

Diesel Technology Standards



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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



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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 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 Diesel Technology 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 Diesel Technology 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 Diesel Technology 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 Diesel Technology 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, DT is the Standards Reference Code for Diesel Technology. For Content Standard 2, Performance Standard 3 and Performance Indicator 4 the Standards Reference Code would be DT.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: IDENTIFY AND UTILIZE SAFETY PROCEDURES AND PROPER TOOLS**Performance Standard 2.1: Demonstrate General Lab Safety Rules and Procedures**

- 2.1.1 Describe general shop safety rules and procedures (i.e., safety test)
- 2.1.2 Utilize safe procedures for handling of tools and equipment
- 2.1.3 Identify and use proper placement of floor jacks and jack stands
- 2.1.4 Identify and use proper lifting procedures and proper use of support equipment (e.g., lifts, hoists, rigging, etc.)
- 2.1.5 Utilize proper ventilation procedures for working within the lab/shop area
- 2.1.6 Identify marked safety areas
- 2.1.7 Identify the location and the types of fire extinguishers and other fire safety equipment.
- 2.1.8 Demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment
- 2.1.9 Identify the location and use of eye wash stations
- 2.1.10 Identify the location of the posted evacuation routes
- 2.1.11 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protection equipment – PPE)
- 2.1.12 Identify and wear appropriate clothing for lab/shop activities
- 2.1.13 Secure hair and jewelry for lab/shop activities
- 2.1.14 Research safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits
- 2.1.15 Research safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, fuel injection systems, etc.)
- 2.1.16 Locate and interpret safety data sheets (SDS)
- 2.1.17 Prepare time or job cards, reports, or records (e.g., work orders, service reports)
- 2.1.18 Maintain clean, organized, and uncluttered work area (general housekeeping duties)
- 2.1.19 Follow verbal instructions to complete work assignments
- 2.1.20 Follow written instructions to complete work assignments
- 2.1.21 Perform a risk assessment (includes workplace inspection [walkways clear, outlets functioning], equipment inspections, proposed mitigation measures, etc.)

Performance Standard 2.2: Identify and Utilize Proper Tools and Fasteners

- 2.2.1 Identify appropriate tools and their proper usage in diesel service applications (includes A/C tools, drive tools, pneumatic tools, power tools, machine tools, and hydraulic tools)
- 2.2.2 Identify standard and metric designation for bolts and tools
- 2.2.3 Demonstrate safe handling and use of appropriate tools
- 2.2.4 Demonstrate proper inspection (prior to use), cleaning, storage, and maintenance of tools and equipment
- 2.2.5 Demonstrate proper use of precision measuring tools (e.g., micrometer, dial-indicator, dial-caliper, torque wrenches)
- 2.2.6 Determine proper size, grade, and torque specifications of fasteners

CONTENT STANDARD 3.0: PERFORM BASIC VEHICLE SERVICE**Performance Standard 3.1: Identify and Utilize Vehicle Service Information**

- 3.1.1 Locate and utilize paper and/or electronic service information (includes technical service bulletins (TSBs), and knowledge of special messages, quotes, service campaigns/recalls, vehicle/service warranty applications, and service interval recommendations)
- 3.1.2 Locate vehicle identification number (VIN and/or serial number) and production date code
- 3.1.3 Analyze vehicle identification number (VIN and/or serial number) information
- 3.1.4 Research other vehicle information labels (such as tire, emissions, etc.)

Performance Standard 3.2: Prepare a Vehicle for Service and Return to Customer

- 3.2.1 Verify work order/service report to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
- 3.2.2 Complete work order/service report to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
- 3.2.3 Demonstrate use of the three C's (concern, cause, and correction)
- 3.2.4 Identify purpose and demonstrate proper use of fender covers, seat covers, and floor mats
- 3.2.5 Identify the need for vehicle service history and possible resources
- 3.2.6 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.)

CONTENT STANDARD 4.0: APPLY FUNDAMENTAL CONCEPTS OF DIESEL ENGINES**Performance Standard 4.1: Explore Diesel Engine Fundamentals**

- 4.1.1 Describe the difference of two stroke and four stroke engines and the significance of each stroke (two stroke principle and four stroke principle)
- 4.1.2 Identify components of a diesel engine (e.g., cylinder block and head, crank shaft, connecting rod, piston and piston rings, bearings, valve train, camshaft)
- 4.1.3 Describe the difference between spark ignition and compression ignition
- 4.1.4 Calculate bore, stroke, compression ratio, and displacement

Performance Standard 4.2: Explore Fuel Systems

- 4.2.1 Identify fuel system design (e.g., inline, rotary, direct injected, pre-combustion chamber, pump and line, unit injection, hydraulic electric unit injection [HEUI], common rail)
- 4.2.2 Explore the difference of low pressure and high-pressure fuel systems and the importance of fuel system filtration
- 4.2.3 Perform fuel system maintenance (change fuel filter, priming/bleeding system, etc.)

Performance Standard 4.3: Identify Air Induction, Exhaust System, and Engine Brake

- 4.3.1 Describe the importance and function of air filters and pre-cleaners
- 4.3.2 Investigate forced induction systems
- 4.3.3 Identify the need for optional intercoolers/aftercoolers (charge air coolers [CACs]) and their function
- 4.3.4 Describe processes to check for exhaust/intake leaks

Performance Standard 4.4: Introduce Diesel Engine Emissions

- 4.4.1 Explore tier emissions (Tier 1 through Tier 4)

Performance Standard 4.5: Explore Cooling Systems

- 4.5.1 Explore the need for cooling systems (heat transfer by conduction, convection, and radiation) and their components
- 4.5.2 Identify the function and components of cooling systems (e.g., water pump, radiator, fan, thermostat)
- 4.5.3 Compare coolant fluid types/additives and applications
- 4.5.4 Demonstrate safety practices when working with cooling systems (e.g., thermal burns, fan and belt, pressurized systems)
- 4.5.5 Perform system pressure test

Performance Standard 4.6: Explore Lubrication Needs and Procedures

- 4.6.1 Explore the need for lubrication (e.g., cooling, friction reduction)
- 4.6.2 Identify the function and components of lubrication (e.g., oil pan, oil pump, pickup tube, filter, pressure regulator, oil coolers, bypass valve, fluid flow pathways)
- 4.6.3 Compare viscosity and grades of lubricants (e.g., American Petroleum Institute [API] rating/service category)
- 4.6.4 Change engine oil and filters; visually check oil for coolant or fuel contamination; inspect and clean magnetic drain plugs (multi-point inspection)

CONTENT STANDARD 5.0: APPLY CONCEPTS OF DIESEL ENGINE REPAIR**Performance Standard 5.1: Perform Cylinder Head and Valve Train Service, Evaluation, and Repair with Supervision**

- 5.1.1 Remove and inspect cylinder head for cracks/damage; check mating surfaces for warpage; check condition of passages; inspect core/expansion and gallery plugs; determine needed action
- 5.1.2 Disassemble head and inspect valves, guides, seats, springs, retainers, locks, and seals; determine needed action
- 5.1.3 Reassemble cylinder head
- 5.1.4 Inspect, measure, and replace/reinstall overhead camshaft; measure/adjust end play and backlash
- 5.1.5 Adjust valve bridges (crossheads); adjust valve clearances and injector settings
- 5.1.6 Reinstall cylinder head and torque in sequence, as per manufacturers specifications

Performance Standard 5.2: Perform Engine Block Service, Evaluation, and Repair with Supervision

- 5.2.1 Remove, inspect, service, and install pans, covers, gaskets, seals, wear rings, and crankcase ventilation components
- 5.2.2 Disassemble, clean, and inspect engine block for cracks/damage; measure mating surfaces for warpage; check condition of passages, core/expansion and gallery plugs; inspect threaded holes, studs, dowel pins, and bolts for serviceability; determine needed action
- 5.2.3 Clean, inspect, and measure cylinder walls or liners for wear and damage; determine needed action
- 5.2.4 Inspect in-block camshaft bearings for wear and damage; determine needed action
- 5.2.5 Inspect, measure, and replace/reinstall in-block camshaft; measure/adjust end play
- 5.2.6 Clean and inspect crankshaft for surface cracks and journal damage; check condition of oil passages; check passage plugs; measure journal diameter; determine needed action
- 5.2.7 Inspect main bearings for wear and damage; check bearing clearances; check crankshaft end play
- 5.2.8 Inspect, install, and time gear train; measure gear backlash; determine needed action
- 5.2.9 Inspect connecting rod and bearings for wear patterns; measure pistons, pins, retainers, and bushings
- 5.2.10 Determine piston-to-cylinder wall clearance; check ring-to-groove fit and end gap; install rings on pistons
- 5.2.11 Assemble pistons and connecting rods; install in block; install rod bearings and check clearances
- 5.2.12 Check condition of piston cooling jets (nozzles); determine needed action
- 5.2.13 Inspect crankshaft vibration damper; determine needed action
- 5.2.14 Inspect flywheel/flexplate (including ring gear) and mounting surfaces for cracks and wear; measure runout; determine needed action

CONTENT STANDARD 6.0: EXPLORE FUNDAMENTAL CONCEPTS OF DRIVETRAINS**Performance Standard 6.1: Explore Drivetrain Fundamentals**

- 6.1.1 Explore the functions and purpose of a drivetrain
- 6.1.2 Examine gear types (e.g., planetary gear sets, straight cut, helical, hypoid and amboid)
- 6.1.3 Identify gear ratios and compound ratios and the effects on performance
- 6.1.4 Calculate gear ratios and compound ratios

Performance Standard 6.2: Explore Manual Transmissions

- 6.2.1 Explain the way a manual transmission works (e.g., main shaft, counter shaft, splitters)
- 6.2.2 Justify gear ratios (1st, 2nd, 3rd, etc.) for performance/application
- 6.2.3 Discuss synchronizer function
- 6.2.4 Identify manufacturer recommended fluids

Performance Standard 6.3: Explore Automatic Transmissions

- 6.3.1 Explain the way an automatic transmission works
- 6.3.2 Discuss gear sets (e.g., compound planetary gear sets)
- 6.3.3 Discuss clutch packs, bands, and one-way clutches (roller and sprag) and how they function
- 6.3.4 Examine torque converter function (e.g., lockup converter clutch, retarder)
- 6.3.5 Discuss electrical and hydraulic controls for automatic transmissions
- 6.3.6 Identify manufacturer recommended fluids

Performance Standard 6.4: Explore Drivelines, Differentials, and Axles

- 6.4.1 Explore the need of drivelines and their function (e.g., u-joints/slip joints, yokes, constant velocity [CV] joints)
- 6.4.2 Explore the needs and functions of differentials (e.g., open end, limited slip, locker)
- 6.4.3 Identify differential components (e.g., pinion gears, ring gears, housings, bearings)
- 6.4.4 Identify axles components (e.g., shaft, housings, wheel bearings)
- 6.4.5 Explore axle types and differences (e.g., semi-floating, full-floating, drop out style, cast center section)
- 6.4.6 Identify manufacturer recommended fluids

CONTENT STANDARD 7.0: EXPLORE FUNDAMENTAL CONCEPTS OF HYDRAULICS

Performance Standard 7.1: Investigate General Hydraulic System Operation

- 7.1.1 Design basic system (e.g., log splitter, floor jack, hydraulic press)
- 7.1.2 Build basic system with schematic symbols
- 7.1.3 Discuss different hydraulic systems and components (e.g., pumps, reservoirs, pressure controls, actuators, open/closed loop)

CONTENT STANDARD 8.0: ANALYZE HYDRAULIC SYSTEMS**Performance Standard 8.1: Examine Hoses, Fittings, and Connections**

- 8.1.1 Diagnose causes of component leakage, damage, and restriction; determine needed action
- 8.1.2 Inspect hoses and connections (length, size, routing, bend radii, and protection); repair or replace as needed
- 8.1.3 Inspect and replace fitting seals and sealants

CONTENT STANDARD 9.0: EXPLORE FUNDAMENTAL CONCEPTS OF ELECTRICAL AND ELECTRONIC SYSTEMS**Performance Standard 9.1: Explore General Electrical Systems**

- 9.1.1 Read and interpret electrical/electronic circuits using wiring diagrams
- 9.1.2 Explain electricity at the atomic level (how energy moves)
- 9.1.3 Explain positive and negative electrical charges and how like charges repel and opposite charges attract
- 9.1.4 Explain electron theory and conventional theory
- 9.1.5 Explain voltage, current, and resistance (i.e., the volt, amp, and Ohm)
- 9.1.6 Introduce Ohm's Law and how it is used in electrical calculations
- 9.1.7 Explain how electricity and magnetism are related and how electromagnetic induction is used
- 9.1.8 Explain Direct Current (DC) and Alternating Current (AC)
- 9.1.9 Describe series circuits and parallel circuits and build circuits on the training boards
- 9.1.10 Introduce the multi-meter and its functions and perform some basic measurements on circuits and components
- 9.1.11 Discuss circuit faults and how to measure them (opens, shorts, high resistance)
- 9.1.12 Discuss source and load testing vs. voltage drop testing
- 9.1.13 Introduce components (wires, connectors, fuses, circuit breakers, relays, lamps, solenoids switches, diodes, capacitors, transistors, resistors) introduce schematic symbols for each
- 9.1.14 Build basic circuits on simulator boards and perform tests
- 9.1.15 Demonstrate the ability to identify circuit design and components using an electrical schematic
- 9.1.16 Demonstrate the ability to perform wire crimping, soldering, and heat shrinking for electrical connections and repairs
- 9.1.17 Explain the fundamentals of battery starting and charging systems

Performance Standard 9.2: Explore General Electronic Systems

- 9.2.1 Explain the fundamentals of electronic systems with inputs, controls, and outputs
- 9.2.2 Introduce the function of SAE data link standards
- 9.2.3 Explain the function of input components (switches, sensors, senders) and input signals (analog, digital, PWM, etc.)
- 9.2.4 Introduce the concepts of sensor diagnostics (includes downloaded information for all system functions including emission, speed, performance, etc.)

CONTENT STANDARD 10.0: EXPLORE FUNDAMENTALS OF HYDRAULIC AND AIR BRAKES**Performance Standard 10.1: Investigate Hydraulic Brakes for Service**

- 10.1.1 Check master cylinder fluid level and condition
- 10.1.2 Inspect brake lines, fittings, flexible hoses, and valves for leaks and damage
- 10.1.3 Check parking brake operation; inspect parking brake application and holding devices; adjust as needed
- 10.1.4 Check operation of hydraulic system: pedal travel, pedal effort, pedal feel
- 10.1.5 Inspect calipers/wheel cylinders for leakage, binding and damage
- 10.1.6 Inspect brake assist system (booster), hoses and control valves; check reservoir fluid level and condition
- 10.1.7 Inspect and record brake pad/lining condition, thickness, and contamination
- 10.1.8 Inspect and record condition of brake rotors/drums
- 10.1.9 Check antilock brake system wiring, connectors, seals, and harnesses for damage and proper routing

Performance Standard 10.2: Introduce Fundamentals of Air Brakes

- 10.2.1 Explore the fundamentals of air brakes
- 10.2.2 Explore the components of air brakes

CONTENT STANDARD 11.0: ANALYZE BRAKE SYSTEMS**Performance Standard 11.1: Assess Hydraulic Brakes**

- 11.1.1 Identify poor stopping, premature wear, pulling, dragging, balance, or pedal feel problems; determine needed action
- 11.1.2 Inspect and test master cylinder for internal/external leaks and damage; determine needed action
- 11.1.3 Inspect hydraulic system brake lines, flexible hoses, and fittings for leaks and damage; determine needed action
- 11.1.4 Inspect disc brake caliper assemblies; determine needed action
- 11.1.5 Inspect and measure rotors; determine needed action
- 11.1.6 Inspect and measure disc brake pads; inspect mounting hardware; determine needed action
- 11.1.7 Check parking brake operation; inspect parking brake application and holding devices; determine needed action

Performance Standard 11.2: Assess Hydraulic Brakes – Mechanical/Foundation Brakes

- 11.2.1 Identify poor stopping, brake noise, premature wear, pulling, grabbing, dragging, or pedal feel problems caused by mechanical components; determine needed action

CONTENT STANDARD 12.0: EXPLORE FUNDAMENTALS OF TIRES, WHEELS, STEERING, AND SUSPENSION**Performance Standard 12.1: Assess Tires and Wheels for Service**

- 12.1.1 Inspect tires for wear patterns, pressure, tread depth, and proper mounting and determine needed action
- 12.1.2 Inspect tires for cuts, cracks, bulges, and sidewall damage
- 12.1.3 Inspect valve caps and stems; determine needed action
- 12.1.4 Measure and record tread depth; probe for imbedded debris
- 12.1.5 Check and record air pressure; adjust air pressure in accordance with manufacturers' specifications
- 12.1.6 Check wheel mounting hardware; determine needed action
- 12.1.7 Inspect tires, wheels/rims for proper application (size, load range, position, and tread design); determine needed action
- 12.1.8 Inspect wheels for cracks, damage, and proper hand hold alignment
- 12.1.9 Check tire matching (diameter and tread) on single and dual tire applications
- 12.1.10 Identify wheel/tire vibration, shimmy, pounding, hop (tramp) problems; determine needed action
- 12.1.11 Check operation of tire pressure monitoring system (TPMS); determine needed action
- 12.1.12 Remove and install steering and drive axle wheel/tire assemblies; torque mounting hardware to specifications with torque wrench

Performance Standard 12.2: Perform Wheel Bearing Service and Repair

- 12.2.1 Inspect and service wheel bearings according to manufactures specifications
- 12.2.2 Identify, inspect, or replace unitized/preset hub bearing assemblies

Performance Standard 12.3: Assess Steering Systems – Linkage

- 12.3.1 Inspect steering linkage components
- 12.3.2 Check and adjust steering (wheel) stops

CONTENT STANDARD 13.0: PERFORM PREVENTATIVE MAINTENANCE INSPECTION AND SERVICE**Performance Standard 13.1: Perform Engine Preventative Maintenance Inspection (PMI) and Service**

- 13.1.1 Check engine fluids and seals (oil level, coolant, leaks while off and running) and determine action
- 13.1.2 Inspect belts, tensioners, and pulleys (tension, alignment) and determine action
- 13.1.3 Check engine compartment (mounts, wiring harnesses/connectors) and determine action
- 13.1.4 Perform lube, oil, filter (LOF) service (multi-point inspection)

Performance Standard 13.2: Investigate Fuel Systems for Service

- 13.2.1 Check fuel tanks, mountings, lines, caps, and vents
- 13.2.2 Drain water from fuel system
- 13.2.3 Service water separator/fuel heater; replace fuel filter(s); prime and bleed fuel system

Performance Standard 13.3: Investigate Intake and Exhaust Systems for Service

- 13.3.1 Perform multi-point inspection for exhaust and intake systems (exhaust system mountings, air induction system, turbocharger, filters, crankcase ventilation system)
- 13.3.2 Inspect diesel exhaust fluid (DEF) system, to include tanks, lines, gauge, pump, and filter

Performance Standard 13.4: Investigate Cooling Systems for Service

- 13.4.1 Perform multi-point inspection for cooling systems (fan clutch operation, radiator, fan assembly and shroud, radiator cap, hoses and clamps, recovery system, coolant filter, water pump)

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 Diesel Technology Standards show connections with the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Diesel Technology 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 Diesel Technology Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Diesel Technology 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 Diesel Technology Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Diesel Technology program connect with and support academic learning.

Crosswalks (Common Career Technical Core)

The crosswalks of the Diesel Technology Standards show connections with the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Diesel Technology 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 Diesel Technology Standards are crosswalked to the Transportation, Distribution, and Logistics Career Cluster™ and the Facility and Mobile Equipment Maintenance Career Pathway.

**Crosswalk of Diesel Technology 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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>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.</p> <p>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.</p> <p>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.</p>

Content Standard 2.0: Identify and Utilize Safety Procedures and Proper Tools

Performance Indicators	Nevada Academic Content Standards
2.1.1	<p>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.</p>
2.1.8	<p>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.</p>
2.1.14	<p>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.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
2.1.15	<p>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.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
2.1.16	<p>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.</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
2.1.17	<p>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.</p>
2.1.19	<p>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.</p>
2.1.20	<p>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.</p>
2.2.6	<p>Math: Number & Quantity – Quantities NQ.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>

Content Standard 3.0: Perform Basic Vehicle Service

Performance Indicators	Nevada Academic Content Standards
3.1.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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.11-12.7 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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>
3.1.4	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</p> <p>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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</p> <p>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>
3.2.2	<p>English Language Arts: Language Standards</p> <p>L.11-12.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.</p> <p>L.11-12.2b Spell correctly.</p>

Content Standard 4.0: Apply Fundamental Concepts of Diesel Engines

Performance Indicators	Nevada Academic Content Standards
4.1.1	<p>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.</p>
4.1.3	<p>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.</p>
4.1.4	<p>Math: Algebra – Seeing Structure in Expressions ASSE.A.1 Interpret expressions that represent a quantity in terms of its context. ASSE.A.2 Use the structure of an expression to identify ways to rewrite it.</p>
4.4.1	<p>English Language Arts: Reading Standards for Informational Text RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</p>
4.5.3	<p>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.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
4.6.1	<p>English Language Arts: Reading Standards for Informational Text RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
4.6.3	<p>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.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>

Content Standard 5.0: Apply Concepts of Diesel Engine Repair

Performance Indicators	Nevada Academic Content Standards
5.1.4	Math: Number & Quantity – Quantities NQ.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Content Standard 6.0: Explore Fundamental Concepts of Drivetrains

Performance Indicators	Nevada Academic Content Standards
6.1.4	<p>Math: Algebra – Seeing Structure in Expressions</p> <p>ASSE.A.1 Interpret expressions that represent a quantity in terms of its context.</p> <p>ASSE.A.2 Use the structure of an expression to identify ways to rewrite it.</p>
6.2.1	<p>English Language Arts: Language Standards</p> <p>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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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>
6.2.2	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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>
6.3.1	<p>English Language Arts: Language Standards</p> <p>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>English Language Arts: Speaking and Listening Standards</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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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
6.3.2	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>
6.3.3	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>
6.3.5	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>

Content Standard 7.0: Explore Fundamental Concepts of Hydraulics

Performance Indicators	Nevada Academic Content Standards
7.1.3	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>

Content Standard 8.0: Analyze Hydraulic Systems

Performance Indicators	Nevada Academic Content Standards
8.1.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</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.11-12.7 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>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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>

Content Standard 9.0: Explore Fundamental Concepts of Electrical and Electronic Systems

Performance Indicators	Nevada Academic Content Standards
9.1.2	<p>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.</p> <p>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.</p> <p>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.</p>
9.1.3	<p>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.</p> <p>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.</p> <p>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.</p>

Performance Indicators	Nevada Academic Content Standards
9.1.4	<p>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.</p> <p>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.</p> <p>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.</p>
9.1.5	<p>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.</p> <p>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.</p> <p>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.</p>
9.1.6	<p>Math: Algebra – Seeing Structure in Expressions ASSE.A.1 Interpret expressions that represent a quantity in terms of its context.</p>

Performance Indicators	Nevada Academic Content Standards
<p>9.1.7</p>	<p>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.</p> <p>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.</p> <p>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.</p>
<p>9.1.8</p>	<p>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.</p> <p>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.</p> <p>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.</p>

Performance Indicators	Nevada Academic Content Standards
9.1.11	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>
9.1.12	<p>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p>
9.1.17	<p>English Language Arts: Language Standards</p> <p>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>English Language Arts: Speaking and Listening Standards</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.11-12.4 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>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</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
9.2.1	<p>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.</p> <p>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.</p> <p>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.</p>
9.2.3	<p>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.</p> <p>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.</p> <p>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.</p>

Content Standard 12.0: Explore Fundamentals of Tires, Wheels, Steering, and Suspension

Performance Indicators	Nevada Academic Content Standards
12.1.4	<p>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.</p> <p>Math: Number & Quantity – Quantities NQ.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>
12.1.5	<p>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.</p> <p>Math: Number & Quantity – Quantities NQ.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>
12.2.1	<p>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.</p>

**Alignment of Diesel Technology Standards
and the Mathematical Practices**

Mathematical Practices	Diesel Technology Performance Indicators
1. Make sense of problems and persevere in solving them.	
2. Reason abstractly and quantitatively.	
3. Construct viable arguments and critique the reasoning of others.	4.5.5 5.2.7, 5.2.14 9.1.11
4. Model with mathematics.	5.1.4; 5.2.5, 5.2.8 6.1.3; 6.2.2 8.1.1 12.1.4, 12.1.5
5. Use appropriate tools strategically.	4.1.4 6.1.4 9.1.6
6. Attend to precision.	
7. Look for and make use of structure.	
8. Look for and express regularity in repeated reasoning.	

Alignment of Diesel Technology Standards and the Science and Engineering Practices

Science and Engineering Practices	Diesel Technology Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	4.2.2; 4.5.1 9.1.3, 9.1.7
2. Developing and using models.	
3. Planning and carrying out investigations.	
4. Analyzing and interpreting data.	6.1.3
5. Using mathematics and computational thinking.	4.1.4 6.1.4
6. Constructing explanations (for science) and designing solutions (for engineering).	7.1.1
7. Engaging in argument from evidence.	
8. Obtaining, evaluating, and communicating information.	6.2.2 9.1.10

**Crosswalks of Diesel Technology Standards
and the Common Career Technical Core**

Transportation, Distribution, and Logistics Career Cluster	Performance Indicators
1. Describe the nature and scope of the Transportation, Distribution, and Logistics Career Cluster and the role of transportation, distribution and logistics in society and the economy.	1.5.1
2. Describe the application and use of new and emerging advanced techniques to provide solutions for transportation, distribution, and logistics problems.	4.4.1
3. Describe the key operational activities required of successful transportation, distribution, and logistics facilities.	2.2.4; 3.2.1-3.2.3, 3.2.6 4.6.4; 13.1.4; 13.3.1 13.4.1
4. Identify governmental policies and procedures for transportation, distribution, and logistics facilities.	3.1.1, 3.1.3
5. Describe transportation, distribution and logistics employee rights and responsibilities and employers' obligations concerning occupational safety and health.	2.1.7, 2.1.8, 2.1.14, 2.1.15
6. Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution, and Logistics Career Pathways.	1.4.3

Facility and Mobile Equipment Maintenance Career Pathway	Performance Indicators
1. Develop preventative maintenance plans and systems to keep facility and mobile equipment inventory in operation.	2.1.21
2. Design ways to improve facility and equipment system performance.	