Subject Curriculum Overview for Academic Year 2022/2023

Subject: Computer Science	Subject Leader: L Kenvyn	Year Group: 12	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Computational thinking & Programming techniques	• Be able to explain low level languages • Be able to explain high level languages • Be able to describe a wide range of variable types • Be able to describe what an IDE is • Be able to effectively use an IDE • Be able to use simple math functions in C# • Be able to use selection within C# • Be able to use iteration within C# • Be able to use arrays within C# • Be able to use Functions within C# • Can explain the difference between a function and procedure • Be able to plan and build simple programs in C#	Abstraction Decomposition Cashing Input Output Pre-conditions Procedures Sub-procedures Functions Concurrent processing Selection Iteration Array IDE Variable	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
Object Orientated Programming techniques & Unity	• Be able to effectively debug code • Be able to explain Object Orientated programming • Be able to use classes in C# • Be able to define inheritance • Be able to define polymorphism • Be able to define abstraction • Be able to explain what are considered dangerous coding practices and why • Be able to utilise the Unity game engine to produce simple 2D games	Debugging OOP Classes Inheritance Polymorphism Abstraction Unity Visual studio Libraries	

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Subject: Computer Science	Subject Leader: L Kenvyn	Year Group: 12	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Software development & Algorithms	• Be able to explain system analysis methods • Be able to explain programming paradigms • Be able to read and write LMC assembly language • Be able to define big O notation • Be able to explain binary search • Be able to explain linear search • Be able to explain bubble sort • Be able to explain insertion sort • Be able to explain merge sort • Be able to explain quick sort • Be able to carry out graph traversal • Be able to explain A* search • Be able to explain Dijkstra's	Paradigms LMC Assembly language Big O notation Search algorithm Sort algorithm Binary search Linear search Bubble sort Insertion sort Merge sort Quick sort A* search Graph traversal Dijkstra's	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
NEA Introduction	• Understand the rules and regulations of the NEA • Have chosen a programming project for the NEA • Have produced an outline document for the NEA written element • Have started to produce the coded element for the NEA	NEA	
Data types & structures	• Be able to covert to and from binary • Be able to covert to and from Hex • Be able to explain ASCII • Be able to explain UNICODE • Be able to carry out binary arithmetic • Be able to carry out floating point calculations • Be able to explain the difference between lists, queues, and stacks • Be able to explain hash tables	Binary Hex ASCII UNICODE Floating point Lists Queues Stacks Hash tables	

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Subject: Computer Science	Subject Leader: L Kenvyn	Year Group: 12	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Components of a computer	• Be able to explain all the internal components of a CPU • Be able to explain the FDE • Be able to explain the factors the affect processor performance • Be able to explain various types of processors • Can explain a range of input devices • Can explain a range of output devices • Can compare and contracts a range of storage devices	CPU MAR MDR Registers PC ACC Bus FDE cycle	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of unit assessment completed under exam conditions. The assessment will be based on past paper questions. Testing on 60% of content from the unit just covered and 40% of all other topics covered in the subject to date.
Systems software	• Be able to describe the functions of an OS • Able to explain a range of processor scheduling methods • Able to explain a range of OS types • Can explain the differences between open and closed source software • Able to explain how code is translated for computers to be able to execute it	OS Open source Closed source BIOS Drivers Scheduling Interrupts	
Legal, moral, ethical and cultural issues	• Able to explain all the British laws that cover the use of computers • Able to explain who Edward Snowden is • Able to explain the impact the internet has and is having on the world • Able to explain the impact computers are having in the workforce • Able to discuss the ethical implication of AI within a range of life sectors • Able to explain the impact of creating and disposing of computing devices • Able to discuss censorship online • Able to discuss privacy issues created by the internet	Data protection act GDPR Copyright act Censorship Monitoring Artificial intelligence	

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How parents can support learning in the subject this academic year
Students can be supported at home by encouraging them to undertake programming projects on topics that interest them. That could be making mods for a game, or randomiser for what outfit to wear.

Recommended Reading
• Revision of theory topics covered - https://isaaccomputerscience.org/topics/a_level?examBoard=all&stage=all#ocr • Revision guides and questions of theory topics covered - https://www.physicsandmathstutor.com/computer-science-revision/a-level-ocr/ • C# concepts - https://www.w3resource.com/csharp-exercises/

Points to note
All students are provided with a “OCR AS and A-level Computer Science” revision guide at the start of the year 12, for them to take home for revision purposes. The last term of the year is used to recap the subject as a whole, and reteach any areas that the cohort as a whole underperform in that have been identified through assessment.