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| **Year 12 Term 1**  **A Level Computer Science** | Our mission is to stimulate and challenge our students to excel and provide a desire for lifelong learning and pursue careers in the world of Business, Computing, and ICT. | | | | | |
| **Enquiry Questions: How much accuracy is required in a real-time CPU? Is there any realistic change in which the CPU needs to record data to the nearest millisecond?** | | | | | | |
| |  | | --- | | **Component 01: Computer Systems**  This component will introduce learners to the internal workings of the Central Processing Unit (CPU), the exchange of data and will also look at software development, data types and legal and ethical issues. It is expected that learners will draw on this underpinning content when studying computational thinking, developing programming techniques and devising their own programming approach in the Programming project component (03). Learners will be expected to apply the criteria below in different contexts including current and future uses of the technologies. | | | | | | | |
| **Knowledge**  Students will know about… | **Application/Skills**  Students will be able to… | **Vocabulary** | **Home Learning** | **Assessment** | **Extra Resources**  **Extended Reading** | **Cultural Capital** |
| **1.1 Characteristics of contemporary processors, input, output and storage devices**  **1.1.1 Architecture**  The main component of a computer systems is the CPU. In this unit students will identify the main Parts of a CPU and investigate its components. Students will understand CPU performance factors and the concept of the architecture in how it was designed.  **1.1.2 Types of Processor**  Students will compare the different types of processors designed for various purposes. They will understand the difference between complex and reduced instructions sets and why they co-exist.  **1.1.3 Input Output and Storage**  Students in this unit will look at the bigger picture of other components and how they function within a computer system. | • List the basic internal components of the processor: ALU, Control Unit, registers and buses  • Name the different registers used in the Fetch-Decode-Execute cycle  • List factors which affect the performance of the CPU: clock speed, number of cores, cache  • Explain what is meant by a multicore system and parallel processing  • Describe the uses of RAM, ROM and virtual storage  • Describe typical uses of magnetic, flash and optical storage devices  • Describe the Fetch-Decode-Execute cycle and its effect on registers  • Describe the use of pipelining in a processor to improve efficiency  • Describe von Neumann and Harvard architectures and the advantages and use of each  • Describe how different I/O and storage devices can be applied to the solution of different problems  • Describe features of contemporary processor architecture  • Describe the differences between, and uses of, CISC and RISC architecture  • Explain how system architecture and bus width relates to assembly language programs | * Control Unit * ALU * Registers * Accumulator * Memory Data Register * Memory Address Register * Program Counter * Current Instruction Register * Registers involved * Fetch, decode, execute cycle * Clock speed * Multi-core * Cache * RAM size * GPU * Pipelining * Von Neumann architecture * MAR & MDR * Program Counter * Accumulator * Harvard architecture * CISC * RISC * Pipelining * Array processor * Multi-core * GPU * Magnetic * Optical * Solid State * RAM * DRAM * SRAM * ROM * Virtual storage | High quality Homework set on Google Classrooms  Teach-ICT.com  PG Online – ClearRevise A Level Computer Science | Sub unit tests via Socrative  In-class end of unit written tests | [Teach-ICT.com](https://teach-ict.com/2016/GCSE_Computing/OCR_J277/OCR_J277_home.html)  [Isaac Computer Science](https://isaaccomputerscience.org/topics/gcse?examBoard=all&stage=all#all)  Seneca – [Computer Science](https://app.senecalearning.com/classroom/course/a1ce4570-6e27-11e8-af4b-35cf52f905c2/section/65ac2e24-3b57-4598-b4dc-01e04eddee1b/session)  BBC Bitesize  Hodder Education – Revision Book A Level Computer Science  PG Online - AS and A Level Computer Science | The National Science Museum (free events)  <https://www.sciencemuseum.org.uk/>  The Royal Institute of Science (free events)  <https://www.rigb.org/families/family-fun-days>  **National Museum of Computing, Bletchley Park (Near Milton Keynes)**  <http://www.tnmoc.org/>    <https://www.bletchleypark.org.uk/>  <http://www.codesandciphers.org.uk/bletchleypark/>  (virtual tour)    Centre for Computing History, Cambridge  <http://www.computinghistory.org.uk/> |