FIRE SCIENCE
STANDARDS

This document was prepared by:

Office of Career Readiness, Adult Learning, and Education Options
Nevada Department of Education
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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

Nevada Department of Education

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The development of Nevada career and technical standards and assessments is a collaborative effort sponsored by the Office of Career Readiness, Adult Learning, and Education Options at the Department of Education. The Department of Education relies on teachers and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. Most important, however, is recognition of the time, expertise and great diligence provided by the writing team members in developing the career and technical standards for Fire Science.

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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 Fire Science standards were validated through the active participation by business and industry on the development team. The Fire Science standards were also validated with the adoption of the Nevada State Fire Marshal's support firefighter requirements.

The Fire Science standards were validated with the adoption of the nationally recognized standards utilizing NFPA Standard 1001-2013 for Firefighter Professional Qualifications, NFPA Standard 1072-2017 for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications, and NFPA Standard 1051-2016 for Wildland Fire Fighter Professional Qualifications, which were approved by the Nevada State Fire Marshal's Office.

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 Fire Science 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 crosswalk and alignment section of the document shows where the performance indicators support the Nevada Academic Content Standards. Where correlation with an academic content standard exists, students in the Fire Science 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 Fire Science 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 "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. 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, FIRE is the Standards Reference Code for Fire Science. For Content Standard 2, Performance Standard 3 and Performance Indicator 4 the Standards Reference Code would be FIRE.2.3.4.

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: PRACTICE FIREFIGHTER SAFETY AND HEALTH

PERFORMANCE STANDARD 2.1: DESCRIBE THE SCOPE OF DEPARTMENTAL ORGANIZATIONS

2.1.1 Summarize the fire service history

2.1.2 Explain the interactions between the different organizations in the fire service

2.1.3 Describe the fire service mission and organization

2.1.4 Identify career tracks within the fire service

2.1.5 Complete the National Incident Management System (NIMS) Incident Command System (ICS) 100, 200, and 700

2.1.6 Participate in oral interview and resume development activity

PERFORMANCE STANDARD 2.2: INTERPRET WRITTEN AGENCY POLICIES AND PROCEDURES

2.2.1 Review departmental policies and procedures

2.2.2 Discuss the effect of policies and procedures on a specific work situation

2.2.3 Create standard operating procedures for a department or agency

PERFORMANCE STANDARD 2.3: EXPLORE SAFETY AND HEALTH

2.3.1 Apply personal safety

2.3.2 Compare annual firefighter injuries and fatalities

2.3.3 Identify safety standards related to fire services, such as National Fire Protection Association (NFPA) 1500 and Occupational Safety and Health Administration (OSHA)

2.3.4 Identify facility safety

2.3.5 Participate in safety training

2.3.6 Recognize employee physical and mental wellness (injury, critical incident stress management (CISM), post-traumatic stress disorder (PTSD))

2.3.7 Demonstrate apparatus safety

CONTENT STANDARD 3.0: UNDERSTAND THE SCIENCE OF FIRE BEHAVIOR

PERFORMANCE STANDARD 3.1: APPLY CONCEPTS OF SCIENCE OF FIRE BEHAVIOR

3.1.1   Describe the fire tetrahedron

3.1.2   Describe transmission of heat

3.1.3   Explain the phases of fire growth

3.1.4   Describe factors that affect fire development

3.1.5   Describe fire control theory

3.1.6   Describe products of combustion

PERFORMANCE STANDARD 3.2: EXAMINE CLASSIFICATION OF FIRES

3.2.1   Distinguish types of fires (A, B, C, D, and K)

CONTENT STANDARD 4.0: IDENTIFY PERSONAL PROTECTIVE EQUIPMENT

PERFORMANCE STANDARD 4.1: IMPLEMENT PERSONAL AND DEPARTMENTAL SAFETY REGULATIONS

4.1.1   Select appropriate personal protective equipment (PPE)

4.1.2   Employ safety hierarchy and communication systems

4.1.3   Demonstrate the care of personal protective equipment

4.1.4   Identify the various types of PPE worn by firefighters

4.1.5   Describe the limitations of PPE worn by firefighters

4.1.6   Demonstrate the method for donning/doffing personal protective clothing

PERFORMANCE STANDARD 4.2: APPLY CONCEPTS OF RESPIRATORY PROTECTION

4.2.1   Discuss the types of respiratory protection (open and closed circuit)

4.2.2   Identify the components of a self-contained breathing apparatus (SCBA)

4.2.3   Describe respiratory hazards and when an SCBA shall be "used" (immediately dangerous to life or health [IDLH])

4.2.4   Practice donning and doffing an SCBA

4.2.5   Explain principles of air management consistent with NFPA 1404

4.2.6   Demonstrate replacement of SCBA air cylinders

4.2.7   Describe emergency procedures and failures

4.2.8   Demonstrate the use of a SCBA through a restricted opening

CONTENT STANDARD 5.0: CLASSIFY BUILDING CONSTRUCTION AND COMPONENTS

PERFORMANCE STANDARD 5.1: DESCRIBE CONSTRUCTION TERMINOLOGY

5.1.1   Identify and utilize various terms related to building construction

5.1.2   Describe the main types of occupancy classifications

PERFORMANCE STANDARD 5.2: DESCRIBE CONSTRUCTION CLASSIFICATION

5.2.1   Distinguish between Types I, II, III, IV, and V

5.2.2   Identify common building materials

PERFORMANCE STANDARD 5.3: IDENTIFY BUILDING COMPONENTS

5.3.1   Describe the basic construction of building components

PERFORMANCE STANDARD 5.4: IDENTIFY BUILDING FIRE DETECTION AND SUPPRESSION SYSTEMS

5.4.1   Define various detection systems

5.4.2   Define various suppression systems

CONTENT STANDARD 6.0: DESCRIBE THE CLASSIFICATIONS OF PORTABLE FIRE EXTINGUISHERS

PERFORMANCE STANDARD 6.1: DESCRIBE THE CLASSIFICATIONS OF EXTINGUISHERS

6.1.1   Define the classification and application of extinguishers – A, B, C, D, and K

6.1.2   Describe fire extinguisher rating systems

6.1.3   Demonstrate the use of a portable fire extinguisher utilizing the pull, aim, squeeze, and sweep (PASS) method of application

6.1.4   Explain how to inspect a portable fire extinguisher

CONTENT STANDARD 7.0: EXPLORE FIRE SERVICE EQUIPMENT

PERFORMANCE STANDARD 7.1: IDENTIFY RESCUE EQUIPMENT

7.1.1   Identify and demonstrate common fire service ropes and knots

7.1.2   Understand hoisting and rope rescue techniques

7.1.3   Identify extrication tools and equipment

7.1.4   Explore technical rescue

7.1.5   Identify various fire service tools (pulling, pushing, and cutting)

PERFORMANCE STANDARD 7.2: IDENTIFY GROUND LADDERS

7.2.1   Identity parts of a ladder

7.2.2   Identify ladder types, construction, and proper maintenance

7.2.3   Demonstrate proper ladder carries and placement

7.2.4   Demonstrate ladder safety

7.2.5   Demonstrate how to secure an extension ladder

PERFORMANCE STANDARD 7.3: IDENTIFY FIRE HOSES

7.3.1   Identify fire hose sizes

7.3.2   Demonstrate care and maintenance of fire hoses

7.3.3   Identify hose appliance and tools

7.3.4   Demonstrate the hose rolls (straight, donut, twin, and self-locking)

7.3.5   Demonstrate the types of hose loads

7.3.6   Demonstrate hose deployment/pulls

PERFORMANCE STANDARD 7.4: IDENTIFY FIRE STREAMS

7.4.1   Describe the properties of water and foam

7.4.2   Describe the concept of friction loss

7.4.3   Demonstrate fire stream patterns and nozzles

CONTENT STANDARD 8.0: EXPLORE TACTICAL VENTILATION

PERFORMANCE STANDARD 8.1: DEFINE TACTICAL VENTILATION

8.1.1   Describe the reasons for tactical ventilation

8.1.2   Demonstrate vertical ventilation

8.1.3   Demonstrate horizontal ventilation

8.1.4   Demonstrate mechanical ventilation

PERFORMANCE STANDARD 8.2: IDENTIFY FORCIBLE ENTRY PRINCIPLES

8.2.1   Identify the basic principles of forcible entry

8.2.2   Identify construction features

8.2.3   Describe the basic construction of locks

8.2.4   Demonstrate entry techniques (e.g., doors, windows, gates, walls, floors)

CONTENT STANDARD 9.0: CLASSIFY WATER SUPPLY

PERFORMANCE STANDARD 9.1: DEFINE THE PRINCIPLES OF WATER SUPPLY SYSTEMS

9.1.1   Describe sources of water supply

9.1.2   Explain various pressure measurements

9.1.3   Identify various types of fire hydrants

9.1.4   Identify alternative water supplies

CONTENT STANDARD 10.0: EXPLORE THE PRINCIPLES OF LOSS CONTROL

PERFORMANCE STANDARD 10.1: DESCRIBE LOSS CONTROL

10.1.1 Explain the philosophy of loss control

10.1.2 Practice safety procedures during overhaul operations

10.1.3 Explore fire scene preservation and property conservation

PERFORMANCE STANDARD 10.2: DEMONSTRATE SALVAGE COVER USE

10.2.1 Describe salvage procedures

10.2.2 Demonstrate the uses of a salvage cover

CONTENT STANDARD 11.0: EXPLORE FIRE-BASED EMERGENCY MEDICAL CARE

PERFORMANCE STANDARD 11.1: COMPLETE EMERGENCY MEDICAL TRAINING

11.1.1   Obtain certification in First Aid and CPR training that meets the requirements of a recognized national standard (e.g., Red Cross, American Heart Association)

11.1.2   Create a safety equipment training plan

11.1.3   Assess emergency and/or disaster situations

11.1.4   Design an emergency or disaster plan

CONTENT STANDARD 12.0: DEFINE HAZARDOUS MATERIALS AWARENESS

PERFORMANCE STANDARD 12.1: INTRODUCTION TO HAZARDOUS MATERIALS

12.1.1   Describe the properties of hazardous materials

12.1.2   Identify hazardous materials

12.1.3   Understand the elements of hazardous materials

12.1.4   Explain the use of personal protective equipment for hazardous materials incidents

12.1.5   Obtain certification of completion in Hazardous Materials Awareness

CONTENT STANDARD 13.0: EXAMINE THE CONCEPTS OF WILDLAND FIRE

PERFORMANCE STANDARD 13.1: CHARACTERIZE THE CONCEPTS OF BASIC WILDLAND FIRE BEHAVIOR

13.1.1   Identify and discuss the fire triangle, as it pertains to wildland fires

13.1.2   Connect the contributing factors that indicate the potential for increased fire behavior and compromised safety

13.1.3   Describe causes of extreme fire behavior (long-range spotting, crowning, and fire whirls) due to weather, fuels, topography, or S190

PERFORMANCE STANDARD 13.2: APPLY CONCEPTS OF BASIC WILDLAND FIRE SUPPRESSION

13.2.1   Complete National Wildfire Coordination Group (NWCG), S130, L180, or equivalent (wildland firefighting)

13.2.2   Explain the "LCES" (Lookouts, Communications, Escape Routes, and Safety Zones) and how it relates to standard firefighting orders and watch-out situations

13.2.3   Explore concepts of fire line construction to proper standards, applying various methods

13.2.4   Discuss the holding actions on a fire line, using various methods

13.2.5   Discuss fire suppression techniques with the use of water

13.2.6   Discuss fire suppression techniques without the use of water

13.2.7   Complete all assigned tasks in regard to basic wildland fire suppression in a safe and efficient manner

13.2.8   Describe environmental factors that could impact firefighter safety

13.2.9   Complete IS320 certification (FEMA self-study on wildfire mitigation basics)

CROSSWALKS AND ALIGNMENTS

CROSSWALKS (ACADEMIC STANDARDS)

The crosswalk of the Fire Science Standards shows links to the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Fire Science program 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 correlation with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Fire Science Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Fire Science 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 Fire Science Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Fire Science program support academic learning.

CROSSWALKS (COMMON CAREER TECHNICAL CORE)

The crosswalk of the Fire Science Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Fire Science 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 Fire Science Standards are crosswalked to the Law, Public Safety, Corrections and Security Career Cluster™ and the Emergency and Fire Management Services Career Pathway.

CROSSWALK OF FIRE SCIENCE 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	**English Language Arts: Speaking and Listening Standards** 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.11-12.2 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. 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.
1.1.2	**English Language Arts: Speaking and Listening Standards** 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.11-12.2 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. 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. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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.
1.1.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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	
1.2.1	**English Language Arts: Speaking and Listening Standards**	
	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.11-12.2	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.
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1.2.4	**English Language Arts: Speaking and Listening Standards**	
	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.11-12.2	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.
	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.
1.2.5	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**	
	WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
1.4.1	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**	
	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	
1.4.2	**English Language Arts: Speaking and Listening Standards**	
	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.11-12.2	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.
	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.
	English Language Arts: Writing Standards for Literacy in Science and Technical Subjects	
	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.
1.4.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**	
	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.
1.4.4	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**	
	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.
1.4.5	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects**	
	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.

Performance Indicators	Nevada Academic Content Standards
1.5.2	**English Language Arts: Language Standards**
	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.
	English Language Arts: Speaking and Listening Standards
	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.
	English Language Arts: Writing Standards for Literacy in Science and Technical Subjects
	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 2.0: PRACTICE FIREFIGHTER SAFETY AND HEALTH

Performance Indicators	Nevada Academic Content Standards
2.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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.
2.1.2	**English Language Arts: Language Standards** 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. **English Language Arts: Speaking and Listening Standards** 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.
2.2.2	**English Language Arts: Speaking and Listening Standards** 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.
2.3.6	**Science: HS-Heredity: Inheritance and Variation of Traits** HS-LS3-3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
2.3.7	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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 **3.0**: UNDERSTAND THE SCIENCE OF FIRE BEHAVIOR

Performance Indicators	Nevada Academic Content Standards
3.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
3.1.2	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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.
3.1.3	**Science: HS-From Molecules to Organisms: Structures and Processes** HS-LS1-6 Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
3.1.4	**English Language Arts: Speaking and Listening Standards** 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.
3.1.6	**Math: Algebra – Seeing Structure in Expressions** ASSE.A.1 Interpret expressions that represent a quantity in terms of its context.
3.2.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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 4.0: IDENTIFY PERSONAL PROTECTIVE EQUIPMENT

Performance Indicators	Nevada Academic Content Standards
4.1.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
4.2.1	**English Language Arts: Speaking and Listening Standards** 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.
4.2.5	**English Language Arts: Language Standards** 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. **Math: Algebra – Creating Equations** ACED.A.1 — Create equations and inequalities in one variable and use them to solve problems.

CONTENT STANDARD 5.0: CLASSIFY BUILDING CONSTRUCTION AND COMPONENTS

Performance Indicators	Nevada Academic Content Standards
5.1.2	**Science: HS-Engineering Design** 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.
5.2.1	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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.
5.3.1	**English Language Arts: Speaking and Listening Standards** 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.

CONTENT STANDARD 6.0: DESCRIBE THE CLASSIFICATIONS OF PORTABLE FIRE EXTINGUISHERS

Performance Indicators	Nevada Academic Content Standards
6.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
6.1.4	**English Language Arts: Language Standards** 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.

CONTENT STANDARD 7.0: EXPLORE FIRE SERVICE EQUIPMENT

Performance Indicators	Nevada Academic Content Standards
7.1.4	**English Language Arts: Reading Standards for Informational Text** RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.
7.2.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
7.4.1	**Math: Number and Quantity – Quantities** 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. **Science: HS-Earth's Systems** HS-ESS2-5 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
7.4.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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. **English Language Arts: Speaking and Listening Standards** 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. **Math: Statistics and Probability – Using Probability to Make Decisions** SMD.A.1 (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.

CONTENT STANDARD 8.0: EXPLORE TACTICAL VENTILATION

Performance Indicators	Nevada Academic Content Standards
8.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
8.2.3	**English Language Arts: Speaking and Listening Standards** 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. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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 9.0: CLASSIFY WATER SUPPLY

Performance Indicators	Nevada Academic Content Standards
9.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
9.1.2	**English Language Arts: Speaking and Listening Standards** 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. **Math: Number and Quantity – Quantities** NQ.A.2　Define appropriate quantities for the purpose of descriptive modeling.

CONTENT STANDARD 10.0: EXPLORE THE PRINCIPLES OF LOSS CONTROL

Performance Indicators	Nevada Academic Content Standards
10.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
10.2.1	**English Language Arts: Speaking and Listening Standards** 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.

CONTENT STANDARD 11.0: EXPLORE FIRE-BASED EMERGENCY MEDICAL CARE

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

CONTENT STANDARD 12.0: DEFINE HAZARDOUS MATERIALS AWARENESS

Performance Indicators	Nevada Academic Content Standards
12.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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.
12.1.3	**Science: HS-From Molecules to Organisms: Structures and Processes** HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
12.1.4	**English Language Arts: Language Standards** 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.

CONTENT STANDARD 13.0: EXAMINE THE CONCEPTS OF WILDLAND FIRE

Performance Indicators	Nevada Academic Content Standards
13.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** 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. **Science: HS-Ecosystems: Interactions, Energy, and Dynamics** HS-LS2-1 — Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
13.2.4	**English Language Arts: Speaking and Listening Standards** 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.
13.2.8	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** 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. **Science: HS-Earth's Systems** HS-ESS2-4 — Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

ALIGNMENT OF FIRE SCIENCE STANDARDS
AND THE MATHEMATICAL PRACTICES

Mathematical Practices	Fire Science Performance Indicators
1. Make sense of problems and persevere in solving them.	10.1.3 12.1.1
2. Reason abstractly and quantitatively.	3.1.4 11.1.1
3. Construct viable arguments and critique the reasoning of others.	2.2.2 13.1.2
4. Model with mathematics.	7.3.4; 7.4.1, 7.4.2 9.1.2
5. Use appropriate tools strategically.	4.1.3; 4.2.6 6.1.3 10.2.2
6. Attend to precision.	4.2.4 6.1.4 13.2.3
7. Look for and make use of structure.	5.2.1 8.2.2
8. Look for and express regularity in repeated reasoning.	2.3.7 10.1.2 13.2.8

ALIGNMENT OF FIRE SCIENCE STANDARDS
AND THE SCIENCE AND ENGINEERING PRACTICES

Science and Engineering Practices	Fire Science Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	2.3.2 13.1.2
2. Developing and using models.	3.1.1 4.2.6 6.1.3 8.1.4
3. Planning and carrying out investigations.	7.1.4; 7.4.3 11.1.3
4. Analyzing and interpreting data.	4.2.5
5. Using mathematics and computational thinking.	5.3.1; 5.4.2 7.3.2 9.1.2
6. Constructing explanations (for science) and designing solutions (for engineering).	2.3.6 12.1.1
7. Engaging in argument from evidence.	8.1.1 10.1.1 13.2.8
8. Obtaining, evaluating, and communicating information.	3.1.3 4.1.2

CROSSWALKS OF FIRE SCIENCE STANDARDS
AND THE COMMON CAREER TECHNICAL CORE

Law, Public Safety, Corrections, and Security Career Cluster	Performance Indicators
1. Analyze the nature and scope of the Law, Public Safety, Corrections, and Security Career Cluster and the role law, public safety, corrections and security play in society and the economy.	2.1.3
2. Formulate ideas, proposals, and solutions to ensure effective and efficient delivery of law, public safety, corrections and/or security services.	2.2.3
3. Assess and implement measures to maintain safe and healthy working conditions in a law, public safety, corrections and/or security environment.	2.3.2; 13.2.2
4. Conduct law, public safety, corrections, and security work tasks in accordance with employee and employer rights, obligations, and responsibilities, including occupational safety and health requirements.	2.3.3
5. Analyze the various laws, ordinances, regulations, and organizational rules that apply to careers in law, public safety, corrections and security.	2.2.3
6. Describe various career opportunities and means to those opportunities in each of the Law, Public Safety, Corrections, and Security Career Pathways.	2.1.4

Emergency and Fire Management Services Career Pathway	Performance Indicators
1. Demonstrate effective communication skills (e.g., writing, speaking, listening and nonverbal communication) while utilizing communications equipment and platforms common to emergency and fire management services.	2.1.6
2. Manage an incident scene as the first responder using emergency response skills.	2.1.5
3. Utilize up-to-date technology equipment and applications to facilitate the management of emergency and fire management situations.	13.2.9
4. Demonstrate an understanding of the objectives and a commitment to the mission of emergency and fire management services.	2.3.3
5. Execute safety procedures and protocols associated with local, state, and federal regulations.	2.3.4; 13.2.7
6. Develop an organizational professional growth plan including the development of team building and leadership skills within the emergency and fire management environment.	2.2.2
7. Describe the legal, regulatory, and organizational guidelines governing emergency and fire management services.	2.2.1; 2.3.3
8. Compare and contrast the different career fields in fire and emergency management services.	2.1.3; 2.1.4
9. Execute protocols for handling emergency situations that range from minor medical and fire emergencies to areawide incidents.	2.2.3; 4.2.7; 10.1.3; 10.2.2
10. Demonstrate the use and various applications of the equipment commonly used in emergency and fire management services.	6.1.3; 7.1.3; 7.2.2; 7.3.3 8.2.4; 9.1.3; 10.2.2

Emergency and Fire Management Services Career Pathway	Performance Indicators
11. Implement an appropriate Incident Command System to effectively manage an incident scene.	2.2.4
12. Use common codes and icons to properly handle and transport potentially hazardous substances in fire and medical emergency scenes.	4.1.2; 12.1.5
13. Implement public relations plans to enhance public awareness and safety in fire and emergency situations.	2.1.1, 2.1.2
14. Describe the elements and issues involved in using the preparedness and response systems available to manage large-scale disasters.	4.2.7; 11.1.3, 11.1.4
15. Analyze the key functions and techniques of critical infrastructure protection in cases of terrorism and/or natural disasters.	2.1.5; 11.1.3, 11.1.4