Auxiliary Concept: Electronics
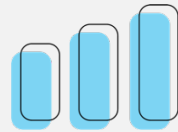
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Engineering Literacy Dimension: Engineering Knowledge
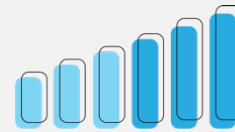**Domain:** Engineering Technical Applications
Overview: *Electronics* are the systems and products that use small amounts of electricity for collecting, storing, retrieving, processing, and communicating data/information necessary to perform a task. This includes creating electrical circuits using both traditional analogue components as well as digital electronic components, microprocessors and microcontrollers, and programmable logic devices. This concept is important to Engineering Literacy as engineering professionals use and apply this knowledge to design and troubleshoot the electronic devices that we use every day.

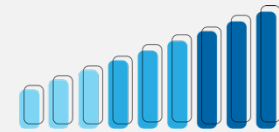## Performance Goal for High School Learners

I can, when appropriate, draw upon the knowledge of Electronics content, such as (a) *electronic instrumentation*, (b) *electronic components (diodes, transistors, resistors, power supplies, capacitors, breadboards, etc.),* (c) *digital logic (integrated circuits, gates, flip-flops, counters, etc.),* and (d) *electrical diagrams/schematics*, to successfully choose different instrumentation, components, and materials to visually represent, analyze, design, and test an electronic device to perform a specific task.

	Basic	Proficient	Advanced
ELECTRONIC INSTRUMENTATION	I can identify different types of electronic instrumentation for circuit analysis (volt meter, oscilloscope).	I can properly use the appropriate instrumentation to analyze my circuit.	I can determine and justify the most appropriate measurements to take with the more appropriate instrumentation for my circuit.
ELECTRONIC COMPONENTS	I can identify different types of electronic components used for circuit analysis (diodes, transistors, resistors, power supplies, capacitors, breadboards, etc.).	I can properly use different types of electronic components for the correct application.	I can justify and determine electronic components to optimize an electric circuit for a specific application.
DIGITAL LOGIC	I can identify the difference between AND, OR, NAND, NOR, and Invertor gates, including drawing their logic tables.	I can draw a logic circuit based on a given Boolean expression.	I can simplify Boolean expressions and logic circuits to use the least number of gate ICs. (i.e. use K-maps, use Boolean algebra, draw multi-logic expression using one gate type, etc.).
ELECTRICAL DIAGRAMS/SCHEMATICS	I can describe and identify an electrical diagram and schematic showing the plan and function for an electrical circuit.	I can draw an electrical diagram and schematic showing the plan and function for an electrical circuit for an appropriate application.	I can assess, create and implement an electrical diagram and schematic showing the plan and function for an electrical circuit for an appropriate application.