

# ***Engineering Foundations Standards***



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Office of Career Readiness, Adult Learning, and Education Options  
Nevada Department of Education  
755 N. Roop Street, Suite 201  
Carson City, NV 89701

[www.doe.nv.gov](http://www.doe.nv.gov)

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**Vision**

*All Nevada students are equipped and feel empowered to attain their vision of success*

**Mission**

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



**Table of Contents**

Acknowledgements / Standards Development Members / Business and Industry Validation.....vii

Introduction .....ix

Content Standard 1.0 Integrate Career and Technical Student Organizations (CTSOs) ..... 1

Content Standard 2.0 Identify Lab Organization and Safety Procedures ..... 2

Content Standard 3.0 Assess the Impact of Engineering on Society ..... 3

Content Standard 4.0 Analyze the Engineering Design Process ..... 4

Content Standard 5.0 Construct Engineering Documentation ..... 5

Content Standard 6.0 Investigate Material Properties ..... 6

Content Standard 7.0 Apply Fundamental Power Systems and Energy Principles..... 7

Content Standard 8.0 Apply Statistics and Kinematic Principles ..... 9

Crosswalks and Alignments ..... 11

## Acknowledgements

The development of Nevada career and technical education (CTE) standards and assessments is a collaborative effort sponsored by the Nevada Department of Education (NDE) Office of Career Readiness, Adult Learning, and Education Options. The Nevada Department of Education relies on educators and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. More importantly, the NDE would like to recognize the time and commitment by the writing team members in developing the career and technical standards for Engineering Foundations.

## Standards Development Members

Name	Occupation/Title	Stakeholder Affiliation	School/Organization
Dr. Yingtao Jiang	Mechanical Engineering Professor	Postsecondary Educator	University of Nevada, Las Vegas
Baillie Keach	Professional Engineer	Business and Industry Representative	Nevada Department of Transportation
Karl Kuhles	Instructor	Secondary Educator	Reno High School, Washoe County School District
Stephen Oranchek	Instructor	Secondary Educator	Northwest Career and Technical Academy, Clark County School District
Adam Shoda	Instructor	Secondary Educator	Incline High School, Washoe County School District
Scott Underwood	Instructor	Secondary Educator	Advanced Technologies Academy, Clark County School District

## 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 is coordinated with industry experts to ensure the standards include the proper content, or (3) nationally recognized standards currently endorsed by business and industry.

The Engineering Foundations standards were validated through active participation of business and industry representatives on the development team.

## 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 Engineering Foundations program. These standards are designed for a two-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 crosswalks and alignment sections of the document show where the performance indicators support the Nevada Academic Content Standards. Where correlation with an academic content standard exists, students in the Engineering Foundations program perform learning activities that connect with and support the academic content standards that are listed. The crosswalks and alignments are not intended to teach academic standards.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to the Engineering Foundations program. CTSOs are co-curricular national organizations that directly reinforce 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 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. The Standards Reference Code is an abbreviated name for the program, and the content standard, performance standard and performance indicator are referenced in the program standards. This abbreviated code for identifying standards uses each of these items. For example, ENG is the Standards Reference Code for Engineering Foundations. For Content Standard 2, Performance Standard 3 and Performance Indicator 4 the Standards Reference Code would be ENG.2.3.4.

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**CONTENT STANDARD 1.0: INTEGRATE CAREER AND TECHNICAL STUDENT ORGANIZATIONS (CTSOs)\*****Performance Standard 1.1: Explore the History and Organization of CTSOs**

- 1.1.1 Discuss the requirements of CTSO participation/involvement as described in Carl D. Perkins Law
- 1.1.2 Research nationally recognized CTSOs
- 1.1.3 Investigate the impact of federal and state government regarding the progression and operation of CTSOs (e.g., Federal Statutes and Regulations, Nevada Administrative Code [NAC], Nevada Revised Statutes [NRS])

**Performance Standard 1.2: Develop Leadership Skills**

- 1.2.1 Discuss the purpose of parliamentary procedure
- 1.2.2 Demonstrate the proper use of parliamentary procedure
- 1.2.3 Differentiate between an office and a committee
- 1.2.4 Discuss the importance of participation in local, regional, state, and national conferences, events, and competitions
- 1.2.5 Participate in local, regional, state, or national conferences, events, or competitions
- 1.2.6 Describe the importance of a constitution and bylaws to the operation of a CTSO chapter

**Performance Standard 1.3: Participate in Community Service**

- 1.3.1 Explore opportunities in community service-related work-based learning (WBL)
- 1.3.2 Participate in a service learning (program related) and/or community service project or activity
- 1.3.3 Engage with business and industry partners for community service

**Performance Standard 1.4: Develop Professional and Career Skills**

- 1.4.1 Demonstrate college and career readiness (e.g., applications, resumes, interview skills, presentation skills)
- 1.4.2 Describe the appropriate professional/workplace attire and its importance
- 1.4.3 Investigate industry-standard credentials/certifications available within this Career Cluster™
- 1.4.4 Participate in authentic contextualized instructional activities
- 1.4.5 Demonstrate technical skills in various student organization activities/events

**Performance Standard 1.5: Understand the Relevance of Career and Technical Education (CTE)**

- 1.5.1 Make a connection between program standards to career pathway(s)
- 1.5.2 Explain the importance of participation and completion of a program of study
- 1.5.3 Promote community awareness of local student organizations associated with CTE programs

\*Refer to the program of study Curriculum Framework for appropriate CTSO(s).

**CONTENT STANDARD 2.0: IDENTIFY LAB ORGANIZATION AND SAFETY PROCEDURES****Performance Standard 2.1: Demonstrate General Lab Safety Rules and Procedures**

- 2.1.1 Describe general shop safety rules and procedures
- 2.1.2 Demonstrate knowledge of the Occupational Safety and Health Administration (OSHA) and its role in workplace safety
- 2.1.3 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protective equipment – PPE)
- 2.1.4 Use safe procedures for handling of tools and equipment
- 2.1.5 Operate lab equipment according to safety guidelines
- 2.1.6 Identify and use proper lifting procedures and proper use of support equipment
- 2.1.7 Use proper ventilation procedures for working within the lab/shop area
- 2.1.8 Identify marked safety areas
- 2.1.9 Identify the location and the types of fire extinguishers and other fire safety equipment
- 2.1.10 Demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment
- 2.1.11 Identify the location and use of eye wash stations
- 2.1.12 Identify the location of the posted evacuation routes
- 2.1.13 Identify and wear appropriate clothing for lab/shop activities
- 2.1.14 Secure hair and jewelry for lab/shop activities
- 2.1.15 Demonstrate knowledge of the safety aspects of low and high voltage circuits
- 2.1.16 Locate and interpret safety data sheets (SDS)
- 2.1.17 Prepare time or job cards, reports, or records
- 2.1.18 Perform housekeeping duties
- 2.1.19 Follow verbal instructions to complete work assignments
- 2.1.20 Follow written instructions to complete work assignments

**Performance Standard 2.2: Use Tools and Equipment Safely**

- 2.2.1 Identify hand tools and their appropriate usage
- 2.2.2 Identify standard and metric designation
- 2.2.3 Demonstrate the proper techniques when using hand tools, power tools, and equipment
- 2.2.4 Demonstrate safe handling and use of appropriate tools
- 2.2.5 Demonstrate proper cleaning, storage, and maintenance of tools and equipment

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## **CONTENT STANDARD 3.0: ASSESS THE IMPACT OF ENGINEERING ON SOCIETY**

### **Performance Standard 3.1: Investigate Related Careers in Engineering**

- 3.1.1 Define engineering
- 3.1.2 Examine engineering achievements throughout history
- 3.1.3 Investigate engineering careers, training, and associated opportunities
- 3.1.4 Describe the difference between engineering disciplines and job functions
- 3.1.5 Explore career opportunities and list the educational requirements for a given engineering field
- 3.1.6 Describe the importance of engineering teams

### **Performance Standard 3.2: Analyze Ethics in Engineering**

- 3.2.1 Analyze current professional engineering codes of ethics
- 3.2.2 Analyze ethical engineering issues
- 3.2.3 Analyze and explain ethical and technical issues contributing to an engineering disaster
- 3.2.4 Investigate the evolution of a product (e.g., telephones, cars, building materials)
- 3.2.5 Describe how ethics influences the engineering process



**CONTENT STANDARD 4.0: ANALYZE THE ENGINEERING DESIGN PROCESS****Performance Standard 4.1: Interpret the Engineering Design Process**

- 4.1.1 Identify the design process
- 4.1.2 Identify the activities that occur during each phase of the design process
- 4.1.3 Apply the steps of the design process to solve a variety of design problems
- 4.1.4 Describe how social, environmental, and financial constraints influence the design process
- 4.1.5 Diagram the lifecycle of a product as it applies to the design and development process

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**CONTENT STANDARD 5.0: CONSTRUCT ENGINEERING DOCUMENTATION****Performance Standard 5.1: Demonstrate Freehand Technical Sketching Techniques**

- 5.1.1 Develop design ideas using freehand sketching
- 5.1.2 Identify the six primary orthographic views
- 5.1.3 Create pictorial and multi-view sketches (e.g., for prototyping, clarifying)
- 5.1.4 Use the alphabet of lines (i.e., styles and weights)
- 5.1.5 Legibly annotate sketches

**Performance Standard 5.2: Demonstrate Measuring and Scaling Techniques**

- 5.2.1 Identify industry standard units of measure (Standard American English [SAE], metric, etc.)
- 5.2.2 Convert between industry standard units of measure
- 5.2.3 Determine appropriate engineering and metric scales
- 5.2.4 Measure speed, distance, object size, area, mass, volume, and temperature
- 5.2.5 Determine and apply the equivalence between fractions and decimals
- 5.2.6 Demonstrate proper use of precision measuring tools

**Performance Standard 5.3: Use Engineering Documentation Procedures**

- 5.3.1 Demonstrate record keeping procedures and communication in engineering
- 5.3.2 Identify the importance of proprietary documentation in engineering
- 5.3.3 Research the copyright and patent processes
- 5.3.4 Illustrate project management timelines

**Performance Standard 5.4: Produce Technical Drawings**

- 5.4.1 Interpret basic elements of a technical drawing (i.e., title block information, dimensions, and line types)
- 5.4.2 Produce drawings from sketches
- 5.4.3 Identify industry standard symbols
- 5.4.4 Describe and construct various types of drawings (i.e., part, assembly, pictorial, orthographic, isometric, and schematic)
- 5.4.5 Construct drawings utilizing metric and customary (i.e., SAE and Imperial) measurement systems
- 5.4.6 Create schematic diagrams using proper symbols
- 5.4.7 Arrange dimensions and annotations using appropriate standards (i.e., American National Standards Institute [ANSI] and International Organization for Standardization [ISO])
- 5.4.8 Use geometric dimensioning and tolerancing (GDT) annotation standards within industry practices
- 5.4.9 Construct bill of materials or schedule

**Performance Standard 5.5: Demonstrate Modeling Techniques**

- 5.5.1 Identify the areas of modeling (i.e., physical, conceptual, and mathematical)
- 5.5.2 Create a scale model or working prototype
- 5.5.3 Evaluate a scale model or a working prototype
- 5.5.4 Identify methods and sources for obtaining modeling materials and supplies

**CONTENT STANDARD 6.0: INVESTIGATE MATERIAL PROPERTIES****Performance Standard 6.1: Identify Material Properties and Science**

- 6.1.1 Identify the major material families used in manufacturing (e.g., polymers, ceramics, metals and alloys, composites, biomaterials, semiconductors)
- 6.1.2 Differentiate between the various types of material properties and their applications
- 6.1.3 Discuss the impact of material usage on the environment
- 6.1.4 Explain how production is affected by the availability, quality, and quantity of resources
- 6.1.5 Differentiate among raw material standard stock and finished products

**Performance Standard 6.2: Analyze the Strengths of Materials**

- 6.2.1 Describe the various forms of stress (i.e., compression, tension, torque, and shear)
- 6.2.2 Calculate material properties relating to a stress strain curve
- 6.2.3 Analyze the principles of statics and dynamics to calculate the strength of various engineering materials used to build a structure
- 6.2.4 Create free body diagrams of objects, identifying all forces acting on the object
- 6.2.5 Locate the centroid of geometric shapes using mathematics
- 6.2.6 Calculate the moment of inertia for a rectangular shape
- 6.2.7 Differentiate between scalar and vector quantities
- 6.2.8 Determine magnitude, direction, and sense of a vector
- 6.2.9 Calculate the X and Y components and determine the resultant vector
- 6.2.10 Calculate moment forces given a specified axis
- 6.2.11 Use equations of static equilibrium to calculate unknown forces
- 6.2.12 Create a written report of material test evaluations

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**CONTENT STANDARD 7.0: APPLY FUNDAMENTAL POWER SYSTEMS AND ENERGY PRINCIPLES****Performance Standard 7.1: Investigate Power Systems and Energy Forms**

- 7.1.1 Define terms used in power systems (power, work, horsepower, watts, etc.)
- 7.1.2 Identify the basic power systems (nuclear, solar, natural gas, electrical, etc.)
- 7.1.3 List the basic elements of power systems (power plant, transformer, transmission line, substations, distribution line, and distribution transformer)
- 7.1.4 Summarize the advantages and disadvantages of various forms of power
- 7.1.5 Calculate the efficiency of power systems and conversion devices
- 7.1.6 Define energy
- 7.1.7 Define potential energy and kinetic energy
- 7.1.8 Identify forms of potential energy and kinetic energy
- 7.1.9 Categorize types of energy into major forms such as thermal, radiant, nuclear, chemical, electrical, mechanical, and fluid
- 7.1.10 Identify units used to measure energy
- 7.1.11 Analyze and apply data and measurements to solve problems and interpret documents
- 7.1.12 Calculate unit conversions between common energy measurements
- 7.1.13 Demonstrate an energy conversion device

**Performance Standard 7.2: Identify and Use Basic Mechanical Systems**

- 7.2.1 Distinguish between the six simple machines, their attributes and components
- 7.2.2 Measure forces and distances related to mechanisms
- 7.2.3 Determine efficiency in a mechanical system
- 7.2.4 Calculate mechanical advantage and drive ratios of mechanisms
- 7.2.5 Calculate work, power, and torque
- 7.2.6 Design, construct, and test various basic mechanical systems

**Performance Standard 7.3: Identify and Use Energy Sources and Applications**

- 7.3.1 Identify and categorize energy sources as nonrenewable, renewable, or inexhaustible
- 7.3.2 Define the possible types of power conversion (e.g., solar or chemical to mechanical)
- 7.3.3 Measure circuit values using a digital multimeter
- 7.3.4 Calculate power in a system that converts energy from electrical to mechanical
- 7.3.5 Determine efficiency of a system that converts an electrical input to a mechanical output
- 7.3.6 Compute values of current, resistance, and voltage using Ohm's law
- 7.3.7 Solve series and parallel circuits using basic laws of electricity including Kirchhoff's laws
- 7.3.8 Test and apply the relationship between voltage, current, and resistance relating to a photovoltaic cell and a hydrogen fuel cell
- 7.3.9 Experiment with a solar hydrogen system to produce mechanical power
- 7.3.10 Design, construct, and test recyclable insulation materials
- 7.3.11 Test and apply the relationship between R-values and recyclable insulation
- 7.3.12 Complete calculations for conduction, R-values, and radiation

**Performance Standard 7.4: Identify and Use Machine Control Systems**

- 7.4.1 Create detailed operational flowcharts
- 7.4.2 Create system control programs (i.e., sequential, logic)
- 7.4.3 Select appropriate input and output devices based on system specifications and constraints
- 7.4.4 Differentiate between the characteristics of digital and analog devices
- 7.4.5 Compare and contrast open and closed loop systems
- 7.4.6 Design and create a control system based on specifications and constraints

**Performance Standard 7.5: Identify and Use Basic Fluid Systems**

- 7.5.1 Define fluid systems (e.g., hydraulic, pneumatic, vacuum, etc.)
- 7.5.2 Identify and define the components of fluid systems
- 7.5.3 Compare and contrast hydraulic and pneumatic systems
- 7.5.4 Identify the advantages and disadvantages of using fluid power systems
- 7.5.5 Explain the difference between gauge pressure and absolute pressure
- 7.5.6 Discuss the safety concerns of working with liquids and gases under pressure
- 7.5.7 Calculate mechanical advantage using Pascal's law
- 7.5.8 Calculate values in a pneumatic system using the ideal gas laws
- 7.5.9 Design, construct, and test various fluid systems

**Performance Standard 7.6: Identify Thermodynamics**

- 7.6.1 Define thermodynamic terminology
- 7.6.2 Distinguish thermodynamic concepts (i.e., conduction, convection, and radiation)
- 7.6.3 Identify the common units of measurement
- 7.6.4 Explain the laws of thermodynamics
- 7.6.5 Calculate the thermal efficiency of various materials

**CONTENT STANDARD 8.0: APPLY STATISTICS AND KINEMATIC PRINCIPLES****Performance Standard 8.1: Use Statistics**

- 8.1.1 Define statistical terminology
- 8.1.2 Calculate theoretical probability
- 8.1.3 Calculate experimental frequency distribution
- 8.1.4 Apply the Bernoulli process to events that only have two distinct possible outcomes
- 8.1.5 Apply AND, OR, and NOT logic to probability
- 8.1.6 Apply Bayes' theorem to calculate the probability of multiple events occurring
- 8.1.7 Create a histogram to illustrate frequency distribution
- 8.1.8 Calculate the central tendency of a data array to include mean, median, and mode
- 8.1.9 Calculate data variation to include range, standard deviation, and variance

**Performance Standard 8.2: Use Kinematic Principles**

- 8.2.1 Define kinematic terminology
- 8.2.2 Calculate distance, displacement, speed, velocity, and acceleration based on specific data
- 8.2.3 Calculate acceleration due to gravity based on data from a free-fall device
- 8.2.4 Calculate the X and Y components of a projectile motion
- 8.2.5 Determine the needed launch angle of a projectile for a specific range and initial velocity
- 8.2.6 Design a device that stores and releases potential energy for propulsion

## Crosswalks and Alignments

Crosswalks and alignments are intended to assist the teacher make connections for students between the technical skills within the program and academic standards. The crosswalks and alignments are not intended to teach the academic standards but to assist students in making meaningful connections between their CTE program of study and academic courses.

### **Crosswalks (Academic Standards)**

The crosswalks of the Engineering Foundations Standards show connections with the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Engineering Foundations program connect with and support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in English Language Arts, Mathematics, and Science.

### **Alignments (Mathematical Practices)**

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

### **Alignments (Science and Engineering Practices)**

In addition to connections 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 Engineering Foundations Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Engineering Foundations program connect with and support academic learning.

### **Crosswalks (Common Career Technical Core)**

The crosswalks of the Engineering Foundations Standards show connections with the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Engineering Foundations program connect with and 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 Engineering Foundations Standards are crosswalked to the Science, Technology, Engineering, and Mathematics Career Cluster™ and the Engineering and Technology and Science and Mathematics Career Pathways.

**Crosswalk of Engineering Foundations Standards  
and the Nevada Academic Content Standards**

**Content Standard 1.0: Integrate Career and Technical Student Organizations (CTSOs)**

Performance Indicators	Nevada Academic Content Standards
1.1.1	<p><b>English Language Arts: Speaking and Listening Standards</b></p> <p>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>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>
1.1.2	<p><b>English Language Arts: Speaking and Listening Standards</b></p> <p>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>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></p> <p>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>
1.1.3	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></p> <p>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>



Performance Indicators	Nevada Academic Content Standards
1.2.1	<p><b>English Language Arts: Speaking and Listening Standards</b></p> <p>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>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>
1.2.4	<p><b>English Language Arts: Speaking and Listening Standards</b></p> <p>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>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>
1.2.5	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></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>
1.4.1	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></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>

Performance Indicators	Nevada Academic Content Standards
1.4.2	<p><b>English Language Arts: Speaking and Listening Standards</b></p> <p>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>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></p> <p>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>
1.4.3	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></p> <p>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>
1.4.4	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></p> <p>WHST.11-12.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p>
1.4.5	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></p> <p>WHST.11-12.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p>

Performance Indicators	Nevada Academic Content Standards
1.5.2	<p><b>English Language Arts: Language Standards</b>  L.11-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.</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.  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>

Content Standard 2.0: Identify Lab Organization and Safety Procedures

Performance Indicators	Nevada Academic Content Standards
2.1.1	<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>
2.1.2	<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: 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><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>
2.1.10	<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>
2.1.15	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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> <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>

Performance Indicators	Nevada Academic Content Standards
2.1.16	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b></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>RST.11-12.6 Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p>
2.1.17	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></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>
2.1.19	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b></p> <p>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></p> <p>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>
2.1.20	<p><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b></p> <p>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 3.0: Assess the Impact of Engineering on Society

Performance Indicators	Nevada Academic Content Standards
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.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
3.1.5	<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>
3.1.6	<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> <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>
3.2.1	<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>
3.2.2	<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>
3.2.3	<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>
3.2.4	<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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Performance Indicators	Nevada Academic Content Standards
3.2.5	<p data-bbox="334 260 1295 289"><b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</b></p> <p data-bbox="347 296 1451 386">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 data-bbox="334 405 1289 434"><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b></p> <p data-bbox="347 438 1455 491">WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>

**Content Standard 4.0: Analyze the Engineering Design Process**

Performance Indicators	Nevada Academic Content Standards
4.1.3	<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> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      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.</p>
4.1.4	<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.11-12.7 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.</p> <p><b>Science: HS. Engineering Design</b>                      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.</p>



## Content Standard 5.0: Construct Engineering Documentation

Performance Indicators	Nevada Academic Content Standards
5.1.3	<b>Math: Geometry – Congruence</b> GCO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
5.1.4	<b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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.
5.2.2	<b>Math: Number &amp; Quantity – Quantities</b> NQ.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
5.2.3	<b>Math: Number &amp; Quantity – Quantities</b> NQ.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
5.2.5	<b>Math: Number &amp; Quantity – Quantities</b> NQ.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
5.2.6	<b>Math: Number &amp; Quantity – Quantities</b> NQ.A.2 Define appropriate quantities for the purpose of descriptive modeling.
5.3.1	<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.  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.
5.3.3	<b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> 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.
5.4.1	<b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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.
5.4.3	<b>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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.
5.5.3	<b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> 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.

Content Standard 6.0: Investigate Material Properties

Performance Indicators	Nevada Academic Content Standards
6.1.2	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      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.</p> <p><b>Science: HS. Earth and Space Sciences – HS. Human Sustainability</b>                      HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.</p>
6.1.3	<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> <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>Science: HS. Earth and Space Sciences – HS. Human Sustainability</b>                      HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.</p>
6.1.4	<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><b>Science: HS. Earth and Space Sciences – HS. Human Sustainability</b>                      HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.</p>
6.1.5	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      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.</p>
6.2.1	<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> <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>
6.2.2	<p><b>Math: Number &amp; Quantity – Quantities</b>                      NQ.A.2 Define appropriate quantities for the purpose of descriptive modeling.</p>

Performance Indicators	Nevada Academic Content Standards
6.2.3	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>Math: Algebra – Seeing Structure in Expressions</b> ASSE.A.1 Interpret expressions that represent a quantity in terms of its context.</p>
6.2.4	<p><b>Science: HS. Physical Sciences-HS. Forces and Interactions</b> HS-PS2-1 Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.</p>
6.2.6	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>
6.2.7	<p><b>Math: Number &amp; Quantity – Vector and Matrix Quantities</b> NVM.A.1 (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., <math>v</math>, <math> v </math>, <math>  v  </math>, <math>v</math>).</p>
6.2.8	<p><b>Math: Number &amp; Quantity – Vector and Matrix Quantities</b> NVM.A.1 (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., <math>v</math>, <math> v </math>, <math>  v  </math>, <math>v</math>).</p>
6.2.9	<p><b>Math: Number &amp; Quantity – Vector and Matrix Quantities</b> NVM.A.2 (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p>
6.2.10	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>Science: HS. Physical Sciences-HS. Forces and Interactions</b> HS-PS2-2 Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.</p>
6.2.11	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>Science: HS. Physical Sciences-HS. Forces and Interactions</b> HS-PS2-1 Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.</p>
6.2.12	<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>

Content Standard 7.0: Apply Fundamental Power Systems and Energy Principles

Performance Indicators	Nevada Academic Content Standards
7.1.4	<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.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>WHST.11-12.8 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>
7.1.5	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b>                      AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>
7.1.7	<p><b>Science: HS. Physical Sciences-HS. Energy</b>                      HS-PS3-1 Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.</p>
7.1.9	<p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
7.1.11	<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.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
7.1.13	<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>
7.2.1	<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>
7.2.3	<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> <p><b>Math: Algebra – Reasoning with Equations and Inequalities</b>                      AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>
7.2.4	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b>                      AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>

Performance Indicators	Nevada Academic Content Standards
7.2.5	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.3.4	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.3.5	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.3.6	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.3.7	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.3.11	<b>Science: HS. Physical Sciences-HS. Energy</b> HS-PS3-4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
7.3.12	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
7.4.4	<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.  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.
7.4.5	<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.  <b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.
7.5.3	<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.  <b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b> WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

Performance Indicators	Nevada Academic Content Standards
7.5.5	<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: 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> <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>
7.5.6	<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>
7.5.7	<p><b>Math: Algebra – Arithmetic with Polynomials and Rational Expressions</b>                      AAPR.C.5 (+) Know and apply the Binomial Theorem for the expansion of <math>(x + y)^n</math> in powers of <math>x</math> and <math>y</math> for a positive integer <math>n</math>, where <math>x</math> and <math>y</math> are any numbers, with coefficients determined for example by Pascal’s Triangle.</p> <p><b>Math: Algebra – Reasoning with Equations and Inequalities</b>                      AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>
7.5.8	<p><b>Math: Algebra – Reasoning with Equations and Inequalities</b>                      AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>
7.6.2	<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>
7.6.4	<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> <p><b>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</b>                      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.</p>
7.6.5	<p><b>Science: HS. Physical Sciences-HS. Energy</b>                      HS-PS3-4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).</p>

## Content Standard 8.0: Apply Statistics and Kinematic Principles

Performance Indicators	Nevada Academic Content Standards
8.1.2	<b>Math: Statistics and Probability – Conditional Probability and the Rules of Probability</b> SCP.A.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
8.1.3	<b>Math: Statistics and Probability – Conditional Probability and the Rules of Probability</b> SCP.A.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
8.1.5	<b>Math: Statistics and Probability – Conditional Probability and the Rules of Probability</b> SCP.A.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
8.1.6	<b>Math: Statistics and Probability – Making Inferences and Justifying Conclusions</b> SIC.B.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
8.1.8	<b>Math: Statistics and Probability – Interpreting Categorical and Quantitative Data</b> SID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
8.1.9	<b>Math: Statistics and Probability – Interpreting Categorical and Quantitative Data</b> SID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
8.2.2	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
8.2.3	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.  <b>Science: HS. Physical Sciences-HS. Forces and Interactions</b> HS-PS2-1 Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
8.2.4	<b>Math: Number &amp; Quantity – Vector and Matrix Quantities</b> NVM.A.2 (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
8.2.5	<b>Math: Algebra – Reasoning with Equations and Inequalities</b> AREI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

**Alignment of Engineering Foundations Standards  
and the Mathematical Practices**

Mathematical Practices	Engineering Foundation Performance Indicators
1. Make sense of problems and persevere in solving them.	6.2.3
2. Reason abstractly and quantitatively.	7.1.11
3. Construct viable arguments and critique the reasoning of others.	
4. Model with mathematics.	5.1.3; 5.5.1 6.2.4, 6.2.5
5. Use appropriate tools strategically.	5.2.3, 5.2.6 7.3.3
6. Attend to precision.	5.4.8; 7.3.3
7. Look for and make use of structure.	7.2.4, 7.2.5; 7.3.11, 7.3.12
8. Look for and express regularity in repeated reasoning.	5.2.5



**Alignment of Engineering Foundations Standards  
and the Science and Engineering Practices**

Science and Engineering Practices	Engineering Foundation Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	8.2.5
2. Developing and using models.	5.5.2, 5.5.3 7.2.6
3. Planning and carrying out investigations.	7.3.8-7.3.10; 7.5.9
4. Analyzing and interpreting data.	7.1.11
5. Using mathematics and computational thinking.	6.2.2, 6.2.6, 6.2.10 7.2.4, 7.2.5; 7.3.12; 7.6.5 8.2.2, 8.2.3
6. Constructing explanations (for science) and designing solutions (for engineering).	6.2.12 8.2.6
7. Engaging in argument from evidence.	
8. Obtaining, evaluating, and communicating information.	6.2.12

**Crosswalks of Engineering Foundations Standards  
and the Common Career Technical Core**

<b>Science, Technology, Engineering, and Mathematics Career Cluster</b>	<b>Performance Indicators</b>
1. Apply engineering skills in a project that requires project management, process control and quality assurance.	4.1.1-4.1.5; 5.3.1-5.3.4 5.4.9
2. Use technology to acquire, manipulate, analyze, and report data.	5.3.4; 5.4.2; 7.3.3
3. Describe and follow safety, health and environmental standards related to science, technology, engineering, and mathematics (STEM) workplaces.	2.1.2-2.1.20
4. Understand the nature and scope of the Science, Technology, Engineering, and Mathematics Career Cluster and the role of STEM in society and the economy.	3.1.2, 3.1.3, 3.1.5; 3.2.3 4.1.4
5. Demonstrate an understanding of the breadth of career opportunities and means to those opportunities in each of the Science, Technology, Engineering, and Mathematics Career Pathways.	3.1.3-3.1.5
6. Demonstrate technical skills needed in a chosen STEM field.	7.1.11; 7.3.3

<b>Engineering and Technology Career Pathway</b>	<b>Performance Indicators</b>
1. Use STEM concepts and processes to solve problems involving design and/or production.	7.1.13
2. Display and communicate STEM information.	5.3.1-5.3.3; 6.2.12
3. Apply processes and concepts for the use of technological tools in STEM.	5.1.3; 7.3.3; 7.4.1-7.4.4
4. Apply the elements of the design process.	4.1.1-4.1.3, 4.1.5
5. Apply the knowledge learned in STEM to solve problems.	6.2.12; 7.4.6
6. Apply the knowledge learned in the study of STEM to provide solutions to human and societal problems in an ethical and legal manner.	3.2.3, 3.2.5; 7.1.4, 7.1.11

<b>Science and Mathematics Career Pathway</b>	<b>Performance Indicators</b>
1. Apply science and mathematics to provide results, answers, and algorithms for engineering and technological activities.	6.2.12; 7.2.4, 7.2.5 7.3.4, 7.3.5
2. Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.	6.1.3-6.1.5; 7.1.4
3. Analyze the impact that science and mathematics has on society.	3.2.3
4. Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.	7.1.1; 8.1.4, 8.1.6