Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA100 - SAFETY
Unit Number: PA100

Dates: Spring 2013 **Hours:** 17.00

Unit Description / Objectives:

Student will know and be able to identify all safety requirements related to the auto body field.

Tasks:

PA101 - Establish general shop safety.

PA102 - Demonstrate proper use of personal safety devices and clothing.

PA103 - Locate and identify fire extinguishers.

PA104 - Locate and operate emergency switches.

PA105 - Explain fire and tornado drill procedures.

PA106 - Demonstrate proper handling of hazardous materials.

PA107 - Identify proper chemical disposal techniques.

PA108 - Operate shop and spray area ventilation systems properly.

PA109 - List rules for care and safe use of hand tools.

PA110 - Demonstrate safe and proper use of hydraulic tools; electric powered, pneumatic equipment.

PA111 - Identify the proper methods and options for safely moving vehicles in the shop area.

PA112 - Identify information on Material Safety Data Sheets (MSDS).

L113 - Identify opportunities in the auto body field.

L114 - Identify program rules and policies.

L115 - Identify government agencies regulating the auto collision industry.

L116 - Demonstrate the use of proper jacking and lifting points on a full frame vehicle.

L117 - Demonstrate the use of proper jacking and lifting points on a uni-body vehicle.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

Supporting Standards/Anchors

3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.

CC.3.5.9-10.D. 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.

CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

CC.3.5.11-12.C. 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.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Connecting Standard/Anchor

- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Supporting Standards/Anchors

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

13.1.11A Relate careers to individual interests, abilities and aptitudes

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Complete SP/2 Safety training on-line
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents
Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents
Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety
Describe safety practices designed to avoid fire and explosions
Identify and explain general purpose hand tools
Identify and explain the use for the most important collision repair hand tools
Compare the advantages and disadvantages of different tools
Properly select the right tool for the job
Maintain and store tools properly
Identify power tools found in a collision repair facility
Explain the purpose of each type of power tool
Summarize how to safely use tools
Identify the typical types of equipment used in collision repair
Describe how to use collision repair equipment
Select the right power tool or piece of equipment for the job
Explain low emissions spray equipment and regulations
Explain the operation of spray booths and drying rooms
Identify the various types of spray guns and explain how each type operates
Describe the recommended maintenance program for a spray booth
Operate and maintain a spray gun
Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.HP-I
REF01 Modules 4
REF03 Modules 2, 4
WKR01 Modules 3
Identify safety and personal health hazards according to OSHA guidelines and "Right to Know".
HP-I WKR01 Modules 1
Inspect spray environment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards.
HP-I REF01 Modules 3
WKR01 Modules 5
Select and use the NIOSH approved personal sanding respirator.
Inspect condition and ensure fit and operation.
Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations.
HP-I WKR01 Modules 4
Select and use the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system.
Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.
HP-I REF01 Modules 2
WKR01 Modules 4
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.).
HP-I REF02 Modules 2
REF03 Modules 2, 4
WKR01 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Hand tools
Grinders
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
English Wheel
Brake Press
Spray Booth
Mig Welder
Torch
Frame Machine
Lift
Jack
DuPont Refinisher magazine
Promotional materials from post-secondary institutions
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA200 - PRINCIPLES OF AUTOBODY DESIGN AND CONSTRUCTION

Unit Number: PA200

Dates: Spring 2013 **Hours:** 50.00

Unit Description / Objectives:

Student will know and be able to list, describe, and identify the various types or parts of a unibody vehicle.

Tasks:

PA201 - List the differences between a unibody vehicle and a full frame vehicle.

PA202 - Describe major advantages of a unibody vehicle.

PA203 - Identify front body panels of a unibody vehicle.

PA204 - Identify underbody panels of a unibody vehicle.

PA205 - Identify side body panels of a unibody vehicle.

PA206 - Identify rear body panels of a unibody vehicle.

PA207 - Identify vehicles by V.I.N. number (vehicle identification number).

PA208 - Demonstrate knowledge of autobody (space frames).

PA209 - Describe advantages and disadvantages of a full frame vehicle.

L210 - Describe proper handling of vehicles in the shop.

L211 - Identify basic auto body construction.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.

3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
CC.3.5.11-12.A. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Connecting Standard/Anchor

- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Define the most important parts of a vehicle
Explain body design and frame variations
Compare unibody and body-over-frame construction
Identify the major structural parts, sections, and assemblies of body-over-frame vehicles
Identify the major structural parts, sections and assemblies of unibody vehicles.
Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair. HP-I
DAM02 Modules 1, 3
FCR01 Modules 2
SSS01 Modules 1
Identify weldable and non-weldable materials used in collision repair. HP-I FCR01 Modules 1
Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan HP-I
DAM02 Modules 1, 3
FCR01 Modules 2
STS01 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner

Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Hand tools
Frame Machine
Lift
Jack
Assorted Vehicles
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources
Promotional materials from post-secondary institutions
Technology integration I-CAR advanced delivery curriculum
Internet resources
Assorted tool catalogs
Computer
Fire extinguisher
Respirator
Eye Wash Station

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA300 - NON-STRUCTURAL REPAIR-PREPARATION

Unit Number: PA300

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to prep vehicle for a non-structural repair following the estimated repair sequence and using the appropriate tools and equipment.

Tasks:

PA301 - Use hand and power equipment.

PA302 - Remove dirt, grease, wax, and corrosion protection.

PA303 - Protect panels and adjacent parts to the repair area.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.

CC.3.5.9-10.D. 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.

CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons
List the steps for shrinking metal
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document repair plan. HP-I
DAM01 Modules 1, 2

EXT01 Modules 1
Inspect, remove, store, and replace exterior trim and moldings. HP-I
DAM04 Modules 4
TRM01 Modules 3, 6, 7
Inspect, remove, store, and replace interior trim and components. HP-I
DAM04 Modules 1
TRM01 Modules 5
Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair. HP-I
DAM02 Modules 2, 3
DAM04 Modules 3
EXT01 Modules 1, 2, 3, 4, 5

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Automotive Body Repair News (ABRN) magazine Volume 47-49.

Protective Tape
Welding Blankets
Hand tools
Grinders
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
English Wheel
Brake Press
Spray Booth
Mig Welder
Torch
Frame Machine
Lift
Jack
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA400 - PANEL REPLACEMENT AND ALIGNMENT

Unit Number: PA400

Dates: Spring 2013 **Hours:** 90.00

Unit Description / Objectives:

Student will know and be able to remove, install, and align body panels.

Tasks:

PA401 - Use panel replacement and alignment tools.

PA402 - Install panels using various alignment methods (weld, bolt).

PA403 - Remove and install bumper, fascia, and header panels.

PA404 - Remove, reinstall, and align hoods, deck lids, and hatches.

PA405 - Remove, reinstall, and align fenders, doors, and tailgates.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions

Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Remove and install fenders
List the various methods for adjusting mechanically fastened panels
Perform hood-to-hinge, hood height, and hood latch adjustments
Remove, install, and adjust deck lids
Remove, install, and adjust bumpers
Replace grilles and other bolt-on body parts
Identify the various fasteners used in vehicle construction
Remove and install bolts and nuts properly
Explain when specific fasteners are used in vehicle construction
Explain bolt and nut torque values
Identify the various fasteners used in vehicle construction
Remove and install bolts and nuts properly
Explain when specific fasteners are used in vehicle construction
Explain bolt and nut torque values
Inspect, remove, and replace bolted, bonded, and welded steel panel or panel assemblies. HP-I
ADH01 Modules 1
DAM02 Modules 1, 2, 3
EXT01 Modules 1, 2, 3, 4
EXT02 Modules 1, 2, 3, 4, 5
Inspect, remove, replace, and align hood, hood hinges, and hood latch. HP-I DAM02 Modules 3
EXT01 Modules 2
Inspect, remove, replace, and align deck lid, lid hinges, and lid latch. HP-I DAM04 Modules 3
EXT01 Modules 4
Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware. HP-I
DAM04 Modules 2, 3
EXT01 Modules 3, 4
EXT02 Modules 2
Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware. HP-I
DAM02 Modules 2
EXT01 Modules 2
EXT02 Modules 5
Inspect, remove, replace, and align front fenders, headers, and other panels. HP-I
DAM02 Modules 3
EXT01 Modules 2
EXT02 Modules 5
Replace door skins according to manufacturer’s procedures. HP-G
ADH01 Modules 1
EXT02 Modules 2
Perform panel bonding according to manufacturer’s specifications. HP-G
ADH01 Modules 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration

Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Measuring tapes
Rulers
Tram gauge
Brake parts
Suspension parts
Air Chucks
Air Pressure Gauge
Fasteners
Rivets & Rivet gun
Chains & Body clamps
Frame machine
Frame specification books
Brake press
Multimeter's
AVR Battery Testers
Battery Chargers
Extension cords
Blow Guns
Compressors
Air hoses & regulators
Extractors
Tap & die
Hammers
Dollies

Pry bars & punches
Body picks
Stinger
Heat Gun
Lift Equipment
Jack stands
Drop Lights
Wheel alignment machine
Pliers
Wrenches
Tin snips
Torque Wrenches
Screw Drivers
Scrapers
Vise grips
Welding clamps
Caulking gun
Air Ratchets
Ratchets
Sockets
Impact gun
DA sanders
Finish sander
Cut off wheel
Drill & bits
Air saw
Grinders

Face shield
Metal files
Buffer & Spur
Sanding blocks
Squeegee
Vacuum Hoses
Vacuum
MIG welders
Plastic welder
Welding Helmets
Welding blankets
Welding gloves
Surge protector
OXY-Acetylene Cutters
Goggles
Spray guns
Spray booth
Paint mixing machine
Paint shaker
Spray gun cleaner
Paint waste recycler
Mixing scale
Paint supplies
Fire proof cabinet
Respirators
Detailing supplies

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA500 - WORKING WITH TRIM AND HARDWARE

Unit Number: PA500

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to remove and replace interior trim, moldings and disarm and diagnose supplemental restraint systems.

Tasks:

PA501 - Identify the types of fasteners.

PA502 - Remove and replace belt molding and trim.

PA503 - Remove and replace adhesive-held molding and trim.

PA504 - Select and repair fasteners.

PA505 - Identify interior components and trim.

PA506 - Remove and replace seats.

PA507 - Remove and reinstall seat belt components.

PA508 - Remove and reinstall carpeting.

PA509 - Use trim removal tools.

PA510 - Remove and install interior door panel.

PA511 - Remove and install door lock and handle assembly.

PA512 - Remove and install decklid lock cylinders.

PA513 - Remove and install exterior trim and moldings.

PA514 - Remove and install pinstripes, decals, and emblems.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.

3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Identify the various fasteners used in vehicle construction
Remove and install bolts and nuts properly
Properly select the right tool for the job
Identify the major parts of a vehicle's interior
Remove and replace seats, seat covers, and carpeting
Service an instrument cluster and other dashboard parts
Explain how to replace headliners
Explain the difference between an active and a passive restraint system
Learn how to service seat belts
Remove, align, and install molding and emblems
Properly remove and install vinyl decals and striping
Prepare the surface before applying adhesive overlay material or before custom painting
Describe the operation of air bag systems
Repair air bag systems safely
Inspect, remove, store, and replace interior trim and components. HP-I
DAM04 Modules 1
TRM01 Modules 5
Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair. HP-I
DAM02 Modules 2, 3
DAM04 Modules 3
EXT01 Modules 1, 2, 3, 4, 5
Disarm SRS in accordance with manufacturer's specifications/procedures. HP-I RES01 Modules 1
Inspect, remove, and replace sensors and wiring in accordance with manufacturer's specifications/procedures; ensure sensor orientation. HP-G DAM04 Modules 1
RES01 Modules 1
Inspect, remove, replace, and dispose of deployed SRS modules in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 1
Verify that SRS is operational in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 2
Inspect, remove, replace, and dispose of non-deployed SRS in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring

Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Protective Tape
Welding Blankets
Hand tools
Grinders
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
English Wheel
Brake Press
Spray Booth
Mig Welder
Torch
Frame Machine
Lift
Jack
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA600 - STRAIGHTEN AND FINISH METALS

Unit Number: PA600

Dates: Spring 2013 **Hours:** 50.00

Unit Description / Objectives:

Student will know and be able to use straightening tools to shrink and straighten metal.

Tasks:

PA601 - Use metal straightening tools to include hammers and dollies.

PA602 - Straighten damaged metal.

PA603 - Shrink stretched metal.

PA604 - Use weld-on nail gun to repair sheet metal.

PA605 - Repair metal to within 1/8 of an inch or orignal shape.

L606 - Demonstrate knowledge of cold and hot stress relief methods.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons

List the steps for shrinking metal
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Heat shrink stretched panel areas to proper contour acccording to manufacturer's specifications. HP-G
STS01 Modules 2
Cold shrink stretched panel areas to proper contour. HP-G
STS01 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Hand tools
Grinders
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
English Wheel
Brake Press
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA700 - USING BODY FILLERS
Unit Number: PA700

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to properly use body filler and tools.

Tasks:

PA701 - Select correct body filler and tools.

PA702 - Prepare surface for body filler.

PA703 - Prepare and apply body filler.

PA704 - Prepare and apply specialty fillers (fiberglass, aluminum, and polyester).

PA705 - Finish body fillers.

PA706 - Apply corrosion protection according to manufacturer's specifications.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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

Supporting Standards/Anchors

CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

CC.3.5.11-12.A. 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.

CC.3.5.9-10.D. 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.

CC.3.5.11-12.D. 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.

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons
List the steps for shrinking metal
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides

Remove paint from the damaged area of a body panel. HP-I
STS01 Modules 2
Locate and reduce surface irregularities on a damaged body panel. HP-I
DAM02 Modules 3
FCR01 Modules 2
STS01 Modules 1, 2
Demonstrate hammer and dolly techniques. HP-I
STS01 Modules 2
Heat shrink stretched panel areas to proper contour acccording to manufacturer's specifications. HP-G
STS01 Modules 2
Cold shrink stretched panel areas to proper contour. HP-G
STS01 Modules 2
Mix body filler. HP-I
STS01 Modules 2
Apply body filler; shape during curing. HP-I
STS01 Modules 2
Rough sand cured body filler to contour; finish sand. HP-I
STS01 Modules

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Automotive Body Repair News (ABRN) magazine Volume 47-49.

Protective Tape
Welding Blanket
Hand tools
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA800 - MOVEABLE GLASS AND HARDWARE

Unit Number: PA800

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to remove and replace a door regulator and glass.

Tasks:

PA801 - Remove and replace a door regulator.

PA802 - Remove and repair moveable door class.

PA803 - Remove and replace rear stationary side glass

PA804 - Remove and replace gaskets glass.

PA805 - Repair stationary glass with urethane sealant.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Remove and Replace and adjust a door regulator
Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls. HP-G

DAM04 Modules 2
GLA01 Modules 2
PWR01 Modules 5

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Protective Tape
Welding Blankets
Hand tools
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA900 - STRUCTURAL REPAIR – DAMAGE ANALYSIS

Unit Number: PA900

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to do structural repair - damage analysis.

Tasks:

PA901 - Classify the various types and extent of damage a vehicle sustains from an accident.

PA902 - Select and interpret body dimension specification sheets and/or manuals.

PA903 - Set up and use tram gauge to diagnose vehicle length and width damage.

PA904 - Explain how to diagnose vehicle height damage with datum line gauges.

PA905 - Identify aspects of universal measuring system.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
CC.3.5.11-12.A. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook

Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Diagnose and measure structural damage using tram and self-centering gauges according to industry
Explain how impact forces are transmitted through frame and unibody construction vehicles
Describe how to visually determine the extent of impact damage
List the various types and variations of body measuring tools
Analyze damage by measuring body dimensions
Given a damaged vehicle and a body specification manual, locate and measure key points using a tape measure, tram bar, and self-centering gauges
Attach vehicle to anchoring devices. HP-I
MEA01 Modules 6
SSS01 Modules 2
Analyze, straighten, and align sag damage. HP-G
MEA01 Modules 4
SSS01 Modules 5
Analyze, straighten, and align sidesway damage. HP-G
MEA01 Modules 4
SSS01 Modules 5
Analyze, straighten, and align twist damage. HP-G
MEA01 Modules 4
SSS01 Modules 5
Restore corrosion protection to repaired or replaced frame areas. HP-I
CPS01 Modules 3
Identify heat limitations in structural components in accordance with vehicle manufacturer’s specifications/procedures. HP-G
FCR01 Modules 1
SSS01 Modules 4
Diagnose and measure structural damage using a universal measuring system (mechanical, electrical, laser). HP-G
DAM02 Modules 1
MEA01 Modules 2
Diagnose and measure structural vehicles using a dedicated (fixture) measuring system. HP-G
MEA01 Modules 2
Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair. HP-I
DAM02 Modules 1, 3
FCR01 Modules 2
SSS01 Modules 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Protective Tape
Welding Blankets
Hand tools
Computer
Assorted vehicles
Frame machine
Tram gauge
Frame specification manuals
Centerline gauges
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA 1000 – STRAIGHTENING STRUCTURAL PARTS

Unit Number: PA1000

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to mount and anchor a vehicle.

Tasks:

PA1001 - Demonstrate knowledge to mount and anchor vehicle to a pulling system.

PA1002 - Remove and reinstall mechanical components.

PA1003 - Prepare vehicle for gauging and analysis.

PA1004 - Prepare vehicle for alignment.

PA1005 - Align vehicle with DIAMOND damage, twist, sag side swag and mash.

L1006 - Identify aspects of dedicated measuring system.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.D. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.5.11-12.C. 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.
CC.3.5.11-12.B. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading

Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons
List the steps for shrinking metal
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Identify all types of vehicle construction. HP-1
SPS03 Module,1 Program 3
Identify five types body damage HP-1
FCR01 Module 2
Demonstrate how to interpret and use vehicle specification manuals HP-G
MEA01 Modules 2,3
Identify the uses of high strength steel in vehicle construction HP-1
SPS02 Module 1
Demonstrate how to read a fractional-inch and metric tape measures HP-1
Diagnnose damage using a tram gauge and a tape measure HP-1
MEA01 Module 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Automotive Body Repair News (ABRN) magazine Volume 47-49.

Protective Tape
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Cut Off Wheel
Assorted vehicles
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Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1100 - FULL OR PARTIAL PANEL REPLACEMENT

Unit Number: PA1100

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to remove and replace bumpers, energy absorbers and bonded door panels.

Tasks:

PA1101 - Identify the principles of full or partial panel replacement.

PA1102 - Select and understand the use of various types of joints used in sectioning.

PA1103 - Weld and adhesively bond panel replacement.

PA1104 - Demonstrate knowledge of bonded door panels.

PA1105 - Remove and replace bumpers, steel and aluminum.

PA1106 - Remove and replace energy absorbers.

PA1107 - Apply corrosion protection.

PA1108 - Remove and replace quarter and rockers panel.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.

3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.11-12.C. 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.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.5.11-12.C. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities

Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons
List the steps for shrinking metal
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Remove and install fenders
List the various methods for adjusting mechanically fastened panels
Perform hood-to-hinge, hood height, and hood latch adjustments
Remove, install, and adjust deck lids
Remove, install, and adjust bumpers
Replace grilles and other bolt-on body parts
Identify all types of vehicle construction. HP-1
SPS03 Module,1 Program 3
Identify five types body damage HP-1
FCR01 Module 2
Demonstrate how to interpret and use vehicle specification manuals HP-G
MEA01 Modules 2,3
Identify the uses of high strength steel in vehicle construction HP-1
SPS02 Module 1
Demonstrate how to read a fractional-inch and metric tape measures HP-1
Diagnnose damage using a tram gauge and a tape measure HP-1
MEA01 Module 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

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Resources/Equipment:

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1200 - STATIONARY GLASS REPLACEMENT

Unit Number: PA1200

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to remove and install stationary glass, using adhesives and sealants.

Tasks:

PA1201 - Identify and select different types of automotive glass.

PA1202 - Operate stationary glass removal tools.

PA1203 - Remove and reinstall stationary glass.

PA1204 - Identify the properties and characteristics of adhesives and sealants.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.5.11-12.A. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.3.5.9-10.G. 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.
CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets

Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Mask a vehicle properly
Remove and reinstall or replace fixed glass (heated and non-heated) using manufacturer's specifications/procedures and recommended materials. HP-G GLA02 Module 1
GLA02 Module 2
GLA02 Module 3
PWR01 Module 3
Remove and reinstall or replace modular glass using manufacturer's specifications/procedures and recommended materials.
R&R a door and adjust it
Replace both welded and adhesive-bonded door skins
Replace an SMC door skin
R&R and adjust a door regulator
R&I (remove and install) a windshield

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes

Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Protective Tape
Welding Blankets
Hand tools
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1300 - RESTORING CORROSION PROTECTION

Unit Number: PA1300

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to identify types of corrosion and methods of corrosion protections and protection of interior, exterior, and accessories surfaces.

Tasks:

PA1301 - Identify corrosion principles and factory corrosion protection.

PA1302 - Identify repair methods and materials for corrosion protection.

PA1303 - Protect interior and exterior surfaces including weld seams from contamination.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

  Supporting Standards/Anchors

  3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
  3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
  3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
  3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
  3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
  3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
  CC.3.5.9-10.D. 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.
  CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Supporting Standards/Anchors

CC.3.5.11-12.A. 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.

CC.3.6.11-12.F. 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.

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.3.5.9-10.G. 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.

CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Mask a vehicle properly
Identify the principal methods of rust protection
Choose the correct antirust materials and equipment

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games

Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1400 - WELDING AND CUTTING-MIG (GMAW) WELDING

Unit Number: PA1400

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to set up welder and complete several types of welds, while demonstrating personal and vehicle protections.

Tasks:

PA1401 - Explain the differences between welding, silver soldering, and brazing.

PA1402 - Demonstrate personal safety practices and vehicle protection measures.

PA1403 - Set up the Mig welder.

PA1404 - Make a weld and tune the welder.

PA1405 - Complete a butt joint with backing in various welding positions.

PA1406 - Complete a fillet weld lap joint.

PA1407 - Complete a plug weld in various positions.

PA1408 - Perform destructive tests.

PA1409 - Demonstrate welding of high strength steel.

PA1410 - Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.

PA1411 - Identify different methods of attaching structural components [squeeze type resistance spot welding (STRSW) riveting, structural adhesive, silicon bronze, etc.].

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.

3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.

3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
3.2.P.B3 Analyze the factors that influence convection, conduction, and radiation between objects or regions that are at different temperatures.
3.2.C.B3 Describe the law of conservation of energy. Explain the difference between an endothermic process and an exothermic process.
3.1.C.A2 Describe how changes in energy affect the rate of chemical reactions.
3.2.10.B3 Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached. Analyze the processes of convection, conduction, and radiation between objects or regions that are at different temperatures.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.
CC.3.5.9-10.I. 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.
CC.3.5.11-12.C. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading

Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Properly select the right tool for the job
Describe when to use and when NOT to use certain welding processes for collision repair
Name the parts of a MIG welder
Summarize how to set up a MIG welder
Describe the differences between MIG electrode wires
Explain the variables for making a quality MIG weld
Describe the various types of MIG welds and joints
Explain the resistance spot welding process
Explain the differences in welding aluminum compared to steel
Describe plasma arc cutting
Identify weldable and non-weldable materials used in collision repair. HP-I
FCR01 Modules 1
Weld and cut high-strength steel and other steels using manufacturer's Specifications/procedures. HP-I
WCS01 Modules 1, 2, 3, 4
Weld and cut aluminum using manufacturer's specifications/procedures. HP-G
WCA01 Modules 1, 2
Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. HP-I
WCS01 Modules 1
Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode tickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded. HP-I
WCS01 Modules 1
Store, handle, and install high-pressure gas cylinders. HP-I
WCS01 Modules 1
Determine work clamp (ground) location and attach. HP-I
WCS01 Modules 1
Use the proper angle of the gun to the joint and the direction of the gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions. HP-I
WCS01 Modules 1
Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. HP-I
WCS01 Modules 1
Protect computers and other electronic control modules during welding procedures according to manufacturer's specifications. HP-I
WCS01 Modules 1
Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required. HP-I
WCS01 Modules 1
Determine the joint type (butt weld with backing, lap, etc.) for weld being made according to manufacturer's/industry specifications. HP-I
SPS01 Modules 1
SPS02 Modules 1
SPS03 Modules 2, 3
Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications. HP-I
SPS01 Modules 1
SPS02 Modules 1
SPS03 Modules 2, 3
Perform the following welds: continuous, stitch, tack, plug, butt weld with backing, and lap joints. HP-I
WCS01 Modules 2, 3, 4
Perform visual and destructive tests on each weld type. HP-I

WCS01 Modules 2, 3, 4
Identify the causes of various welding defects; make necessary adjustments. HP-I
WCS01 Modules 1
Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. HP-I
WCS01 Modules 1
Identify cutting process for different materials and locations in accordance with manufacturer's procedures; perform cutting operation. HP-G
WCS05 Modules 4
Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicone bronze, etc.) HP-G
SPA01 Modules 2
SPA02 Modules 1, 2
SPS03 Modules 4
WCS04 Modules 1, 2, 3
Describe different types of metals used in vehicle construction
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1500 - CUTTING AND HEATING PROCESSES

Unit Number: PA1500

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to set up and demonstrate proper sheet metal cutting processes.

Tasks:

PA1501 - Identify cutting processes.

PA1502 - Demonstrate sheet metal cutting processes.

PA1503 - Set up and use plasma arc cutters.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
3.2.10.B3 Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached. Analyze the processes of convection, conduction, and radiation between objects or regions that are at different temperatures.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools

Complete assigned individual projects
Describe plasma arc cutting

Skill:

Describe plasma arc cutting
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Weld and cut high-strength steel and other steels using manufacturer's specifications/procedures. HP-I
WCS01 Modules 1, 2, 3, 4
Weld and cut aluminum using manufacturer's specifications/procedures. HP-G
WCA01 Modules 1, 2
Determine work clamp (ground) location and attach. HP-I
WCS01 Modules 1
WCS05 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

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Any content related assessment
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Resources/Equipment:

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1600 - REFINISHING - SAFETY AND ENVIRONMENTAL PRACTICES

Unit Number: PA1600

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to explain various regulations as well as locate hazardous warnings and inspect personal safety equipment.

Tasks:

PA1601 - Explain various environmental regulations and other items regulated in an automotive refinishing department.

PA1602 - Locate hazardous warning information.

PA 1603 - Select and inspect personal safety equipment and clothing needed for protection during refinishing operations.

PA1604 - Demonstrate safe painting practices and use of protective clothing equipment.

PA1605 - Identify personal health and safety hazards according to OSHA guidelines.

PA1606 - Demonstrate knowledge and skill in applying water borne automotive finishing materials.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.

CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

CC.3.5.11-12.A. 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.

CC.3.5.11-12.C. 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.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.3.6.11-12.F. 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.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents
Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety

Skill:

Describe safety practices designed to avoid fire and explosions
Explain the benefits of ASE certification
Summarize the purpose of I-CAR
Know the sources of professional training and certification available to collision repair facility personnel
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Identify and take necessary precautions with hazardous operations and materials according to federal,state, and local regulations. HP-I
REF01 Modules 4

REF03 Modules 2, 4
WKR01 Modules 3
Identify safety and personal health hazards according to OSHA guidelines and "Right to Know". HP-I
WKR01 Modules 1
Inspect spray environment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards. HP-I
REF01 Modules 3
WKR01 Modules 5
Select and use the NIOSH approved personal sanding respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations. HP-I
WKR01 Modules 4
Select and use the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation. HP-I
REF01 Modules 2
WKR01 Modules 4
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.). HP-I
REF02 Modules 2
REF03 Modules 2, 4
WKR01 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Respirator
Gloves
Paint Suit
Fresh Air hood
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1700 Understanding Automotive Finishes

Unit Number: PA1700

Dates: Spring 2013 **Hours:** 10.00

Unit Description / Objectives:

Student will know and be able to describe and identify paint defects while demonstrating use of refinishing equipment.

Tasks:

PA1701 - Describe the difference between paint systems and why the materials are applied by the manufacturer.

PA1702 - Describe paint defects - causes and cures.

PA1703 - Identify primerer clean coats and topcoats finishes.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
CC.3.5.9-10.B. 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.
CC.3.5.11-12.B. 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.
CC.3.5.11-12.C. 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.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

CC.3.5.9-10.I. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

CC.2.3.8.A.3Understand and apply the Pythagorean Theorem to solve problems.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain the difference between spot refinishing, panel refinishing and overall refinishing
Properly use a spray gun
Summarize the different kinds of spray coats
Outline general color coat/clear coat application procedures
Explain the key points to keep in mind when applying multistage finishes
List general rules for painting/refinishing vehicles
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Explain how damage repair estimates are determined
Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation. HP-I
DAM04 Modules 4
TRM01 Modules 3, 6, 7
Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
REF02 Modules 1
REF04 Modules 1
Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
DAM01 Modules 3
REF02 Modules 1
Remove paint finish in accordance with manufacturer's recommendations. HP-I
REF02 Modules 2
Dry or wet sand areas to be refinished. HP-I
REF02 Modules 4
REF03 Modules 2
Featheredge damaged areas to be refinished. HP-I
REF02 Modules 4
Apply suitable metal treatment or primer in accordance with total product systems. HP-I
CPS01 Modules 3
REF02 Modules 4
Mask and protect other areas that will not be refinished. HP-I
REF02 Modules 2
Mix primer, primer-surface, or primer-sealer. HP-I
REF01 Modules 5
REF02 Modules 4
REF03 Modules 4
Apply primer onto surface of repaired area. HP-I REF02 Modules 4
Apply two-component finishing filler to minor surface imperfections. HP-I
STS01 Modules 2
Dry or wet sand area to which primer-surface has been applied. HP-I
REF02 Modules 4
Dry sand area to which two-component finishing filler has been applied. HP-I
STS01 Modules 2
Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Clean area to be refinished using a final cleaning solution. HP-I
REF03 Modules 3
Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
REF02 Modules 3, 4
REF03 Modules 4
Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
REF03 Modules 4
Scuff sand to remove nibs or imperfections from a sealer. HP-I
Apply stone chip resistant coating. HP-I

CPS01 Modules 4
REF03 Modules 3
Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I
CPS01 Modules 3, 4
REF02 Modules 5
Prepare adjacent panels for blending. HP-I
REF02 Modules 4, 5
Prepare plastic panels for refinishing. HP-I
REF02 Modules

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago: IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

SIMS Virtual Paint Sprayer
Hand tools
Spray Booth
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA 1800 - PREPARING THE SURFACE FOR REFINISHING

Unit Number: PA1800

Dates: Spring 2013 **Hours:** 25.00

Unit Description / Objectives:

Student will know and be able to repair a surface for refinishing.

Tasks:

PA1801 - Demonstrate proper steps to pre-wash entire vehicle.

PA1802 - Chemically and mechanically remove paint finish when necessary.

PA1803 - Dry sand and featheredge areas.

PA1804 - Wet sand and featheredge areas.

PA1805 - Apply suitable metal treatments.

PA1806 - Identify the color of paint on vehicle with use of paint catalogs.

PA1807 - Apply undercoats.

PA1808 - Use a block sander.

PA1809 - Prepare panels for blending.

PA1810 - Apply caulking and seam sealers.

PA1811 - Apply chip-resistant coating.

PA1812 - Mask a vehicle.

PA1813 - Select the proper grid of abrasive paper.

PA1814 - Identify safety and personal health hazards according to OSHA guidelines.

L1815 - Identify various substrates.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
CC.3.5.9-10.B. 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.
CC.3.5.11-12.B. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to cCC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.
complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3Understand and apply the Pythagorean Theorem to solve problems.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain the difference between spot refinishing, panel refinishing and overall refinishing
Properly use a spray gun
Summarize the different kinds of spray coats
Outline general colorcoat/clearcoat application procedures
Explain the key points to keep in mind when applying multistage finishes
List general rules for painting/refinishing vehicles
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation. HP-I
TRM01 Modules 3, 6, 7
Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
REF02 Modules 1
REF04 Modules 1
Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
DAM01 Modules 3
REF02 Modules 1
Remove paint finish in accordance with manufacturer’s recommendations. HP-I
REF02 Modules 2
Dry or wet sand areas to be refinished. HP-I
REF02 Modules 4
REF03 Modules 2
Featheredge damaged areas to be refinished. HP-I
REF02 Modules 4
Apply suitable metal treatment or primer in accordance with total product systems. HP-I
CPS01 Modules 3
REF02 Modules 4
Mask and protect other areas that will not be refinished. HP-I
REF02 Modules 2

Mix primer, primer-surfacer, or primer-sealer. HP-I
REF01 Modules 5
REF02 Modules 4
REF03 Modules 4
Apply primer onto surface of repaired area. HP-I REF02 Modules 4
Apply two-component finishing filler to minor surface imperfections. HP-I
STS01 Modules 2
Dry or wet sand area to which primer-surface has been applied. HP-I
REF02 Modules 4
Dry sand area to which two-component finishing filler has been applied. HP-I
STS01 Modules 2
Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Clean area to be refinished using a final cleaning solution. HP-I
REF03 Modules 3
Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
REF02 Modules 3, 4
REF03 Modules 4
Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
REF03 Modules 4
Scuff sand to remove nibs or imperfections from a sealer. HP-I
Apply stone chip resistant coating. HP-I
CPS01 Modules 4
REF03 Modules 3
Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I
CPS01 Modules 3, 4
REF02 Modules 5
Prepare adjacent panels for blending. HP-I
REF02 Modules 4, 5
Prepare plastic panels for refinishing. HP-I
REF02 Modules

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner

Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Hand tools
Spray Booth
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA1900 - PREPARING THE EQUIPMENT, PAINT AREA, AND REFINISH MATERIALS
Unit Number: PA1900

Dates: Spring 2013 **Hours:** 25.00

Unit Description / Objectives:
Student will know and be able to properly prepare and use the painting environment and mixing area.

Tasks:
PA1901 - Prepare the painting environment.

PA1902 - Prepare and use the paint mixing area.

PA1903 - Set up, test and adjust spray guns.

PA1904 - Inspect, clean, and determine conditions of spray guns and equipment.

PA1905 - Select and use the National Institution of Safety and Health (NOISH) approved (Fresh Air Make-up System) personal painting/refinishing respirator system.

PA1906 - Identify and demonstrate use of refinishing equipment

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors
3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Prepare a vehicle for painting/refinishing
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Evaluate the condition of the vehicle’s paint
Describe methods for removing the damaged paint if needed
Properly prepare and treat bare metal surfaces
Correctly sand and featheredge surfaces
Apply an undercoat
Mask a vehicle properly
Describe different types of metals used in vehicle construction
Select the right power tool or piece of equipment for the job

Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
REF02 Modules 1
REF04 Modules 1
Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
REF02 Modules 1
Remove paint finish in accordance with manufacturer's recommendations. HP-I
REF02 Modules 2
Dry or wet sand areas to be refinished. HP-I
REF02 Modules 4
REF03 Modules 2
Featheredge damaged areas to be refinished. HP-I
REF02 Modules 4
Apply suitable metal treatment or primer in accordance with total product systems. HP-I
CPS01 Modules 3
REF02 Modules 4
Mask and protect other areas that will not be refinished. HP-I
REF02 Modules 2
Mix primer, primer-surfacer, or primer-sealer. HP-I
REF01 Modules 5
REF02 Modules 4
REF03 Modules 4
Apply primer onto surface of repaired area. HP-I
REF02 Modules 4
Apply two-component finishing filler to minor surface imperfections. HP-I
STS01 Modules 2
Dry or wet sand area to which primer-surface has been applied. HP-I
REF02 Modules 4
Dry sand area to which two-component finishing filler has been applied. HP-I
STS01 Modules 2
Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Clean area to be refinished using a final cleaning solution. HP-I
REF03 Modules 3
Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
REF02 Modules 3, 4
REF03 Modules 4
Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
REF03 Modules 4
Scuff sand to remove nibs or imperfections from a sealer. HP-I
Apply stone chip resistant coating. HP-I
CPS01 Modules 4
REF03 Modules 3
Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I
CPS01 Modules 3, 4
REF02 Modules 5
Prepare adjacent panels for blending. HP-I
REF02 Modules 4, 5
Prepare plastic panels for refinishing. HP-I
REF02 Modules

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring

Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

SIMS Virtual Paint Sprayer
Hand tools
Spray Booth
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2000 - APPLYING THE FINISH
Unit Number: PA2000

Dates: Spring 2013 **Hours:** 25.00

Unit Description / Objectives:

Student will know and be able to apply various types of finishes.

Tasks:

PA2001 - Prepare surface for topcoat system.

PA2002 - Apply primer-sealer.

PA2003 - Apply single-stage finish.

PA2004 - Apply basecoat/clearcoat finish.

PA2005 - Apply tri-coat finish.

PA2006 - Apply stone chip-resistant coating to lower body areas.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.3.5.9-10.D. 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.

CC.3.5.11-12.D. 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.

CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe color theory and how it relates to refinishing
Define the terms relating to color
Describe the use of a computerized color matching system
Make let-down and spray-out test panels
Explain how to tint solid and metallic colors
Summarize the repair procedures for multistage finishes
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Determine type and color of paint already on vehicle by manufacturer’s vehicle information label. HP-I
DAM01 Modules 4
REF03 Modules 1
Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer’s procedures. HP-I
REF03 Modules 4
Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. HP-I
REF02 Modules 3
Apply selected product on test and let-down panel in accordance with manufacturer’s recommendations; check for color match. HP-I
REF03 Modules 2
Apply single stage topcoat for refinishing. HP-I

REF03 Modules 4
Apply basecoat/clearcoat for panel blending or partial refinishing. HP-I
REF03 Modules 3, 4
Apply basecoat/clearcoat for overall refinishing. HP-G
REF03 Modules 4
Denib, buff, and polish finishes where necessary. HP-I
REF04 Modules 2
Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Refinish rigid, semi-rigid, and flexible plastic parts. HP-G
REF03 Modules 3, 4
Apply multi-stage (tricoat) coats for panel blending or overall refinishing. HP-G REF03 Modules 4
Identify and mix paint using a formula. HP-G
REF01 Modules 5
Identify poor hiding colors, determine necessary action. HP-G
REF03 Modules 3
Tint color using formula to achieve a blendable match. HP-G
REF03 Modules 5
Identify alternative color formula to achieve a blendable match. HP-G
REF03 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests

Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2100 - BLENDING
Unit Number: PA2100

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to prepare and blend base/clear coat finishes.

Tasks:

PA2101 - Prepare an area for blending of the finish.

PA2102 - Blend basecoat/clearcoat finish.

PA2103 - Tint and blend color coat

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe color theory and how it relates to refinishing
Define the terms relating to color
Describe the use of a computerized color matching system
Make let-down and spray-out test panels
Explain how to tint solid and metallic colors
Summarize the repair procedures for multistage finishes
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Determine type and color of paint already on vehicle by manufacturer’s vehicle information label. HP-I
REF03 Modules 1
Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer’s procedures. HP-I
REF03 Modules 4
Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. HP-I

REF02 Modules 3
Apply selected product on test and let-down panel in accordance with manufacturer's recommendations; check for color match. HP-I
REF03 Modules 2
Apply single stage topcoat for refinishing. HP-I
REF03 Modules 4
Apply basecoat/clearcoat for panel blending or partial refinishing. HP-I
REF03 Modules 3, 4
Apply basecoat/clearcoat for overall refinishing. HP-G
REF03 Modules 4
Denib, buff, and polish finishes where necessary. HP-I
REF04 Modules 2
Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Refinish rigid, semi-rigid, and flexible plastic parts. HP-G
REF03 Modules 3, 4
Apply multi-stage (tricoat) coats for panel blending or overall refinishing.
HP-G REF03 Modules 4
Identify and mix paint using a formula. HP-G
REF01 Modules 5
Identify poor hiding colors, determine necessary action. HP-G
REF03 Modules 3
Tint color using formula to achieve a blendable match. HP-G
REF03 Modules 5
Identify alternative color formula to achieve a blendable match. HP-G
REF03 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.

Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2200 - SOLVING PAINT APPLICATION PROBLEMS AND DEFECTS IN AUTOMOTIVE FINISHES

Unit Number: PA2200

Dates: Spring 2013 **Hours:** 100.00

Unit Description / Objectives:

Student will know and be able to identify contaminants in the paint finish.

Tasks:

PA2201 - Identify contaminants in the paint finish.

PA2202 - Identify paint film defects, causes and cures.

PA2203 - Identify surface defects in finish.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Supporting Standards/Anchors

CC.3.5.11-12.A. 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.

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

List and explain the most common paint/refinish problems
Repair common finish problems
Wet sand to remove minor finish problems
Hand and machine compound a finish
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Identify blistering (raising of the paint surface); determine the cause(s) and correct the condition. HP-G
REF03 Modules 3

Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition. HP-G
Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Identify lifting; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition. HP-G
Identify orange peel; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
REF04 Modules 2
Identify overspray; determine the cause(s) and correct the condition. HP-G
DAM01 Modules 3
REF04 Modules 2
Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Identify sags and runs in paint surface; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
REF04 Modules 2
Identify sanding marks (sandscratch swelling); determine the cause(s) and correct the condition. HP-G
DAM01 Modules 3
REF03 Modules 3
REF04 Modules 2
Identify contour mapping (shrinking and splitting) while finish is drying; determine the cause(s) and correct the condition. HP-G
REF02 Modules 1
Identify color difference (off-shade); determine the cause(s) and correct the condition. HP-G
REF03 Modules 1
Identify tape tracking; determine the cause(s) and correct the condition. HP-G REF03 Modules 3
Identify low gloss condition; determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
REF04 Modules 2
Identify poor adhesion; determine the cause(s) and correct the condition. HP-G REF03 Modules 3
Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition. HP-G
Identify corrosion; determine the cause(s) and correct the condition. HP-G
REF02 Modules 3
REF03 Modules 3
Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition. HP-I
DAM01 Modules 3
REF03 Modules 3
REF04 Modules 1, 2
Identify water spotting; determine the cause(s) and correct the condition. HP-G REF04 Modules 2
Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition. HP-G
DAM01 Modules 3 REF04 Modules 2
Identify finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes); correct the condition. HP-G
DAM01 Modules 3
REF04 Modules 2
Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Identify chalking (oxidation); determine the cause(s) and correct the condition. HP-G

Identify bleed-through (staining); determine the cause(s) and correct the condition. HP-G
Identify pin-holing; determine the cause(s) and correct the condition. HP-G
Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition. HP-I
REF04 Modules 2
Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition. HP-G
REF03 Modules 3
Measure mil thickness. HP-I
REF02 Modules 1
REF04 Modules 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2300 - DETAILING
Unit Number: PA2300

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to completely detail a vehicle.

Tasks:

PA2301 - Remove overspray/perform final finishing.

PA2302 - Clean exterior of vehicle.

PA2303 - Clean interior of vehicle.

PA2304 - Apply decals and stripes.

PA2305 - Demonstrate wet sand and polishing techniques.

PA2306 - Clean body openings.

PA2307 - Clean exterior and interior glass surfaces.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.3.5.9-10.D. 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.

CC.3.5.11-12.D. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects
Properly remove and install vinyl decals and striping
Prepare the surface before applying adhesive overlay material or before custom painting
Explain various techniques for doing custom paint work
Remove, align, and install molding and emblems

Skill:

Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Mask a vehicle properly

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2400 - ESTIMATING – ANALYZING DAMAGE

Unit Number: PA2400

Dates: Spring 2013 **Hours:** 12.00

Unit Description / Objectives:

Student will know and be able to identify different types of vehicle damage.

Tasks:

PA2401 - Demonstrate usage of collision estimating guides.

PA2402 - Identify different types of vehicle damage.

PA2403 - Identify mechanical damage.

PA2404 - Indicate repair and replace decisions.

PA2405 - Prepare an estimate/repair sequence

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Make a rough estimate of the time required to refinish a given collision repair job
Explain the difference between direct and indirect damage and locate both types

Identify the key operating features of manual and computerized estimating systems
Compare manual and computerized estimating
Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Select the right power tool or piece of equipment for the job
Mask a vehicle properly

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2500 - CREATING A DAMAGE REPORT
Unit Number: PA2500

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to estimate parts and labor costs then create a damage report with the gathered data.

Tasks:

PA2501 - Demonstrate proper use of a collision estimating guide.

PA2502 - Estimate parts and labor amounts.

PA2503 - Create a damage report.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research

Supporting Standards/Anchors

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Make a rough estimate of the time required to refinish a given collision repair job
Explain the difference between direct and indirect damage and locate both types
Identify the key operating features of manual and computerized estimating systems
Compare manual and computerized estimating

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Select the right power tool or piece of equipment for the job
Mask a vehicle properly

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.
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Automotive Body Repair News (ABRN) magazine Volume 47-49.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2600 - PLASTIC REPAIR – IDENTIFICATION AND REPAIR DECISIONS

Unit Number: PA2600

Dates: Spring 2013 **Hours:** 10.00

Unit Description / Objectives:

Student will know and be able to identify plastic and perform tests to make repair decisions.

Tasks:

PA2601 - Identify plastic and perform tests to make repair decisions.

PA2602 - Select and demonstrate how to use plastic repair methods.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. 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.

Supporting Standards/Anchors

CC.3.5.11-12.D. 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.
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.3.5.11-12.C. 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

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

List typical plastics and composite applications in vehicle construction
Identify automotive plastics through the use of international symbols (ISO codes) and by making a trial-and-error weld
Describe the basic differences between welding metal and welding plastic
Outline the basics of hot-air and airless welding
Repair interior and unreinforced hard plastics
Perform two-part adhesive repairs
Repair RRIM and other reinforced plastics
Describe different types of metals used in vehicle construction
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Mask a vehicle properly
Identify and explain the most common abbreviations used in collision estimating guides
Identify the types of plastics; determine repairability. HP-I
DAM02 Modules 2 PLA01 Modules 1, 3 PLA02 Modules 1, 4

Identify the types of plastics repair procedures; clean and prepare the surface of plastic parts. HP-I
PLA01 Modules 1, 2 PLA02 Modules 1, 2
Replace or repair rigid, semi-rigid, and flexible plastic panels according to manufacturer's/industry specifications. HP-G
EXT01 Modules 1, 2, 3, 4, 5, 6 EXT02 Modules 2, 3, 4 PLA01 Modules 2 PLA02 Modules 2, 3
Remove or repair damaged areas from rigid exterior sheet-molded compound (SMC) panels. HP-G
EXT02 Modules 2 PLA02 Modules 3
Replace bonded sheet-molded compound (SMC) body panels; straighten or align panel supports. HP-G
EXT02 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2700 - ADHESIVE REPAIR - PLASTIC
Unit Number: PA2700

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to repair and prepare plastic surfaces.

Tasks:

PA2701 - Demonstrate proper use of adhesive repair methods, tools, and materials.

PA2702 - Prepare plastic surfaces for adhesive repair.

PA2703 - Repair interior and exterior plastics with two-part adhesives, with and without reinforcement.

PA2704 - Repair rigid plastic parts with urethane or epoxy adhesives.

PA2705 - Repair flexible plastic parts with urethane or epoxy adhesives.

PA2706 - Repair rigid plastic parts with urethane or epoxy adhesives and fiberglass reinforcements.

PA2707 - Repair flexible plastic parts with urethane or epoxy adhesives and fiberglass reinforcements.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.3.5.9-10.B. 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.
CC.3.5.11-12.B. 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
CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

List typical plastics and composite applications in vehicle construction
Identify automotive plastics through the use of international symbols (ISO codes) and by making a trial-and-error weld
Describe the basic differences between welding metal and welding plastic
Outline the basics of hot-air and airless welding
Repair interior and unreinforced hard plastics
Perform two-part adhesive repairs
Repair RRIM and other reinforced plastics
Describe different types of metals used in vehicle construction
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Identify the types of plastics; determine repairability. HP-I
DAM02 Modules 2
PLA01 Modules 1
3 PLA02 Modules 1, 4
Identify the types of plastics repair procedures; clean and prepare the surface of plastic parts. HP-I
PLA01 Modules 1
2 PLA02 Modules 1, 2
Replace or repair rigid, semi-rigid, and flexible plastic panels according to manufacturer's /industry specifications. HP-G
EXT01 Modules 1, 2, 3, 4, 5, 6
EXT02 Modules 2, 3, 4
PLA01 Modules 2
PLA02 Modules 2, 3
Remove or repair damaged areas from rigid exterior sheet-molded compound (SMC) panels. HP-G
EXT02 Modules 2 and PLA02 Modules 3
Replace bonded sheet-molded compound (SMC) body panels; straighten or align panel supports. HP-G

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner

Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Automotive Body Repair News (ABRN) magazine Volume 47-49.

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Assorted vehicles
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ICAR Student Discs
Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2800 - DEMONSTRATE KNOWLEDGE OF MECHANICAL REPAIR
Unit Number: PA2800

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to identify, inspect and replace tires. Student will also know and be able to identify alignment angles and measurements.

Tasks:

PA2801 - Replace wheels/tires.

PA2802 - Inspect and diagnose causes of tire wear patterns.

L2803 - Identify wheel alignment angles and measurements.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain the basics of front, rear, and computer-controlled suspension systems
Describe the design and operation of steering systems
Understand how various brake systems work, and describe procedures for manual and pressure bleeding
Perform key cooling and air-conditioning system repairs and maintenance
Inspect an exhaust system, and describe the guidelines for working on an emission control system
Diagnose common tire, wheel, and wheel bearing problems. Describe tire inflation and rotation procedures.
Measure tire and wheel runout.
Explain static and dynamic wheel balance.
Summarize different methods of balancing wheels and tires.
Explain service procedures for wheel bearings.
Use safe practices while servicing tires and wheels.

Correctly answer ASE certification test questions requiring knowledge of the service and repair of tires, wheels, and wheel bearings.
Identify the major parts of a suspension system.
Describe the basic function of each suspension system component.
Explain the operation of the four common types of springs.
Compare the various types of suspension systems.
Explain automatic suspension leveling systems
Select the right power tool or piece of equipment for the job
Identify and explain the most common abbreviations used in collision estimating guides
Diagnose problems relating to a suspension system.
Replace shock absorbers and ball joints.
Describe the removal and replacement of springs.
Service a strut assembly.
Replace control arm bushings.
Use safe work procedures while repairing suspension systems.
Diagnose and repair electronically-controlled suspension systems.
Correctly answer ASE certification test questions about the diagnosis and repair
Identify the major parts of a steering system.
Explain the operating principles of steering systems.
Compare the differences between a linkage steering and a racking pinion steering system.
Describe the operation of hydraulic and electric-assist power steering systems.
Explain the operation of four-wheel steering systems.
Correctly answer ASE certification test questions requiring knowledge of modern steering and suspension system designs.
Describe common steering system problems.
Properly inspect and determine the condition of a steering system.
Explain basic steering column repair operations.
Adjust both worm gears and rack-and-pinion gears.
Describe service and repair procedures for a rack-and-pinion steering gear.
Service power steering belts, hoses, and fluid.
Explain how to complete basic power steering tests

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area

Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA2900 - ELECTRICAL AND ELECTRONIC SYSTEMS
Unit Number: PA2900

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to inspect, service, test, and replace batteries, cables, links, breakers, and fuses.

Tasks:

PA2901 - Inspect and service batteries and battery cables.

PA2902 - Inspect, test and replace fusible links, circuit breakers and fuses.

PA2903 - Aim headlights using mechanical aiming equipment.

PA2904 - Demonstrate skills in using a Digital Voltage, Ohm Meter.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
3.2.10.B4 Describe quantitatively the relationships between voltage, current, and resistance to electrical energy and power. Describe the relationship between electricity and magnetism as two aspects of a single electromagnetic force.
3.4.12.E3 Compare and contrast energy and power systems as they relate to pollution, renewable and non-renewable resources, and conservation.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers
CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Use various kinds of electrical test instruments
Find electrical problems
Explain the operation of automotive electrical-electronic systems
Describe the operation of computer systems

Use scanners to find electrical-electronic problems
Identify the major parts of a vehicle's interior
Remove and replace seats, seat covers, and carpeting
Service an instrument cluster and other dashboard parts
Explain how to replace headliners
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain the principles of electricity.
Describe the action of basic electric circuits.
Compare voltage, current, and resistance.
Describe the principles of magnetism and magnetic fields.
Identify basic electric and electronic terms and components.
Explain different kinds of automotive wiring.
Perform fundamental electrical tests.

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA3000 - BRAKE SYSTEMS
Unit Number: PA3000

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to identify brake components.

Tasks:

PA3001 - Identify brake components.

PA3002 - Inspect and diagnose disk and drum brake systems.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain the hydraulic and mechanical principles of a brake system.
Identify the major parts of an automotive brake system.
Define the basic functions of the major parts of a brake system.
Compare drum and disc brakes.
Describe the operation of parking brakes.
Explain the operation of power brakes.
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group

Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA3100 - HEATING AND AIR CONDITIONING

Unit Number: PA3100

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to identify parts of air conditioning systems.

Tasks:

PA3101 - Identify parts of air conditioning systems.

PA3102 - Evacuate and recharge an automotive air conditioning system.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Perform key cooling and air-conditioning system repairs and maintenance
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment

Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
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Time Cards
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SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA3200 - DRIVE TRAINS
Unit Number: PA3200

Dates: Spring 2013 **Hours:** 20.00

Unit Description / Objectives:

Student will know and be able to identify major drive train components.

Tasks:

PA3201 - Identify major drive train components.

L3202 - Identify steering and suspension system.

L3203 - Identify rear suspension system.

L3204 - Remove and reinstall suspension systems.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the , selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Select the right power tool or piece of equipment for the job
Identify parts and operation of the transmissions/trans-axle systems
Describe the operation of linkages and accessories used on transmissions / trans-axles
State common problems, their diagnosis, and service suggestions pertaining transmissions / trans-axles

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2008). Instructor's Manual to Accompany Collision Repair Fundamental.Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

- Hand tools
- Lift
- Jack
- Assorted tool catalogs
- Computer
- Assorted vehicles
- Fire extinguisher
- Respirator
- Eye Wash Station
- Internet websites: ICAR, ASE, SP/2 Safety Training
- ICAR Student Discs
- Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA3300 - FUEL, INTAKE AND EXHAUST SYSTEMS
Unit Number: PA3300

Dates: Spring 2013 **Hours:** 40.00

Unit Description / Objectives:

Student will know and be able to identify fuel intake and exhaust systems.

Tasks:

PA3301 - Identify fuel intake and exhaust systems.

Standards / Assessment Anchors

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
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Participate in group activities as directed
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Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Inspect an exhaust system, and describe the guidelines for working on an emission control system
Select the right power tool or piece of equipment for the job

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer’s directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests

Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2008).Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2008). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Internet resources

Monroe Career & Technical Institute
Course Name: Auto Collision & Repair 2015

Unit Name: PA3400 - RESTRAINT SYSTEMS
Unit Number: PA3400

Dates: Spring 2013 **Hours:** 60.00

Unit Description / Objectives:

Student will know and be able to identify, inspect, and disarm supplemental restraint systems.

Tasks:

PA3401 - Research auto manufacturers' recommended safety procedures to prevent accidental deployment of supplemental restraint systems.

PA3402 - Identify, inspect, and disarm supplemental restraint systems.

PA3403 - Diagnose supplemental restraint systems.

PA3404 - Replace supplemental restraint systems.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.6.11-12.F. 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.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
CC.3.5.9-10.D. 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.
CC.3.5.11-12.D. 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.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
CC.2.1.7.D.1Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
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Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Explain the difference between an active and a passive restraint system
Learn how to service seat belts
Describe the operation of air bag systems
Repair are bag systems safely
Explain the difference between an active and a passive restraint system
Learn how to service seat belts
Describe the operation of air bag systems
Repair are bag systems safely
Disarm SRS in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 1
Inspect, remove, and replace sensors and wiring in accordance with manufacturer's specifications/procedures; ensure sensor orientation. HP-G
DAM04 Modules 1
RES01 Modules 1
Inspect, remove, replace, and dispose of deployed SRS modules in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 1
Verify that SRS is operational in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 2
Inspect, remove, replace, and dispose of non-deployed SRS in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 1
Diagnose and repair SRS using fault codes and test equipment. HP-G
RES01 Modules
Inspect, remove, and replace seatbelt and shoulder harness assembly and components in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 3, 4
Inspect restraint system mounting areas for damage; repair in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 3
Verify proper operation of seatbelt in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 3

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
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Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

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Safety:

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