



Curriculum Plan – Computer Science



Subject: Computer Science

Vision: Influence today, Innovate tomorrow!

Brief overview of topics, themes, skills or key questions for each term:

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	7.1 Introduction: Passwords Logon Email SMHW Safe and effective searching Plagiarism Copyright Hardware Computer systems Networks <i>Accessibility and usability</i>	7.2 E safety: Cyberbullying Social media Netiquette Digital footprint Reporting concerns. <i>To include; Word, PowerPoint, Publisher.</i>	7.3 Spreadsheets: <i>Basic and advanced functions and formulas</i> <i>Representing data</i> <i>Formatting</i>	7.4 Cryptology & Flowol: <i>Sequence</i> <i>Shapes</i> <i>Boolean operators</i>	7.5 Scratch : <i>Sequence-Block based programming</i> <i>(Scratch, Kodu,)</i>	7.6: Introduction to text based programming: (logo, turtle, Python)
8	8.1 HTML (notepad): Input Output Processing	8.2 Web Authoring: (Serif Webplus) E-Safety information Reliability Bias Legislation Plagiarism Ethical issues.	8.3 Python Chatbot: (binary, logic AND OR NOT, list) <i>Selection</i> <i>Iteration</i> <i>Sequence</i>	8.4 Animation & Video editing: File type Frame rate Transition	8.5 Spreadsheets: <i>basic and advanced functions and formulae</i> <i>Formatting</i> <i>What if modelling</i> <i>Vlookup</i> <i>Macros</i>	8.6 Database Flat file: <i>Interrogation</i> <i>Data entry form</i> <i>Multiple criteria queries</i> <i>Data types</i> <i>Simple queries</i> <i>Data entry</i> <i>Simple reports</i> <i>Mail merge (letter to businesses)</i>



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						DPA/GDPR
9	9.1 Bitmap editing: <i>Vector</i> <i>Bitmap</i> <i>File types</i> <i>Compression</i> <i>Resolution</i> <i>RGB</i> <i>CMYK</i>	9.2 Coding-Data representation: <i>Text</i> <i>ASCII</i> <i>Unicode</i> <i>Sounds-audacity</i> <i>Analogue</i> <i>Digital</i> <i>Pictures</i> <i>Metadata</i> <i>Resolution</i> <i>Compression</i>	9.3 Database relational: <i>Key fields</i> <i>Entity relationship</i> <i>Importing data from a text file and a spreadsheet</i> <i>Validation</i> <i>Verification</i> <i>Foreign key</i>	9.4: Python; <i>Searching</i> <i>Linear & Binary</i> <i>Sorting</i> <i>Bubble</i> <i>Merge</i> <i>Text files</i> <i>Array (1D & 2D)</i> <i>Divide & Conquer</i>	9.5 and 9.6: Integrated Project:: <i>Planning</i> <i>Mind maps</i> <i>Gantt charts</i> <i>system life cycles</i> <i>Researching</i> <i>Designing</i> <i>Implementing</i> <i>Evaluating</i> <i>Spreadsheets - Financial Models</i>	



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<p>10 Computer Science</p>	<p>Unit 1 Algorithms</p> <ul style="list-style-type: none"> • Computational Thinking • Searching • Sorting • Flowcharts • Pseudocode <p>Unit 2 Practical programming skills</p> <ul style="list-style-type: none"> • Fundamentals • Sequence • Selection • Iteration 	<p>Unit 1 Networks</p> <ul style="list-style-type: none"> • Internet • WAN • LAN • Wireless networking • Client server • P2P networks • Standards, Protocols & Layers <p>Unit 2 Practical programming skills</p> <ul style="list-style-type: none"> • Arrays • Procedures • Functions • Records • Files 	<p>Unit 1 Network Security & Systems software</p> <ul style="list-style-type: none"> • Network threats • Preventing vulnerabilities • OS • Utility software <p>Unit 2 Computational thinking</p> <ul style="list-style-type: none"> • Algorithms • Program control flow • Handling data • Programming languages • IDE • Testing 	<p>Unit 1 Data Representation</p> <ul style="list-style-type: none"> • Units • Binary numbers • Binary arithmetic • Hexadecimal • Characters • Images • Sound • Compression <p>Unit 2 Logic and Languages</p> <ul style="list-style-type: none"> • Logic diagrams • Truth tables • Defensive design • Errors & Testing • Translators • IDE 	<p>Unit 1 Impacts of digital technology</p> <ul style="list-style-type: none"> • Ethical • Cultural • Environmental • Legislation • Privacy <p>Unit 2 Problem solving</p> <ul style="list-style-type: none"> • Battle of the Bands 	<p>Revision for PPE PPE Problem areas revisited</p>
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10 ICT	<p>Theory: Project management:</p> <ul style="list-style-type: none"> • Systems Lifecycle • SMART targets • Success Criteria • SWOT <p>Practical: Powerpoint skills:</p> <ul style="list-style-type: none"> • Speaker notes • Master slide • Backgrounds • Graphs & Charts • Export • Non linear • Linking objects <p>Database skills:</p> <ul style="list-style-type: none"> • Tables • Queries • Relational • Import data • Data validation 	<p>Theory: Risk management:</p> <ul style="list-style-type: none"> • Logical • Mitigating risks <p>Planning tools</p> <ul style="list-style-type: none"> • Gantt charts • Mind maps • Pert chart • Critical Path • Flow chart • Task List <p>Practical: Database skills:</p> <ul style="list-style-type: none"> • Reports • Queries • Security • Exporting to other applications 	<p>Theory: Data Collection:</p> <ul style="list-style-type: none"> • Biometric • Sensors • Interviews • Questionnaires <p>Practical: DTP skills:</p> <ul style="list-style-type: none"> • Master pages • Booklet design • Business card 	<p>Theory: Communication Methods</p> <ul style="list-style-type: none"> • Audience • Purpose • Social demographics <p>Practical: Spreadsheet skills:</p> <ul style="list-style-type: none"> • Functions • Linking worksheets • What If • Macros • Importing data • Graphs & Charts • Security 	<p>Theory: Revision</p> <p>Practice papers</p> <p>Practical: Integrated presentation- Word</p> <ul style="list-style-type: none"> • Tables • Footnotes • Contents • Mail merge • Macros • Embedding data • Security • Watermarks • Review 	<p>Theory: Exams</p> <p>Practical: Beauty Case Study</p>
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<p>11 Computer Science</p>	<p>Unit 1 Database:</p> <ul style="list-style-type: none"> • Tables, records & fields • Entities & Relationships • Queries & SQL • Data independence • DBMS <p>Unit 2 Practical Programming skills:</p> <ul style="list-style-type: none"> • Fundamentals • Sequence • Selection • Iteration • Arrays • Procedures • Functions • Records • Files 	<p>Unit 1 Networks:</p> <ul style="list-style-type: none"> • Internet • WAN • LAN • Wireless networking • Client server • P2P networks • Standards, Protocols & Layers <p>Unit 2 Computational Thinking:</p> <ul style="list-style-type: none"> • Algorithms • Program control flow • Handling data • Programming languages • IDE • Testing 	<p>Unit 1 System security & software:</p> <ul style="list-style-type: none"> • Network threats • Preventing vulnerabilities • OS • Utility software <p>Unit 2 Logic & Languages</p> <ul style="list-style-type: none"> • Logic diagrams • Truth tables • Defensive design • Errors & Testing • Translators • IDE 	<p>Revision using PLCs and Practice papers</p>	<p>Practice papers</p>	<p>External exams</p>
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11 ICT	R013 Controlled Conditions		R012 Exam paper practice and targeted revision			External examination
	<ul style="list-style-type: none"> • Planning tools • System Life cycle • Risk mitigation • Legislation • Iterative testing 	<ul style="list-style-type: none"> • Importing data files • Data entry forms • Queries • Reports • Business cards • Leaflets 	<ul style="list-style-type: none"> • Selecting information • PPE 	<ul style="list-style-type: none"> • Interactions between stages of life cycle • SMART goals 	<ul style="list-style-type: none"> • Storage methods • Types of threats • Impact of cyber security threats 	
12 Computer Science	Unit 1 Components of a Computer: <ul style="list-style-type: none"> • Processor components • Processor performance • Types of Processor • Input devices • Output devices • Storage devices • Fetch decode execute Systems Software: <ul style="list-style-type: none"> • OS functions • Types of OS • Nature of applications • Programming languages • Assembly code 		Unit 1 Problem Solving and programming: <ul style="list-style-type: none"> • Waterfall life cycle • Agile software • Spiral • RAD Data types, data structures and algorithms: <ul style="list-style-type: none"> • Binary hexadecimal and denary 	Unit 1 Networks: <ul style="list-style-type: none"> • Internet • Internet communication • Security & Threats • HTML & CSS • Javascript • Search engine indexing • Client server • P2P Boolean Algebra: <ul style="list-style-type: none"> • Logic Gates • Boolean expressions • Karnaugh maps 	Unit 1 Ethical, Cultural and Moral issues: <ul style="list-style-type: none"> • Computers in the workplace • Artificial Intelligence • Automated decision making • Analysis of personal information • Privacy Assembly Language LMC	Unit 1 Legislation: <ul style="list-style-type: none"> • Data Protection Act; • Computer Misuse Act • Copyright, Design & Patents Act • Regulation of Investigatory powers Act • Censorship



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	<p>Unit 2 Programming techniques:</p> <ul style="list-style-type: none"> • Programming basics • Selection • Iteration • Subroutines • Recursion • OOPS 	<ul style="list-style-type: none"> • ASCII & Unicode • Binary arithmetic • Floating point • Bitwise manipulation • masks <p>Unit 2 Elements of Computational Thinking</p> <ul style="list-style-type: none"> • parameter passing by value and reference • Identify the components of a solution to a problem 	<ul style="list-style-type: none"> • Adders & D type flip flops <p>Unit 2 Algorithms</p> <ul style="list-style-type: none"> • Analysis & design • Searching • bubble sort, • insertion sort • Merge sort • Quick sort • Graph traversal • Optimisation 	<p>Unit 2 Data structures</p> <ul style="list-style-type: none"> • Arrays • Tuples • Records • Lists & Linked list • Graphs • Stacks • Queues • Trees • Binary search tree • Hash tables 	<p>Unit 2 Object-oriented languages</p> <ul style="list-style-type: none"> • Pygame <p>Unit 3 Practical programming project</p> <ul style="list-style-type: none"> • Analysis • Design
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<p>13 Computer Science</p>	<p>Unit 1 Data Types:</p> <ul style="list-style-type: none"> • Binary • Hex • ASCII / Unicode • Binary arithmetic • Floating point arithmetic • Bitwise manipulation and masks <p>Database:</p> <ul style="list-style-type: none"> • Concepts • Relational • Normalisation <p>Unit 2 Object-oriented languages:</p> <ul style="list-style-type: none"> • classes, • objects, • methods, • attributes, • inheritance, • encapsulation • polymorphism 	<p>Unit 1 Boolean Logic:</p> <ul style="list-style-type: none"> • Logic Gates • Boolean expressions • Karnaugh Maps • Adders & D type flip flops <p>Database:</p> <ul style="list-style-type: none"> • SQL • Transaction processing <p>Unit 2 Algorithms:</p> <ul style="list-style-type: none"> • Analysis & design • Searching • bubble sort, • insertion sort • Merge sort • Quick sort • Graph traversal • Optimisation 	<p>Unit 1 System Software:</p> <ul style="list-style-type: none"> • Translators, Compiler, • Interpreters • Linkers, • Loaders, uses • of libraries <p>Components of Systems</p> <ul style="list-style-type: none"> • Pipelining • Processor performance <p>Unit 2 Software development</p> <ul style="list-style-type: none"> • Modes of addressing 	<p>Topic revision based on PLCs and practice papers</p>	<p>Revision and practice papers</p>	<p>External assessment</p>
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	Unit 3 Practical Programming Project <ul style="list-style-type: none"> • Design 	Unit 3 Practical Programming Project <ul style="list-style-type: none"> • Development • Iterative testing 	Unit 3 Practical Programming Project <ul style="list-style-type: none"> • Testing • Evaluation 			
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Competitions taken part in: E safety (Year 7, October), Game Design (Year 7, Trust, July), FXP (Year 12/13, July), Scratchoff (Year 9, June)

External speakers in/visits out/field: Computer Science clubs Lunchtime organised by Year 12 for KS3; TTA Computer Science trip to London (KS5, November); Elvin Computer Science in Industry; Illuminate; Local businessmen

Exam syllabus followed (GCSE/A level (or equivalent) – if different for different year groups please state: OCR GCSE Year 11 [Computer Science \(9-1\)](#) J276; Year 10 J277

OCR A Level [Computer Science](#) H446, Cambridge National in Information Technologies J808

Any cross-curricular opportunities: ERASMUS+ participation, Contexts for skills in each area

Any further resources you wish children/parents to be directed to?

<https://www.python.org/> . <https://www.bbc.com/education/guides/zts8d2p/revision/1> (Introduction to programming). <https://scratch.mit.edu/>