

**Kings College Computer Science Department: GCSE Curriculum Overview 2022-23**

**Curriculum Intent:** The Computer Science Department offers a broad curriculum that does the following:

- Explore how Computer Science has an impact on our day-to-day world.
- Understand how Computer Science has grown and developed to be the industry of the future.
- Develop skills in Computer Science to allow access to a broad range of careers.

Our aim is to create inquisitive and critical computer literate students who are able to navigate and understand the power and impact that Computing has on the modern world. We seek to empower students to interpret the code, programs and hardware and understand how these are constructed. We offer pupils a curriculum which is tailored to GCSE success while consistently using modern contemporary resources which are relevant to their lives.

We expose students to a range of wider cultural and technical knowledge from Computing industries including Architecture, Networks, Python and the Ethics in Computing.

Year 9	Term 3
	Module 6 [9 lessons]
	<b>GCSE Computer Science Starter: Introduction to Computer Science and The CPU</b>
<b>Content</b>	<ol style="list-style-type: none"><li>1. Introduction to Computer Science</li><li>2. System Architecture</li><li>3. Architecture of the CPU</li><li>4. Embedded Systems</li><li>5. Von Neumann</li><li>6. Components and function</li><li>7. CPU Performance</li></ol>
<b>Feedback Points</b>	End of unit assessment.
<b>Key Questions</b>	<ol style="list-style-type: none"><li>1. What is Computer Science?</li><li>2. What is the purpose of the CPU?</li><li>3. How does the architecture of the CPU effect performance?</li><li>4. How do the components work together in the CPU?</li></ol>
<b>Direct Vocab Instruction</b>	Purpose, Embedded, Characteristics.
<b>Standardised Homework</b>	Lesson 3 Research Task – How has the CPU evolved? Lesson 6 – Revision Task: Build a PC for £1500

Year 10	Term 1		Term 2		Term 3	
	Module 1 [10 lessons]	Module 2 [10 lessons]	Module 3 [9 lessons]	Module 4 [9 lessons]	Module 5 [9 lessons]	Module 6 [9 lessons]
	Memory and Storage	Computer Networks, connections and protocols.	Network Security Systems software	Ethical, legal, cultural and environmental impacts of digital technology.	Algorithms	Programming fundamentals
<b>Content</b>	<ol style="list-style-type: none"> <li>Primary Storage</li> <li>Secondary storage</li> <li>Units</li> <li>Data Storage</li> <li>Numbers, Characters, Images, Sound, Compression</li> </ol>	<ol style="list-style-type: none"> <li>Networks and topologies</li> <li>Wired and Wireless networks</li> <li>Protocols</li> <li>Layers</li> </ol>	<ol style="list-style-type: none"> <li>Threats to computer systems</li> <li>Threats to networks.</li> <li>Identifying and preventing vulnerabilities.</li> <li>Operating systems</li> <li>Utility software</li> </ol>	<ol style="list-style-type: none"> <li>Ethical issues</li> <li>Legal issues</li> <li>Cultural issues</li> <li>Environmental impact</li> </ol>	<ol style="list-style-type: none"> <li>Computational Thinking</li> <li>Designing creating and refining algorithms</li> <li>Searching and sorting algorithms.</li> </ol>	<ol style="list-style-type: none"> <li>Programming fundamentals</li> <li>Data types</li> <li>Additional programming techniques</li> </ol>
<b>Feedback Points</b>	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.
<b>Key Questions</b>	<ol style="list-style-type: none"> <li>What are the different types of storage?</li> <li>What do they do differently?</li> <li>What are the units used in Computer science?</li> <li>How is information stored in a computer?</li> </ol>	<ol style="list-style-type: none"> <li>How do networks operate?</li> <li>What is a LAN?</li> <li>What is a WAP?</li> <li>How are the networks controlled?</li> <li>Who controls the networks?</li> </ol>	<ol style="list-style-type: none"> <li>What threats are there to modern systems?</li> <li>How is information taken?</li> <li>How is information used?</li> <li>How can we protect our systems?</li> </ol>	<ol style="list-style-type: none"> <li>What are the ethical issues surrounding Computer Science?</li> <li>What are the legal issues and how are they policed?</li> <li>How does society react to issues with AI?</li> <li>What impact does Computer Science have on the environment and how can we protect it?</li> </ol>	<ol style="list-style-type: none"> <li>How do they work?</li> <li>What information do they need?</li> <li>How can they be used to sort information?</li> <li>How can they be used to search for information?</li> </ol>	<ol style="list-style-type: none"> <li>How do we use Python to program?</li> <li>What sort of data can it use?</li> <li>What can we achieve with this software?</li> </ol>
<b>Direct Vocab Instruction</b>	Primary, CPU, RAM, Volatile, BIOS, Firmware.	LAN, WAP, Packet, Router, Switch, NIC.	Phishing, privileges, penetration, encryption, malware.	Principles, digital technology, ethics, moral.	Computational thinking, abstraction, decomposition, algorithmic thinking.	Robust, refine, algorithm, pseudocode, flowchart, variable.
<b>Standardised Homework</b>	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.
Year 11	Term 1		Term 2		Term 3	
	Module 7 [9 lessons]	Module 8 [10 lessons]	Module 9 [9 lessons]	Module 10 [9 lessons]	Module 11 [9 lessons]	
	Producing robust programs	Boolean Logic	Programming languages and Integrated development environments.	20 Hours Practical Programming	GCSE Computer Science Revision Unit 1/2 focus	GCSE Computer Science Revision Unit 1/2 focus
<b>Content</b>	<ol style="list-style-type: none"> <li>Defensive Design</li> <li>Testing</li> </ol>	<ol style="list-style-type: none"> <li>Boolean logic</li> </ol>	<ol style="list-style-type: none"> <li>Languages</li> <li>The integrated development environment (IDE)</li> </ol>	<ol style="list-style-type: none"> <li>Python Programming</li> <li>Testing, refining and developing.</li> </ol>	Revision sessions focusing on all units.	<b>Exams</b>
<b>Feedback Points</b>	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.	Mid unit and end of unit assessment.		
<b>Key Questions</b>	<ol style="list-style-type: none"> <li>How can we create programs to protect us?</li> <li>How do they protect us?</li> <li>How can we test these programs?</li> </ol>	<ol style="list-style-type: none"> <li>How do logic gates work?</li> <li>Difference between AND OR NOT?</li> <li>Explain why data needs to be in binary.</li> </ol>	<ol style="list-style-type: none"> <li>What are the different generations of programming language?</li> <li>What are the differences between high-level and low-level languages.</li> <li>Which transistor is needed and why?</li> <li>What are the benefits of programming at high and low level?</li> </ol>	<ol style="list-style-type: none"> <li>How do we use it create programs?</li> <li>How do the different commands work?</li> <li>How do we debug the programmes?</li> <li>What uses do we have for the program?</li> </ol>		
<b>Direct Vocab Instruction</b>	Sub program, procedure, function, maintainability.	Logic gates, Transistor, Bit, Logic circuit. Truth tables.	1 <sup>st</sup> generation, High Level, Low-level, device driver, debug.	Asset. Import, false, #, while, True.		
<b>Standardised Homework</b>	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.	Teams based homework based on lesson structure.		