style-type: none"> • Summer Progress test (Paper 1 and Paper 2) with exam questions - Summer term Key Assessed piece of work 2 • Practical Programming task - Summer term Key Assessed piece of work 3 • End of topic assessment



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	<p>Paper 2 Past questions\OCR GCSE Computer Science Paper 2 Past questions\2.2 Programming Fundamentals Q3 (Drinks Machine)</p> <ul style="list-style-type: none"> • End of topic assessment <p>Autumn term Key Assessed piece of work 1</p>	<p>Programming Fundamentals Q3 (Drinks Machine) Autumn term Key Assessed piece of work 3</p> <ul style="list-style-type: none"> • End of topic assessment 		<p>term Key Assessed piece of work 3</p> <ul style="list-style-type: none"> • End of topic assessment 		
<p>HOME LEARNING</p>	<ul style="list-style-type: none"> • Home Learning 1 – CGP Test 1 set via Microsoft Teams • Home Learning 2 – CGP Test 2 set via Microsoft Teams • Home Learning 3 – CGP Test 3 set via Microsoft Teams <p>Seneca Learning x2</p> <ul style="list-style-type: none"> • 1.1 Systems Architecture • 1.2 Memory and 1.3 Storage) 	<ul style="list-style-type: none"> • Home Learning 4 – CGP Test 4 set via Microsoft Teams • Home Learning 5 – CGP Test 5 set via Microsoft Teams • Home Learning 6 – CGP Test 6 set via Microsoft Teams 	<ul style="list-style-type: none"> • Home Learning 7 – CGP Test 1 set via Microsoft Teams • Home Learning 8 – CGP Test 2 set via Microsoft Teams • Home Learning 9 – CGP Test 3 set via Microsoft Teams 9- 	<ul style="list-style-type: none"> • Home Learning 10 – CGP Test 10 set via Microsoft Teams • Home Learning 11 – CGP Test 11 set via Microsoft Teams • Home Learning 12 – CGP Test 12 set via Microsoft Teams – Seneca Learning x2 • 2.2 Network Topologies Protocols & Layers - <i>split across two assignments.</i> 	<ul style="list-style-type: none"> • Home Learning 13 – CGP Test 13 set via Microsoft Teams • Home Learning 14 – CGP Test 14 set via Microsoft Teams • Home Learning 15 – CGP Test 15 set via Microsoft Teams 	<ul style="list-style-type: none"> • Home Learning 16 – CGP Test 16 set via Microsoft Teams • Home Learning 17 – CGP Test 17 set via Microsoft Teams • Home Learning 18 – CGP Test 18 set via Microsoft Teams 18-
<p>READING, WRITING, TALK</p>	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab 	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab. 	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab. 	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab. 	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab. 	<ul style="list-style-type: none"> • Reading Strategies of ‘predicting’, ‘ask questions’ and ‘form opinions’ used regularly. • Opportunities for talk and debate in every lesson using ‘Talk Protocols’. • SEEC used for all Tier 3 Vocab.



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TIER 3 VOCAB	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Integer • Real • Boolean • Character • String • Casting • Variable • Constant • Operators • Input • Output • Assignments • Sequence • Selection • Iteration 	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Records • Database • Arrays • Sub programs • Functions • Procedures 	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Bit • Nibble • Byte • Kilobyte • Megabyte • Gigabyte • Terabyte • Petabyte • Binary • Denary • Hexadecimal • Integers • Binary shift • Character set • ASCII • Unicode • Metadata • Lossy • Lossless 	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Network topologies • LAN • WAN • Client-Server • Peer to peer • Wireless Access Point • Router • Switches • NIC (Network Interface Card) • Transmission media • Domain Name Server • Hosting • The Cloud • Web server and clients • Star topology • Meh topology. • Wired • Ethernet • Wi-Fi • Bluetooth • Encryption • IP Addressing • MAC addressing • Standards • TCP/IP (Transmission Control Protocol/Internet Protocol) • HTTP (Hyper Text Transfer Protocol) • HTTPS (Hyper Text Transfer Protocol Secure) • FTP (File Transfer Protocol) 	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Ethical • Legal • Cultural • Environmental • Privacy • Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright, Design and Patent Act 1988 • Software Licenses • Open source • Proprietary 	<p>Tier 3 – Subject-specific academic vocabulary:</p> <ul style="list-style-type: none"> • Authentication • Validation • Maintainability • Iterative testing • Final/terminal testing • Test data
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				<ul style="list-style-type: none"> • POP (Post Office Protocol) • IMAP (Internet Message Access Protocol) • SMTP (Simple Mail Transfer Protocol) • Malware • Social Engineering • Brute Force attack • Denial of Service Attack • Penetrating testing 		
PSPSMC, BRITISH VALUES	<p>Personal: Developing the valuable transferable skill of logical thinking.</p> <p>Social: Paired programming opportunities.</p> <p>British value: Consideration of the working environment of a programmer</p> <p>Moral: Giving peer feedback in a respectful manner.</p> <p>Cultural: Understanding the cultural environment of the workplaces of programmers.</p>	<p>Personal: Developing the valuable transferable skill of critical thinking.</p> <p>Social: Presentations to the group</p> <p>British value: Consideration of the involvement of governments and companies in internet surveillance</p> <p>Moral: Giving peer feedback in a respectful manner.</p> <p>Cultural: Understanding the cultural norms associated with the digital issues (smartphone use, automation)</p>	<p>Personal: Developing the valuable transferable skill of critical thinking.</p> <p>Social: Presentations to the group</p> <p>British value: Consideration of the involvement of governments and companies in internet surveillance</p> <p>Moral: Giving peer feedback in a respectful manner.</p> <p>Physical: Environmental issues with computing, effect of computing on physical wellbeing</p> <p>Cultural: Understanding the cultural norms associated with the digital issues (smartphone use, automation)</p>			