Years 10 & 11 Curriculum
GCSE: Computer Science

Year 10	Term 1 (Autumn)		Term 2 (Spring)		Term 3 (Summer)	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**Programming Techniques**					
	Algorithms **Data Storage**	**Moral, Ethical & Cultural Issues**	**Algorithms** **System Architecture** **Memory**	**Algorithms** **Storage**	**Computational logic** **Sub programs** **Search and Sort Algorithms**	**Producing robust programs** **Software Development - NEA**
Key Concepts	• Variable and constant in an imperative language • Data types integer, real, Boolean, character and string • Manipulate data in variables • Basic maths functions • Outputs the results to the console display • Maths functions +, *, - and / • Handle data in an algorithm • Selection - if and case • Reading in from the keyboard • Problem Solving • Number Bases – Binary and Hex • Binary Addition and shift	• Iteration – For and While • Handling data in algorithms • Use of one-dimensional arrays • Legal, ethical, cultural and environmental issues - Computers in the workforce • Environmental effects of computer technology • Ethical and cultural issues • Privacy	• Writing to and reading from files • Computational thinking – Exam Reference Code • Two dimensional arrays and large data files • Purpose of the CPU • Boot sequence • Factors affecting the performance of a computer • Types of computer systems • Difference between RAM and ROM • Purpose of ROM in a computer system • Purpose of RAM in a computer system • How the amount of RAM in a personal computer affects the performance of the computer • The need for virtual memory and what disk thrashing is	• The need for secondary storage • Calculate data capacity requirements • Common storage technologies such as optical, magnetic and solid state • Suitable storage devices and storage media for a given application, and the advantages and disadvantages of each, using characteristics such as capacity, speed, portability, durability, cost and reliability • Why data is represented in computer systems in binary form	• Produce simple logic diagrams using the operations NOT ¬, AND Λ and OR V • Produce a truth table from a given logic diagram • Combine Boolean operators to two levels • Apply Boolean logical operators in appropriate truth tables to solve problems • Apply computing related mathematics + - / * Exponent MOD DIV • How Boolean logic is used in programming • Why subprograms are needed – advantages • Implementing procedures and functions • Binary and linear Search • Bubble, Insertion and Merge Sort	• Defensive design considerations • Purpose of testing • Types of testing – iterative and final/terminal • How to identify syntax and logical errors • Selecting and using suitable test data. • NEA

Years 10 & 11 Curriculum *(continued)*

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Year 11	Term 1 (Autumn)		Term 2 (Spring)		Term 3 (Summer)	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	**NEA**	**Characters & Images**	**System Software: Operating system** **System Software: Utility System Software** **SQL** **Characteristics and purpose of different levels of programming language, including low level languages**	**Types of Networks**	**Revision & Past Papers**	
Key Concepts		• How binary is used to represent characters – ASCII and Unicode • Images and sound • Compression	• The purpose and functionality of system software - user interface - memory management/multitasking - peripheral management and drivers - user management - file management • Utility system software: - encryption software - defragmentation - data compression – done earlier • Describe the use of records to store data • Describe the use of SQL to search for data • The purpose of translators • The characteristics and advantages/disadvantages of an assembler, a compiler and an interpreter • Integrated Development Environment (IDE): editors, error diagnostics, run-time environment and translators	• LAN (Local Area Network) and WAN (Wide Area Network) • Factors that affect the performance of networks • The different roles of computers in a client-server and a peer-to-peer network • The hardware needed to connect stand-alone computers into a Local Area Network: wireless access points, routers/switches, NIC (Network Interface Controller/Card) and transmission media • The internet as a worldwide collection of computer networks: DNS (Domain Name Server), hosting, the cloud • Star and mesh network topologies • Modes of connection – wired ethernet, wireless WIFI and Bluetooth • The uses of IP addressing, MAC addressing, and protocols including TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (Hyper Text Transfer Protocol), HTTPS (Hyper Text Transfer Protocol Secure), FTP (File Transfer Protocol), POP (Post Office Protocol), IMAP (Internet Message Access Protocol), SMTP (Simple Mail Transfer Protocol) • The concept of layers • Packet switching		

NEA = Non-examined assessment

Years 10 & 11 Assessment
GCSE: Computer Science

All pupils will sit several knowledge tests and a mock examination in Year 10. In Year 11, pupils will sit an assessment and a mock examination.

	Year 10		Year 11		
	Knowledge Tests	**Mock Exam**	**Assessment**	**Mock Exam**	**Revision Resources**
	Autumn/Spring Terms	**Summer Term**	**Autumn Term**	**Spring Term**	*Kennet Resources* • Core Questions • Knowledge Organisers • Learning Habits *External Resources* • www.teach-ict.com • www.bbc.com/bitesize • www.senecalearning.com • eRevision.uk You can also find additional revision material on Frog
Style of Assessment	Each knowledge test will consist of 20 multiple-choice questions	Theory questions Programming Test	Theory questions	Theory questions	
Topics Assessed	• Core knowledge taught until that point in the academic year	• Programming fundamentals & algorithms • Ethical, legal, cultural and environmental concerns • Flow charts & exam reference code, search and sort algorithms • System architecture, memory & storage • Boolean logic & Number Basis	• Programming fundamentals & algorithms • Ethical, legal, cultural & environmental concerns • Flow charts & exam reference code, search & sort algorithms • System architecture, memory & storage • Boolean logic & data representation	• Programming fundamentals & algorithms • Network topologies, protocols & layers & security • System software, producing robust programs, ethical, legal, cultural & environmental concerns • System architecture, memory & storage, languages • Boolean logic & data representation • Programming languages & integrated development environment	

Exam Board: OCR Oxford Cambridge and RSA

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