

Year 12 & 13 Computer Science Paper 1 – Outline Programme of Study

	Year 12 Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Big ideas/ topics	3.1 Fundamentals of programming	3.1 Fundamentals of programming & 3.2 Fundamentals of data structures	3.3 Systematic approach to problem solving & 3.4 Theory of computation	3.1 Fundamentals of programming	Revise/Recap Examinations	4.1 Fundamentals of programming
Key Knowledge	- Programming: Data types, Programming concepts, Exception handling, Returning a value/values from a subroutine, etc. - Procedural-oriented programming	- Data structures and abstract data types - Single- and multi-dimensional arrays (or equivalent)	- Aspects of software development - Abstraction and automation - Following and writing algorithms - Decomposition - Finite state machines (FSMs)	- Continued application of programming techniques to solve various problems. - Preparing for Paper 1 by using previous skeleton programs and preliminary materials.	- Revise Paper 1 - Complete AS Paper 1 exam	- Programming paradigms - Basic concepts of Object-oriented programming - Encapsulation, instantiation and Inheritance
	Year 13 Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Big ideas/ topics	4.1 Fundamentals of programming	4.2 Fundamentals of data structures	4.3 Fundamentals of algorithms	4.4 Theory of computation	Revise/Recap	Examinations
Key Knowledge	- Classes, constructors, properties, etc. - OOP Design Principles, composition and association.	- Queues - Lists - Stacks - Graphs - Trees - Hash tables - Vectors	- Recursive Algorithms - Big-O Notation - Searching & Sorting - Graph Traversal - Optimisation Algorithms - Limits of Computation	- Mealy Machines - Sets - Regular Expressions - Turing Machine - Backus-Naur Form - Reverse Polish Notation	- Preparing for Paper 1 by using previous skeleton programs and preliminary materials. - Revise Paper 1	- Complete A2 Paper 1 exam

Further information and reading list

Exam board: AQA A Level Computer Science 7516/7517: <https://www.aqa.org.uk/subjects/computer-science-and-it/as-and-a-level/computer-science-7516-7517>

Textbook: AQA AS and A Level Computer Science: <https://www.pgonline.co.uk/resources/computer-science/a-level-aqa/aqa-as-and-a-level-textbook/>

Useful websites: Physics and Maths Tutor: <https://www.physicsandmathstutor.com/computer-science-revision/a-level-aqa/>, Isaac Computer Science: https://isaaccomputerscience.org/topics/a_level?examBoard=all&stage=all#aqa, AQA subject specific vocabulary: <https://www.aqa.org.uk/resources/computer-science-and-it/as-and-a-level/computer-science-7516-7517/teach/subject-specific-vocabulary> and AQA command words: <https://www.aqa.org.uk/resources/computer-science-and-it/as-and-a-level/computer-science-7516-7517/teach/command-words>

Ways to support and extend student learning in this subject

Support guidance:

- All lessons and resources are posted to the students Google Classroom for Computer Science. The assignments should be revisited to consolidate knowledge and to revise.
- Learn the subject specific vocabulary: <https://www.aqa.org.uk/resources/computer-science-and-it/as-and-a-level/computer-science-7516-7517/teach/subject-specific-vocabulary>
- Use the Craig 'n' Dave YouTube tutorials on Physics and Maths Tutor to revisit topics and consolidate learning: <https://www.physicsandmathstutor.com/computer-science-revision/a-level-aqa/>

High-achieving guidance:

- Previous exam papers with corresponding answers and commentary are available for students to work through independently on the AQA website: <https://www.aqa.org.uk/subjects/computer-science-and-it/as-and-a-level/computer-science-7516-7517/assessment-resources>
- Further reading and revision tasks can be found with Isaac Computer Science: https://isaaccomputerscience.org/topics/a_level?examBoard=all&stage=all#aqa