

Curriculum Map 2022/23

Subject: GCSE Computer Science

Year Group: 10 (22_23)

Time Period	Autumn Term	Spring Term	Summer Term
Content	<p>2.1 Algorithms</p> <ul style="list-style-type: none"> • Computational thinking • Designing, creating and refining algorithms • Searching and sorting algorithms <p>2.2 Programming Fundamentals (using Python)</p> <ul style="list-style-type: none"> • Programming concepts • Data types • Additional programming techniques 	<p>2.2 Programming Fundamentals (using Python)</p> <ul style="list-style-type: none"> • Programming concepts • Data types • Additional programming techniques <p>1.3 Computer Networks, connections and protocols</p> <ul style="list-style-type: none"> • Networks and topologies • Wired and wireless networks, protocols and layers 	<p>1.4 Network security</p> <ul style="list-style-type: none"> • Threats to computer systems and networks • Identifying and preventing vulnerabilities <p>1.5 System software</p> <ul style="list-style-type: none"> • Operating systems • Utility software
Skills	<p>Students will learn the key cornerstones of computational thinking and how to apply them to planning and solving problems.</p> <p>Students will learn the skills in how to plan, using algorithms, how a program or system will work before they begin to create.</p> <p>Students will build on the programming skills from year 9 with more complex challenges. Students can also apply the skills learnt in unit 2.1 to support them with each challenge.</p>	<p>Students will build on the programming skills from year 9 with more complex challenges. Students can also apply the skills learnt in unit 2.1 to support them with each challenge.</p> <p>Students learn how different aspects of computer networks work, from an abstracted view, and apply the concepts learnt to the real world of communication and data transmission.</p>	<p>Students demonstrate their awareness of real world network threats and how to prevent such threats.</p> <p>Students will gain the understanding of how different operating systems work and the important part the OS plays in a computer system.</p> <p>Students explore different utility software and how they work to maintain the optimal running of a computer system.</p>

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<p>Key Questions</p>	<p>Using abstraction, decomposition and algorithmic thinking to define a problem. Create structure diagrams & flowcharts. How to efficiently search and sort data. Writing algorithms using Python. What are binary, bubble, merge, insertion sorts. How do I identify bugs and fixes? What are trace tables?</p> <p>Using variables, constants, operators, inputs/outputs. Sequences, selection & iteration. Arithmetic, integers, Boolean. Characters & string manipulation, data types and casting. String manipulation & file handling, open, read, write, close. Storing data in records. Using SQL to search for data. Using arrays, sub programs.</p>	<p>What are LANS & WANs? What factors affect the performance of networks? What does client server and peer-to-peer mean? What hardware do you use on a LAN? What is the Internet really? What is a DNS, hosting, the cloud, web server and client mean? What hardware is used in a network? What is a topology? Which is better wired or wireless? What is Ethernet, Wi-Fi and Bluetooth connections and how do they work? Why is cryptography and encryption? What's an IP and MAC address? How do I learn these TCP/IP, HTTP, HTTPS, FTP, POP, IMAP, SMTP, and what are layers?</p>	<p>What forms of attack happen to computers and networks? What's malware, phishing, brute force attacks, DoS and Interception & theft? How to prevent attacks. What is an SQL injection, firewalls, password encryption and security?</p> <p>What are operating systems & interfaces? What is memory, peripheral, user and file management? What is utility software? What is the purpose of encryption, defragmentation and file management & data compression?</p>
<p>Assessment week and content</p>	<p>2.1 Algorithms Mid-term test wb 26/09 End of Unit test wb 17/10</p> <p>2.2 Programming fundamentals Mid-term test wb 05/12</p>	<p>2.2 Programming fundamentals End of Unit test wb /02</p> <p>1.3 Computer Networks, connections and protocols End of Unit test wb 06/02</p>	<p>1.4 Network security End of Unit test wb 27/03</p> <p>1.5 System software Mid-term test wb 08/06 End of Unit test wb 26/06</p>

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