

CPU and von Neumann Architecture

A		CPU structure		B	Key vocab	
Control Unit		CU	Communicates with the ALU, immediate access store and main memory to perform the functions of the CPU.	Systems Architecture		The way the components of a computer are arranged.
Immediate access store			A collection of registers with specific roles in the CPU	von Neumann architecture		System architecture where the data is stored in the same place as the instructions
1	Accumulator		Stores data to be operated on, or the result of any operation carried out by the ALU	Fetch-Decode-Execute cycle		The cycle followed by the von Neumann architecture
2	Current Instruction Register	CIR	Stores the instruction to be used next	<div>C</div> <div>CPU hardware</div> <div>Bus</div> <div>A connector which transfers data between components. Three types are data, address and control</div> <div>Cache</div> <div>Fast, expensive memory which is loaded from RAM and called by the CPU</div> <div>Clock generator</div> <div>A circuit which produces a square wave, which is the maximum frequency a CPU can perform instructions</div> <div>Core</div> <div>A processing unit which can run simultaneously with others. It will have its own L1 and L2 cache, but share L3 cache and RAM</div> <div>Single-core</div> <div>Only one core</div> <div>Dual-core</div> <div>Two cores</div> <div>Quad-core</div> <div>Four cores</div> <div>Multi-core</div> <div>More than one core</div> <div>Register</div> <div>A section of high speed memory</div>		
3	Memory Address Register	MAR	Stores the address to be used next (all stages)			
4	Memory Data (or Buffer) Register	MDR MBR	Stores data which has been retrieved from or is about to be sent to RAM			
5	Program Counter	PC	Stores the next address in the program (Fetch stage)			
Arithmetic and Logic Unit		ALU	Takes two operands from the Accumulator and an operator from the CIR and returns a single result to the Accumulator			
Central Processing Unit		D	CPU vocab			
Control Unit		Boot Process		Set of instructions required to make the computer start		
Arithmetic Logic Unit		Clock speed		The frequency which the CPU runs at, and the number of instructions which can be processed per second (Hz)		
Immediate Access Store		Overclock		Run the CPU at a higher clock speed than its default		
• Accumulator						
• CIR		• MDR				
• MAR		• PC				