

# Basic Auto Mechanics Curriculum Design

## **Power Standards**

Students will be able to:

1. Perform under-the-hood service.
2. Perform chassis inspections and repairs.
3. Integrate safety in all aspects of the automotive classroom and lab.

## **Power Benchmarks**

Students will be able to:

1. Apply shop and equipment safety rules, including hazardous material.
2. Determine the identification, use, and care of shop tools and equipment.
3. Service engine lubrication systems per manufacturer's specifications.
4. Demonstrate tire and wheel services.
5. Practice repair on brake assemblies.
6. Assess automotive belts and hoses.
7. Distinguish parts of the cooling system.
8. Incorporate basic electrical system theory.
9. Demonstrate ignition system fundamentals.
10. Disassemble and reassemble an automotive lower engine block.

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Students will be able to:

1. Perform under-the-hood maintenance.
  - Service engine lubrication systems per manufacturer's specifications. (3)
  - Assess automotive belts and hoses. (6)
  - Distinguish parts of the cooling system. (7)
  - Incorporate basic electrical system theory. (8)
  - Demonstrate ignition system fundamentals. (9)
  - Disassemble and reassemble an automotive lower engine block. (10)
2. Perform chassis inspection and do repairs.
  - Demonstrate tire and wheel services (4)
  - Practice repair on brake assemblies. (5)
2. Integrate safety in all aspects of the automotive classroom and lab.
  - Apply shop and equipment safety rules, including hazardous material. (1)
  - Determine the identification, use, and care of shop tools and equipment. (2)

## Basic Auto Mechanics Curriculum Design

### Stage 1 – Desired Results:

<p><b>Power Standard 3:</b> Integrate safety in all aspects of the automotive classroom and lab.</p> <p><b>Power Benchmark/Competency #1:</b> Apply shop and equipment safety rules, including hazardous material.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;">X</td> <td style="padding: 2px;">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
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ Safety stands are required.</li> <li>➤ Floor jack handles must remain up when not in use.</li> <li>➤ Personal Protective Equipment is required.</li> <li>➤ Cords, hoses, and tools are trip hazards.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ Why are jack stands required?</li> <li>➤ Why must liquids be removed from the floor?</li> <li>➤ What is the purpose of floor dry?</li> <li>➤ What is the proper procedure for using a fire extinguisher?</li> <li>➤ Where are the fire extinguishers located in the room?</li> <li>➤ Why is smoking prohibited in the shop area?</li> <li>➤ Why is eye protection always required in the shop area?</li> <li>➤ What must be done if an accident occurs?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Proper use of tools.</li> <li>➤ Proper use of floor jacks and jack stands.</li> <li>➤ Proper use of vehicle lifts.                             <ul style="list-style-type: none"> <li>○ Fire extinguisher, fire blanket, eye wash station, safety cabinet for flammable materials, floor jack, and safety stands, vehicle lift, personal protective equipment.</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify safety hazards.</li> <li>➤ Wear eye protection at all times.</li> <li>➤ Use safety stands and floor jacks when lifting a vehicle.</li> <li>➤ Use car lift as safely demonstrated by instructor.</li> <li>➤ <b>WORK SAFELY and WATCH OUT FOR OTHERS.</b> <ul style="list-style-type: none"> <li>○ Fire extinguisher, fire blanket, eye wash station, safety cabinet for flammable materials, floor jack, and safety stands, vehicle lift, personal protective equipment.</li> </ul> </li> </ul>																				
<h3 style="margin: 0;">Stage 2 – Assessment Evidence</h3>																					
<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Demonstrate The Proper Care and Use of Hand Tools and Power Tools.</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to demonstrate The Proper Care and Use of Hand Tools and Power Tools.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				



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## Stage 1 – Desired Results:

<p><b>Power Standard 3:</b> Integrate safety in all aspects of the automotive classroom and lab.</p> <p><b>Power Benchmark/Competency # 2:</b> Determine the identification, use, and care of shop tools and equipment.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;">X</td> <td style="padding: 2px;">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
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ Tools may be metric or English.</li> <li>➤ Tools will be returned to the tool chest directly after use.</li> <li>➤ Tools are to be kept clean and organized.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What is the importance of using the proper tool for the job?</li> <li>➤ What must be done once the tool has been used and the job is completed?</li> <li>➤ What is this tool and what is it used for?</li> <li>➤ How can tools be damaged?</li> <li>➤ How do you distinguish SAE and Metric tools?</li> <li>➤ What is the importance of tool organization in the tool cabinet/box/chest?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ How to choose the proper tool for the proper job.</li> <li>➤ Know the limitation of a particular tool.</li> <li>➤ Tools are an extension of a person’s hand.                             <ul style="list-style-type: none"> <li>○ Basic socket sets: ¼, 3/8, ½, and metrics, 4 - way, wrench sets: English/metric, basic hand tools, Impact wrench, electric hand drill,</li> </ul> </li> </ul> <p>Note: Additional tools as needed are supplied.</p>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Use hand and power tools correctly.</li> <li>➤ Use all tools safely.</li> <li>➤ Keep the tools off of the floor when not in use.</li> <li>➤ Keep your mind on what you are doing.</li> <li>➤ Work safely and efficiently.                             <ul style="list-style-type: none"> <li>○ Basic socket sets: ¼, 3/8, ½, and metrics, 4 -way, wrench sets: English/metric, basic hand tools, Impact wrench, electric hand drill,</li> </ul> </li> </ul>																				
<h2 style="margin: 0;">Stage 2 – Assessment Evidence</h2>																					
<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Demonstrate the proper care and use of hand tools and power tools.</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to demonstrate the proper care and use of hand tools and power tools.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				

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## Stage 3 – Learning Plan:

Determine the identification, use, and care of shop tools and equipment.

### Power Benchmark/Competency: # 2

<b>Learning Activities:</b>	<b>Resources:</b>
Student will participate in teacher led discussion on identification, use, and care of shop tools and equipment.	Lecture
Students will complete test over identification, use, and care of shop tools and equipment.	Tool Packet

# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the hood maintenance.</p> <p><b>Power Benchmark/Competency # 3:</b> Service engine lubrication systems per manufacturer’s specifications.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;"></td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">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><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ The importance of changing engine oil and filter at pre determined mileage to increase vehicle longevity.</li> <li>➤ Greasing the vehicle is important to increase vehicle longevity.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ When should engine oil and oil filter be changed?</li> <li>➤ What are the proper steps in performing an engine oil change?</li> <li>➤ How is engine oil rated?</li> <li>➤ How are oil viscosities different?</li> <li>➤ What is the correct grease for the chassis vehicle?</li> <li>➤ What component parts require greasing?</li> <li>➤ How do you compare a new oil filter to an old oil filter to make sure it is correct?</li> <li>➤ What are other items that need to be checked during an oil change?</li> <li>➤ What is the correct procedure for disposes of used lubricants?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify engine oil that is contained with antifreeze or excessive gasoline and engine slug.</li> <li>➤ Differentiate the difference between oil viscosities and service ratings.</li> <li>➤ Identify the correct grease for vehicle.</li> <li>➤ Identify the parts of the chassis requiring lubrication.</li> <li>➤ Identify proper quantities of lubricants for the service job.                             <ul style="list-style-type: none"> <li>○ Viscosity, service ratings, oil slug, Chassis grease vs. wheel bearing grease, grease gun, suction gun, zerks, drive shafts zerks, hypoid gear oil</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Oil and filter change.</li> <li>➤ Select correct fluids for oil,</li> <li>➤ Viscosity, service ratings, oil slug, , oil pan plug, oil filter wrench</li> <li>➤ Correctly grease of vehicle</li> <li>➤ Correctly lubricate the U-joints</li> <li>➤ Correctly check and/or add 90 Wt. Gear oil to the rear axle assembly</li> <li>➤ Know the difference between Posi-track and regular rear axle lube                             <ul style="list-style-type: none"> <li>○ Chassis grease vs. wheel bearing grease, grease gun, suction gun, zerks, drive shafts zerks, hypoid gear oil</li> </ul> </li> </ul>																				
<b>Stage 2 – Assessment Evidence</b>																					
<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Check and/or Replace oil and Filters per Manufacturer’s Specs.</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to Check and/or Replace engine oil and Filter per Manufacturer’s Specs.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				



# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 2:</b> Perform chassis inspections and do repairs.</p> <p><b>Power Benchmark/Competency # 4:</b> Demonstrate tire and wheel services.</p> <p><b>Estimated Timeline: 1 day + on going application</b></p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;">X</td> <td style="padding: 2px;">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
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ Tire wheel maintenance is important for the safety of the occupants as well as the longevity of the tire.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What does it indicate if a tire is worn more in the middle than on the sides?</li> <li>➤ What does it indicate if a tire is worn more on the sides than in the middle?</li> <li>➤ What does it indicate if a tire is worn more on one side than on the sides?</li> <li>➤ What is the proper procedure for tightening lug nuts?</li> <li>➤ What is the proper procedure for dismounting and mounting of a tire using the tire machine?</li> <li>➤ What is the proper procedure for computerized balancing of a tire and wheel?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify worn/damaged tires and wheels.</li> <li>➤ Distinguish tire wear/irregular wear patterns</li> <li>➤ Understand proper inflation.</li> <li>➤ Use of tire mounting machine</li> <li>➤ Use of tire balancer                             <ul style="list-style-type: none"> <li>○ Tire bead, aspect ratio, sidewalls, tread, valve stems, DOT numbering system, RuGlide (tire lube), tire pressure gauge, worn out lug holes, bent rims, alloys vs steel rims, wheel weight, weight hammer, die grinder for repairing flats, roller for patches, cement for patches, tire patch solvent.</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify tire wear indicators</li> <li>➤ Know the national standard for sizing tires</li> <li>➤ Locate the correct tire pressure of a given vehicle</li> <li>➤ Locate bent wheel rims</li> <li>➤ Know the difference between the various tire tread designs</li> <li>➤ Identify the various irregular tread wear patterns</li> <li>➤ Know how to change out the valve stem assembly.</li> <li>➤ Dismount and remount tire.</li> <li>➤ Balance accordingly.</li> <li>➤ Repairing flat tires.                             <ul style="list-style-type: none"> <li>○ Tire bead, aspect ratio, sidewalls, tread, valve stems, DOT numbering system, RuGlide (tire lube), tire pressure gauge, worn out lug holes, bent rims, alloys vs steel rims, wheel weight, weight hammer, die grinder for repairing flats, roller for patches, cement for patches, tire patch solvent.</li> </ul> </li> </ul>																				
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<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Inspect tires and wheels for damage and irregular wear.</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to Inspect tires and wheels for damage and irregular wear.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				

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<b>Stage 3 – Learning Plan:</b> Demonstrate tire and wheel services. <b>Power Benchmark/Competency: #4</b>	
<b>Learning Activities:</b>	<b>Resources:</b>
Student will participate in power point discussion	Power point on tires
Activity Sheet # 90	Workbook/ Auto packet
Activity Sheet # 91	Workbook/ Auto packet
Activity Sheet # 92	Workbook/ Auto packet
Activity Sheet # 93	Workbook/ Auto packet
ASE Lab Prep Worksheet #4-1	Workbook/ Auto packet
ASE Lab Prep Worksheet #4-4	Workbook/ Auto packet
ASE Lab Prep Worksheet #4-6	Workbook/ Auto packet
Tire and wheel services quiz	Workbook/ Auto packet

# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 2:</b> Perform chassis inspection and do repairs.</p> <p><b>Power Benchmark/Competency # 5:</b> Practice repair on brake assemblies.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;">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	X
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ The importance of checking vehicles front and rear brakes.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What is the difference between the brake shoes and the brake pads?</li> <li>➤ How frequently are the brakes inspected?</li> <li>➤ How does an individual determine brake fluid condition?</li> <li>➤ What causes asbestos in the brake system?</li> <li>➤ How can asbestos be removed from the brake system?</li> <li>➤ What is the purpose of the C clamp?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ...(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Disassemble the wheel tire assembly from the vehicle.</li> <li>➤ Remove brake drum.</li> <li>➤ Identify worn shoes/brake pads.</li> <li>➤ Identify leaking wheel cylinders.</li> <li>➤ Identify gouged rotors/drums</li> <li>➤ Reassemble the wheel assemblies.</li> <li>➤ Remove caliper.</li> <li>➤ Using C-clamp to push the piston back into the caliper.</li> <li>➤ Removal and re-assembly of the brake pads/shoes.</li> <li>➤ Turn rotors/drums.             <ul style="list-style-type: none"> <li>○ Caliper, rotor, brake lines, hoses, wheel cylinders, shoes, pads, parking brake assembly, master cylinder, “brake clean” brake fluid classifications, brake lathe, micrometer, brake shoe tools, hammer.</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)...(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Perform brake inspection.</li> <li>➤ Identify worn or damaged drums/pads/rotors.</li> <li>➤ Identify leaking wheel cylinders or calipers.</li> <li>➤ Add brake fluid as needed.</li> <li>➤ Differentiate between DOT 3, 4 and 5.</li> <li>➤ Identify damaged hoses and brake lines.</li> <li>➤ Perform a brake pad/shoe replacement job.             <ul style="list-style-type: none"> <li>○ Caliper, rotor, brake lines, hoses, wheel cylinders, shoes, pads, parking brake assembly, master cylinder, “brake clean” brake fluid classifications, brake lathe, micrometer, brake shoe tools, hammer.</li> </ul> </li> </ul>																				

## Stage 2 – Assessment Evidence

<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency) Disassemble and reassemble an automotive lower engine block.</p>	<p><b>Key Criteria:</b> (Rubric) Students will be able to Disassemble and reassemble an automotive lower engine block.</p> <ul style="list-style-type: none"> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>
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# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the-hood service.</p> <p><b>Power Benchmark/Competency # 6:</b> Assess automotive belts and hoses.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;"></td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">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><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ Maintaining belt &amp; hoses is important to the proper operation of the vehicle.</li> <li>➤ Proper size &amp; type of belts &amp; hoses are important to engine function.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What are the essential purposes of automotive belts and hoses?</li> <li>➤ When does a belt or hose need to be replaced?</li> <li>➤ What characterizes a worn or damaged belt?</li> <li>➤ What characterizes a worn or damaged hose?</li> <li>➤ How do you distinguish the proper size of a belt or hose?</li> <li>➤ How does one distinguish between a V-Belt and Serpentine type belt?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify worn belts &amp; hoses</li> <li>➤ Differentiate the design between the serpentine belt &amp; V-belt                             <ul style="list-style-type: none"> <li>○ Serpentine belt, V-belt, clamp-type, upper hose, lower hose, heater hose</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Change a worn or damaged hose</li> <li>➤ Demonstrate the removal of belts and belts</li> <li>➤ Select an appropriate belt of hose for a given task                             <ul style="list-style-type: none"> <li>○ Serpentine belt, V-belt, clamp-type, upper hose, lower hose, heater hose</li> </ul> </li> </ul>																				

## Stage 2 – Assessment Evidence

<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Identify, Remove, &amp; Repair Worn Belts &amp; Hoses.</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will identify and replace belts and hoses.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>
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# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the-hood service.</p> <p><b>Power Benchmark/Competency # 7:</b> Distinguish parts of the cooling system.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #ffffcc;"> <th>Career</th> <th>Technology</th> <th>Critical Thinking</th> <th>Personal Responsibility</th> <th>Global &amp; 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></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		Math	Science	Reading	Social Responsibility	Communication	X		X	X	X
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ Proper maintenance is needed to increase vehicle longevity.</li> <li>➤ The importance of the proper draining and recovery of used coolant.</li> <li>➤ How to attain the proper boil point and freeze point in the cooling system.</li> <li>➤ The importance of overall vehicle drivability with a properly functioning thermostat.</li> <li>➤ The proper procedure to remove and replace a thermostat.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ When does a belt or hose need to be replaced?</li> <li>➤ What are the major components of the cooling system?</li> <li>➤ How does an individual determine if the coolant is at a 50:50 ratio and displays the correct color, acidic level, and boiling point?</li> <li>➤ Why do most vehicles have a liquid cooling system with an overflow tank?</li> <li>➤ What is the purpose of a thermostat?</li> <li>➤ What is meant by the term overheating and its affect on the engine?</li> <li>➤ What is meant by the term overcooling and its affect on the engine?</li> </ul>																				
<p><b>Students will: ( know) ...</b>(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify worn or damaged belts and hoses.</li> <li>➤ Distinguish between air and liquid cooling systems.</li> <li>➤ Differentiate between coolant and other vehicle fluids.                             <ul style="list-style-type: none"> <li>○ thermostat, antifreeze, belts and hoses, water pump, core plugs, radiator, radiator cap</li> </ul> </li> </ul>	<p><b>Students will be able to: (i.e. do)...</b>(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Demonstrate flushing of the coolant system.</li> <li>➤ Interpret proper antifreeze condition.</li> <li>➤ Identify components of the cooling systems.</li> <li>➤ Cite the difference between liquid and air-cooling systems.                             <ul style="list-style-type: none"> <li>○ thermostat, antifreeze, belts and hoses, water pump, core plugs, radiator, radiator cap, overcooling, over heating</li> </ul> </li> </ul>																				
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<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency) Identify, Remove, &amp; Replace Engine Thermostat and Antifreeze.</p>	<p><b>Key Criteria:</b> (Rubric) Students will be able to identify, remove and replace the thermostat and antifreeze.</p> <ul style="list-style-type: none"> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				



# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the-hood service.</p> <p><b>Power Benchmark/Competency # 8:</b> Incorporate basic electrical system theory.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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></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		Math	Science	Reading	Social Responsibility	Communication			X	X	X
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ The Importance of starters and alternators</li> <li>➤ The meaning of CCA</li> <li>➤ The basic components of automotive electrical systems.</li> <li>➤ The meaning of Ohm’s Law.</li> <li>➤ Understand the various setting of the VOM</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ Why does a 12 volt battery put out 12.6 volts?</li> <li>➤ What is the purpose of the alternator?</li> <li>➤ What is the safest procedure for jump starting a vehicle?</li> <li>➤ Why should you not have an open flame around a battery?</li> <li>➤ What is the charging voltage of a 12-volt alternator?</li> <li>➤ How many cells are there in a 12-volt battery?</li> <li>➤ Why is Ohm’s law important?</li> <li>➤ Why is CCA important when purchasing batteries?</li> <li>➤ Why is the solenoid required?</li> <li>➤ What are the various settings of the VOM?</li> <li>➤ What is the difference between a series and parallel circuit?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ...(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify the basic components of the starter system.</li> <li>➤ Differentiate the top post from the side terminal battery.</li> <li>➤ Identify the basic components of the charging system.</li> <li>➤ Differentiate between the various settings of the VOM.                             <ul style="list-style-type: none"> <li>○ Starter motor solenoid, alternator, fan belt, battery, battery cables, Ohms Law, VAT - 40, Ohm’s, volts, amperage, circuits, fuse, series, parallel</li> </ul> </li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)...(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify the basic application of Ohms Law.</li> <li>➤ Identify a starter.</li> <li>➤ Identify an alternator.</li> <li>➤ Identify a solenoid.</li> <li>➤ Safely demonstrate how to jump start a vehicle’s battery.</li> <li>➤ Determines amps, ohms, and volts per Ohms Law.</li> <li>➤ Differentiate between a series and parallel circuit.</li> <li>➤ Demonstrate the proper use of the VOM.                             <ul style="list-style-type: none"> <li>○ Starter motor solenoid, alternator, fan belt, battery, battery cables, Ohms Law, VAT – 40, Ohm’s, volts, amperage, circuits, fuse, series, parallel</li> </ul> </li> </ul>																				
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<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Identify the Parts to and Test Automotive Starting and Charging Systems.</li> </ul>	<p><b>Key Criteria: (Rubric)</b></p> <ul style="list-style-type: none"> <li>➤ Student will be able to identify the Parts to and Test Automotive Starting and Charging Systems.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				



# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the-hood service.</p> <p><b>Power Benchmark/Competency #9:</b> Demonstrate ignition system fundamentals.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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;"></td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">X</td> <td style="padding: 2px;">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><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ The importance of gapping the spark plugs.</li> <li>➤ Inspect cap and rotor for wear.</li> <li>➤ The importance of the spark plug wires.</li> <li>➤ Using ALL DATA, Repair manuals, and other resources to find automotive information.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What is the importance of the engine tune-up?</li> <li>➤ What are the components involved in the engine tune-up?</li> <li>➤ What are the three targeted areas for emissions?</li> <li>➤ What is the difference between a distributor and distributor-less ignition system?</li> <li>➤ What are the symptoms of defective spark plugs, spark plug wires, and oxygen sensors?</li> <li>➤ How are shop manuals and the ALL DATA system used in engine tune-ups?</li> </ul>																				
<p><b>Students will: (know) ...</b>(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Differentiate a vehicle that has coil packs or a Distributor cap and rotor.</li> <li>➤ Identify fouled or defective spark plugs.</li> <li>➤ Check spark plug wires with an VOM.             <ul style="list-style-type: none"> <li>○ Distributor cap, rotor, coil packs, spark plugs, spark plug wires, spark plug gap, PCV valve, fuel filter, air filter, Oxygen sensor</li> </ul> </li> </ul>	<p><b>Students will be able to: (i.e. do)...</b>(Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Remove and replace spark plugs and spark plug wires.</li> <li>➤ Gap spark plugs correctly.</li> <li>➤ Use the VOM to check for continuity.</li> <li>➤ Use the ALL DATA or service manual to find manufactures specifications.</li> </ul>																				
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<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency)</p> <ul style="list-style-type: none"> <li>➤ Minor engine tune-up</li> </ul>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to perform a minor engine tune-up.</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>																				



# Basic Auto Mechanics Curriculum Design

## Stage 1 – Desired Results:

<p><b>Power Standard 1:</b> Perform under-the-hood service.</p> <p><b>Power Benchmark/Competency #10:</b> Disassemble and reassemble an automotive lower engine block.</p> <p><b>Estimated Timeline:</b> 1 day + on going application</p>	<p><b>Place ‘X’ in square if goal addresses Essential/Content Standard(s).</b></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 &amp; 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></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		Math	Science	Reading	Social Responsibility	Communication			X	X	X
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<p><b>Understandings:</b> <i>Students will understand that:</i></p> <ul style="list-style-type: none"> <li>➤ 4 stroke engine theory.</li> <li>➤ The importance of the internal moving parts and their relationship with each other.</li> <li>➤ Marking and separation of the internal parts for proper re-assembly.</li> <li>➤ Cleaning and measuring the internal parts for re-assembly.</li> <li>➤ Differentiate between specialty tools for proper dis-assembly and re-assembly.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>➤ What are the four steps in the 4 stroke engine theory?</li> <li>➤ What specialty tools will be needed in the disassembly and re-assembly of the lower engine block?</li> <li>➤ How can you determine where each piston, bearing, end cap, or main cap is placed during re-assembly?</li> <li>➤ When using measurement tools, how can the lower engine block components be determined within specifications?</li> <li>➤ How do the components of the lower engine block correlate with each other during engine operation?</li> </ul>																				
<p><b>Students will:</b> (<i>know</i>) ... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Identify components of the lower engine block.</li> <li>➤ Differentiate between internal and external micrometers.</li> <li>➤ Interpret whether an engine component is worn beyond specifications.</li> <li>○ Oil pan, oil pump, main caps, main bearings, rod caps, rod bearings, crankshaft, pistons, connecting rods, wrist pin, oil ring, compression rings, cylinder wall, combustion chamber, micrometer, plastigage, timing chain, camshaft, crankshaft sprocket, cam shaft sprocket,</li> </ul>	<p><b>Students will be able to:</b> (<i>i.e. do</i>)... (Include vocabulary)</p> <ul style="list-style-type: none"> <li>➤ Disassemble the lower engine block.</li> <li>➤ Label, separate, clean, and measure lower engine block components.</li> <li>➤ Referencing engine manual specifications, determine if the internal parts of the lower engine block are within specifications.</li> <li>➤ Re-assemble the lower engine block.</li> <li>○ Oil pan, oil pump, main caps, main bearings, rod caps, rod bearings, crankshaft, pistons, connecting rods, wrist pin, oil ring, compression rings, cylinder wall, combustion chamber, micrometer, plastigage, timing chain, camshaft, crankshaft sprocket, cam shaft sprocket,</li> </ul>																				

## Stage 2 – Assessment Evidence

<p><b>Performance Tasks:</b> (i.e. Assessment used to determine proficiency on competency) Disassemble and Reassemble an Automotive Lower Engine Block.</p>	<p><b>Key Criteria:</b> (Rubric)</p> <ul style="list-style-type: none"> <li>➤ Student will be able to Disassemble and Reassemble an Automotive Valve Train Assembly</li> <li>➤ Exceeds = 90%– 100%</li> <li>➤ Meets = 60% – 89%</li> <li>➤ Needs = 59% and below</li> </ul>
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