# *AUTOMATION TECHNOLOGY STANDARDS*


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*All Nevadans ready for success in the 21st century*

## MISSION

*To improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence*

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## STANDARDS DEVELOPMENT MEMBERS

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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 Automation Technology standards were validated through a complete review by an industry panel.

## 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 Automation Technology 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 in English Language Arts and Mathematics (based on the Common Core State Standards). Where correlation with an academic content standard exists, students in the Automation Technology 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 the Automation Technology program. 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: Automation Technology Standards Reference Code: **AT**

Example: AT.2.3.4

| Standards | Content Standard | Performance Standard | Performance Indicator |
|---|---|---|---|
| Automation Technology | 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/low 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 : INTRODUCTION TO AUTOMATION

### PERFORMANCE STANDARD 2.1 : DESCRIBE THE HISTORY OF AUTOMATION

- 2.1.1 Define automation and industry standard vocabulary
- 2.1.2 Identify automation achievements throughout history
- 2.1.3 Research how historical periods and regional styles have influenced the use of automation

### PERFORMANCE STANDARD 2.2 : INVESTIGATE RELATED CAREERS IN AUTOMATION

- 2.2.1 Investigate automation careers, training options, and associated opportunities
- 2.2.2 Describe the difference between automation disciplines and job functions
- 2.2.3 Research the various types of engineering careers (e.g., chemical, civil, electrical, mechanical)

### PERFORMANCE STANDARD 2.3 : ANALYZE ETHICS IN AUTOMATION

- 2.3.1 Analyze current professional automation codes of ethics
- 2.3.2 Analyze ethical automation issues
- 2.3.3 Analyze and explain ethical and technical issues contributing to an automation incident
- 2.3.4 Describe how ethics influence the automation process

### PERFORMANCE STANDARD 2.4 : INTERPRET SCHEMATICS AND TECHNICAL DRAWINGS

- 2.4.1 Identify industrial standard symbols (i.e., fluid power, electrical, mechanical)
- 2.4.2 Interpret schematics and technical drawings
- 2.4.3 Create schematic diagrams using proper symbols
- 2.4.4 Understand the general redline process for changing schematics/drawings

### PERFORMANCE STANDARD 2.5 : INVESTIGATE THE ENGINEERING DESIGN PROCESS

- 2.5.1 Identify the engineering design process
- 2.5.2 Identify the activities that occur during each phase of the engineering design process
- 2.5.3 Utilize office software to perform engineering recordkeeping and communication
- 2.5.4 Describe the importance of engineering teams
- 2.5.5 Apply the steps of the engineering design process to solve a variety of design problems employing a core physics perspective

| PERFORMANCE STANDARD 2.6 : INVESTIGATE MATERIALS USED IN AUTOMATION SYSTEMS |
|---|
| 2.6.1 Discuss the importance of material selection in an automated system |
| 2.6.2 Identify the major material families (e.g., wood, glass, metal, plastic) |
| 2.6.3 Differentiate between the various types of materials and their properties (e.g., mechanical, physical, chemical) |
| 2.6.4 Discuss the impact of material usage on the environment |
| **PERFORMANCE STANDARD 2.7 : IDENTIFY FUNDAMENTAL AUTOMATION COMPONENTS AND SYSTEMS** |
| 2.7.1 Identify common automation systems |
| 2.7.2 Identify common components in automation systems |
| 2.7.3 Describe the function of components in automation systems |
| 2.7.4 Examine the functions of an industrial network |
| 2.7.5 Analyze the application of automation in various industries |

## CONTENT STANDARD 3.0 : ELECTRONICS FOR AUTOMATION

### PERFORMANCE STANDARD 3.1 : APPLY FUNDAMENTALS OF ELECTRICITY

- 3.1.1 Define AC and DC electrical systems and terminology
- 3.1.2 Discuss the safety concerns of working with electricity (e.g., arc flash, electrical burns)
- 3.1.3 Describe the principles of generation, transmission, distribution, and storage of electricity
- 3.1.4 Compute values of current, resistance, and voltage using Ohm's law and power equations
- 3.1.5 Discuss the concept of impedance in relation to Ohm's Law
- 3.1.6 Identify series, parallel, and series-parallel (combination) circuits
- 3.1.7 Solve series and parallel circuits using basic laws of electricity including Kirchhoff's laws
- 3.1.8 Introduce single-phase and three-phase AC power
- 3.1.9 Construct and test simple electrical circuits from a schematic

### PERFORMANCE STANDARD 3.2 : APPLY FUNDAMENTALS OF ELECTRONICS

- 3.2.1 Understand and demonstrate basic electrical theory
- 3.2.2 Identify electronic components and their applications (e.g., resistors, capacitors, inductors, and transformers)
- 3.2.3 Utilize tools and test equipment appropriately and safely (i.e., multi-meters)
- 3.2.4 Measure electrical characteristics of voltage, current, and resistance in basic electronic circuits
- 3.2.5 Demonstrate appropriate soldering and de-soldering techniques for electronic circuits
- 3.2.6 Demonstrate appropriate use of various connectors
- 3.2.7 Construct, measure, and analyze, simple series, parallel, and series-parallel (combination) circuits

## CONTENT STANDARD 4.0 : CHARACTERIZE AUTOMATION CONTROL DEVICES

### PERFORMANCE STANDARD 4.1 : INVESTIGATE MOTORS IN AUTOMATED SYSTEMS

- 4.1.1 Identify the function of an electric motor
- 4.1.2 Identify the various types of motors and their designated uses (e.g., 1 phase AC, 3 phase AC, DC, Servo)
- 4.1.3 Describe various motor applications in automation systems
- 4.1.4 Construct and test a simple motor application

### PERFORMANCE STANDARD 4.2 : INVESTIGATE FLUID POWER SYSTEMS

- 4.2.1 Identify and apply safety protocols for fluid power systems
- 4.2.2 Identify components of fluid power systems
- 4.2.3 Describe the operation and use of fluid power in automation systems
- 4.2.4 Identify different control components used in pneumatic systems (e.g., DCVs, Flow control, Solenoids)
- 4.2.5 Construct and test a simple fluid power system

### PERFORMANCE STANDARD 4.3 : INVESTIGATE SENSORS AND ACTUATORS

- 4.3.1 Differentiate between sensors and actuators
- 4.3.2 Describe the functions of sensors and actuators used in automation systems
- 4.3.3 Construct and test a circuit utilizing sensors and actuators
- 4.3.4 Define analog and binary sensors
- 4.3.5 Differentiate between different Binary sensors and what they detect (e.g., inductive, capacitive, photoelectric)

### PERFORMANCE STANDARD 4.4 : INVESTIGATE SWITCHES AND RELAYS

- 4.4.1 Differentiate between switches and relays
- 4.4.2 Explain the characteristics and operations of switches and relays
- 4.4.3 Explain the role of electromagnetic relays
- 4.4.4 Construct and test a simple circuit utilizing switches and relays

### PERFORMANCE STANDARD 4.5 : EXPLORE PROGRAMMABLE LOGIC CONTROLLERS

- 4.5.1 Investigate the basic components of a programmable logic controller (PLC)
- 4.5.2 Identify the major advantages in the use of PLCs in automation
- 4.5.3 Identify the various programming devices used to program a PLC
- 4.5.4 Explain the various modes of operations of a PLC

| PERFORMANCE STANDARD 4.6 : RESEARCH CONVEYANCE SYSTEMS |
|---|
| 4.6.1 Investigate different conveyance systems |
| 4.6.2 Describe control systems utilized in conveyance systems |
| 4.6.3 Examine applications of conveyance systems in automation systems |
| **PERFORMANCE STANDARD 4.7 : EXPLORE VARIABLE FREQUENCY DRIVES** |
| 4.7.1 Define the functions of variable frequency drives |
| 4.7.2 Explore the application of variable frequency drives in automation systems |
| 4.7.3 Construct and test a simple automated process utilizing variable frequency drives |
| **PERFORMANCE STANDARD 4.8 : IDENTIFICATION AND VISION SYSTEMS** |
| 4.8.1 Identify different identification and vision systems used in automation systems |
| 4.8.2 Investigate the applications of different identification and vision systems (i.e., barcode, RFID, QR codes, machine vision systems, applications of ID systems) |

## CONTENT STANDARD 5.0 : MODEL CONTROL SYSTEMS

### PERFORMANCE STANDARD 5.1 : DEMONSTRATE CONTROL TECHNOLOGY AND AUTOMATION PRINCIPLES

- 5.1.1 Distinguish between standard and safety programmable controllers, their components, and their functions
- 5.1.2 Interpret programming diagrams (e.g., flow charts)
- 5.1.3 Sketch programming diagrams for real world applications
- 5.1.4 Compare and contrast open and closed loop control systems
- 5.1.5 Initialize a PLC
- 5.1.6 Understand and select proper communication drivers to interface with a PLC system
- 5.1.7 Apply suitable commands for PLC circuits
- 5.1.8 Apply timer and counter principles to industry-related problems
- 5.1.9 Program ladder logic statements to perform a specific task
- 5.1.10 Design, construct, and test an automated system

### PERFORMANCE STANDARD 5.2 : DEMONSTRATE DIAGNOSTIC AND TROUBLESHOOTING PRACTICES

- 5.2.1 Explore diagnostic procedures
- 5.2.2 Identify components of a safety procedure checklist
- 5.2.3 Utilize all safety procedures necessary before performing a repair (e.g., lock-out/tag-out)
- 5.2.4 Navigate through user software
- 5.2.5 Understand and use software instructions offered in user software
- 5.2.6 Use manufacturer's documentation for troubleshooting
- 5.2.7 Create a detailed troubleshooting checklist
- 5.2.7 Utilize diagnostic tools appropriately
- 5.2.8 Troubleshoot and repair common problems in control systems
- 5.2.9 Complete a troubleshooting work order

### PERFORMANCE STANDARD 5.3 : DEMONSTRATE MAINTENANCE FUNDAMENTALS

- 5.3.1 Explore mechanical fundamentals (e.g., alignment, wear, lubrication)
- 5.3.2 Distinguish between preventative and predictive maintenance
- 5.3.3 Develop a routine maintenance plan
- 5.3.4 Utilize various repair, maintenance, and troubleshooting resources (e.g., print media, electronic, tech support, and local experts)

## CONTENT STANDARD 6.0 : INTRODUCTION TO ROBOTIC SYSTEMS

### PERFORMANCE STANDARD 6.1 : EXPLORE ROBOTIC SYSTEMS IN AUTOMATION

- 6.1.1 Research the history of robotics (i.e., industrial and non-industrial)
- 6.1.2 Identify Isaac Asimov's three laws of robotics
- 6.1.3 Investigate the societal impact of robotics
- 6.1.4 Apply robotic vocabulary (e.g., degrees of freedom, axis, work envelope, tool point, tool tip)

### PERFORMANCE STANDARD 6.2 : DETERMINE COMPONENTS IN ROBOTIC SYSTEMS FOR AUTOMATION

- 6.2.1 Identify main components of a robot
- 6.2.2 Investigate robotic specifications (e.g., payload, repeatability, environmental requirements, power sources)
- 6.2.3 Identify robot control systems
- 6.2.4 Describe end effectors utilized by robots
- 6.2.5 Identify teaching and programming interfaces for robots
- 6.2.6 Construct a simple automated system utilizing HMI interfaces

### PERFORMANCE STANDARD 6.3 : CONSTRUCT A ROBOTIC SYSTEM FOR AUTOMATION

- 6.3.1 Identify programming languages for robotics applications
- 6.3.2 Identify path control techniques used by robots
- 6.3.3 Create a robotic control program
- 6.3.4 Construct a robotic control system combining several automation components (e.g., electrical, pneumatic, conveyance, VFDs, PLCs, and HMIs)

## CROSSWALKS AND ALIGNMENTS

### CROSSWALKS (ACADEMIC STANDARDS)

The crosswalk of the Automation Technology Standards shows links to the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards – Disciplinary Core Ideas Arrangement) and in 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 Automation Technology 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 Automation Technology Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Automation Technology program support academic learning.

### ALIGNMENTS (SCIENCE AND ENGINEERING PRACTICES)

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

### CROSSWALKS (COMMON CAREER TECHNICAL CORE)

The crosswalk of the [Automation Technology] Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Automation Technology 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 Automation Technology Standards are crosswalked to the Manufacturing Career Cluster™ and the Production Career Pathway.

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## CROSSWALK OF AUTOMATION TECHNOLOGY 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 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| 1.1.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.<br>**English Language Arts: Speaking and Listening Standards**<br>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. |
| 1.1.9 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 1.1.15 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>RST.11-12.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.<br>WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research. |
| 1.1.16 | **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| 1.1.18 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Speaking and Listening Standards**<br>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. |
| 1.1.19 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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. |

## CONTENT STANDARD 2.0: INTRODUCTION TO AUTOMATION

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 2.1.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| 2.1.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.2.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 2.2.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.2.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.3.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 2.3.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.3.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.3.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.4.4 | **Science: HS-Engineering Design**<br>HS-ETS1-2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. |

| Performance Indicators | Nevada Academic Content Standards |
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| 2.5.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.6.1 | **English Language Arts: Speaking and Listening Standards**<br>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.<br>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.<br>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. |
| 2.6.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
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| 2.6.4 | **English Language Arts: Speaking and Listening Standards**<br>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.<br>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.<br>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. |
| 2.7.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 2.7.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
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| 2.7.5 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

## CONTENT STANDARD 3.0: ELECTRONICS FOR AUTOMATION

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 3.1.2 | **English Language Arts: Speaking and Listening Standards**<br>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.<br>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.<br>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. |
| 3.1.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 3.1.5 | **English Language Arts: Speaking and Listening Standards**<br>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.<br>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.<br>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. |

## CONTENT STANDARD 4.0: CHARACTERIZE AUTOMATION CONTROL DEVICES

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 4.1.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.2.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.3.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 4.3.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.3.5 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.4.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
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| 4.4.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.4.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.5.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.5.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 4.6.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.6.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.6.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 4.7.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 4.8.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

## CONTENT STANDARD 5.0: MODEL CONTROL SYSTEMS

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 5.1.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 5.1.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 5.1.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 5.2.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 5.2.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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. |
| 5.2.7 | **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| 5.3.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 5.3.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 5.3.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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. |

## CONTENT STANDARD 6.0: INTRODUCTION TO ROBOTIC SYSTEMS

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 6.1.1 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 6.1.3 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 6.2.2 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>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.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |

| Performance Indicators | Nevada Academic Content Standards |
|---|---|
| 6.2.4 | **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects**<br>RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.<br>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.<br>**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>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. |
| 6.3.3 | **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**<br>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |

## ALIGNMENT OF AUTOMATION TECHNOLOGY STANDARDS AND THE MATHEMATICAL PRACTICES

| Mathematical Practices | Automation Technology Performance Indicators |
|---|---|
| 1. Make sense of problems and persevere in solving them. | 2.5.5<br>3.1.4<br>6.1.2 |
| 2. Reason abstractly and quantitatively. | 2.5.5<br>3.1.4, 3.1.5, 3.1.7<br>6.1.2 |
| 3. Construct viable arguments and critique the reasoning of others. | 2.5.5 |
| 4. Model with mathematics. | 2.5.5<br>3.1.5 |
| 5. Use appropriate tools strategically. | 2.5.5<br>3.1.4, 3.1.7; 3.2.3, 3.2.4 |
| 6. Attend to precision. | 2.5.5<br>3.1.4, 3.1.7; 3.2.4<br>5.1.8 |
| 7. Look for and make use of structure. | 2.4.2; 2.5.5<br>6.1.2 |
| 8. Look for and express regularity in repeated reasoning. | 2.5.5 |

## ALIGNMENT OF AUTOMATION TECHNOLOGY STANDARDS AND THE SCIENCE AND ENGINEERING PRACTICES

| Science and Engineering Practices | Automation Technology Performance Indicators |
|---|---|
| 1. Asking questions (for science) and defining problems (for engineering). | 2.5.5<br>3.1.3<br>5.2.8<br>6.3.3 |
| 2. Developing and using models. | 2.5.5<br>3.1.9; 3.2.7 |
| 3. Planning and carrying out investigations. | 2.5.5 |
| 4. Analyzing and interpreting data. | 2.5.5; 2.6.3<br>5.2.6; 5.3.4 |
| 5. Using mathematics and computational thinking. | 2.5.5<br>3.1.4, 3.1.7; 3.2.4 |
| 6. Constructing explanations (for science) and designing solutions (for engineering). | 2.5.3, 2.5.5<br>3.1.9; 3.2.7<br>4.1.4; 4.2.5; 4.3.3; 4.4.4; 4.7.3<br>5.1.10<br>6.2.6; 6.3.4 |
| 7. Engaging in argument from evidence. | 2.5.5; 2.6.4 |
| 8. Obtaining, evaluating, and communicating information. | 2.4.4; 2.5.3, 2.5.5 |

## CROSSWALKS OF AUTOMATION TECHNOLOGY STANDARDS AND THE COMMON CAREER TECHNICAL CORE

| Manufacturing Career Cluster™ (MN) | Performance Indicators |
|---|---|
| 1. Evaluate the nature and scope of the Manufacturing Career ClusterTM and the role of manufacturing in society and in the economy. | 2.1.2, 2.1.3 |
| 2. Analyze and summarize how manufacturing businesses improve performance. | 2.7.5 |
| 3. Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices. | 1.1.1 – 1.1.19 |
| 4. Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways. | 2.2.1 – 2.2.3 |
| 5. Describe government policies and industry standards that apply to manufacturing. | 2.3.1 – 2.3.4 |
| 6. Demonstrate workplace knowledge and skills common to manufacturing. | 2.5.5, 5.1.10, 5.2.9 |

| Production Career Pathway (MN-PRO) | Performance Indicators |
|---|---|
| 1. Diagnose production process problems and take corrective action to meet production quality standards. | 5.2.1 – 5.2.9 |
| 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. | 2.5.5, 2.7.5, 5.3.2, 5.3.4 |
| 4. Coordinate work teams when producing products to enhance production process and performance. | 2.5.5, 6.3.4 |
| 5. Demonstrate the safe use of manufacturing equipment. | 1.1.4, 1.3.3, 1.3.4 |