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## CHS Curriculum Intent

**SUCCESSFUL:** Learners who gain deep and powerful knowledge in preparation for life; combining academic rigour, curiosity and creative flair.

**CREATIVE:** Learners who are imaginative, optimistic and inventive; finding their voice to become effective communicators prepared for lifelong adaptability

**HAPPY:** Learners who are confident, resilient, well-rounded citizens; they understand the world's communities and are ready to discover their place in it.

### CHS Curriculum Area Framework for Learning – Year 11

<b>SUBJECT</b>	<b>Computer Science</b>
<b>INTENT</b>	<p style="text-align: center;">“Those who can imagine anything, can create the impossible.” — Alan Turing</p> <p>As we live in an ever-changing digital world, Computer Science impacts everything from gaming, to medicine, banking, communications and connectivity. Most individuals and businesses rely on sophisticated computer systems and software throughout their daily lives and operations. Learners today are preparing for careers that might not even exist yet, and we hope our students can be one of the Computer Scientists who makes the world better, faster and more inter-connected!</p> <p>Studying Computer Science at Chorlton High School will provide our learners with the tools, knowledge and skills to develop their computational thinking, programming, problem solving and analytical skills. Our learners can then apply these to a variety of programming projects. Studying Computer Science will also allow our learners to access a wider range of topics including digital literacy, e-safety, computer systems, networks, data representation and the positive and negative impact of computing on modern society.</p>

**Department:** **Computing & Technology 2021-2022**

**Subject:** GCSE Computer Science (OCR J277 (from 2020))

<b>Year Group</b>	<b>Year 11</b>
<b>Rationale/ Narrative</b>	<p>Students have previously studied the majority of GCSE Computer Science (OCR J277) during Year 9 and Year 10 across component 01 (Computer systems) and component 02 (Computational thinking, algorithms and programming); however, as a result of the school closures during the previous academic terms (2019-2020 and 2020-2021), a variety of topics haven't been formally taught face to face in the classroom. Therefore, during Year 11, students will study all remaining units and topics which were previously delivered via distance learning/live lessons and focus on exam question practice and explicit teaching of exam techniques throughout. Walking talking mocks will embed this practice, and there will be room for structured revision in the Spring/Summer term based on exam analysis. A bank of OCR past questions by topic has been shared with students (Microsoft Teams, which will allow students to independently focus on their own areas for development and these will be used throughout Year 11 to assess</p>



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students' understanding of key topics learnt during GCSE Computer Science (OCR). All students have been provided with electronic access to the OCR Revision Guide and the department will run an after-school revision session on a fortnightly basis to further develop students' confidence with Computer Science post lockdown.

*There is no longer a requirement for students to complete an NEA Programming Project (20 timetabled hours) as completed during previous years, however, students must be given an opportunity to complete a programming project. This was completed during Year 10 as students were given a variety of programming challenges and a formal programming project (Form Tutor System) in addition to a significant focus on past exam paper algorithm questions which featured throughout their Year 10 Computer Science lessons.*

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>KNOWLEDGE</b>	<p><b>Computer systems</b></p> <p>The knowledge, understanding and skills that all students will focus on this term are:</p> <p><b>Systems architecture –</b></p> <ul style="list-style-type: none"> <li>Architecture of the CPU</li> <li>CPU performance</li> <li>Embedded systems</li> </ul> <p><b>Memory and storage -</b></p> <ul style="list-style-type: none"> <li>Primary storage (Memory)</li> <li>Secondary storage</li> </ul> <p><b>The units of data storage:</b></p> <ul style="list-style-type: none"> <li>How data needs to be converted into a binary format to be processed by a computer</li> <li>Data capacity and calculation of data capacity requirements</li> </ul>	<p><b>Computer systems</b></p> <p>The knowledge, understanding and skills that all students will focus on this term are:</p> <p><b>Data storage (Numbers)</b></p> <ul style="list-style-type: none"> <li>Binary conversions</li> <li>Binary addition and overflow errors</li> <li>Denary to Hex and vice versa</li> <li>Binary to Hex and vice versa</li> <li>Binary shifts</li> </ul> <p><b>Characters</b></p> <ul style="list-style-type: none"> <li>The use of binary codes to represent characters.</li> <li>The term 'character set'</li> <li>The relationship between the number of bits per character in a character set, and the number of characters which can be represented, e.g.: <ul style="list-style-type: none"> <li>ASCII</li> <li>Unicode</li> </ul> </li> </ul> <p><b>Images</b></p>	<p><b>Computer systems</b></p> <p>The knowledge, understanding and skills that all students will focus on this term are:</p> <p><b>Networks and topologies</b> <i>Revisit to lead into the below:</i></p> <p><b>Wired and wireless networks, protocols and layers</b></p> <ul style="list-style-type: none"> <li>Common protocols</li> <li>The concept of layers</li> </ul> <p><b>Threats to computer systems and networks</b></p> <ul style="list-style-type: none"> <li>Forms of attack</li> <li>Identifying and preventing vulnerabilities</li> </ul> <p><b>Operating systems</b></p> <ul style="list-style-type: none"> <li>The purpose and function of operation systems</li> </ul> <p><b>Utility software</b></p> <ul style="list-style-type: none"> <li>The purpose and function of utility software.</li> </ul> <p><b>Ethical, legal, cultural and environmental impact</b></p>	<p><b>Computational thinking, algorithms and programming</b></p> <p>The knowledge, understanding and skills that all students will focus on this term are:</p> <p><b>Designing, creating, and refining algorithms</b></p> <p><b>Programming fundamentals</b></p> <p><b>Searching and sorting algorithms.</b></p> <p><b>Standard searching algorithms:</b></p> <ul style="list-style-type: none"> <li>Binary search</li> <li>Linear search</li> </ul> <p><b>Standard sorting algorithms:</b></p> <ul style="list-style-type: none"> <li>Bubble sort</li> <li>Merge sort</li> <li>Insertion sort</li> </ul>	<p><b>Revision and Exam Preparations</b></p> <p>During this term students will complete a range of revision lessons focusing on their own knowledge development of key concepts from both paper 1 and paper 2.</p> <p>This will be supported by students personalised study plans to enable them to use PLC documents to focus their revision with the support of class teachers.</p> <p><b>Structured revision based on exam analysis</b></p> <ul style="list-style-type: none"> <li>Algorithm a day</li> <li>6 a day exam questions</li> <li>Revision guides</li> </ul>	



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		<ul style="list-style-type: none"> <li>How an image is represented as a series of pixels, represented in binary</li> <li>Metadata</li> <li>The effect of colour depth and resolution on:               <ul style="list-style-type: none"> <li>The quality of the image</li> <li>The size of an image file</li> </ul> </li> </ul> <p><b>Sound</b></p> <ul style="list-style-type: none"> <li>How sound can be sampled and stored in digital form</li> <li>The effect of sample rate, duration and bit depth on:               <ul style="list-style-type: none"> <li>The playback quality</li> <li>The size of a sound file</li> </ul> </li> </ul> <p><b>Compression</b></p> <ul style="list-style-type: none"> <li>The need for compression</li> <li>Types of compression:               <ul style="list-style-type: none"> <li>Lossy</li> <li>Lossless</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Impacts of digital technology.</li> <li>Legislation</li> <li>Software licenses (i.e., open source and proprietary)</li> </ul>			
<b>SKILLS</b>	<ul style="list-style-type: none"> <li>Evaluation skills</li> <li>Metacognitive practice</li> <li>Exam technique</li> <li>Identifying and selecting information</li> <li>Breaking down key information</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation skills</li> <li>Metacognitive practice</li> <li>Exam technique</li> <li>Identifying and selecting information</li> <li>Breaking down key information</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation skills</li> <li>Metacognitive practice</li> <li>Exam technique</li> <li>Identifying and selecting information</li> <li>Breaking down key information</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation skills</li> <li>Metacognitive practice</li> <li>Exam technique</li> <li>Converting binary to denary</li> <li>Converting denary to binary</li> <li>Converting hex to denary</li> <li>Converting denary to hex</li> <li>Converting hex to binary</li> <li>Converting binary to hex</li> <li>Logical reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation skills</li> <li>Metacognitive practice</li> <li>Exam technique</li> <li>Identifying and selecting information</li> <li>Breaking down key information</li> </ul> <p>Preparations to also include:</p> <ul style="list-style-type: none"> <li>Extended writing</li> <li>Competing tables and graphs</li> <li>Descriptive writing</li> <li>Revision techniques</li> <li>Reading questions</li> </ul>	



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<b>ASSESSMENTS</b>	<p><b>Key Assessment Piece:</b> <b>Baseline Assessment (Paper 1 and Paper 2 will be assessed with RAG checklist)</b> – to identify key focus areas for development during the Autumn/Spring terms. Students will receive a personalised checklist with practice questions by topic.</p> <p><b>Key Assessment Piece:</b> <b>Home Learning 1</b> Exam questions: - 1.4.1 Threats to computer systems and networks Q1-4</p>	<p><b>Key Assessment Piece:</b> Year 11 Mock Exam Students will complete a full paper as part of their mock examinations. Home Study topics will be shared with their class teacher.</p> <p><b>Paper 1 and Paper 2:</b> With exam questions based on networks and sorting/searching algorithms to check understanding from Autumn term</p> <p><b>Key Assessment Piece:</b> <b>Home Learning 4</b> Exam questions: - 2.2 Programming fundamentals Past Papers Q4 (Players table array)</p>	<p><b>Key Assessment Piece:</b> Exam questions: 1.3.1 Networks and Topologies Q8 (DNS) &amp; 12 (Network Protocols)</p> <p><b>Key Assessment Piece:</b> <b>Home Learning 7</b> Exam questions: - 1.6.1 Ethical, legal, cultural and environmental impact Past Papers Q4</p>	<p><b>Key Assessment Piece:</b> <b>Spring Mock Examinations Paper 1 and Paper 2:</b> Students will sit separate Paper 1 and Paper 2 mock exams with their marks recorded. Students will receive a personalised checklist with practice questions by topic. –</p>	<p><b>Key Assessment Piece:</b></p> <ul style="list-style-type: none"> <li>• Walking talking mock x 2</li> <li>• External exams</li> </ul>	
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