

Auto Tech 1 Curriculum Design

Power Standards

Students will be able to:

1. Demonstrate the safe use and care of tools and equipment in an automotive environment.
2. Diagnose and repair various automotive systems.
3. Operate efficiently within the automotive repair shop setting.
4. Explore advanced transportation technologies.

Power Benchmarks

Students will be able to:

1. Apply shop and equipment safety rules including hazardous materials.
2. Evaluate, diagnose, and repair the automotive steering and suspension system.
3. Evaluate, diagnose, and repair the condition of the automotive cooling/heating systems.
4. Perform shop and equipment maintenance and repair.
5. Diagnose and repair various automotive systems using the diagnostic scan tool and system information resources.
6. Evaluate, diagnose, and repair the automotive brakes system.
7. Disassemble, clean, measure/ evaluate, and re-assemble an automotive engine.
8. Remove and replace an automotive engine from a vehicle.
9. Evaluate, diagnose, and repair the automotive AC system.
10. Demonstrate the ability to interact with others in a professional, courteous and tactful manner.

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Students will be able to:

1. Demonstrate the safe use and care of tools and equipment in an automotive environment.
 - Apply shop and equipment safety rules including hazardous materials. (1)
 - Demonstrate the ability to interact with others in a professional, courteous and tactful manner. (10)

2. Diagnose and repair various automotive systems.
 - Evaluate, diagnose, and repair the condition of the automotive cooling/heating systems and repair as needed. (3)
 - Diagnose and repair various automotive systems using the diagnostic scan tool and system information resources.(5)
 - Evaluate, diagnose, and repair the automotive steering and suspension system.(2)
 - Evaluate, diagnose, and repair the automotive brakes system. (6)
 - Evaluate, diagnose, and repair the automotive AC system. (9)

3. Operate efficiently within the automotive repair shop setting.
 - Disassemble, clean, measure/ evaluate, and re-assemble an automotive engine. (7)
 - Perform shop and equipment maintenance and repair (4)

4. Explore advanced transportation technologies.
 - Remove and replace an automotive engine from a vehicle. (8)

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Stage 1 – Desired Results:

<p>Power Standard 1: Demonstrate the safe use and care of tools and equipment in an automotive environment.</p> <p>Power Benchmark/Competency #1: Apply shop and equipment safety rules including hazardous materials.</p> <p>Estimated Timeline: 2 days + on-going application</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global & Cultural</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr style="background-color: #ffffcc;"> <th>Math</th> <th>Science</th> <th>Reading</th> <th>Social Responsibility</th> <th>Communication</th> </tr> <tr> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X	X	Math	Science	Reading	Social Responsibility	Communication	X		X	X	X
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Safety standards were developed to ensure the safety of all workers. ➤ Eye protection is required at all times in the workshop. ➤ Tools need to be put away after using. ➤ All accidents must be reported to instructor. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ Why must hazmat material be treated differently than regular waste? ➤ What are blood-borne pathogens? ➤ What is OSHA? ➤ What is the most dangerous liquid in the shop? ➤ Where are the fire extinguishers located? 																				
<p>Students will: (<i>know</i>)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Project the need for safety of every job. ➤ Identify potential safety hazards. ➤ Ascertain the location of all fire extinguishers in the shop area. <ul style="list-style-type: none"> ○ OSHA, Hazmat, Flammable, Combustible, band aid, personal protective equipment. 	<p>Students will be able to: (<i>i.e. do</i>)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Operate in a safe environment. ➤ Recognize unsafe situations. ➤ Pass a safety test. ➤ Work safely and watch out for others. ○ OSHA, Hazmat, Flammable, Combustible, band aid, personal protective equipment. 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Apply shop and equipment safety rules including hazmat. 	<p>Key Criteria: (Rubric)</p> <ul style="list-style-type: none"> ➤ Students will be able to function in a safe environment. 																																							
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Stage 1 – Desired Results:

<p>Power Standard 2: Diagnose and repair various automotive systems.</p> <p>Power Benchmark/Competency #2: Evaluate, diagnose, and repair the automotive steering and suspension system.</p> <p>Estimated Timeline: 3 days + on-going application</p>	<p>Place 'X' in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global & Cultural</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> <tr style="background-color: #ffffcc;"> <th>Math</th> <th>Science</th> <th>Reading</th> <th>Social Responsibility</th> <th>Communication</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X		Math	Science	Reading	Social Responsibility	Communication	X	X	X		X
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Proper steering and suspension settings are important to maintenance and safety of a vehicle. ➤ Most new vehicles use rack and pinion steering. ➤ Tire life is affected by a number of factors. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ What affects tire life? ➤ Name five major components of the suspension system and list their function. ➤ What are three signs of a bad steering component? ➤ How is toe adjusted? ➤ How is caster adjusted? ➤ How is camber adjusted? ➤ What is the proper sequence of alignment adjustments when performing a 4-wheel vehicle alignment? ➤ Why is tire pressure important to the economy, handling and longevity of a vehicle? 																				
<p>Students will: (know)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Recognize steering conditions. ➤ Name the components of the suspension system. ➤ Describe the components of the steering system. ➤ Perform a 4-wheel vehicle alignment. ➤ Check vehicle ride height. <ul style="list-style-type: none"> ○ Ball joint, tie rod ends, shock absorber, strut, springs, thrust angle, toe-in, toe-out, caster, and camber, ride height 	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Identify suspension for damaged and worn parts. ➤ Identify steering for damaged and worn parts. ➤ Properly pull a vehicle on the alignment rack and set up the front-end alignment machine. ➤ Operate a front-end alignment machine setting toe-in, caster, and camber. <ul style="list-style-type: none"> ○ Alignment, tread-wear pattern, shim, dog leg, sleeve, tire run out, radial run out. 																				

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Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Evaluate the condition of the automotive steering and suspension systems and repair as needed. 	Key Criteria: (Rubric)		
	➤ Students will effectively evaluate, repair, or adjust an automobile steering or suspension system.		
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Stage 1 – Desired Results:

<p>Power Standard 2: Diagnose and repair various automotive systems.</p> <p>Power Benchmark/Competency #3: Evaluate, diagnose, and repair the condition of the automotive cooling/heating systems and repair as needed.</p> <p>Estimated Timeline: 2 days+ on-going application.</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Career</th> <th style="padding: 2px;">Technology</th> <th style="padding: 2px;">Critical Thinking</th> <th style="padding: 2px;">Personal Responsibility</th> <th style="padding: 2px;">Global & Cultural</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Math</th> <th style="padding: 2px;">Science</th> <th style="padding: 2px;">Reading</th> <th style="padding: 2px;">Social Responsibility</th> <th style="padding: 2px;">Communication</th> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X		Math	Science	Reading	Social Responsibility	Communication	X	X	X	X	
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ The cooling/heating system is vital to the overall operation of a vehicle. ➤ The components of the cooling/heating system must be kept in good condition. ➤ Most new vehicles have computer controlled cooling/heating system components. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ What is the purpose of the heater core? ➤ Why is the condition of the anti-freeze important? ➤ How is a sensor determined to be bad? ➤ Why won't a cooling fan work? ➤ What is the difference between coolant and Dex-cool? ➤ What is the importance of the thermostat in the cooling system? ➤ What is the difference between open loop and closed loop in terms of coolant flow? 																				
<p>Students will : (know) ... Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Recognize the symptoms for replacement of an item in the cooling system. ➤ Name the components of the cooling/heating system. ➤ Describe the function of anti-freeze. ➤ Use a hydrometer to measure the vehicle's coolant specific gravity. <ul style="list-style-type: none"> ○ Radiator, fan, heater core, hose, thermostat, fuse, hydrometer 	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Decide if the cooling/heating system needs to be serviced. ➤ Rate the condition of coolant in a vehicle. ➤ Replace any faulty part in the cooling/heating system. ➤ Test the electrical sensors and connections in the cooling/heating system. <ul style="list-style-type: none"> ○ Sensor, relay, ohms 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Evaluate the condition of the automotive cooling/heating system and repair as needed. 	<p>Key Criteria: (Rubric)</p> <ul style="list-style-type: none"> ➤ Student will be able to demonstrate knowledge of the cooling/heating systems.
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Stage 1 – Desired Results:

<p>Power Standard 3: Operate efficiently within the automotive repair shop setting.</p> <p>Power Benchmark/Competency # 4: Perform shop and equipment maintenance and repair.</p> <p>Estimated Timeline: 2 days + on-going application</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global & Cultural</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> <tr style="background-color: #ffffcc;"> <th>Math</th> <th>Science</th> <th>Reading</th> <th>Social Responsibility</th> <th>Communication</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X		Math	Science	Reading	Social Responsibility	Communication	X	X	X	X	
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Shop tools and equipment need to be maintained. ➤ Shop vehicles need to be serviced on a schedule. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ Why should you clean and put away your tools when you are done using them? ➤ Why should you clean, grease, lubricate equipment with moving parts? ➤ When and why should you use air tool oil? ➤ What are the proper steps in drilling out a broken bolt? ➤ Why should maintenance records be kept on shop equipment and vehicles? 																				
<p>Students will: (know)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ How to replace a hammer handle. ➤ How to drill out and repair broken bolts. ➤ Why Air tools must be lubricated daily. ➤ How to Lubricate equipment. ➤ Importance of upkeep of shop vehicles. ➤ Importance of returning tools, jack stands, etc. to there proper storage locations. <p style="margin-left: 40px;">○ Center punch, tap and die set, air tool oil, maintenance schedule, schematic drawing</p>	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Clean, maintain, and properly put tools away where they belong when they are done using them. ➤ Maintain equipment following a schedule. ➤ Remove, repair threads, and replace broken bolts in equipment. ➤ Repair broken tools if possible following a schematic. <p style="margin-left: 40px;">○ Easy out extractor set, penetrating fluid, drill bit, chuck key, ball peen hammer</p>																				

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Stage 1 – Desired Results:

<p>Power Standard 2: Diagnose and repair various automotive systems.</p> <p>Power Benchmark/Competency #5: Diagnose and repair various automotive systems using the diagnostic scan tool and system information resources.</p> <p>Estimated Timeline: 2 days + on-going application</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Career</th> <th style="padding: 2px;">Technology</th> <th style="padding: 2px;">Critical Thinking</th> <th style="padding: 2px;">Personal Responsibility</th> <th style="padding: 2px;">Global & Cultural</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> </tr> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Math</th> <th style="padding: 2px;">Science</th> <th style="padding: 2px;">Reading</th> <th style="padding: 2px;">Social Responsibility</th> <th style="padding: 2px;">Communication</th> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X	X	Math	Science	Reading	Social Responsibility	Communication		X	X	X	
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	X	X	X																		
<p>Understandings: Students will understand that:</p> <ul style="list-style-type: none"> ➤ Evaluating which sensor is bad is important to the proper function of the vehicle’s engine. ➤ The student will cite the main function of the sensor. ➤ Servicing the emission or powertrain management systems has environmental concerns. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ What does a “check engine” light mean? ➤ What is a sign of a bad sensor? ➤ How is a sensor checked? ➤ What are some of the vehicle sensors under the hood? ➤ What are the locations of the different sensors under the hood? ➤ What are the purposes of the different sensors under the hood? 																				
<p>Students will: <i>(know)...</i> <i>(Include vocabulary)</i></p> <ul style="list-style-type: none"> ➤ Report to the instructor any bad sensor readings. ➤ Predict sensor output. ➤ Develop an understanding of the purpose of a sensor. <ul style="list-style-type: none"> ○ Oxygen sensor, IAC, EGR, TPS 	<p>Students will be able to: <i>(i.e. do)...</i> <i>(Include vocabulary)</i></p> <ul style="list-style-type: none"> ➤ Investigate the cause of a “check engine” light. ➤ Evaluate the overall condition of the emission and power train management system. ➤ Replace a bad sensor. ➤ Determine if a sensor is bad. ➤ Measure sensor output using a multimeter. <ul style="list-style-type: none"> ○ MAP sensor, MAF sensor, OBD, OBD II 																				
Stage 2 – Assessment Evidence																					
<p>Performance Tasks: <i>(i.e. Assessment used to determine proficiency on competency)</i></p> <ul style="list-style-type: none"> ➤ Evaluate the automotive emissions and power train management systems and repair as needed 	<p>Key Criteria: <i>(Rubric)</i></p>																				

Auto Tech 1 Curriculum Design

Stage 1 – Desired Results:

Power Standard 1: Demonstrate the safe use and care of tools and equipment in an automotive environment.

Power Benchmark/Competency #6:

Evaluate, diagnose, and repair the automotive brakes system.

Estimated Timeline: 15 days + on-going application

Place 'X' in square if goal addresses Essential/Content Standard(s).

Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural
X	X	X	X	
Math	Science	Reading	Social Responsibility	Communication
X	X	X		

Understandings:

Students will understand that:

- The brakes system is one of the most important system in a vehicle.
- The brake system will require replacement of brake pads, rotors, shoes, and drums periodically.
- Air in the brake hydraulic system will cause a spongy pedal.
- Brake fluid is available in DOT 1, 2, 3, 4, and 5. DOT 3 is the most common.
- Brake pedal height is controlled by rear brakes adjustment.
- Most master cylinders must be bench bleed before installation.
- Rotors and drums may be re-usable if properly machined on a brake lathe.
- The importance of Pascal's Law.
- The functionality of a vehicle equipped with ABS
- The procedures for releasing or adjusting the parking brake.
- The different types of wheel bearings.
- The importance of lubricating the moving brake components.
- Distinguishing between free floating and fixed calipers.
- The micrometer is the precision measurement tool to check rotor and drum thickness.

Essential Questions:

- What is a caliper?
- What is the difference between fixed and floating calipers?
- What are some common malfunctions of calipers?
- What are the different styles of brake pads?
- How do the different wear patterns of brake pads alert a service technician towards repair procedures?
- What is a master cylinder?
- What are some common malfunctions of master cylinders?
- What are the different types of master cylinders?
- What is bench bleeding a master cylinder?
- What is a proportioning valve?
- What is a metering valve?
- What is a combination valve?
- How are the various valves of the brake system diagnosed?
- What are the different methods for bleeding the air from the brake lines?
- How can rotors or drums be resurfaced?
- What are the numerous parts of the drum brake system?
- What are the two types of brake line flaring techniques?
- What are the different types of braking systems?
- What is a wheel speed sensor?
- How is a wheel speed sensor diagnosed?
- What is a wheel cylinder?
- What function does a wheel cylinder perform?
- What is the difference between brake grease, wheel bearing grease, and shop grease?
- What is the procedure for cleaning, inspecting, and re-packing wheel bearings?
- What is the importance of replacing a grease seal?
- What is the difference between a non sealed and sealed wheel bearing?

Auto Tech 1 Curriculum Design

	<ul style="list-style-type: none"> ➤ What is the proper procedure for releasing or adjusting a parking brake? ➤ What are dual-servo brakes? ➤ What is the importance of lubricating and diagnosing the caliper slides or through bolts? ➤ What are the different types of brake systems?
<p>Students will: (know)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Recognize the parts of the disc brake system. ➤ Recognize the parts of the drum brakes system. ➤ Proper methods for bleeding the brake system. ➤ The proper usage for compressing a brake caliper piston back into its bore with various compression tools. <ul style="list-style-type: none"> ○ Rotor, drum, caliper, through bolts, parking brake, parking brake cable, wheel cylinder, wheel speed sensors, bleeder valves, brake line, brake hoses, brake pads, brake hanger, brake grease, C-clamp, micrometer, ABS brake systems, 	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Replace the brake pads. ➤ Replace the brake drums. ➤ Replace the rotors and drums. ➤ Re-surface the rotors and drums. ➤ Service the caliper and wheel cylinders. ➤ Measure rotors and drums for minimum thickness and run-out. ➤ Properly bleed the entire brakes system. ➤ Properly lubricate the brake system components. <ul style="list-style-type: none"> ○ Resurfacing, brake bleeding, repacking, lubricating, dual-servo, self energizing, split-hydraulic, run-out, self-adjusting, drum brake gauge, out of round, distortion, brake fade, wheel drag, spongy pedal, pulsation, chatter, brakes too sensitive

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Evaluate an automotive transmission/transaxle 	Key Criteria: (Rubric)			
	A	93 and above	Firm command of knowledge domain High level of skill development Exceptional preparation for later learning	
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D⁻	60 - 62			
F	59 and below			

Auto Tech 1 Curriculum Design

Stage 1 – Desired Results:

<p>Power Standard 4: Explore advanced transportation technologies.</p> <p>Power Standard/Competency #7: Disassemble, clean, measure/ evaluate, and re-assemble an automotive engine.</p> <p>Estimated Timeline: 4 days + on-going application</p>	<p>Place 'X' in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Career</th> <th style="padding: 2px;">Technology</th> <th style="padding: 2px;">Critical Thinking</th> <th style="padding: 2px;">Personal Responsibility</th> <th style="padding: 2px;">Global & Cultural</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Math</th> <th style="padding: 2px;">Science</th> <th style="padding: 2px;">Reading</th> <th style="padding: 2px;">Social Responsibility</th> <th style="padding: 2px;">Communication</th> </tr> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X			Math	Science	Reading	Social Responsibility	Communication	X	X	X		
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Measurement and cleanliness are essential for proper engine construction. ➤ All parts of the engine must work together to have the total performance potential met. ➤ Previous maintenance of the engine can affect the parts needed in the rebuild. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ Why is the proper torque sequence important? ➤ When do you use a ridge reamer? ➤ What is a cylinder hone used for? ➤ What is engine balancing? ➤ What is plastigage? ➤ How does a service technician keep the different engine parts in order for re-assembly? ➤ What is cross-hatching a cylinder mean? ➤ 																				
<p>Students will: (<i>know</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Analyze out-of-round measurements. ➤ Describe the construction of a rod or main bearing. ➤ Choose parts needed for the engine rebuild. ➤ Interpret wear patterns. <ul style="list-style-type: none"> ○ Ring compressor, ring groove cleaner, cylinder hone, rod bearings, main bearings, ring remover tool, rings, piston, 	<p>Students will be able to: (<i>i.e. do</i>)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Rebuild an automotive engine. ➤ Measure various parts using micrometers ➤ Evaluate the condition of the engine after disassemble. ➤ Run engine on a stand after rebuilding. <ul style="list-style-type: none"> ○ Feeler gauge, plastigage, timing chain, clearance, tolerance, crankshaft, micrometer, straight edge, 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (<i>i.e. Assessment used to determine proficiency on competency</i>)</p> <ul style="list-style-type: none"> ➤ Overhaul an automotive engine 	<p>Key Criteria: (Rubric)</p>
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Auto Tech 1 Curriculum Design

Stage 1 – Desired Results:

<p>Power Standard 2: Diagnose and repair various automotive systems.</p> <p>Power Benchmark/Competency #8: Remove and replace an automotive engine from a vehicle</p> <p>Estimated Timeline: 1 day + on-going application</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Career</th> <th style="padding: 2px;">Technology</th> <th style="padding: 2px;">Critical Thinking</th> <th style="padding: 2px;">Personal Responsibility</th> <th style="padding: 2px;">Global & Cultural</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> </tr> <tr style="background-color: #ffffcc;"> <th style="padding: 2px;">Math</th> <th style="padding: 2px;">Science</th> <th style="padding: 2px;">Reading</th> <th style="padding: 2px;">Social Responsibility</th> <th style="padding: 2px;">Communication</th> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;">X</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X		Math	Science	Reading	Social Responsibility	Communication			X		
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ There are certain steps involved in removing and replacing an engine. ➤ Removing an engine is the first step for overhauling. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ What safety precautions need to be taken before starting the engine removal? ➤ Why should you label items left in engine compartment? ➤ What parts can generally be swapped over to the new engine? 																				
<p>Students will: (know)... Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Determine when an engine needs to be removed from a vehicle. ➤ Formulate a method to remove and replace engine without damaging it or surrounding parts. ➤ Decide if engine needs to be removed with transmission attached or alone. <ul style="list-style-type: none"> ○ Engine hoist, Engine/Transmission support, wiring harness, accelerator cable, shift linkage 	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Choose the proper tools to safely remove an engine. ➤ Participate with another student in the removal of an engine. ➤ Remove and replace the engine from the vehicle in a timely manner. 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Remove and replace an automotive engine from a vehicle 	<p>Key Criteria: (Rubric)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">A</td> <td style="width: 20%;">93 and above</td> <td style="width: 70%;">Firm command of knowledge domain High level of skill development Exceptional preparation for later learning</td> </tr> <tr> <td style="text-align: center;">A⁻</td> <td>90 - 92</td> <td rowspan="2">Command of knowledge beyond the basic concepts Advanced development of most skills Has prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">B⁺</td> <td>87 - 89</td> </tr> <tr> <td style="text-align: center;">B</td> <td>83 - 86</td> <td rowspan="3">Command of the basic concepts of knowledge Demonstrates ability to use basic skills Lacks a few prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">B⁻</td> <td>80 - 82</td> </tr> <tr> <td style="text-align: center;">C⁺</td> <td>77 - 79</td> </tr> <tr> <td style="text-align: center;">C</td> <td>73 - 76</td> <td rowspan="4">Lacks knowledge of some fundamental ideas Some important skills not attained Deficient in many of the prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">C⁻</td> <td>70 - 72</td> </tr> <tr> <td style="text-align: center;">D⁺</td> <td>67 - 69</td> </tr> <tr> <td style="text-align: center;">D</td> <td>63 - 66</td> </tr> <tr> <td style="text-align: center;">D⁻</td> <td>60 - 62</td> <td rowspan="2">Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning</td> </tr> <tr> <td style="text-align: center;">F</td> <td>59 and below</td> </tr> </table>	A	93 and above	Firm command of knowledge domain High level of skill development Exceptional preparation for later learning	A ⁻	90 - 92	Command of knowledge beyond the basic concepts Advanced development of most skills Has prerequisites for later learning	B ⁺	87 - 89	B	83 - 86	Command of the basic concepts of knowledge Demonstrates ability to use basic skills Lacks a few prerequisites for later learning	B ⁻	80 - 82	C ⁺	77 - 79	C	73 - 76	Lacks knowledge of some fundamental ideas Some important skills not attained Deficient in many of the prerequisites for later learning	C ⁻	70 - 72	D ⁺	67 - 69	D	63 - 66	D ⁻	60 - 62	Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning	F	59 and below
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Auto Tech 1 Curriculum Design

Stage 1 – Desired Results:

<p>Power Standard 2: Diagnose and repair various automotive systems.</p> <p>Established Goal/Competency #9: Evaluate, diagnose, and repair the automotive AC system.</p> <p>Estimated Timeline: 2 days + on-going application</p>	<p>Place 'X' in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global & Cultural</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr style="background-color: #ffffcc;"> <th>Math</th> <th>Science</th> <th>Reading</th> <th>Social Responsibility</th> <th>Communication</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </tbody> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X	X	Math	Science	Reading	Social Responsibility	Communication	X	X	X	X	X
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Air conditioners use Freon to absorb and release heat. ➤ Servicing the air conditioning system has environmental concerns. ➤ Using the air conditioning system may make a vehicle less economical. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ Why must a manifold gauge be used on an AC system? ➤ What are the signs an AC system needs to be serviced? ➤ How are leaks detected in the AC system? ➤ What are the steps in reclaiming Freon? 																				
<p>Students will: (know)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Distinguish the difference between R12 and 134A Freon. ➤ Identify the environmental effects of the AC system. ➤ Read the AC manifold gauges. <ul style="list-style-type: none"> ○ Freon (R12, 134A), compressor, condenser, accumulator, high pressure port, low pressure port, manifold gauges. 	<p>Students will be able to: (i.e. do)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Analyze manifold gauge readings. ➤ Recharge an AC system. ➤ Replace faulty AC components. ➤ Determine if thermometer reading at vent is acceptable. <ul style="list-style-type: none"> ○ Schrader valve, orifice tube, reclaimer unit, leak detector 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Evaluate the automotive AC systems based upon industry identified standards and repair as needed 	<p>Key Criteria: (Rubric)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Grade</th> <th>Score Range</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>93 and above</td> <td>Firm command of knowledge domain High level of skill development</td> </tr> <tr> <td>A⁻</td> <td>90 - 92</td> <td>Exceptional preparation for later learning</td> </tr> <tr> <td>B⁺</td> <td>87 - 89</td> <td>Command of knowledge beyond the basic concepts Advanced development of most skills</td> </tr> <tr> <td>B</td> <td>83 - 86</td> <td>Has prerequisites for later learning</td> </tr> <tr> <td>B⁻</td> <td>80 - 82</td> <td></td> </tr> <tr> <td>C⁺</td> <td>77 - 79</td> <td>Command of the basic concepts of knowledge Demonstrates ability to use basic skills</td> </tr> <tr> <td>C</td> <td>73 - 76</td> <td>Lacks a few prerequisites for later learning</td> </tr> <tr> <td>C⁻</td> <td>70 - 72</td> <td></td> </tr> <tr> <td>D⁺</td> <td>67 - 69</td> <td>Lacks knowledge of some fundamental ideas Some important skills not attained</td> </tr> <tr> <td>D</td> <td>63 - 66</td> <td>Deficient in many of the prerequisites for later learning</td> </tr> <tr> <td>D⁻</td> <td>60 - 62</td> <td></td> </tr> <tr> <td>F</td> <td>59 and below</td> <td>Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning</td> </tr> </tbody> </table>	Grade	Score Range	Description	A	93 and above	Firm command of knowledge domain High level of skill development	A ⁻	90 - 92	Exceptional preparation for later learning	B ⁺	87 - 89	Command of knowledge beyond the basic concepts Advanced development of most skills	B	83 - 86	Has prerequisites for later learning	B ⁻	80 - 82		C ⁺	77 - 79	Command of the basic concepts of knowledge Demonstrates ability to use basic skills	C	73 - 76	Lacks a few prerequisites for later learning	C ⁻	70 - 72		D ⁺	67 - 69	Lacks knowledge of some fundamental ideas Some important skills not attained	D	63 - 66	Deficient in many of the prerequisites for later learning	D ⁻	60 - 62		F	59 and below	Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning
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Auto Tech 1 Curriculum Design

Stage 1 – Desired Results:

<p>Power Standard 3: Operate efficiently within the automotive repair shop setting.</p> <p>Power Benchmark/Competency #10: Demonstrate the ability to interact with others in a professional, courteous and tactful manner.</p> <p>Estimated Timeline: 2 days + on-going application</p>	<p>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global & Cultural</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> <tr style="background-color: #ffffcc;"> <th>Math</th> <th>Science</th> <th>Reading</th> <th>Social Responsibility</th> <th>Communication</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	Career	Technology	Critical Thinking	Personal Responsibility	Global & Cultural	X	X	X	X		Math	Science	Reading	Social Responsibility	Communication	X	X	X	X	X
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<p>Understandings: <i>Students will understand that:</i></p> <ul style="list-style-type: none"> ➤ Working well with others is important to the function of the workshop. ➤ Proper behavior is essential to success in the workshop. ➤ Communication between customer and business is very important. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ➤ What is the purpose of a repair order? ➤ What information is important to attain from a customer in order to write a proper work order? ➤ What is the importance of being courteous and tactful in the workplace? 																				
<p>Students will: (know)... (Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Translate the use of Alldata program to access repairs on vehicle. ➤ Decide what questions to ask customers. <ul style="list-style-type: none"> ○ Alldata, estimate, flat rate, repair order 	<p>Students will be able to: (i.e. do)...(Include vocabulary)</p> <ul style="list-style-type: none"> ➤ Compose a shop repair order. ➤ Interact with potential customers on phone and in person. ➤ Employ the use of Alldata program for vehicle repair. 																				

Stage 2 – Assessment Evidence

<p>Performance Tasks: (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> ➤ Demonstrate the ability to interact with others in a professional, courteous and tactful manner. 	<p>Key Criteria: (Rubric)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">93 and above</td> <td>Firm command of knowledge domain High level of skill development Exceptional preparation for later learning</td> </tr> <tr> <td style="text-align: center;">A⁻</td> <td style="text-align: center;">90 - 92</td> <td>Command of knowledge beyond the basic concepts Advanced development of most skills Has prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">B⁺</td> <td style="text-align: center;">87 - 89</td> <td>Command of the basic concepts of knowledge Demonstrates ability to use basic skills Lacks a few prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">83 - 86</td> <td>Lacks knowledge of some fundamental ideas Some important skills not attained Deficient in many of the prerequisites for later learning</td> </tr> <tr> <td style="text-align: center;">B⁻</td> <td style="text-align: center;">80 - 82</td> <td>Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning</td> </tr> <tr> <td style="text-align: center;">C⁺</td> <td style="text-align: center;">77 - 79</td> <td></td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">73 - 76</td> <td></td> </tr> <tr> <td style="text-align: center;">C⁻</td> <td style="text-align: center;">70 - 72</td> <td></td> </tr> <tr> <td style="text-align: center;">D⁺</td> <td style="text-align: center;">67 - 69</td> <td></td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">63 - 66</td> <td></td> </tr> <tr> <td style="text-align: center;">D⁻</td> <td style="text-align: center;">60 - 62</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">59 and below</td> <td></td> </tr> </table>	A	93 and above	Firm command of knowledge domain High level of skill development Exceptional preparation for later learning	A ⁻	90 - 92	Command of knowledge beyond the basic concepts Advanced development of most skills Has prerequisites for later learning	B ⁺	87 - 89	Command of the basic concepts of knowledge Demonstrates ability to use basic skills Lacks a few prerequisites for later learning	B	83 - 86	Lacks knowledge of some fundamental ideas Some important skills not attained Deficient in many of the prerequisites for later learning	B ⁻	80 - 82	Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning	C ⁺	77 - 79		C	73 - 76		C ⁻	70 - 72		D ⁺	67 - 69		D	63 - 66		D ⁻	60 - 62		F	59 and below	
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