



# YEAR 10 GCSE COMPUTER SCIENCE AUTUMN TERM 1 – PAPER 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning - System Architecture

Curriculum Intent	Pupils will be taught the following National Curriculum guidelines this term:
Skills/Assessment Objective Links	<p><b>At the end of this Unit all students should be able to:</b></p> <ul style="list-style-type: none"><li>• Understand the purpose of RAM</li><li>• List various secondary storage devices and storage media</li><li>• Give examples of embedded systems</li></ul> <p><b>Most students will be able to:</b></p> <ul style="list-style-type: none"><li>• Understand the purpose of the CPU including the fetch-execute cycle</li><li>• Describe common CPU components and their function: ALU, CU, Cache, Registers</li><li>• Understand the purpose of ROM</li><li>• Be able to state the differences between RAM and ROM</li><li>• Understand the need for primary storage</li><li>• Understand the need for virtual memory</li><li>• Understand the need for secondary storage</li><li>• Be able to list the common types of storage: optical, magnetic, solid state</li><li>• Choose suitable storage devices and storage media for a given application</li><li>• Describe the advantages and disadvantages of different storage devices and media relating to the following characteristics: capacity, speed, portability, durability, reliability, cost</li><li>• Describe the characteristics of CPUs that affect their performance including clock speed, cache size, number of cores</li><li>• Understand the purpose and characteristics of embedded systems</li></ul> <p><b>Some students will be able to:</b></p> <ul style="list-style-type: none"><li>• Describe how virtual memory is used</li><li>• Accurately evaluate the differences in characteristics between different devices</li><li>• Describe the Von Neumann architecture including: MAR, MDR, Program counter, accumulator</li></ul>
Numeracy	Clock speed, cost, cache size, capacity
Literacy	<p><b>Vocabulary Tier 3:</b> Fetch-execute, CPU, ALU (Arithmetic Logic Unit), CU (control unit), cache, registers, Von Neumann architecture, MAR (Memory Address Register), MDR (Memory Data Register), Program Counter, Accumulator, clock speed, cache size, cores, embedded systems, memory address, Primary storage, RAM, ROM, virtual memory, volatile, non-volatile, secondary storage, optical, magnetic, solid state, drive, disk, hard disk, floppy disk, tape drive, Blu-ray, storage device, storage media</p> <p><b>Vocabulary Tier 2:</b> Capacity, Speed, Portability, Durability, Reliability, Cost, DVD, CD</p> <p><b>Reading:</b> Worksheets, presentations, answer sheets, exam questions, mark scheme, further reading for homework</p> <p><b>Writing:</b> Answer on the worksheet via word</p> <p><b>Oracy:</b> listening and using tier 3 words</p>
Becoming future ready	<p><b>Careers/Employability:</b></p> <ul style="list-style-type: none"><li>▪ Software Architect.</li><li>▪ Data Scientist.</li><li>▪ Machine Learning Engineer.</li><li>▪ Blockchain Developer</li><li>▪ Cybersecurity Engineer.</li><li>▪ Cloud Solutions Architect.</li><li>▪ AI Research Scientist.</li><li>▪ Full-Stack Developer.</li></ul>
Adaptation	Throughout this topic, quality first teaching will provide differentiation:

QFT/SEND Provision	<p><b>By product:</b> Learners are asked to present outcomes in a different way via pieces of writing, targeted questioning, models and drawings and speaking.</p> <p><b>By resource:</b> Worksheets are well presented and accessible. Instructions are clearly outlined and separate from the information so that pupils know where to begin and end. Handouts are differentiated by outcome. Resources used will appeal to the range of preferred learning styles of pupils e.g. visual, auditory or kinesthetic learners. Scaffolding of tasks – word frames.</p> <p><b>By Intervention:</b> By providing different levels of supervision and support</p> <p><b>By Progressive Questioning:</b> Exploring pupils’ understanding through interactive dialogue using Blooms Taxonomy.</p> <p><b>By Grouping:</b> According to prior attainment, gender, social preference, preferred learning style.</p> <p><b>By Task:</b> Pupils identify targets which are meaningful to them via feedback sheets</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson by lesson schemes of work.</p>
Implementation Curriculum Delivery	To be able to:
Learning Outcomes (Knowledge)	<p><b>Topic 1 Architecture of the CPU</b></p> <p>Understand the purpose of the CPU and the fetch-execute cycle</p> <p>Understand the following registers in the Von Neumann architecture:</p> <ul style="list-style-type: none"> <li>o MAR (Memory Address Register)</li> <li>o MDR (Memory Data Register)</li> <li>o Program Counter</li> <li>o Accumulator</li> </ul> <p>Understand common CPU components including:</p> <ul style="list-style-type: none"> <li>o ALU (Arithmetic Logic Unit)</li> <li>o CU (Control Unit)</li> <li>o Cache</li> <li>o Registers</li> </ul> <p><b>Topic 2 CPU performance</b></p> <p>Understand the function of cache in the CPU</p> <p>Describe how common characteristics of CPUs affect their performance including:</p> <ul style="list-style-type: none"> <li>o Clock speed</li> <li>o Cache size</li> <li>o Number of cores</li> </ul> <p>Explain the purpose and give examples of embedded systems</p> <p><b>Topic 3 Memory</b></p> <p>Explain the need for primary storage</p> <p>Describe the difference between RAM and ROM</p> <p>Describe the purpose of RAM and ROM in a computer system</p> <p>Explain the need for virtual memory</p> <p><b>Topic 4 Secondary storage</b></p> <p>Discuss the need for secondary storage including optical, magnetic and solid-state storage</p> <p>Evaluate suitable storage devices and media for a given application using the following characteristics:</p> <ul style="list-style-type: none"> <li>o Capacity</li> <li>o Speed</li> <li>o Portability</li> <li>o Durability</li> <li>o Reliability</li> <li>o Cost</li> </ul> <p>End of unit assessment</p>
Current learning to be developed in the future within:	

<b>Assessment</b>	See assessment maps for formative and summative assessment opportunities.
<b>Impact</b>	<p>Review assessment results and target pupils that require further support via:-</p> <ul style="list-style-type: none"> <li>• Learning conversation</li> <li>• Changing seating plan</li> <li>• Plan lessons to address areas of concern in assessment</li> <li>• Targeted homework based on low performance areas identified in the assessment and marked pieces</li> <li>• Stretch and challenge high ability pupils by identifying ambitious next steps to expand knowledge</li> </ul> <p>Create a feedback sheet for each student  Each student identifies areas of Green, Amber and Red using Mark Assessment on their feedback sheet  Complete NOW task on areas identified as Amber and Red</p>

