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	Kodu – selection, sequencing and variables	E-Safefy - inc social media, sexting and legislation	Spreadsheet - modelling	Scratch – sequencing, selection and iteration	Flowol – control, flowcharts and algorithms	Python Turtle – use of a command line
8	Animation – stop frame, sequencing	Python – advancing to chat bot, with logic and binary	Database (flat file) – Interrogation using criteria queries	HTML – hardware and software via web page design	Spreadsheet – functions and linked sheets to extend modelling	Data representation – looking at how sound and image files are processed using logic
9 Computer Science	Group project – • Importance of working as a team • Sharing expertise • Introduction to coding	Unit 1 Computing Hardware; • Input & output devices • Specialist devices • CPU • Storage • Converging technology Unit 2 Introduction to Python • Selection • Flowcharts • Validation	Unit 1 Computing Software; • Application • Utilities • Operating system Unit 2 Introduction to Python • Repetition • Pseudocode	Unit 1 Data Representation • Denary to binary • Binary logic • Characters • Bits/Bytes Unit 2 Introduction to Python • Planning • Trace tables	Unit 1 Data Representation • Hexadecimal • Images • Sound Unit 2 • Testing	Practice controlled assessment

9 ICT	Food Festival integrated project	Theory: System life cycle Presenting information: Artwork-Logo Database • Data collection • Data types • Forms	Theory: Planning tools • Gantt charts • Mind maps Presenting information: DTP-brochures Database • Queries	Theory: Planning tools • Flowchart • Task list Presenting information: • DTP-brochures • Copyright, Designs & Patents Act Database • Reports	Theory: Planning tools • Pert chart • Critical path Presenting information: • Website Database • Data Protection Act	Practice assessment brief
10 Computer Science	Unit 1 Algorithms • Computational Thinking • Searching • Sorting Unit 2 Practical programming skills • Functions • Lists	Unit 1 Systems • CPU Unit 2 CPU simulator • LMC	Unit 1 Ethics • Ethical • Cultural • Other issues Unit 2 Practical programming skills • 2D lists • Reading files	Unit 1 Logic diagrams with truth tables • Logic gates • Defensive design • Errors & testing Unit 2 Practical programming skills • Writing to file • Interrogation of files	Practice Controlled Assessment	Unit 1 Translation • Interpreters • Compilers Unit 2 SQL • Data dictionary • Interrogation using Kahn Academy Revision for PPE
10 ICT	Theory: Systems Lifecycle Spreadsheet: • Terminology • Formulae	Theory: Planning tools • Gantt charts • Mind maps	Theory: Planning tools • Flowchart • Task list Spreadsheet:	Theory: Planning tools • Pert chart • Critical path Spreadsheet:	Theory: Testing tools • Test tables • Test data Spreadsheet:	Practice assessment brief

	• Formatting Database • Data v information	• Visualisation diagrams Spreadsheet: • Absolute values • Data validation Database • Data types • Set up data • file • Forms	• Functions Database • Queries	• Macros • What Ifs Database • Reports	• Import data Database • Data Protection Act	
11 Computer Science	Unit 1 Networks • The internet • Local Area Networks • Wireless networking • Types of networks • Protocols & Layers Unit 2 • Translators • 2-D arrays •	Controlled assessment	Unit 1 Database • Terminology • Entity relationships • Queries & SQL • DBMS Unit 2 LMC • Assembly code • Fetch Decode Execute cycle	Revision using PLCs and topic tests	Practice papers	
12 Computer Science	Unit 1 Software and software development • Types of software • BIOS • OS	Unit 1 Software and software development • Interrupts • Scheduling	Unit 1 Data types, data structures and algorithms • Convert positive integers	Unit 1 Boolean Algebra • Boolean logic • Karnaugh maps Introduction to programming	Unit 1 Legal, moral and cultural issues • Data Protection Act; • Computer Misuse Act	Unit 1 Ethical, moral and cultural issues • Computers in the workplace • Artificial Intelligence

	Characteristics of contemporary processors, input, output and storage devices • RAM v ROM • Virtual memory • Suitable devices Unit 2 Problem solving and programming • Use of an IDE to develop / debug a program • Procedural programming techniques • Programming constructs	• Memory management Characteristics of contemporary processors, input, output and storage devices • CISC vs RISC • fetch-decode-execute cycle • Multicore and parallel systems Unit 2 Problem solving and programming • Functions • Subroutines • Arrays • Recursion	between Binary Hexadecimal and denary • Normalise floating point representation • Character sets Problem solving and programming • Systems life cycle • Agile, Waterfall etc Unit 2 Elements of Computational Thinking • parameter passing by value and reference • Identify the components of a solution to a problem	• Assembly language • Translators, Compiler, Interpreters Web technologies • HTML • CSS • Javascript Unit 2 Algorithms Standard algorithms • bubble sort, • insertion sort • binary search • linear search	• Copyright, Designs and Patents Act; • Regulation of Investigatory Powers Act Unit 2 Data structures • Linked list • Graph (directed, undirected) • Stack • Queue • Tree • Binary search tree • Hash table.	• Environmental effects • automated decision making Unit 2 Object-oriented languages • Pygame Unit 3 Practical programming project • Analysis • Design
13 Computer Science	Unit 1 Networks • Characteristics of networks • Internet structure • Network security and threats • Network hardware • Search engine indexing	Unit 1 Databases • Relational database • Referential integrity • SQL Interpret and modify • ACID • Redundancy Unit 2 Data structures	Unit 2 Applications Generation • Translators, Compiler, Interpreters • Linkers, Loaders, uses of libraries Unit 1 Exchanging Data	Topic revision based on PLCs and practice papers	Revision and practice papers	

	Unit 2 Object-oriented languages • classes, • objects, • methods, • attributes, • inheritance, • encapsulation • polymorphism Unit 3 Practical Programming Project • Final prototype • Testing • Evaluation	• Arrays • Tuples and records • Stacks and Queues • Hash Tables • Lists and Linked lists • Graphs • Trees Unit 3 Practical Programming Project • Updates	• Lossy v lossless compression • Hashing • Transaction processing			

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); Mr S. Elvin Computer Science in Industry; Illuminate T. Merritt, J.Jarvis, Local businessmen (Josh Ayres ECS)

Exam syllabus followed (GCSE/A level (or equivalent) – if different for different year groups please state: OCR GCSE Computer Science (9-1) J276, 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/