

# AUTO 1: AUTOMOTIVE MECHANICS, COMPREHENSIVE

**INDUSTRY SECTOR |** Transportation  
**PATHWAY |** Systems Diagnostics and Service

## **COURSE ESSENTIAL QUESTION:**

Car Care and Beyond! Becoming employable in the transportation and many other industries! Gathering the tools and starting to move.

## **COURSE OVERVIEW:**

This course provides entry level training on automotive service and maintenance awareness so that students can keep themselves going without waiting for a tow truck. Students will learn basic do it yourself maintenance and minor repairs to keep them on the go. Students will learn such things as fluid inspection, oil changing, brake inspections and tire changing, jump starting a vehicle, metal cutting and welding techniques to be able to keep them, their friends, and family vehicles moving. Students will learn that by having the knowledge that this class provides, they will be able to save their allowance for enjoyment instead of vehicle repairs. Students will gain knowledge to not be taken advantage of during the vehicle buying process and how to save money during the process.

## **INFORMATION:**

- |   |   |
|---|---|
| <b>A. Pre-requisite:</b> None.  | <b>H. UC a-g Approved:</b> No                       |
| <b>B. Abilities Required:</b> Reading and Writing Comprehension, basic math skills.                     | <b>I. Industry Certification:</b> No                |
| <b>C. Dress Requirement and Grooming:</b> Must adhere to Dress Code / As indicated by Industry Standard | <b>J. Sequencing to Include a Capstone:</b> Yes     |
| <b>D. Students must master 75% of the certificate competencies to receive a certificate.</b>            | <b>K. Community College Articulation:</b> No        |
| <b>E. Fee:</b> Free to High School students   | <b>L. Common Core Alignment:</b> Yes                |
| <b>F. Course Length:</b> 180 hours  | <b>M. Community Classroom:</b> No                   |
| <b>G. Textbook:</b> Modern Automotive Technology/Auto Upkeep  | <b>N. Career Technical Student Organization:</b> No |
|   | <b>O. Work-Based Learning:</b> No                   |

THEME: UNIT 1. PLAY IT SAFE

ENGAGING TITLE:

ESSENTIAL QUESTION: *Does safety happen on accident?*

INSTRUCTIONAL HOURS: 10 Hours

### Key Assignments

- Students will create Posters highlighting safety practices discussed in class lectures, textbooks, and the internet.
- Using a Rubric, students will be assessed using power tools and safety equipment.
- Students will demonstrate safety equipment (PPE) and tool usage by poster board presentation".

### Anchor Standards

- 2.0 **Communications:** Acquire and accurately use Transportation sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.
- 2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.
- 2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- 2.6 Advocate and practice safe, legal, and responsible use of digital media information and communications technologies.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C1.4 Use appropriate personal protective equipment and safety practices.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
- C2.2 Demonstrate and use appropriate tools and equipment – such as wrenches, sockets, and pliers – to diagnose, service, repair, and maintain systems and components.
- C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.



### Common Core Standards

- WS 11-12.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
- RLST 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.

### RESOURCES:

#### Resources

1. Modern Automotive Technologies – Chapter 5, Pages 61-68.
2. CTE-Auto.net / Auto 1 – Sem 1 Basic Intro to Auto.
3. Youtube.com – AHS Auto Tech Safety Video.
4. Youtube.com – Automotive Lift Safety Awareness.
5. Youtube.com – Lesson 1 Auto Shop Safety and Tools.



THEME: UNIT 2. Use Tools For Diagnostics And Repairing Vehicles

ENGAGING TITLE:

ESSENTIAL QUESTION: Why do tools make a difference?

INSTRUCTIONAL HOURS: 20.0 Hours

### Common Core Unit Objective

Short description of course section

### Key Assignments

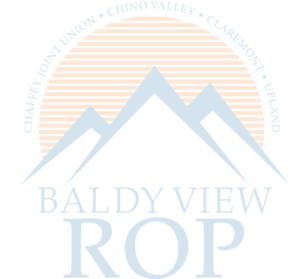
- Enter the Key Assignments.

### Anchor Standards

- 6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Transportation sector workplace environment.
- 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
  - 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
  - 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
- C5.0 Apply and understand appropriate business practices.
- C5.2 Know the laws and regulations applicable to recordkeeping and the appropriate handling and disposal of hazardous materials.
- C5.5 Practice the concept and application of acceptable customer relations practices.



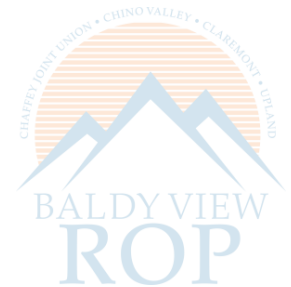
### Common Core Standards

Enter Common Core Standards

### RESOURCES:

#### Resources

M.A.T Chapter 4 (Modern Automotive Technology)



THEME: UNIT 3. FRICTION KILLS

ENGAGING TITLE:

ESSENTIAL QUESTION: Will the expense of car maintenance pay off in the long run?

INSTRUCTIONAL HOURS: 20.0 Hours

### Common Core Unit Objective

Students will be able to demonstrate and explain the procedures for checking fluid levels and quality through the Fluid inspection & demonstration practicum after using their lecture notes and textbook.

### Key Assignments

- Hands on Lab Activity - Fluid level and integrity inspection.
- Take and pass a written oil and lubrication exam.

### Anchor Standards

- 4.0 **Technology:** Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Transportation sector workplace environment.
- 4.1 Use electronic reference materials to gather information and produce products and services.
- 5.0 **Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.
- 10.0 **Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks.
- 10.1 Interpret and explain terminology and practices specific to the Transportation sector.
- 10.2 Comply with the rules, regulations, and expectations of all aspects of the Transportation sector.



### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
  - C1.1 Know and understand common environmental conservation practices and their applications.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
  - C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources
- C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
  - C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

### Common Core Standards

- RLST 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.

## RESOURCES:

### Resources

1. Modern Automotive Technologies – Chapter 10, Pages 127-134
2. CTE-Auto.net / Module 3 AO Maintenance.
3. Youtube.com – How automotive lubrication systems work (video).
4. Youtube.com – Basic automotive maintenance Part 1 (video).
5. Youtube.com – Basic automotive maintenance Part 2 (video).
6. Hands on Lab Activity – Fluid exchange. Change engine oil and filter.



THEME: UNIT

ENGAGING TITLE:

ESSENTIAL QUESTION: Will the expense of car maintenance pay off in the long run?

INSTRUCTIONAL HOURS: 20.0 Hours

### Common Core Unit Objective

Students will be able to demonstrate and explain the procedures for checking Tire PSI and quality through the Tire Maintenance and inspection & demonstration practicum after using their lecture notes and textbook.

### Key Assignments

- Hands on Lab Activity – Tire Inspection and Tire Rotation.
- Take and pass a written tire and wheel exam.

### Anchor Standards

- 4.0 **Technology:** Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Transportation sector workplace environment.
- 4.1 Use electronic reference materials to gather information and produce products and services.
- 5.0. **Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.
- 10.0 **Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks.
- 10.1 Interpret and explain terminology and practices specific to the Transportation sector.
- 10.2 Comply with the rules, regulations, and expectations of all aspects of the Transportation sector.





### Pathway Standards

- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
  - C2.1 Recognize the importance of calibration process, systems and techniques using various measurement and testing devices.
  - C2.2 Demonstrate and use appropriate tools and equipment – such as wrenches, sockets, and pliers- to diagnose, service, repair, and maintain systems and components.
  - C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
  - C8.5 Interpret tire and rim sizing to select appropriate wheels and tires for vehicles.

### Common Core Standards

- RLST 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.

## RESOURCES:

### Resources

1. Modern Automotive Technologies – Chapter 65, Pages 1227-1236.
2. CTE-Auto.net / Module 2 Tires and Wheels.
3. Youtube.com – Tire Safety Starts with Inspection.



THEME: UNIT 14. ELECTRICAL

ENGAGING TITLE: Excite your Vehicle

ESSENTIAL QUESTION: What makes your car roar?

INSTRUCTIONAL HOURS: 20.0 Hours

### Common Core Unit Objective

Students will be able to properly charge and test a vehicle battery. They will be able to start a vehicle by jump starting and using an auxiliary power source.

### Key Assignments

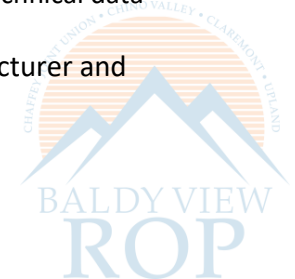
- Lab activity: Battery Inspection Alternator Output Test.

### Anchor Standards

- 5.0. **Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C1.4 Use appropriate personal protective equipment and safety practices
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes
- C2.2 Demonstrate and use appropriate tools and equipment – such as wrenches, sockets, and pliers- to diagnose, service, repair, and maintain systems and components
- C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.
- C7.2 Maintain, diagnose, repair, and service batteries



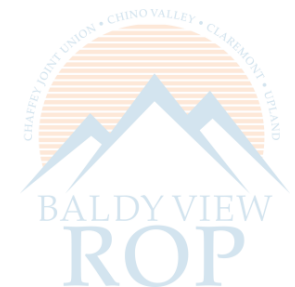
### Common Core Standards

RLST 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.

### RESOURCES:

#### Resources

1. CTE-Auto.net / Module 1 Electrical Theory
2. Youtube.com – Automotive Electrical System Basics
3. Youtube.com – Automotive Electrical System Overview



**THEME: UNIT 5. BRAKE SYSTEM**

**ENGAGING TITLE: How to stop the madness?**

**ESSENTIAL QUESTION: What slows your roll?**

**INSTRUCTIONAL HOURS: 20.0 Hours**

**Common Core Unit Objective**

Students will be able to demonstrate and explain the procedures for checking brake pad/shoe and rotor/drum thickness and quality through the Brake System Maintenance and Inspection & demonstration practicum after using their lecture notes and textbook.

**Key Assignments**

- Lab activity: Brake system inspection.
- Students will verbally identify Brake system components.

**Anchor Standards**

- 5.0. **Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.

**Pathway Standards**

- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes
- C2.1 Recognize the importance of calibration process, systems and techniques using various measurement and testing devices.
- C2.6 Demonstrate how access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
- C8.3 Diagnose, service, and repair disc brakes, drum brakes, antilock brakes, and other brake systems as developed.



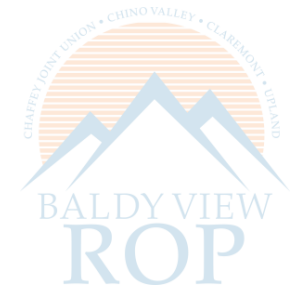
### Common Core Standards

RLST 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.

### RESOURCES:

#### Resources

1. CTE-Auto.net
2. Brake Videos
3. Brake System Theory
4. Brake System Measuring Tools



**THEME: UNIT 6. SUSPENSION AND STEERING**

**ENGAGING TITLE: Around the Bend**

**ESSENTIAL QUESTION: How do we smooth out the bumps and make it around the bend?**

**INSTRUCTIONAL HOURS: 20.0 HOURS**

**Common Core Unit Objective**

Student will be able to identify major components of Suspension Systems and will be able to inspect Suspension Systems. The will know how the Suspension System works.

**Key Assignments**

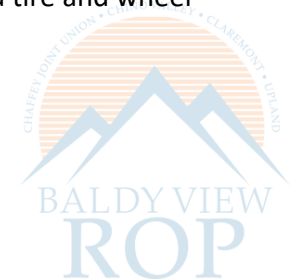
- Lab activity: Suspension and Steering
- Terms and Component Identification and Inspection.

**Anchor Standards**

- 5.0. **Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Transportation sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.

**Pathway Standards**

- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
- C2.2 Demonstrate and use appropriate tools and equipment – such as wrenches, sockets, and pliers- to diagnose, service, repair, and maintain systems and components.
- C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C8.0 Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.
- C8.4 Diagnose, service, and repair steering and suspension systems.



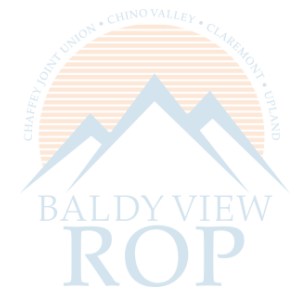
### Common Core Standards

RLST 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.

### RESOURCES:

#### Resources

1. CTE-Auto.net
2. Suspension and Steering
3. Suspension Systems



**THEME: UNIT 7. How is power created and how does it move vehicles?**  
**ENGAGING TITLE: What moves me?**  
**ESSENTIAL QUESTION: How do engines work and how can we get them to perform well?**  
**INSTRUCTIONAL HOURS: 40.0 Hours**

### Common Core Unit Objective

*Enter Common Core Unit Objectives*

### Key Assignments

*Enter Key Assignments*

### Anchor Standards

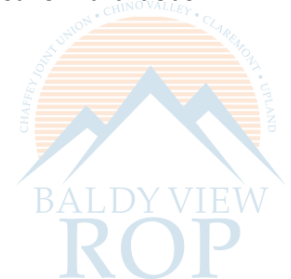
- 6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Transportation sector workplace environment.
  - 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
  - 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
  - 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
- C5.0 Apply and understand appropriate business practices.
  - C5.2 Know the laws and regulations applicable to recordkeeping and the appropriate handling and disposal of hazardous materials.
  - C5.5 Practice the concept and application of acceptable customer relations practices.

### Common Core Standards

*Enter Common Core Standards*

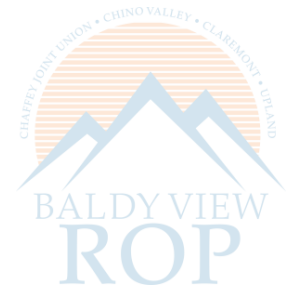




RESOURCES:

Resources

M.A.T - Sections 2, 6, 7, 10 , Chapter 34 and 35



**THEME: UNIT 11. IGNITION SYSTEM**

**ENGAGING TITLE: What ignites my fire?**

**ESSENTIAL QUESTION: How can I make a move?**

**INSTRUCTIONAL HOURS: 10.0 Hours**

### Key Assignments

Students will work in groups to hook up and be able to name the components of an early distributor ignition system and make it work on the bench.

### Anchor Standards

*Enter Anchor Standards*

### Pathway Standards

- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
  - C2.2 Demonstrate and use appropriate tools and equipment – such as wrenches, sockets, and pliers- to diagnose, service, repair, and maintain systems and components
  - C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
- C3.0 Use scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems.
  - C3.7 Perform necessary procedures to maintain, diagnose, service, and repair vehicle systems and malfunctions.
- C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
  - C6.4 Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems.

### Common Core Standards

- RLST 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.



## RESOURCES:

### Resources

1. CTE-Auto.net, Module 2
2. Youtube.com: Solving Engine Performance Issues (Video)



**THEME: UNIT 8. Power Transmission Essentials For Performance And Durability**

**ENGAGING TITLE: Get into gear**

**ESSENTIAL QUESTION: How is engine power transmitted to the ground?**

**INSTRUCTIONAL HOURS: 40.0 Hours**

### Common Core Unit Objective

Students will know basic engine terminology. Students will be able to identify major engine components and know their basic functions.

### Key Assignments

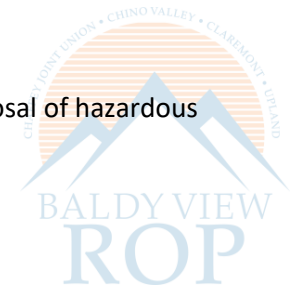
- Students will identify major Engine components presented to them in the shop.
- Identify major engine components on a shop engine individually.

### Anchor Standards

- 6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Transportation sector workplace environment.
- 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
- 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
- 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
- C5.0 Apply and understand appropriate business practices.
- C5.2 Know the laws and regulations applicable to recordkeeping and the appropriate handling and disposal of hazardous materials.
- C5.5 Practice the concept and application of acceptable customer relations practices.



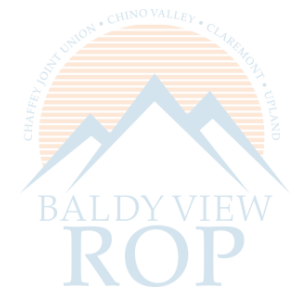
### Common Core Standards

RLST 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.

### RESOURCES:

#### Resources

M.A.T, section 11



**THEME: UNIT 9. Maintaining Safe Engine Temperatures**

**ENGAGING TITLE: Keep it Cool**

**ESSENTIAL QUESTION: How do we control engine temperatures for maximum durability and performance?**

**INSTRUCTIONAL HOURS: 10.0 Hours**

### Common Core Unit Objective

*Enter Common Core Unit Objectives*

### Key Assignments

In the lab, students will identify cooling system components and check coolant levels.

### Anchor Standards

- 4.0 **Technology:** Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Transportation sector workplace environment.
  - 4.5 Research past, present, and projected technological advances as they impact a particular pathway.
- 6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Transportation sector workplace environment.
  - 6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
  - 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
  - 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
- 10.0 **Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Transportation sector, following procedures when carrying out experiments or performing technical tasks.
  - 10.1 Interpret and explain terminology and practices specific to the Transportation sector.
  - 10.2 Comply with the rules, regulations, and expectations of all aspects of the Transportation sector.
- 11.0 **Demonstration and Application:** Demonstrate and apply the knowledge and skills contained in the Transportation anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the Skills USA career technical student organization.
  - 11.1 Utilize work-based/workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Transportation sector program of study.

### Pathway Standards

- C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
- C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
  - C2.6 Demonstrate how to access technical reports, manuals, electronic retrieval systems, and related technical data resources.
  - C2.7 Test and analyze the elements of precision measuring using standard and metric systems.
- C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.
  - C4.1 Communicate the procedures and practices of various manufacturers regarding service, repair, and maintenance schedules.
- C5.0 Apply and understand appropriate business practices.
  - C5.6 Recognize, analyze, and evaluate the need for maintenance of components and systems and the conditions under which service and maintenance are required.
- C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.
  - C6.2 Maintain, diagnose, service, and repair lubrication and cooling systems.

### Common Core Standards

*Enter Common Core Standards*

## RESOURCES:

### Resources

M.A.T, Section 7

