

## Colton Hills Community School medium term planning – ICT/Computer Science

<p><b>Topic title:</b> 1.1 The Characteristics of contemporary processors, input, output and storage devices</p>	<p><b>Year: A-Level CS</b>  <b>Term:</b> Autumn</p>	<p><b>Why we teach this:</b> Explores general purpose computers that have stored programs in the same memory space as the data required for them and modern embedded systems. Introduces the core purpose of the Central Processing Unit (CPU), its role in fetching and executing instructions and the components involved. Learners will gain an understanding and knowledge of various types of input, output, storage. This knowledge will be applied to the solution of different problems.</p>	<p><b>Why we teach this here:</b> It looks at the underlying components of a computer and the way they carry out processes and instructions. This will then lead on to topics that cover software and why different types of software are used in general purpose computers.</p>
<p><b>Big questions:</b></p> <ul style="list-style-type: none"> <li>- What is the structure and function of the processor?</li> <li>- What are the different types of processors?</li> <li>- How are the different types of Input, Output, storage devices applied in solutions to different problems?</li> </ul>	<p><b>Builds on previous topics:</b></p> <ul style="list-style-type: none"> <li>- Recap on computer hardware; input/output devices and internal components, taught at GCSE CS Unit 1.1</li> </ul>	<p><b>Links to future topics:</b> 1.2 Software and software development</p> <p>Understanding how the Operating Systems, Application and Utility Software utilise the underlying hardware and the platform influences design decisions when developing software.</p>	
<p><b>Skills developed:</b></p> <ul style="list-style-type: none"> <li>- To be able to research and compare different CPUs and identify key characteristics when selecting one for different scenarios.</li> <li>- Develop their capability, creativity, and knowledge in computer science, digital media, and information technology.</li> </ul>	<p><b>Key knowledge:</b></p> <ul style="list-style-type: none"> <li>- Understand what actions occur at each stage of the fetch-decode-execute cycle</li> <li>- The role/purpose of each component and what it manages, stores, or controls during the fetch-execute-decode cycle.</li> <li>- The purpose of each register and what its contents are.</li> <li>- How does the role of individual registers relate to assembly language programs?</li> <li>- Understanding Von Neumann, Harvard and Contemporary processor architecture.</li> </ul>	<p><b>Key knowledge continued:</b></p> <ul style="list-style-type: none"> <li>- The use of pipelining in a processor to improve efficiency.</li> <li>- Understand the difference between CISC and RISC processors and the use of GPU's</li> <li>- Multicore and parallel systems</li> <li>- The use of different input, output, storage systems, including magnetic, flash and optical devices.</li> <li>- Understanding each of the following characteristics and the effects on system performance when they are changed: <ul style="list-style-type: none"> <li>○ Clock speed</li> <li>○ Cache size</li> <li>○ Number of cores</li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li>- Develop and apply their analytic, problem-solving, design, and computational thinking skills</li> <li>- To construct high level answers to exam type questions</li> </ul>			
<b>Mini/Interim assessments:</b> <ul style="list-style-type: none"> <li>- Exam questions</li> <li>- Kahoot quiz</li> <li>- Retrieval</li> <li>- Class and homework task sheets</li> </ul> <b>Termly summative assessment:</b> <ul style="list-style-type: none"> <li>- End of unit assessment</li> </ul>	<b>Independent study tasks/resources:</b> <ul style="list-style-type: none"> <li>- Revision of keywords and definition</li> <li>- Weekly revision in preparation for retrieval</li> <li>- Set regular Seneca assignments.</li> <li>- Bitesize revision with topic self-tests</li> <li>- Recommended text book(s)</li> </ul>	<b>Key vocabulary 1:</b> <ul style="list-style-type: none"> <li>- CPU/GPU</li> <li>- Registers</li> <li>- Von Neumann</li> <li>- Address/Control/Data bus</li> <li>- Clock Speed</li> <li>- Overclocking</li> <li>- CPU cores</li> <li>- Cache</li> <li>- Fetch-decode-execute.</li> <li>- Embedded system</li> <li>- Virtual storage</li> </ul>	<b>Key vocabulary 2:</b> <ul style="list-style-type: none"> <li>- Pipelining</li> <li>- ALU</li> <li>- Control unit</li> <li>- MAR/MDR</li> <li>- PC/CIR</li> <li>- Assembly language</li> <li>- CISC/RISC</li> <li>- Multicore</li> <li>- Parallel processing</li> <li>- Ram/ROM</li> </ul>
<b>Cultural capital opportunities:</b> <ul style="list-style-type: none"> <li>- Use of cloud collaboration live.</li> <li>- Invest in online resources to give wider access to technology</li> </ul>	<b>Whole school Curricular Concept links:</b> Technological development – to understand the key roles of key hardware in a computer system.		

<u>Week/Phase</u>	<u>Key Features</u>	
1	<b>Small Questions: ...</b>	
	<b>Key Activities/Resources:</b> ...	<b>Retrieval focus:</b> ...  <b>Independent study:</b> ...
2	<b>Small Questions: ...</b>	

	<b>Key Activities/Resources:</b> ...	<b>Retrieval focus:</b> ...  <b>Independent study:</b> ...
3	<b>Small Questions: ...</b>	

	<b>Key Activities/Resources:</b> ...	<b>Retrieval focus:</b> ...  <b>Independent study:</b> ...
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<u>Week/ Phase</u>	<u>Key Features</u>	
	<b>Small Questions: ...</b>	
4	<b>Key Activities/Resources:</b> ...	<b>Retrieval focus:</b> ...  <b>Independent study:</b> ...
	<b>Small Questions: ...</b>	
5	<b>Key Activities/Resources:</b> ...	<b>Retrieval focus:</b> ...  <b>Independent study:</b> ...
6	<b>Small Questions: ...</b>	