

# Auxiliary Concept: Computer Architecture

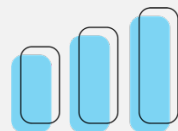
**Engineering Literacy Dimension:** Engineering Knowledge

**Domain:** Engineering Technical Applications

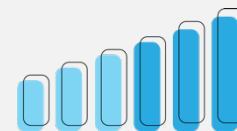
**Overview:** *Computer Architecture* concerns the knowledge related to understanding how a computer's sub-components are organized, and interact with each other, to perform desired functions. This includes the physical components (hardware) and operating instructions (software). The hardware is comprised of the computer system's central processing unit (CPU), memory, input devices, and output devices. The software includes both operating software (the programs that manage the computer's processes, memory, and operation of all other hardware and software) as well as application software (the programs that work with the operating software to perform specific tasks, which includes applications such as word processors, computer aided design programs, and games). *Computer Architecture* is important to Engineering Literacy as computer systems are the heart of all information-processing and communication technologies and perform countless functions related to extending capabilities for calculations, automation, and communication between people and machines across the world and beyond.

## Performance Goal for High School Learners

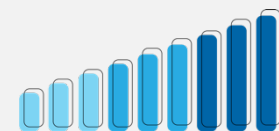
I can, when appropriate, draw upon the knowledge of Computer Architecture content, such as (a) *computer hardware*, (b) *computer operating software and applications*, (c) *processors and microprocessors*, (d) *coding*, and (e) *memory*, to visually represent the how the components of a computer system relate to one another and how to configure the components for desired performance.



Basic



Proficient



Advanced

### COMPUTER HARDWARE

I can identify the major systems in a computer (processor, memory, RAM, motherboard, fan).

I can explain the functions of each major hardware system within a computer.

I can draw a basic block diagram of a full computer system and explain it.

### COMPUTER OPERATING SOFTWARE AND APPLICATIONS

I can identify various software and applications that computers use to perform specific tasks.

I can use various operating systems and software applications to perform various tasks in running a CPU.

I can assess and implement appropriate operating systems and software programs for specific processing needs.

### PROCESSORS & MICROPROCESSORS

I can identify the characteristics (processing power, number of bits, etc.) of a given processor/microprocessor (Arduino, Raspberry Pi, etc.).

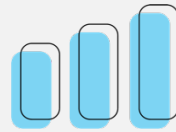
I can explain how a given microprocessor/processor works.

I can implement a given microprocessor/processor in a system of my own design.

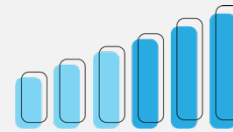
## Auxiliary Concept: Computer Architecture Cont.

### Performance Goal for High School Learners

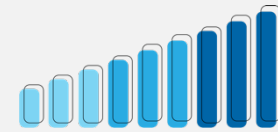
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Basic



Proficient



Advanced

### CODING

I can write pseudo-code for a simple process to run on a microprocessor.

I can write code (any language) for a simple process to run on a microprocessor.

I can write pseudo-code (and then run-able code) for more complex processes to run on a microprocessor.

### MEMORY

I can identify a variety of memory types that can be included in a computer system. (ROM, RAM, etc.).

I can explain the performance of different types of computer memory.

I can determine and justify which type of memory is most appropriate for my design.