Topic: Unit 1.1 Systems Architecture

Key vocabulary:	**Core knowledge questions**	**Powerful knowledge crucial to commit to long term memory**	**Links to previous and future topics**
Accumulator ALU (Arithmetic Logic Unit) Busses Cache Clock Speed Core CU (Control Unit) Embedded System Execute Fetch/Execute GHz Hertz Instruction MAR (Memory Address Register) MDR (Memory Data Register) MHz Processor Program Counter Von Neumann Architecture	1. What is the purpose of the CPU? 2. What actions occur at each stage of the fetch-execute cycle 3. What is the role/purpose of each component and what it manages, stores, or controls during the FDE cycle? 4. What are the common CPU components and their function? (ALU, CU, Cache, Registers) 5. What is the purpose of each register, what does it store (data or address)? 6. What is the difference between storing data and an address? 7. What are the key characteristics of the Von Neumann architecture? (MAR, MDR, PC, ACC) 8. What are common characteristics of: Clock Speed; Cache Size; Number of Cores? 9. What are the effects of changing any of the common characteristics on system performance, either individually or in combination? 10. What are embedded systems? 11. What are the typical characteristics of embedded systems? 12. List a range of different embedded systems	• The CPU carries out instructions and process data ○ CPUs fetch data and instructions from main memory, process/execute and store the result in main memory ○ This process is known as the Fetch-Execute Cycle ○ Clock Speed, Cache Size and Number of Cores have an effect on the performance speed of a processor • Describe the effects of increasing the Clock Speed on the computers performance • Describe the effects of increasing the Cache Size on the computers performance • Describe the effects of increasing the Number of Cores on the computers performance. • Describe the differences between the MAR and the MDR • Describe the differences between the ALU and the CU	• CPUs are covered in Y7 and Y8 • How the CPU processes information is fundamental to Computer Science and will be revisited throughout the course.

We will develop these skills:

Impressive reading	**Impressive speaking**	**Impressive writing**	**Resilience**	**Numeracy via:**	**Digital Literacy via:**	**Employability via:**
Research using the Internet to find relevant and appropriate information about the development of CPUs	Discussion of research findings and answers to processor performance scenarios. Discussion in pairs of the FDE Cycle	Recording research findings appropriately. Writing descriptions of the different stages of the FDE Cycle.	Developing ability to consistently amend and refine work.	Use of Hertz, GHz and MHz to calculate Clock speeds. Use calculations to compare processor performance	Use of the Internet Use of MS Office Suite	Teamwork – working in pairs Flexibility – taking on opinions of others Problem Solving – using information to assess appropriate CPUs

SEND

- Some students may be more aware of processors and different types – using these students as Lead Students
- Differentiated within tasks (Performance of Computers)
- Questioning
- Differentiated Activities
- Flipped Learning resources for students to study either prior to or after lesson
- Peer Assessment / Support on labelling tasks