

# ***MANUFACTURING TECHNOLOGIES STANDARDS***



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**VISION**

*All Nevadans ready for success in the 21<sup>st</sup> century*

**MISSION**

*To improve student achievement and educator effectiveness by ensuring opportunities,  
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## BUSINESS AND INDUSTRY VALIDATION

All CTE standards developed through the Nevada Department of Education are validated by business and industry through one or more of the following processes: (1) the standards are developed by a team consisting of business and industry representatives; or (2) a separate review panel was coordinated with industry experts to ensure the standards include the proper content; or (3) the adoption of nationally-recognized standards endorsed by business and industry.

The Manufacturing Technologies standards were validated through active participation of business and industry representatives on the development team and through a complete review by the Nevada Manufacturing Sector Council.

## PROJECT COORDINATOR

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INTRODUCTION

The standards in this document are designed to clearly state what the student should know and be able to do upon completion of an advanced high school Manufacturing Technologies program. These standards are designed for a three-credit course sequence that prepares the student for a technical assessment directly aligned to the standards.

These exit-level standards are designed for the student to complete all standards through their completion of a program of study. These standards are intended to guide curriculum objectives for a program of study.

The standards are organized as follows:

**Content Standards** are general statements that identify major areas of knowledge, understanding, and the skills students are expected to learn in key subject and career areas by the end of the program.

**Performance Standards** follow each content standard. Performance standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

**Performance Indicators** are very specific criteria statements for determining whether a student meets the performance standard. Performance indicators may also be used as learning outcomes, which teachers can identify as they plan their program learning objectives.

The crosswalk and alignment section of the document shows where the performance indicators support the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards) and the English Language Arts and Mathematics (based on the Common Core State Standards). Where correlation with an academic content standard exists, students in the Manufacturing Technologies program perform learning activities that support, either directly or indirectly, achievement of the academic content standards that are listed.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to their program area. CTSOs are co-curricular national associations that directly enforce learning in the CTE classroom through curriculum resources, competitive events, and leadership development. CTSOs provide students the ability to apply academic and technical knowledge, develop communication and teamwork skills, and cultivate leadership skills to ensure college and career readiness.

The Employability Skills for Career Readiness identify the “soft skills” needed to be successful in all careers, and must be taught as an integrated component of all CTE course sequences. These standards are available in a separate document.

The **Standards Reference Code** is only used to identify or align performance indicators listed in the standards to daily lesson plans, curriculum documents, or national standards.

Program Name	Standards Reference Code
Manufacturing Technologies	MANUF

Example: MANUF.2.3.4

Standards	Content Standard	Performance Standard	Performance Indicator
Manufacturing Technologies	2	3	4

**CONTENT STANDARD 1.0 : IDENTIFY LAB ORGANIZATION AND SAFETY PROCEDURES**

**PERFORMANCE STANDARD 1.1 : DEMONSTRATE GENERAL LAB SAFETY RULES AND PROCEDURES**

1.1.1	Describe general shop safety rules and procedures
1.1.2	Demonstrate knowledge of OSHA and its role in workplace safety
1.1.3	Comply with the required use of personal protective equipment (PPE) during lab/shop activities
1.1.4	Utilize safe procedures for handling of tools and equipment
1.1.5	Operate lab equipment according to safety guidelines
1.1.6	Identify and use proper lifting procedures and proper use of support equipment
1.1.7	Utilize proper ventilation procedures for working within the lab/shop area
1.1.8	Identify marked safety areas
1.1.9	Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment
1.1.10	Identify the location and use of eye wash stations
1.1.11	Identify the location of the posted evacuation routes
1.1.12	Identify and wear appropriate clothing for lab/shop activities
1.1.13	Secure hair and jewelry for lab/shop activities
1.1.14	Demonstrate knowledge of the safety aspects of high voltage circuits
1.1.15	Locate and interpret safety data sheets (SDS)
1.1.16	Prepare time or job cards, reports or records
1.1.17	Perform housekeeping duties
1.1.18	Follow verbal instructions to complete work assignments
1.1.19	Follow written instructions to complete work assignments

**PERFORMANCE STANDARD 1.2 : IDENTIFY AND UTILIZE HAND TOOLS**

1.2.1	Identify hand tools and their appropriate usage
1.2.2	Identify standard and metric designation
1.2.3	Demonstrate the proper techniques when using hand tools
1.2.4	Demonstrate safe handling and use of appropriate tools
1.2.5	Demonstrate proper cleaning, storage, and maintenance of tools

**PERFORMANCE STANDARD 1.3 : IDENTIFY AND UTILIZE POWER TOOLS AND EQUIPMENT**

1.3.1	Identify power tools and their appropriate usage
1.3.2	Identify equipment and their appropriate usage
1.3.3	Demonstrate the proper techniques when using power tools and equipment
1.3.4	Demonstrate safe handling and use of appropriate power tools and equipment
1.3.5	Demonstrate proper cleaning, storage, and maintenance of power tools and equipment

**CONTENT STANDARD 2.0 : ANALYZE PROFESSIONAL PRACTICES****PERFORMANCE STANDARD 2.1 : RESEARCH THE HISTORY OF MANUFACTURING**

- |       |  |
|-------|--|
| 2.1.1 | Research and compare manufacturing techniques used throughout history        |
| 2.1.2 | Explain how historical innovations have impacted today's society             |
| 2.1.3 | Describe the significant impacts manufacturing has on the environment        |
| 2.1.4 | Describe the significant impacts governmental policies have on manufacturing |

**PERFORMANCE STANDARD 2.2 : INVESTIGATE CAREER OPPORTUNITIES**

- |       |   |
|-------|---|
| 2.2.1 | Discuss various career opportunities in the manufacturing industry                                      |
| 2.2.2 | Differentiate between the relationships of all stakeholders involved in the manufacturing process       |
| 2.2.3 | Identify the primary duties and attributes of all stakeholders involved in the manufacturing process    |
| 2.2.4 | Describe the traditional career path needed for all stakeholders involved in the manufacturing industry |

**PERFORMANCE STANDARD 2.3 : ANALYZE PROFESSIONAL ETHICAL PRACTICES**

- |       |   |
|-------|---|
| 2.3.1 | Analyze current professional code of ethics             |
| 2.3.2 | Analyze ethical manufacturing issues                    |
| 2.3.3 | Describe how ethics influence the manufacturing process |

**CONTENT STANDARD 3.0 : APPLY FUNDAMENTAL ENGINEERING SKILLS**

**PERFORMANCE STANDARD 3.1 : DEMONSTRATE PRINT READING PRACTICES**

- 3.1.1 Interpret basic elements of a technical drawing (e.g., title block information, dimensions, line types, and 1<sup>st</sup> and 3<sup>rd</sup> angle projection)
- 3.1.2 Identify industry standard symbols (i.e., hydraulic, pneumatic, electrical, welding, and mechanical)
- 3.1.3 Prepare a materials list from a technical drawing
- 3.1.4 Describe various types of drawings (i.e., part, assembly, pictorial, orthographic, isometric, and schematic)
- 3.1.5 Understand dimensioning, sectional drawings, fasteners, tables, charts, and assembly drawings

**PERFORMANCE STANDARD 3.2 : UTILIZE MATHEMATICAL OPERATIONS AND MEASURING TECHNIQUES**

- 3.2.1 Identify industry standard units of measure
- 3.2.2 Convert between customary (i.e., SAE and Imperial) and metric units
- 3.2.3 Determine and apply the equivalence between fractions and decimals
- 3.2.4 Demonstrate proper use of precision measuring tools (i.e., micrometer, dial-indicator, and dial-caliper)
- 3.2.5 Utilize measurement systems to solve real manufacturing problems

**PERFORMANCE STANDARD 3.3 : DEMONSTRATE SPATIAL REASONING AND 3D MODELING TECHNIQUES**

- 3.3.1 Define spatial reasoning
- 3.3.2 Identify spatial reasoning techniques (e.g., mapping, rotating, matching, patterning, and counting)
- 3.3.3 Utilize spatial reasoning techniques to solve design problems
- 3.3.4 Prepare freehand sketches utilizing appropriate proportions
- 3.3.5 Utilize 3D modeling software to solve manufacturing design problems

**PERFORMANCE STANDARD 3.4 : UTILIZE MANUFACTURING COMMUNICATION TOOLS**

- 3.4.1 Utilize informational resources useful in manufacturing
- 3.4.2 Utilize technical writing/reading techniques to communicate
- 3.4.3 Demonstrate the use of office software to perform communication tasks

**CONTENT STANDARD 4.0 : APPLY FUNDAMENTAL POWER SYSTEM PRINCIPLES****PERFORMANCE STANDARD 4.1 : IDENTIFY POWER SYSTEMS**

- |       |   |
|-------|---|
| 4.1.1 | Define terms used in power systems (e.g., power, work, horsepower, and watts) |
| 4.1.2 | Identify the basic power systems  |
| 4.1.3 | List the basic elements of power systems                                      |
| 4.1.4 | Summarize the advantages and disadvantages of various forms of power          |
| 4.1.5 | Define potential and kinetic energy   |
| 4.1.6 | Identify forms of potential and kinetic energy                                |
| 4.1.7 | Calculate the efficiency of power systems and conversion devices              |
| 4.1.8 | Demonstrate the use of an energy conversion device                            |

**PERFORMANCE STANDARD 4.2 : IDENTIFY AND UTILIZE BASIC MECHANICAL SYSTEMS**

- |       |   |
|-------|---|
| 4.2.1 | Locate and explain examples of the six simple machines, their attributes and components |
| 4.2.2 | Measure forces and distances related to mechanisms                                      |
| 4.2.3 | Calculate mechanical advantage  |
| 4.2.4 | Design, construct, and test various basic mechanical systems                            |

**PERFORMANCE STANDARD 4.3 : IDENTIFY AND UTILIZE BASIC ELECTRICAL SYSTEMS**

- |       |   |
|-------|---|
| 4.3.1 | Define AC and DC electrical systems and terminology   |
| 4.3.2 | Discuss the safety concerns of working with electricity                                       |
| 4.3.3 | Describe the principles of generation, transmission, distribution, and storage of electricity |
| 4.3.4 | Compute values of current, resistance, and voltage using Ohm's law                            |
| 4.3.5 | Identify series, parallel and series-parallel (combination) circuits                          |
| 4.3.6 | Solve series and parallel circuits using basic laws of electricity including Kirchhoff's laws |
| 4.3.7 | Introduce single-phase and three-phase AC power   |
| 4.3.8 | Construct and test simple electrical circuits from a schematic                                |

**PERFORMANCE STANDARD 4.4 : IDENTIFY AND UTILIZE BASIC FLUID SYSTEMS**

- |       |  |
|-------|--|
| 4.4.1 | Define fluid systems (e.g., hydraulic, pneumatic, and vacuum)                |
| 4.4.2 | Identify and define the components of fluid systems                          |
| 4.4.3 | Compare and contrast hydraulic and pneumatic systems                         |
| 4.4.4 | Identify the advantages and disadvantages of using fluid power systems       |
| 4.4.5 | Explain the difference between gauge pressure and absolute pressure          |
| 4.4.6 | Discuss the safety concerns of working with liquids and gases under pressure |
| 4.4.7 | Calculate mechanical advantage using Pascal's law                            |
| 4.4.8 | Calculate values in a pneumatic system, using the ideal gas laws             |
| 4.4.9 | Design, construct, and test various fluid systems                            |

**CONTENT STANDARD 5.0 : IDENTIFY AND APPLY MANUFACTURING PROCESSES**

**PERFORMANCE STANDARD 5.1 : IDENTIFY BASIC MANUFACTURING SYSTEMS**

- 5.1.1 Identify the basic processes, systems, design processes, and materials used in manufacturing
- 5.1.2 Identify and describe the major manufacturing processes
- 5.1.3 Conduct reverse engineering processes to describe the process and materials used to manufacture a given product
- 5.1.4 Describe how different manufacturing processes can be used to produce similar products

**PERFORMANCE STANDARD 5.2 : IDENTIFY MATERIAL PROPERTIES AND SCIENCE**

- 5.2.1 Identify the major material families used in manufacturing
- 5.2.2 Differentiate between the various types of materials and their usage in specific applications
- 5.2.3 Discuss the impact of material usage on the environment
- 5.2.4 Explain how production is affected by the availability, quality, and quantity of resources
- 5.2.5 Differentiate among a raw material standard stock and finished products
- 5.2.6 Analyze the effects of the environmental conditions and manufacturing processes on material properties

**PERFORMANCE STANDARD 5.3 : APPLY ADDITIVE MANUFACTURING PROCESSES**

- 5.3.1 Identify and describe additive manufacturing processes (e.g., casting, molding, and 3D printing)
- 5.3.2 Develop a list of additive operations and identify the sequence needed to make a specific product
- 5.3.3 Construct a 3D model utilizing a design software
- 5.3.4 Print a 3D model utilizing the additive process
- 5.3.5 Research plating and finishing techniques and their uses as an additive process

**PERFORMANCE STANDARD 5.4 : DEMONSTRATE SUBTRACTIVE MANUFACTURING PROCESSES**

- 5.4.1 Identify and describe subtractive manufacturing processes
- 5.4.2 Explain the computer numerical control (CNC) processes and software requirements (e.g., Cartesian coordinates, numeric code, machine code, and import/export programs)
- 5.4.3 Perform safety inspections of subtractive equipment and accessories
- 5.4.4 Demonstrate the ability to use manual and computer numerical control subtractive equipment (e.g., oxy-fuel cutting, plasma cutting, mills, lathes, drill presses, saws, routers, and grinders)
- 5.4.5 Determine appropriate tooling, cutting speeds, and feed rates
- 5.4.6 Develop a list of manual material-cutting operations and identify the sequence needed to make a specific product
- 5.4.7 Utilize manual subtractive equipment to produce a specific product
- 5.4.8 Develop a list of CNC material-cutting operations and identify the sequence needed to make a specific product
- 5.4.9 Utilize a model or drawing to develop and adjust a CNC tool path
- 5.4.10 Utilize CNC subtractive equipment to produce a specific product

**PERFORMANCE STANDARD 5.5 : UTILIZE JOINING AND FASTENING MANUFACTURING PROCESSES**

- |       |  |
|-------|--|
| 5.5.1 | Identify and describe joining processes (e.g., forming, forging, and welding)              |
| 5.5.2 | Demonstrate the ability to utilize various mechanical and permanent joining processes      |
| 5.5.3 | Perform safety inspections of welding equipment and accessories                            |
| 5.5.4 | Demonstrate the ability to set-up and operate welding equipment (i.e., SMAW and GMAW)      |
| 5.5.5 | Demonstrate proper fit-up and completion of a welded joint                                 |
| 5.5.6 | Identify various fastening methods (e.g., rivets, adhesive, screws, seams, and spot welds) |
| 5.5.7 | Categorize fastening methods by appropriate applications                                   |
| 5.5.8 | Demonstrate fastening methods on various materials   |
| 5.5.9 | Manufacture a product utilizing joining and fastening processes                            |

**PERFORMANCE STANDARD 5.6 : RESEARCH BUSINESS OPERATIONS AND QUALITY CONTROL**

- |       |   |
|-------|---|
| 5.6.1 | Describe the business cycle of manufacturing operations                         |
| 5.6.2 | Discuss the different types of production systems                               |
| 5.6.3 | Discuss the various manufacturing markets (e.g., local, domestic, and global)   |
| 5.6.4 | Describe Lean manufacturing and explain its importance                          |
| 5.6.5 | Describe Just-in-Time systems   |
| 5.6.6 | Identify and describe the importance of shift to shift communications           |
| 5.6.7 | Investigate the importance of quality assurance systems                         |
| 5.6.8 | Research quality control testing methods (e.g., destructive and nondestructive) |

**CONTENT STANDARD 6.0 : APPLY FUNDAMENTAL ELECTRONIC AND INSTRUMENTATION PRINCIPLES**

**PERFORMANCE STANDARD 6.1 : DEMONSTRATE ANALOG AND DIGITAL ELECTRONIC PRINCIPLES**

6.1.1	Demonstrate safe use of electricity and lab equipment
6.1.2	Understand and demonstrate basic electronic theory
6.1.3	Identify electronic components and their applications (e.g., resistors, capacitors, inductors, and transformers)
6.1.4	Utilize tools and test equipment appropriately
6.1.5	Measure electrical characteristics of voltage, current, and resistance in basic electronic circuits using multi-meters and oscilloscopes
6.1.6	Verify Ohm’s law and power equations
6.1.7	Construct, measure, and analyze simple series, parallel, and series-parallel (combination) circuits
6.1.8	Demonstrate appropriate solder and de-solder techniques for electronics and electrical circuits
6.1.9	Demonstrate appropriate use of various connectors
6.1.10	Construct a simple AC circuit using passive components (i.e., resistors, inductors, and capacitors)
6.1.11	Construct a simple AC circuit using active components (i.e., diodes, transistors, and linear devices)
6.1.12	Demonstrate the appropriate use of relays and switches
6.1.13	Build electronic circuits utilizing basic TTL logic with AND, OR, NAND, NOR, buffer and inverter chips

**PERFORMANCE STANDARD 6.2 : DEMONSTRATE CONTROL TECHNOLOGY AND AUTOMATION PRINCIPLES**

6.2.1	Research the history and fundamentals of automation and control systems
6.2.2	Identify applications of control logic
6.2.3	Distinguish between programmable controllers, their components, and their functions
6.2.4	Interpret programming diagrams (e.g., flow charts)
6.2.5	Sketch programming diagrams for real world applications
6.2.6	Program ladder logic statements to perform a specific task
6.2.7	Develop ladder/relay logic application use for a programmable logic controller (PLC) to control industry specific processes
6.2.8	Select the most appropriate type of circuit logic for each application
6.2.9	Understand varying types of hardware used throughout the industry
6.2.10	Apply suitable commands for PLC circuits
6.2.11	Apply timer and counter principles to industry-related problems
6.2.12	Setup and test PLCs
6.2.13	Understand and select proper communication drivers to interface with a PLC system
6.2.14	Troubleshoot issues with PLCs
6.2.15	Perform basic maintenance with PLCs

**PERFORMANCE STANDARD 6.3 : DEMONSTRATE DIAGNOSTIC AND TROUBLESHOOTING PRACTICES**

- |        |   |
|--------|---|
| 6.3.1  | Explain a diagnostic procedure  |
| 6.3.2  | Identify the components of a safety procedure checklist   |
| 6.3.3  | Utilize all safety procedures necessary before performing a repair (e.g., lock-out/tag-out)   |
| 6.3.4  | Navigate through user software  |
| 6.3.5  | Understand and use software instructions offered in user software   |
| 6.3.6  | Develop a routine maintenance plan  |
| 6.3.7  | Utilize various repair, maintenance, and troubleshooting resources (e.g., print media, electronic, tech support, and local experts) |
| 6.3.8  | Use manufacturer's documentation for troubleshooting  |
| 6.3.9  | Utilize diagnostic tools appropriately  |
| 6.3.10 | Troubleshoot and repair common problems   |

**CROSSWALKS AND ALIGNMENTS OF  
MANUFACTURING TECHNOLOGIES STANDARDS  
AND THE NEVADA ACADEMIC CONTENT STANDARDS  
AND THE COMMON CAREER TECHNICAL CORE STANDARDS**

**CROSSWALKS (ACADEMIC STANDARDS)**

The crosswalk of the Manufacturing Technologies Standards shows links to the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards – Disciplinary Core Ideas Arrangement) and the English Language Arts and Mathematics (based on the Common Core State Standards). The crosswalk identifies the performance indicators in which the learning objectives in the Manufacturing Technologies program support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in Science, English Language Arts, and Mathematics.

**ALIGNMENTS (MATHEMATICAL PRACTICES)**

In addition to correlation with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Manufacturing Technologies Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Manufacturing Technologies program support academic learning.

**CROSSWALKS (COMMON CAREER TECHNICAL CORE)**

The crosswalk of the Manufacturing Technologies Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Manufacturing Technologies program support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Manufacturing Technologies Standards are crosswalked to the Manufacturing Career Cluster™ and the Production Career Pathway.

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**CROSSWALK OF MANUFACTURING TECHNOLOGIES STANDARDS  
AND THE NEVADA ACADEMIC CONTENT STANDARDS**

**CONTENT STANDARD 1.0: IDENTIFY LAB ORGANIZATION AND SAFETY PROCEDURES**

Performance Indicators	Nevada Academic Content Standards
1.1.1	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
1.1.2	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.</p>
1.1.9	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
1.1.15	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>RST.11-12.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
1.1.16	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>

1.1.18	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1d Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>
1.1.19	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>

CONTENT STANDARD 2.0: ANALYZE PROFESSIONAL PRACTICES

Performance Indicators	Nevada Academic Content Standards
2.1.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.1.2	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.</p>
2.1.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.1.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.2.1	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.</p>
2.2.2	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>

2.2.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.3.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.3.2	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
2.3.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>

**CONTENT STANDARD 3.0: APPLY FUNDAMENTAL ENGINEERING SKILLS**

Performance Indicators	Nevada Academic Content Standards
3.1.1	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>
3.1.2	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>
3.1.3	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
3.1.4	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
3.3.3	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b>                      RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
3.4.1	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
3.4.2	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
3.4.3	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>

## CONTENT STANDARD 4.0: APPLY FUNDAMENTAL POWER SYSTEM PRINCIPLES

Performance Indicators	Nevada Academic Content Standards
4.1.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
4.1.8	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
4.2.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
4.2.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
4.3.2	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.</p> <p>SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
4.3.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>

4.3.8	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
4.4.3	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
4.4.5	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
4.4.6	<p><b>English Language Arts: Speaking and Listening Standards</b>                      SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.</p> <p>SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
4.4.9	<p><b>English Language Arts: Reading Standards for Literacy</b>                      RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>

## CONTENT STANDARD 5.0: IDENTIFY AND APPLY MANUFACTURING PROCESSES

Performance Indicators	Nevada Academic Content Standards
5.1.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
5.1.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
5.2.2	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p>
5.2.3	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.</p> <p>SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
5.2.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
5.2.5	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p>

5.2.6	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
5.3.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
5.3.2	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
5.3.5	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
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5.4.2	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
5.4.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
5.4.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>

5.4.5	<b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
5.4.6	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5.4.8	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5.4.9	<b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b> RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
5.5.1	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. <b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.5.2	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5.5.3	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
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5.5.5	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5.5.7	<b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5.5.8	<b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

<p>5.6.1</p>	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
<p>5.6.2</p>	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.</p>
<p>5.6.3</p>	<p><b>English Language Arts: Speaking and Listening Standards</b> SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.</p>
<p>5.6.4</p>	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
<p>5.6.5</p>	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
<p>5.6.7</p>	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>

5.6.8	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
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CONTENT STANDARD 6.0: APPLY FUNDAMENTAL ELECTRONIC AND INSTRUMENTATION PRINCIPLES

Performance Indicators	Nevada Academic Content Standards
6.1.6	<p><b>Math: Algebra – Creating Equations</b> A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p><b>Math: Algebra – Reasoning with Equations and Inequalities</b> A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>Math: Functions – Linear, Quadratic, and Exponential Models</b> F-LE.5 Interpret the parameters in a linear or exponential function in terms of a context.</p>
6.1.7	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.1.10	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.1.11	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.2.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
6.2.4	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
6.2.6	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.2.12	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.2.14	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>

6.3.1	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
6.3.3	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>
6.3.8	<p><b>English Language Arts: Reading Standards for Literacy</b> RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>

**ALIGNMENT OF MANUFACTURING TECHNOLOGIES STANDARDS  
AND THE MATHEMATICAL PRACTICES**

Mathematical Practices	Manufacturing Technologies Performance Indicators
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	4.1.7; 4.2.2, 4.2.3; 4.3.4, 4.3.6; 4.4.7, 4.4.8 6.1.6
3. Construct viable arguments and critique the reasoning of others.	6.1.6, 6.1.7
4. Model with mathematics.	
5. Use appropriate tools strategically.	3.2.2, 3.2.3, 3.2.4, 3.2.5; 3.3.3, 3.3.5 4.1.7; 4.2.2, 4.2.3; 4.3.4, 4.3.6; 4.4.7, 4.4.8 6.1.5, 6.1.7; 6.2.11
6. Attend to precision.	3.2.2, 3.2.3, 3.2.5; 3.3.3, 3.3.5 4.1.7; 4.2.2, 4.2.3; 4.3.4, 4.3.6; 4.4.7, 4.4.8 6.1.5, 6.1.6
7. Look for and make use of structure.	4.1.7
8. Look for and express regularity in repeated reasoning.	3.3.3

**CROSSWALKS OF MANUFACTURING TECHNOLOGIES STANDARDS  
AND THE COMMON CAREER TECHNICAL CORE**

<b>Manufacturing Career Cluster™ (MN)</b>	<b>Performance Indicators</b>
1. Evaluate the nature and scope of the Manufacturing Career Cluster™ and the role of manufacturing in society and in the economy.	5.2.4, 5.2.3
2. Analyze and summarize how manufacturing businesses improve performance.	5.6.1 - 5.6.8
3. Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.	1.1.1 - 1.1.19 5.4.3; 5.5.3
4. Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.	2.2.1 - 2.2.4
5. Describe government policies and industry standards that apply to manufacturing.	2.1.4
6. Demonstrate workplace knowledge and skills common to manufacturing.	5.2.1 - 5.5.9

<b>Production Career Pathway (MN-PRO)</b>	<b>Performance Indicators</b>
1. Diagnose production process problems and take corrective action to meet production quality standards.	5.6.7, 5.6.8
2. Manage safe and healthy production working conditions and environmental risks.	1.1.1 - 1.1.19
3. Make continuous improvement recommendations based on results of production process audits and inspections.	5.6.7
4. Coordinate work teams when producing products to enhance production process and performance.	5.6.6
5. Demonstrate the safe use of manufacturing equipment.	1.1.4; 1.3.3, 1.3.4