

The courses may be sequenced with a variety of career and technical courses to form a specialization to prepare students for careers and support additional education and training in the protective services industry. The Transportation cluster of programs prepares students for careers in automotive service and repair, aviation maintenance, diesel equipment maintenance and repair, and small engine repair.

Programs within the Transportation cluster are listed as follows:

- Auto Body Technology — Certified
- Auto Body Repair — Non-Certified
- Automotive Service Technology — Certified
- Automotive Servicing — Non-Certified
- Aviation Maintenance Technology
- Diesel Equipment Technology
- Power Equipment Technology
- Career Role CIP Code – 47.0603
- O-NET 49-3021.XX

Laboratory Activities

Special Notes

Career and Technical Student Organization (CTSO)
SkillsUSA

**Arkansas Department of Career Education
Student Performance Standards**

Course Title: **Painting and Refinishing**
Course Number: **494310**
Course Credit: **1**

Painting and Refinishing Indicators: At the completion of the course the student will be able to . .

- 1.0 Demonstrate Appropriate Safety Procedures
 - 1.1 Practice shop safety
 - 1.2 Practice personal safety
- 2.0 Demonstrate Safe Usage of Tools and Equipment
 - 2.1 Demonstrate knowledge of shop tools and equipment
- 3.0 Demonstrate Employability/Leadership Skills
 - 3.1 Demonstrate employability skills
 - 3.2 Demonstrate leadership skills
- 4.0 Demonstrate Surface Preparation Procedures
 - 4.1 Demonstrate surface preparation procedures
 - 4.2 Demonstrate spray gun and related equipment operation
 - 4.3 Demonstrate paint mixing, matching, and applying procedures
 - 4.4 Evaluate the causes of paint defects and determine the appropriate cure
 - 4.5 Demonstrate final detail procedures
- 5.0 Preparing Vehicle for Service/Customer
 - 5.1 Prepare a vehicle for service as listed on the work order
 - 5.2 Prepare vehicle for customer
- 6.0 Demonstrate Damage Analysis, Estimating, and Customer Service Procedures
 - 6.1 Evaluate vehicle damage and demonstrate appropriate procedures
 - 6.2 Demonstrate estimating procedures
 - 6.3 Demonstrate vehicle construction and parts identification procedures
 - 6.4 Student will demonstrate
 - 6.5 customer relations and sales skills

Standard 1.0 Demonstrate Appropriate Safety Procedures			
Performance Indicator 1.1 Practice shop safety.	Recommended Application/Activity	CCSS Standards	CCTC Standards
1.1.1 Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.	<ul style="list-style-type: none"> • Research state and federal regulation for handling hazardous materials in a collision shop • Apply safety and environmental regulations • Instructor mandates personal and environmental safety practices and PPE and all students must comply • Students must pass the safety test 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
1.1.2 Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.	<ul style="list-style-type: none"> • Research state and federal regulation for handling hazardous materials in a collision shop • Apply safety and environmental regulations • Instructor mandates personal and environmental safety practices and PPE and all students must comply • Students must pass the safety test 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
1.1.3 Identify safety and personal health hazards according to OSHA guidelines and the “Right to Know Law”.	<ul style="list-style-type: none"> • Research state and federal regulation for handling hazardous materials in a collision shop • Apply safety and environmental regulations • Instructor mandates personal and environmental safety practices and PPE and all students must comply • Students must pass the safety test 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
1.1.4 Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards.	<ul style="list-style-type: none"> • Have students’ research state and federal regulation for handling hazardous materials in a collision shop • Apply safety and environmental regulations • Instructor mandates personal and environmental safety practices and PPE and all students must comply • Students must pass the safety test 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
1.1.5 Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform	<ul style="list-style-type: none"> • Instructor must teach students how to identify and use NIOSH approved air purifying respirator • Demonstrate a fit test to instructor 	L11-12.6	CRP2 CRP5 CRP9

proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.			
1.1.6 Select and use a NIOSH approved supplied air (Fresh Air Make-up) respirator system. Perform proper maintenance on the NIOSH in accordance with OSHA Regulation 1910.134 and applicable state and local regulations.	<ul style="list-style-type: none"> Instructor demonstrates personal safety equipment for all areas and mandates students to comply with all federal and state regulations 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
1.1.7 Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.).	<ul style="list-style-type: none"> Instructor demonstrates personal safety equipment for all areas and mandates students to comply with all federal and state regulations 	R11-12.1 SL11-12.5	CRP2 CRP5 CRP9
Performance Indicator 1.2 Practice personal safety.	Recommended Application/Activity	CCSS Standards	CCTC Standards
1.2.1 Identify the location and use of eye wash stations.	<ul style="list-style-type: none"> Pass a safety procedure test Label eye station on diagram of shop 	SL11-12.2	CRP3
1.2.2 Identify the location of the posted evacuation routes.	<ul style="list-style-type: none"> Pass a safety procedure test Label location of evacuation route on diagram of shop 	SL11-12.2	CRP3
1.2.3 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.	<ul style="list-style-type: none"> Demonstrate the proper usage of personal protective equipment (PPE) Have rules posted including consequences of noncompliance 	SL11-12.2 R11-12.7	CRP3 TD5
1.2.4 Identify and wear appropriate clothing for lab/shop activities.	<ul style="list-style-type: none"> Students will demonstrate appropriate dress before working in shop 	SL11-12.2 R11-12.7	CRP3

	<ul style="list-style-type: none"> • Have rules posted and logical consequences for noncompliance 		
1.2.5 Secure hair and jewelry for lab/shop activities.	<ul style="list-style-type: none"> • Identify hair and jewelry safety violations with other students. 	SL11-12.2 R11-12.7	CRP3 CRP4
1.2.6 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	<ul style="list-style-type: none"> • Identify areas of possible danger • Show video or demonstrate air bag deployment • Emphasize the importance of correctly identifying the yellow and orange circuits 	SL11-12.2 R11-12.7 R11-12.6	CRP3 CRP5 CRP11
1.2.7 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).	<ul style="list-style-type: none"> • Identify areas of possible danger • Have a live demonstration of a volunteer being tazed by security office so they will understand the shock hazard 	SL11-121d	CRP1 CRP12
1.2.8 Locate and demonstrate knowledge of safety data sheets (SDS).	<ul style="list-style-type: none"> • Location of SDS included in safety test • Identify chemicals and pull up and print SDS sheets on chemicals in the lab area 	R11-12.3	CRP11 CRP7
1.2.9 Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	<ul style="list-style-type: none"> • Identify and locate fire extinguishers in shop • Pass a fire safety test • Review evacuation plan and where it is located in the building 	SL11-12.2	CRP3
Standard 2.0 Demonstrate Safe Usage of Tools and Equipment			
Performance Indicator 2.1 Demonstrate knowledge of shop tools and equipment.	Recommended Application/Activity	CCSS Standards	CCTC Standards
2.1.1 Identify tools and their usage in automotive applications.	<ul style="list-style-type: none"> • Tool identification exercises to include hand outs and spot quizzes 	R11-12.4	TD2
2.1.2 Identify standard and metric designation.	<ul style="list-style-type: none"> • Review and identify common tool sizes 	R11-12.4 L11-12.6	TD2
2.1.3 Demonstrate safe handling and use of appropriate tools.	<ul style="list-style-type: none"> • Demonstrate proficiency in the proper application of tools 	R11-12.4 L11-12.6	CRP1 CRP3
2.1.4 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	<ul style="list-style-type: none"> • Demonstrate proficiency in cleaning and storing tools 	R11-12.4 L11-12.6	CRP12

Tools:

<http://www.onguardsafetytraining.com/samples/2Automotive%20Hand%20tools.pdf>

SAE/Metric:

<http://www.sosmath.com/tables/sae/sae.html>

http://www.hondachopper.com/garage/sae_to_metric/SAE-Metric_Conversion_Chart.pdf

http://www.engineeringtoolbox.com/wrenches-inches-metric-us-conversion-comparison-d_1607.html

Standard 3.0 Demonstrate Employability/Leadership Skills			
Performance Indicator 3.1 Demonstrate employability skills.	Recommended Application/Activity	CCSS Standards	CCTC Standards
3.1.1 Demonstrate a good work ethic (i.e., relations with others, dependability, attitude, and personal hygiene).	<ul style="list-style-type: none"> • Use guest speakers from industry • Utilize career coaches to model appropriate behavior and attitude 	SL11-12.1	TD1 CRP1
3.1.2 Demonstrate teamwork.	<ul style="list-style-type: none"> • Assign paired work placing students in work groups with rotating roles 	SL11-12.1b	CRP1 CRP12
3.1.3 Demonstrate job-seeking techniques (i.e., write a resume, search for a job, arrange references, and apply interview techniques)	<ul style="list-style-type: none"> • Write resume • Have career coach assist in resume building • Complete a job application • Perform mock interview 	W11-12.5 W11-12.6	CRP10
3.1.4 Describe legal issues of sexual harassment in the workplace.	<ul style="list-style-type: none"> • Sexual harassment seminar, invite guest speakers 	SL11-12.3	CRP5
3.1.5 Identify employment eligibility requirements (e.g. valid driver's license, background check etc.)	<ul style="list-style-type: none"> • Guest speaker for job requirements • Review job opening requirements 	SL11-12.3	TD5
Performance Indicator 3.2	Recommended Application/Activity	CCSS	CCTC

Demonstrate leadership skills.		Standards	Standards
3.2.1 Perform basic parliamentary procedures in a group meeting.	<ul style="list-style-type: none"> • Have class meetings following Robert Rules of Order 	SL11-12.1b	CRP9
3.2.2 Demonstrate an understanding of one's personal values, interpersonal skills, etiquette, effectiveness in oral and written communication and courtesy. Develop and maintain a code of professional ethics.	<ul style="list-style-type: none"> • Perform self-evaluation • Use a professional development manual • Practice communication exercises • Practice writing examples, role-play conflict resolution scenarios 	SL11-12.1b	CRP4 CRP9
3.2.3 Maintain a good professional appearance.	<ul style="list-style-type: none"> • Counsel students on importance of maintaining a positive image • Invite industry representatives to discuss employment standards 	SL11-12.3	CRP3
3.2.4 Perform basic tasks related to securing and terminating employees.	<ul style="list-style-type: none"> • Perform mock interviews • Evaluate employee performance and simulate terminations 	SL11-12.3	CRP9 TD5

Standard 4.0 Demonstrate Surface Preparation Procedures			
Performance Indicator 4.1 Demonstrate surface preparation procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
4.1.1 Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.	<ul style="list-style-type: none"> Instructor demonstrates inspection, removal and replacement of exterior trim and proper storage Student can demonstrate on a door or panel 	R11-12.3 L11-12.6	CRP2
4.1.2 Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants.	<ul style="list-style-type: none"> Demonstrate proper procedure and cleaners needed to thoroughly wash a vehicle Student performs task on instructor approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP3
4.1.3 Inspect and identify substrate, type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.4 Strip paint to bare substrate (paint removal).	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.1.5 Dry or wet sand areas to be refinished.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.6 Featheredge damaged areas to be refinished.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.7 Apply suitable metal treatment or primer in accordance with total product systems.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.1.8 Mask and protect other areas that will not be refinished	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.9 Mix primer, primer-surfacer or primer-sealer.	<ul style="list-style-type: none"> Instructor demonstrate proper procedure for mixing primer, primer-surfacer or primer sealer Perform task while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.10 Identify a complimentary color or shade of undercoat to improve coverage. Apply primer onto surface of repaired area.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP3
4.1.11 Apply two-component finishing filler	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while 	R11-12.3	CRP2

to minor surface imperfections.	instructor observes	L11-12.6	
4.1.12 Dry or wet sand area to which primer-surfacer has been applied.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.13 Dry sand area to which two-component finishing filler has been applied.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.14 Remove dust from area to be refinished, including cracks or moldings of adjacent areas.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.1.15 Clean area to be refinished using a final cleaning solution.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.1.16 Remove, with a tack rag, any dust or lint particles from the area to be refinished.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.1.17 Apply suitable sealer to the area being refinished.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.18 Scuff sand to remove nibs or imperfections from a sealer.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.19 Apply stone chip resistant coating.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.20 Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.21 Prepare adjacent panels for blending.	<ul style="list-style-type: none"> Perform task on instructor-approved vehicle or panel while instructor observes 	R11-12.3 L11-12.6	CRP2
4.1.22 Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.	<ul style="list-style-type: none"> Provide various examples of different plastics Use multimedia or collision related sources to show materials, preparation, and refinishing procedures 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.1.23 Identify aluminum parts to be refinished; determine the materials, preparation, and refinishing procedures.	<ul style="list-style-type: none"> Use multimedia, collision related sources, or aluminum panel to demonstrate correct preparation and refinishing procedures using appropriate materials 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
Performance Indicator 4.2 Demonstrate spray gun and related equipment operation.	Recommended Application/Activity	CCSS Standards	CCTC Standards

4.2.1 Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment).	<ul style="list-style-type: none"> Instructor demonstrates proper gun disassembly, cleaning, and reassembling of spray gun Instructor demonstrates proper care of spray gun-related equipment Perform tasks while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP5
4.2.2 Check and adjust spray gun operation for HVLP (high volume, low pressure) or compliant spray guns.	<ul style="list-style-type: none"> Instructor demonstrates spray gun controls for operation Perform task while instructor observes 	R11-12.3 L11-12.6	CRP2
4.2.3 Set-up (fluid needle, nozzle, and cap), test, and adjust spray gun using fluid, air, and pattern control valves.	<ul style="list-style-type: none"> Instructor demonstrates proper settings of gun controls Adjust gun settings for painting while instructor observes 	R11-12.3 L11-12.6	CRP2
4.2.4 Demonstrate an understanding of the operation of pressure spray equipment.	<ul style="list-style-type: none"> Instructor demonstrates the operation of pressure spray gun equipment Perform task while instructor observes 	R11-12.3 L11-12.6	CRP2
Performance Indicator 4.3 Demonstrate paint mixing, matching, and applying procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
4.3.1 Identify type and color code by manufacturer's vehicle information label.	<ul style="list-style-type: none"> Instructor shows location of paint codes on vehicles Locate paint codes on vehicles 	R11-12.3 L11-12.6	CRP2 CRP7
4.3.2 Shake, stir, reduce, catalyze/activate, and strain refinsh materials.	<ul style="list-style-type: none"> Instructor demonstrates how to properly stir and combine paint products per manufacture's recommendations Mix paint using paint procedures while instructor observes 	R11-12.3 L11-12.6	CRP2 CRP7
4.3.3 Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.4 Apply selected product on test and let-down panel; check for color match.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.5 Apply single stage topcoat.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11

4.3.6 Apply basecoat/clearcoat for panel blending or panel refinishing.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.7 Apply basecoat/clearcoat for overall refinishing.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.8 Remove nibs or imperfections from basecoat.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.9 Refinish rigid or semi-rigid, and plastic parts.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.10 Refinish flexible plastic parts.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.11 Apply multi-stage coats for panel blending or overall refinishing.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.12 Identify and mix paint using a formula.	<ul style="list-style-type: none"> Use multimedia and collision related materials Instructor demonstrates using mixing system 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.13 Identify poor hiding colors; determine necessary action.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.14 Tint color using formula to achieve a blendable match.	<ul style="list-style-type: none"> Use multimedia and collision related materials Instructor demonstrates using mixing system 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.15 Identify alternative color formula to achieve a <i>blendable</i> match.	<ul style="list-style-type: none"> Use multimedia and collision related materials Instructor demonstrates using mixing system 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.3.16 Identify the materials equipment, and preparation differences between solvent and waterborne technologies.	<ul style="list-style-type: none"> Use multimedia and collision related materials or application on a panel 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
Performance Indicator 4.4 Evaluate the causes of paint defects and determine the appropriate cure.	Recommended Application/Activity	CCSS Standards	CCTC Standards

4.4.1 Identify blistering (raising of the paint surface, air entrapment); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.2 Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.3 Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.4 Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.5 Identify lifting; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.6 Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.7 Identify orange peel; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.8 Identify overspray; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.9 Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify paint manufacture defect related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.10 Identify sags and runs in paint surface; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.11 Identify sanding marks or sandscratch swelling; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.12 Identify contour mapping/edge mapping while finish is drying; determine	<ul style="list-style-type: none"> Identify gun control related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6	CRP2 CRP8

the cause(s) and correct the condition.		R11-12.9	
4.4.13 Identify color difference (off-shade); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify paint manufacture defect related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.14 Identify tape tracking; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.15 Identify low gloss condition; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify gun control or manufacture defect related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.16 Identify poor adhesion; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.17 Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.18 Identify corrosion; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify environmental related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.19 Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.20 Identify water spotting; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify vehicle preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.21 Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.	<ul style="list-style-type: none"> Identify environmental related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8 CRP5
4.4.22 Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition.	<ul style="list-style-type: none"> Identify environmental related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8 CRP5
4.4.23 Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the	<ul style="list-style-type: none"> Identify environmental related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8 CRP5

condition.			
4.4.24 Identify chalking (oxidation); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify environmental related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8 CRP5
4.4.25 Identify bleed-through (staining); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.26 Identify pin-holing; determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Identify preparation related paint problems Determine the cause(s) and correct the condition 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
4.4.27 Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle or panel to demonstrate and correct buffing related imperfections 	R11-12.3 L11-12.6 R11-12.9 SI11-12.5	CRP2 CRP8 CRP11
4.4.28 Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle or panel to demonstrate and correct the condition 	R11-12.3 L11-12.6 R11-12.9 SL11-12.5	CRP2 CRP8 CRP11
Performance Indicator 4.5 Demonstrate final detail procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
4.5.1 Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle or panel to demonstrate. 	R11-12.3 SL11-12.5	CRP2 CRP11
4.5.2 Buff and polish finish to remove defects as required.	<ul style="list-style-type: none"> Instructor demonstrates correct buffing procedures to polish and remove defects from finishes Perform task while instructor observes 	R11-12.3 L11-12.6	CRP2
4.5.3 Clean interior, exterior, and glass.	<ul style="list-style-type: none"> Instructor demonstrates proper methods to clean interior, exterior, and glass on instructor approved vehicle Perform task while instructor observes 	R11-12.3 L11-12.6	CRP2
4.5.4 Clean body openings (door jams and edges, etc.).	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle or panel to demonstrate and correct the condition 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
4.5.5 Remove overspray.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle or panel to demonstrate the removal of overspray Perform task while instructor observes 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11

4.5.6 Perform pre-delivery detail and inspection.	<ul style="list-style-type: none"> • Use multimedia, collision related material, or instructor-approved vehicle to demonstrate detail and inspection procedures for the delivery of vehicle • Perform task while instructor observes 	R11-12.3 L11-12.6 SL11-12.5	CRP2 CRP11
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Standard 5.0 Preparing Vehicle for Service/Customer

Performance Indicator 5.1 Prepare a vehicle for service as listed on the work order.	Recommended Application/Activity	CCSS Standards	CCTC Standards
5.1.1 Identify information needed and the service requested on a repair order.	<ul style="list-style-type: none"> • Write and print repair orders • Explain information on repair orders 	SL11-12.1a SL11-12.5 W11-12.8	CRP11
5.1.2 Identify purpose and demonstrate proper use of fender covers, mats.	<ul style="list-style-type: none"> • Establish a policy of using covers and mats • Rotate as service writer and have them install mats and covers 	R11-12.2 W11-12.8	CRP2
5.1.3 Demonstrate use of the three C's (concern, cause, and correction).	<ul style="list-style-type: none"> • List 3 c's on every work order 	SL11-12.1b W11-12.8	CRP2
5.1.4 Review vehicle service history.	<ul style="list-style-type: none"> • Review available service records • Discuss previous repairs and effect on current problem 	SL11-12.5	CRP2
5.1.5 Complete work order to include customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.	<ul style="list-style-type: none"> • Fill out work order on every vehicle • Write and fill out repair orders 	W11-12.2	CRP11 CRP4
Performance Indicator 5.2 Prepare vehicle for customer.	Recommended Application/Activity	CCSS Standards	CCTC Standards
5.2.1 Ensure vehicle is prepared to return to customer per school or company policy (floor mats, steering wheel cover, etc.).	<ul style="list-style-type: none"> • Establish a policy of what is done to a vehicle before it is returned to customer • Clean of grease marks or stains etc. • Car is fixed according to work order 	R11-12.2 R11-12.9	CRP11 CRP2

Standard 6.0 Demonstrate Damage Analysis, Estimating, and Customer Service Procedures			
Performance Indicator 6.1 Evaluate vehicle damage and demonstrate appropriate procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
6.1.1 Position the vehicle for inspection.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle 	SL11-12.1a SL11-12.5 W11-12.8	CRP11
6.1.2 Prepare vehicle for inspection by providing access to damaged areas.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor-approved vehicle by removing all damaged non-structural accessible panels and parts 	R11-12.2 W11-12.8	CRP2
6.1.3 Analyze damage to determine appropriate methods for overall repairs.	<ul style="list-style-type: none"> Show theory of tools and equipment to repair damage 	W11-12.8	CRP2
6.1.4 Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage	<ul style="list-style-type: none"> Visually inspect impact area and travel of energy through vehicle 	SL11-12.5	CRP2
6.1.5 Gather details of the incident/accident necessary to determine the full extent of vehicle damage.	<ul style="list-style-type: none"> Report nature of accident from owner or accident report 	W11-12.2	CRP11 CRP4
6.1.6 Identify and record pre-existing damage.	<ul style="list-style-type: none"> Note all pre-existing damage for liability control 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
6.1.7 Identify and record prior repairs.	<ul style="list-style-type: none"> Inspect for previous repairs showing alignment issues, bodywork and repainting 	R11-12.3 L11-12.6	CRP2
6.1.8 Perform visual inspection of structural components and members.	<ul style="list-style-type: none"> Walk student around vehicle showing structural aspects and importance of different components and members 	R11-12.3 R11-12.9	CRP2 CRP8
6.1.9 Identify structural damage using measuring tools and equipment.	<ul style="list-style-type: none"> Set up vehicle on frame machine, if available, and hang targets Set up measuring system and read results 	R11-12.3 L11-12.6 R11-12.9	CRP2 CRP8
6.1.10 Perform visual inspection of non-structural components and members.	<ul style="list-style-type: none"> Walk students around vehicle and show visual damage on outer parts and components of vehicle 	L11-12.6	CRP11

6.1.11 Determine parts, components, material type(s) and procedures necessary for a proper repair.	<ul style="list-style-type: none"> Instructor helps student decided what parts, components, and materials are needed to repair vehicle and make a repair plan 	R11-12.9	CRP8
6.1.12 Identify type and condition of finish; determine if refinishing is required.	<ul style="list-style-type: none"> Use multimedia, collision related material, or instructor approved vehicle to identify different types and conditions of paint finishes Decide if refinishing is required. 	SL11-12.1b	CRP11
6.1.13 Identify suspension, electrical and mechanical component physical damage.	<ul style="list-style-type: none"> Visually inspect drivetrain for damages 	SL11-12.1a	CRP11
6.1.14 Identify safety systems physical damage.	<ul style="list-style-type: none"> Check SRS system for damage 	R11-12.3 L11-12.6	CRP2
6.1.15 Identify interior component damage.	<ul style="list-style-type: none"> Visually inspect the entire interior of vehicle for damages 	R11-12.9	CRP2
6.1.16 Identify damage to add-on accessories and modifications.	<ul style="list-style-type: none"> Visually inspect added accessories and components for damage Record results 	R11-12.9	CRP2 CRP8
6.1.17 Identify single (one time) use components.	<ul style="list-style-type: none"> Components such as: SRS system, bumper bar, door beam, and safety system 	R11-12.3	
Performance Indicator 6.2 Demonstrate estimating procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
6.2.1 Determine and record customer/vehicle owner information. Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant. Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications.	<ul style="list-style-type: none"> Identify and record vehicle owner information, VIN, all descriptive information, options, accessories, and modifications on vehicle 	R11-12.3 L11-12.6	CRP2
6.2.2 Identify safety systems; determine replacement items.	<ul style="list-style-type: none"> Safety systems such as: SRS system, bumper bar, door beam, and safety system 	R11-12.3	CRP2 CRP8
6.2.3 Apply appropriate estimating and parts nomenclature (terminology).	<ul style="list-style-type: none"> Appropriately use estimating and parts terminology used in the field 	R11-12.3 R11-12.9	CRP2
6.2.4 Determine and apply appropriate	<ul style="list-style-type: none"> Follow estimating system guidelines from front to back of car 	R11-12.9	

estimating sequence.			
6.2.5 Utilize estimating guide procedure pages.	<ul style="list-style-type: none"> Cover guide procedure pages 	L11-12.6	CRP8
6.2.6 Apply estimating guide footnotes and headnotes as needed.	<ul style="list-style-type: none"> Use estimating footnotes and symbols for judgment & special operations 	W11-12.2	
6.2.7 Estimate labor value for operations requiring judgment.	<ul style="list-style-type: none"> Describe time required for operations not in the estimating system 	SL11-12.5	CRP2 CRP11
6.2.8 Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).	<ul style="list-style-type: none"> Identify labor rates (accurate) for mechanical, body, paint, and frame time 	R11-12.3 L11-12.6	CRP8
6.2.9 Select and price OEM parts; verify availability, compatibility, and condition.	<ul style="list-style-type: none"> Use estimating system for OEM parts pricing Use local dealerships for pricing 	R11-12.3	CRP2
6.2.10 Select and price alternative/optional OEM parts, aftermarket parts, remanufactured, rebuilt, and reconditioned parts, recyclable/used parts; verify availability, compatibility and condition.	<ul style="list-style-type: none"> Use salvage yard parts supplier for pricing Determine local parts suppliers Determine aftermarket dealers Determine OEM parts suppliers 	SL11-12.5 R11-12.3	CRP2 CRP11
6.2.11 Determine price and source of necessary sublet operations.	<ul style="list-style-type: none"> Research local shops to perform sublet operations such as: R & I Glass, Front end alignments, and Engine Diagnostics 	SL11-12.5	CRP2 CRP11
6.2.12 Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.	<ul style="list-style-type: none"> Use procedure pages in estimating system to determine non-included operations 	SL11-12.5	CRP2 CRP11
6.2.13 Recognize and apply overlap deductions, included operations, and additions.	<ul style="list-style-type: none"> Use estimating system to determine paint overlap, included and additional operations 	SL11-12.5	CRP2 CRP11
6.2.14 Determine additional material and charges. Determine refinishing material and charges. Apply math skills to establish charges and totals.	<ul style="list-style-type: none"> Add for seam sealers, undercoating, etc. and add for pricing Apply quantitative math skills to develop an accurate cost analysis; then compile the work order using a manual template or word processing software 	R11-12.3	CRP2
6.2.15 Interpret computer-assisted and manually written estimates; verify the information is current.	<ul style="list-style-type: none"> Refer to online estimating software and paper and pencil worksheets 	SL11-12.5	CRP2 CRP11
6.2.16 Identify procedural differences between computer-assisted systems	<ul style="list-style-type: none"> Compare and contrast differences in computer-assisted systems and manual estimates 	R11-12.3	CRP2 CRP11

and manually written estimates.			
6.2.17 Identify procedures to restore corrosion protection; establish labor values, and material charges.	<ul style="list-style-type: none"> Write explanatory narratives that examine and define the various components, values and costs 	W11-12.2	
6.2.18 Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value.	<ul style="list-style-type: none"> Refer to estimate for repair cost Refer to www.kbb.com for vehicle value Compare and contrast values 	R11-12.3	CRP2
6.2.19 Recognize the differences in estimation procedures when using different information provider systems.	<ul style="list-style-type: none"> Compare and contrast different estimating software 	SL11-12.5	CRP2 CRP11
6.2.20 Verify accuracy of estimate compared to the actual repair and replacement operations.	<ul style="list-style-type: none"> Compare and contrast estimate to actual charges 	R11-12.3	CRP2 CRP11
Performance Indicator 6.3 Demonstrate vehicle construction and parts identification procedures.	Recommended Application/Activity	CCSS Standards	CCTC Standards
6.3.1 Identify type of vehicle construction (space frame, unibody, body-over-frame). Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles. Identify impact energy absorbing components.	<ul style="list-style-type: none"> Consult OEM parts manuals and electronic data to determine cost of components and accessories for various makes and models of vehicles. 	R11-12.3	
6.3.2 Identify steel types; determine repairability. Identify aluminum/magnesium components; determine repairability. Identify plastic/composite components; determine repairability. Identify vehicle glass components and repair/replacement procedures. Identify add-on accessories.	<ul style="list-style-type: none"> Write explanatory narratives that examine and define the various components, establish the repairability of those components, and integrate the information accurately into the work order 	W11-12.2	
Performance Indicator 6.4 Student will demonstrate customer relations and sales skills.	Recommended Application/Activity	CCSS Standards	CCTC Standards
6.4.1 Acknowledge and/or greet customer/client. Listen to customer/client; collect information and identify customers/client's concerns, needs and	<ul style="list-style-type: none"> Interact respectfully with individuals involved in various aspects of customer service, including OEM representatives, customers/clients, insurance representatives, and suppliers 	SL11-12.5	CRP2 CRP11

expectations. Establish cooperative attitude with customer/client. Identify yourself to customer/client; offer assistance.			
6.4.2 Appropriately manage angry customer/client situations.. Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.	<ul style="list-style-type: none"> Resolve conflicts and differences to maintain a smooth workflow 	R11-12.3 L11-12.6	CRP8
6.4.3 Recognize basic claims handling procedures and explain to customer/client while projecting a positive attitude and professional appearance.	<ul style="list-style-type: none"> Individually craft written scenarios narrating a challenging customer interaction and use the scenarios to practice effective communication techniques in a role-play 	R11-12.3	CRP2
6.4.4 Provide and review warranty information. Provide and review technical and consumer protection information. Estimate and explain duration of out-of-service time. Apply negotiation skills to obtain a mutual agreement. Interpret and explain manual or computer-assisted estimate to customer/client	<ul style="list-style-type: none"> Research negotiation skills and apply them to workplace scenarios 	SL11-12.5 R11-12.3	CRP2 CRP11

Suggested resource: <http://ccc.cccis.com/pages/home/1.php?tab=4>

Common Core State Standards Grades 9-12

ELA Speaking and Listening Standards Grades 9-10

1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. **SL9-10.1**
 - a. 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. **SL9-10.1a**
 - b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed. **SL9-10.1b**
 - c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions. **SL9-10.1c**
 - d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. **SL9-10.1d**
2. Integrate multiple sources of information presented in diverse media or format(e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. **SL9-10.2**
3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. **SL9-10.3**
4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. **SL9-10.4**
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. **SL9-10.5**

ELA Speaking and Listening Standards Grades 11-12

1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. **SL11-12.1**
 - a. 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. **SL11-12.1a**

- b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. **SL11-12.1b**
 - c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. **SL11-12.1c**
 - d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. **SL11-12.1d**
- 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. **SL11-12.2**
 - 3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. **SL11-12.3**
 - 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. **SL11-12.4**
 - 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. **SL11-12.5**

ELA Language Grades 9-10

- 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. **L9-10.4**
 - a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. **L9-10.4a**
 - b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy). **L9-10.4b**
 - c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. **L9-10.4c**
 - d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). **L9-10.4d**
- 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. **L9-10.6**

ELA Language Grades 11-12

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. **L11-12.4**
 - a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. **L11-12.4a**
 - b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). **L11-12.4b**
 - c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. **L11-12.4c**
 - d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary) **L11-12.4d**
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. **L11-12.6**

Reading Standards for Literacy in Science and Technical Subjects Grades 9-10

1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. **R9-10.1**
2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. **R9-10.2**
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **R9-10.3**
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 9–10 texts and topics. **R9-10.4**
5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). **R9-10.5**
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. **R9-10.6**
7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. **R9-10.7**
8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **R9-10.8**
9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. **R9-10.9**
10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. **R9-10.10**

Reading Standards for Literacy in Science and Technical Subjects Grades 11-12

1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. **R11-12.1**
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. **R11-12.2**
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. **R11-12.3**
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. **R11-12.4**
5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. **R11-12.5**
6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. **R11-12.6**
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. **R11-12.7**
8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. **R11-12.8**
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. **R11-12.9**
10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently. **R11-12.10**

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9-10

1. Write arguments focused on discipline-specific content. **W9-10.1**
 - a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. **W9-10.1a**
 - b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience’s knowledge level and concerns. **W9-10.1b**
 - c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. **W9-10.1c**
 - d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. **W9-10.1d**
 - e. Provide a concluding statement or section that follows from or supports the argument presented. **W9-10.1e**

2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **W9-10.2**
 - a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. **W9-10.2a**
 - b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic. **W9-10.2b**
 - c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. **W9-10.2c**
 - d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. **W9-10.2d**
 - e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. **W9-10.2e**
 - f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **W9-10.2f**
3. Write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results. **W9-10.3**
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **W9-10.4**
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. **W9-10.5**
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically. **W9-10.6**
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. **W9-10.7**
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. **W9-10.8**
9. Draw evidence from informational texts to support analysis, reflection, and research. **W9-10.9**
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. **W9-10.10**

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 11-12

1. Write arguments focused on discipline-specific content. **W11-12.1**

- a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. **W11-12.1a**
 - b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. **W11-12.1b**
 - c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. **W11-12.1c**
 - d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. **W11-12.1d**
 - e. Provide a concluding statement or section that follows from or supports the argument presented. **W11-12.1e**
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **W11-12.2**
 - a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. **W11-12.2a**
 - b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. **W11-12.2b**
 - c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. **W11-12.2c**
 - d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. **W11-12.2d**
 - e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). **W11-12.2e**
 3. Write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results. **W11-12.3**
 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **W11-12.4**
 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. **W11-12.5**
 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. **W11-12.6**

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. **W11-12.7**
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. **W11-12.8**
9. Draw evidence from informational texts to support analysis, reflection, and research. **W11-12.9**
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. **W11-12.10**

Common Career and Technical Core Standards

Transportation, Distribution, & Logistics Career Cluster

Transportation, Distribution, & Logistics Career Cluster Standards (TD)

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. **TD1**
2. Describe the application and use of new and emerging advanced techniques to provide solutions for transportation, distribution, and logistics problems. **TD2**
3. Describe key operational activities required of successful transportation, distribution, and logistics facilities. **TD3**
4. Identify governmental policies and procedures for transportation, distribution, and logistics facilities. **TD4**
5. Describe transportation, distribution, and logistics employee rights and responsibilities and employers' obligations concerning occupational safety and health. **TD5**
6. Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution, and Logistics Career Pathways. **TD6**

Facility and Mobile Equipment Maintenance Career Pathway (TD-MTN)

1. Develop preventative maintenance plans and systems to keep facility and mobile equipment inventory in operation. **TD-MTN1**
2. Design ways to improve facility and equipment system performance. **TD-MTN2**

Common Career and Technical Core Career Ready Practices (CCTC CRP)

1. Act as a responsible and contributing citizen and employee. **CRP1**

2. Apply appropriate academic and technical skills. **CRP2**
3. Attend to personal health and financial well-being. **CRP3**
4. Communicate clearly, effectively, and with reason. **CRP4**
5. Consider the environmental, social and economic impacts of decisions. **CRP5**
6. Demonstrate creativity and innovation. **CRP6**
7. Employ valid and reliable research strategies. **CRP7**
8. Utilize critical thinking to make sense of problems and persevere in solving them. **CRP8**
9. Model integrity, ethical leadership, and effective management. **CRP9**
10. Plan education and career path aligned to personal goals. **CRP10**
11. Use technology to enhance productivity. **CRP11**
12. Work productively in teams while using cultural/global competence. **CRP12**