

Electronic Technology Criticality Survey - 2014		Nice to Know	Need to Know	Critical to Know	Rating Average	Response Count
<b>Content Standard 1: Safety and Tools</b>						
<b>Performance Standard 1.1: Demonstrate general lab safety rules and procedures</b>						
1.1.1	Describe the physiological reactions electrical shock causes; list various	3	5	7	2.27	15
1.1.2	Describe the roles of OSHA in the workplace	4	9	2	1.87	15
1.1.3	Identify and use proper lifting procedures and proper use of support	0	8	7	2.47	15
1.1.4	Utilize proper ventilation procedures for working within the lab/shop area	0	5	9	2.64	14
1.1.5	Identify marked safety areas	2	6	7	2.33	15
1.1.6	Describe the type and usage of the fire extinguishers	2	8	5	2.20	15
1.1.7	Identify the location of the posted evacuation routes	1	6	8	2.47	15
1.1.8	Explain eye and ear protection needed by technicians, and appropriate clothing for lab/shop activities	0	5	10	2.67	15
1.1.9	Explain the concepts of First Aid and its particular importance to workers in electronic and electronics fields; explain precautions for untrained people	3	8	4	2.07	15
1.1.10	Describe fusing and circuit breaker rules and reasons for different types of fuses	1	10	5	2.25	16
1.1.11	Explain how electrostatic discharge (ESD) damages sensitive electronic components	1	8	6	2.33	15
1.1.12	Demonstrate proper procedures for preventing damage from ESD (ground straps, mats, etc.)	2	8	4	2.14	14
<b>Performance Standard 1.2: Identify and safely utilize tools and equipment</b>						
1.2.1	Identify the appropriate usage of tools and equipment	1	9	5	2.27	15
1.2.2	Demonstrate the proper techniques when using tools and equipment	0	9	6	2.4	15
1.2.3	List tools hazards that are associated with technician activities in the	2	7	6	2.27	15
1.2.4	Demonstrate proper cleaning, storage, and maintenance of tools and	3	10	2	1.93	15
1.2.5	Identify meter protection, safety and usage	1	9	5	2.27	15
1.2.6	Explain care of equipment and test leads	3	10	2	1.93	15
1.2.7	List the purposes and types of signal generators	6	7	2	1.73	15
1.2.8	Describe meter loading and precautions	2	9	4	2.13	15
1.2.9	Describe oscilloscope usage; explain the purpose of each front panel control	4	9	2	1.87	15
<b>Content Standard 2: Electronic Theory</b>						
<b>Performance Standard 2.1: Explain the principles of electronic theory</b>						
2.1.1	Describe the atomic structure, the components of the atom, their charges and importance to electronics technology	8	4	2	1.57	14
2.1.2	Explain the characteristics of voltage, current, and resistance (unit of measure, letter/symbol)	0	7	7	2.5	14
2.1.3	Explain basic uses for electricity	3	5	6	2.21	14
2.1.4	Describe the basic methods of using electricity to operate a motor and how to mechanical motion causes a generator to produce electrical current	2	8	4	2.14	14
2.1.5	List different types of resistive materials and how resistors are used in electronics	3	8	3	2	14
2.1.6	Describe the purposes of capacitors. List common types and construction designs	2	9	3	2.07	14
2.1.7	Explain how inductance relates to magnetism and describe coil construction, cores and usages	2	9	3	2.07	14
2.1.8	Compare impedance with reactance and resistance, and describe current/voltage relationships.	2	9	3	2.07	14
2.1.9	List voltage sources, AC and DC, batteries and natural generation (solar, wind, hydro, etc.)	4	6	4	2	14
2.1.10	List Ohms law formulas for current, voltage, resistance and power. Solve math problems utilizing each	0	4	10	2.71	14
2.1.11	Calculate power consumption and its effects on circuit design	3	6	5	2.14	14
<b>Performance Standard 2.2: Utilize schematics and block diagrams</b>						
2.2.1	Draw and interpret common electrical/electronic symbols	0	8	6	2.43	14

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2.2.2	Explain how block diagrams are used for troubleshooting and maintenance of electronics products	1	10	2	2.08	13
2.2.3	Explain the differences between wiring prints, schematics and block diagrams	1	10	3	2.14	14
2.2.4	Describe the purpose and use of test points.	0	12	2	2.14	14
2.2.5	Explain how schematics are used to locate component and wiring failures in electronics products	0	6	8	2.57	14
2.2.6	Explain the methods of using flow diagrams/charts	5	8	1	1.71	14
2.2.7	Draw common electrical/electronic symbols	2	7	5	2.21	14
2.2.8	Explain how block diagrams are used for troubleshooting and maintenance of electronics products	2	10	2	2	14
2.2.9	Explain the differences between wiring prints, schematics and clock diagrams	2	10	2	2	14
<b>Performance Standards 2.3: Identify basic wiring principles</b>						
2.3.1	List wire types and construction	6	7	1	1.64	14
2.3.2	List American wire gauges used for various purposes	4	9	1	1.79	14
2.3.3	Explain the effects of proper and improper termination	0	9	5	2.36	14
2.3.4	Explain the purposes of grounding and common conventions used in electrical systems and electronics	0	8	6	2.43	14
<b>Content Standard 3: Electronic Components</b>						
<b>Performance Standard 3.1: Identify electronic components</b>						
3.1.1	Illustrate schematic symbols for various types of electrical and electronic components	2	6	5	2.23	13
3.1.2	Recognize the effects of environmental conditions on electronic components	2	10	1	1.92	13
3.1.3	Identify capacitor types; list common usages; methods of varying capacitance and explain the terms charge and coulomb	6	5	2	1.69	13
3.1.4	Identify inductor types and reasons for various core materials; how diameter and wire size affects inductance	7	4	2	1.62	13
3.1.5	Identify common types of transformers and list uses for each; explain step up/down voltage methods; explain why laminations are used	3	8	2	1.92	13
3.1.6	List common optical devices (LEDs, LCDs, etc.) and describe how a photovoltaic cell is activated. Draw symbols for photo resistors, photodiodes and phototransistors; list materials from which these devices are made	5	6	2	1.77	13
<b>Performance Standard 3.2: Analyze quantities utilized in electronics</b>						
3.2.1	Identify and utilize the basic units of electronic measurements	0	7	6	2.46	13
3.2.2	Express and convert numbers in scientific, engineering and metric notation	4	6	3	1.92	13
3.2.3	Convert from scientific notation to engineering notation	6	4	3	1.77	13
3.2.4	Identify resistor values from color code or other marks and list composition and reasons for different usages	1	9	3	2.15	13
<b>Content Standard 4: DC and AC Circuit Configuration</b>						
<b>Performance Standard 4.1: Analyze series circuit configuration</b>						
4.1.1	Identify series circuit configuration	3	2	8	2.38	13
4.1.2	Calculate voltage drops in a series circuit	1	6	6	2.38	13
4.1.3	Utilize Kirchhoff's Voltage Law	2	6	5	2.23	13
4.1.4	Recognize polarity in a series circuit	2	3	8	2.46	13
4.1.5	Calculate voltage, current, resistance, and power in a series circuit	1	6	6	2.38	13
4.1.6	Construct, measure, and analyze simple series circuits	2	5	6	2.31	13
<b>Performance Standard 4.2: Analyze parallel circuit configuration</b>						
4.2.1	Identify parallel circuit configuration	3	2	8	2.38	13
4.2.2	Calculate voltage drops in a parallel circuit	2	5	6	2.31	13
4.2.3	Utilize Kirchhoff's Current Law	2	6	5	2.23	13
4.2.4	Recognize polarity in a parallel circuit	3	3	7	2.31	13
4.2.5	Calculate voltage, current, resistance, and power in a parallel circuit	1	5	7	2.46	13
4.2.6	Construct, measure, and analyze simple parallel circuits	3	4	6	2.23	13

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<b>Performance Standard 4.3: Analyze series-parallel circuit configuration</b>						
4.3.1	Identify series-parallel circuit configuration	2	3	8	2.46	13
4.3.2	Calculate voltage drops in a series-parallel circuit	1	6	6	2.38	13
4.3.3	Utilize Kirchhoff's Voltage and Current Laws where appropriate	2	6	5	2.23	13
4.3.4	Recognize polarity in a series-parallel circuit	2	4	7	2.38	13
4.3.5	Calculate voltage, current, resistance, and power in a series-parallel circuit	1	5	7	2.46	13
4.3.6	Utilize Thevenin's and Norton's theorems	3	5	5	2.15	13
<b>Performance Standard 4.4: Analyze alternating circuits (AC)</b>						
4.4.1	Construct and test AC circuits	1	6	6	2.38	13
4.4.2	Identify AC wave form characteristics: effective voltage (RMS), average voltage, negative alternation, positive alternation, wavelength, amplitude, period, and frequency	2	5	6	2.31	13
4.4.3	Calculate peak, peak-to-peak, RMS, and average voltage values for an AC waveform	2	3	8	2.46	13
4.4.4	Explain cycle, hertz, phase, and frequency	1	5	7	2.46	13
4.4.5	Describe the requirement for inductance in AC electrical circuits (self and mutual inductance)	2	6	5	2.23	13
4.4.6	Compare and contrast reactance, resistance, and impedance	4	4	5	2.08	13
4.4.7	Explain phase relationships for series, and series- parallel RL, RC, and RCL circuits	4	5	4	2	13
4.4.8	Analyze high and low pass filter circuits	5	5	3	1.85	13
<b>Content Standard 5: Digital Electronic Principles</b>						
<b>Performance Standard 5.1: Analyze digital concepts design and circuitry</b>						
5.1.1	Identify and convert numbers between numbering systems (decimal, binary, hexadecimal, BCD)	2	6	5	2.23	13
5.1.2	Compare and contrast between 1 (high) and 0 (low or ground)	2	5	6	2.31	13
5.1.3	Perform numerical calculations in numbering systems (binary, hexadecimal, octal)	4	6	3	1.92	13
5.1.4	Identify and describe basic logic operations (AND, OR, buffer, inverter, NAND)	4	5	4	2	13
5.1.5	Explain Boolean Algebra and its use in digital circuitry	4	6	3	1.92	13
5.1.6	Utilize Karnaugh Maps	8	3	2	1.54	13
5.1.7	Interpret data sheet information	2	7	4	2.15	13
5.1.8	Evaluate logic circuit truth tables	5	5	3	1.85	13
5.1.9	Analyze clock and timing circuit operations	5	5	3	1.85	13
5.1.10	Analyze combinational logic circuits for a given application (relay logic)	4	6	3	1.92	13
5.1.11	Assess the operation of analog-to-digital and digital-to-analog convertors	3	8	2	1.92	13
5.1.12	Describe ASCII code	6	5	2	1.69	13
5.1.13	List the uses and precautions for logic test probes	5	5	3	1.85	13
5.1.14	Explain how logic pulsers are used	6	5	2	1.69	13
<b>Performance Standard 5.2: Utilize microcontroller devices</b>						
5.2.1	Describe basic principles of microcontrollers	3	6	4	2.08	13
5.2.2	Describe the process of executing instructions in a microcontroller	3	7	3	2	13
5.2.3	Draw a flowchart for a typical program or process	6	5	2	1.69	13
5.2.4	Describe the procedure for instruction coding and program debugging	5	6	2	1.77	13
5.2.5	Describe the fundamental principles for microcontroller interfacing	5	6	2	1.77	13
5.2.6	Demonstrate basic wiring procedures for microcontrollers	4	6	2	1.83	12
5.2.7	Write, deploy, and test an original microcontroller program	5	6	2	1.77	13
<b>Content Standard 6: Soldering and Desoldering Techniques</b>						
<b>Performance Standard 6.1: Apply soldering techniques</b>						
6.1.1	Describe solder safety as it pertains to burns and potential fires, damage to facilities or customer products	4	4	5	2.08	13
6.1.2	Explain the causes of solder fumes and the effects of lead poisoning	2	5	6	2.31	13
6.1.3	List causes and precautions to prevent or reduce solder splatter	4	5	4	2	13
6.1.4	Explain the reasons for flux usage and describe types	2	8	3	2.08	13
6.1.5	List types of solder and reasons for choosing each	2	7	4	2.15	13
6.1.6	Explain heat sinks, why and how they are used	1	8	4	2.23	13

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6.1.7	Identify cold solder joints and explain causes	1	8	4	2.23	13
6.1.8	Describe the difference between good and bad mechanical and electrical solder connections	1	9	3	2.15	13
6.1.9	Demonstrate proper care of solder-desolder equipment and aids	3	7	3	2	13
6.1.10	Demonstrate proper soldering techniques for through-hole and surface mount	3	5	5	2.15	13
<b>Performance Standard 6.2: Apply desoldering techniques</b>						
6.2.1	Explain desoldering principles	5	4	4	1.92	13
6.2.2	Describe various types of desoldering equipment and how it is used	4	5	4	2	13
6.2.3	Demonstrate the use of braid-wick and pump solder removers	4	6	3	1.92	13
<b>Content Standard 7: Troubleshooting and Maintenance Techniques</b>						
<b>Performance Standard 7.1: Apply troubleshooting techniques</b>						
7.1.1	Explain troubleshooting techniques	0	5	8	2.62	13
7.1.2	Create and utilize a non-routine task form (job hazard analysis)	2	7	4	2.15	13
7.1.3	Utilize all safety procedures necessary while troubleshooting (lock-out tag-out, etc.)	0	3	10	2.77	13
7.1.4	Select and utilize appropriate tools for electronics troubleshooting	0	6	7	2.54	13
7.1.5	Research various sources of repair/maintenance/troubleshooting documentation (print media, electronic media, tech support, local expert, and manufacturer)	0	8	4	2.33	12
7.1.6	Interpret electronic schematic diagrams	1	2	10	2.69	13
7.1.7	Measure electrical characteristics of voltage, current, and resistance in basic electronic circuits using multimeters, oscilloscopes, logic probes, etc.	1	3	9	2.62	13
<b>Performance Standard 7.2: Demonstrate repair documentation techniques</b>						
7.2.1	Explain the difference between maintenance and repair	3	6	4	2.08	13
7.2.2	Identify the common causes of system and equipment failures	1	10	2	2.08	13
7.2.3	Use electrostatic discharge (ESD) control devices and techniques when handling ESD-sensitive equipment and components	2	7	4	2.15	13
7.2.4	Isolate common faults in wiring and equipment	0	8	5	2.38	13
7.2.5	Identify common preventive maintenance measures (lubrication, housekeeping, alignment, and filters)	1	9	3	2.15	13
7.2.6	Explain the purposes and requirements for proper recordkeeping	1	7	5	2.31	13
7.2.7	Interpret preventative maintenance and inspection schedules	2	7	4	2.15	13