



## **Home and Auto: Happy Home, Happy Car**

**Course Information**

<b>Grade(s):</b>	11-12 only
<b>Discipline/Course:</b>	Technology education
<b>Course Title:</b>	Home And Auto: Happy Home, Happy Car
<b>Prerequisite(s):</b>	Students cannot have taken “Transportation Technology III: Auto Servicing” nor “Woods II: Making the Case for a Bedside Cabinet” or any higher level courses in these subjects.
<b>Course Description: Program of Studies</b>	This course is geared towards students who have not taken upper-level auto or woodshop courses. Classroom learning and hands-on lab work combine to provide students with the knowledge and skills needed as an owner of a home or automobile. Would you like to know how to perform basic repairs or modifications around your home? Would you like to acquire a basic understanding of the major systems in your car? This course could potentially save you thousands of dollars over your lifetime and empower you to become a more self-sufficient person. Learning activities may include installing a new electrical outlet, changing oil or spark plugs on a car, or fixing a leaky pipe.
<b>Course Essential Questions:</b>	<ul style="list-style-type: none"> <li>● How can one acquire safety education and training on a tool or machine?</li> <li>● How can we create a workplace culture that prioritizes safety and health?</li> <li>● How do mechanical skills and technological problem-solving methods interact to diagnose and repair automotive systems?</li> <li>● How do various technologies in mechanical, electrical and fuel systems play a role in the function, efficiency, and emission control of automotive systems?</li> <li>● How do alternate sources of energy differ from present automotive systems?</li> <li>● How do I troubleshoot problems that arise during mechanical repair?</li> <li>● How do I evaluate success while working on mechanical projects?</li> </ul>
<b>Course Enduring Understandings:</b>	<ul style="list-style-type: none"> <li>● Knowledge and skills are needed to solve “real world” problems encountered as an owner of a home and automobile.</li> <li>● Homes and automobiles are two of the most important and expensive purchases of one’s life, requiring constant maintenance and repair to hold their value.</li> </ul>

<b>Duration: Credit:</b>	Half Year/ .5 credit(s)
<b>Course Materials/Resources:</b>	Equipment and Consumables
<b>FPS Course Academic Expectation(s):</b>	EU: Exploring and Understanding CC: Creating and Constructing
<b>Year at a Glance (Units):</b>	Unit 1: Introduction and Safety in a construction environment (1 week) Unit 2: Measurement and layout tools (1 week) Unit 3: Framing and layout (2 weeks) Unit 4: Residential wiring and electronics (2 weeks) Unit 5: Residential Plumbing (2 weeks) Unit 6: Sheathing and Sheet Rock (2 weeks) Unit 7: Introduction and Safety in the Automobile Repair Lab (2 weeks) Unit 8: Engine construction and principles of Operation for 2-cycle and 4-cycle engines (2 weeks) Unit 9: Tires and wheels (2 weeks)

<b>Unit Number and Title:</b>	Unit 1: Introduction and Safety in a Construction Environment
<b>Duration:</b>	1 week
<b>Resource(s):</b>	Equipment and consumables.
<b>Unit Overview:</b>	Students will learn how to actively incorporate safety while working in a construction laboratory and become aware of general safety practices.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>BC.01.03 Compare the advantages and disadvantages of different types of home purchases, additions, renovations and repairs.</p> <p>BC.02 Describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices.</p> <p>BC.02.01 Demonstrate safe material handling practices.</p> <p>BC.02.02 Demonstrate and explain knowledge of workplace safety procedures. *(A2)</p> <p>BC.02.03 Demonstrate and explain knowledge of personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology. *(A3)</p> <p>BC.02.04 Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and miter saw. *(A4)</p> <p>BC.02.05 Demonstrate and explain knowledge of proper use and storage of basic hand tools. *(A5)</p> <p>BC.02.06 Demonstrate and explain knowledge of proper use and storage of portable power tools. *(A6)</p> <p>BC.02.07 Evaluate workplace/jobsite activities for compliance with governmental and other applicable safety regulations such as EPA and OSHA.</p> <p>BC.02.08 Read and discuss information on OSHA, EPA and other safety regulations.</p> <p>BC.02.09 Obtain, understand and follow MSDS (Material Safety Data Sheets) information.</p> <p>BC.02.10 Explain safe proper use, disposal, and storage of chemicals following OSHA standards. *(A7)</p> <p>BC.02.11 Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility. *(A1)</p>

<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>• How does knowledge from other content areas help us solve problems (Math, Science, etc.)?</li> <li>• How can I demonstrate the value and necessity of practicing personal and occupational safety by using materials and processes in accordance with manufacturer and industry standards?</li> <li>• How can I demonstrate the value and necessity of protecting the environment by using materials and processes in accordance with manufacturer and industry standards?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Knowledge from other content areas like math and science is useful in solving Technological problems in our homes and automobiles.</li> <li>• Materials should be used per manufacturers’ instructions in a safe manner at work and at home.</li> <li>• Materials should be used per manufacturers’ instructions in order to protect the environment as much as possible..</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning to:</i> (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>• safety rules and procedures for the woods and autos laboratories.</li> <li>• application of selected tools when working on homes and autos.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>• demonstrate proper tool use.</li> <li>• demonstrate proper safety skills.</li> </ul>

<b>Unit Number and Title:</b>	Unit 2: Measurement and Layout Tools
<b>Duration:</b>	1 week
<b>Resource(s):</b>	Machines and Consumables
<b>Unit Overview:</b>	Students will learn to accurately create scale drawings and sketches for projects including the proper use of measuring and layout tools and skills during production.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>BC.04 Understand and be able to demonstrate the methods involved in turning materials into usable structures and products.</p> <p>BC.04.01 Describe and identify fractional measurements from a basic plan and assembly drawings. *(C13)</p> <p>BC.04.02 Describe and prepare rough drawings and sketches. *(C14)</p> <p>BC.04.03 Explain and prepare a cut list or bill of material from a basic plan and assembly drawing. *(C15)</p> <p>BC.04.04 Interpret a design to facilitate replication.</p> <p>BC.04.05 Measure accurately to a sixteenth of an inch. *(C16)</p> <p>BC.04.06 Identify the difference between both nominal and actual dimensions. *(C17)</p> <p>BC.04.07 Explain and use fractional dimensions.</p> <p>BC.04.08 Extrapolate information from a set of plans.</p> <p>BC.04.09 Consider the natural characteristics of grain, knots, and checks when laying out a board. *(C19)</p> <p>BC.04.10 Estimate materials quantities in both board feet and linear feet. *(C18)</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● How do I design a plan for a structure?</li> <li>● How do I troubleshoot problems that arise during a construction project?</li> <li>● How do I use Imperial measurement units, and how do I convert to metric when needed?</li> <li>● How do I measure success in a construction project?</li> </ul>

<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Construction layout tools can be used to draw projects on paper.</li> <li>• Construction is a creative and problem-solving activity that requires the use of critical thinking, and teamwork skills.</li> <li>• Wood is a natural material with a variety of properties that make it suitable for a wide range of uses.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning to:</i> (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>• the identity and use of the following: measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding “T” bevel, and compass.</li> <li>• the difference between technical drawings and rough drawings or sketches.</li> <li>• how to draw and visually communicate simple geometric shapes and parts.</li> <li>• how to describe and identify fractional measurements from basic plan and assembly drawings.</li> <li>• the difference between nominal and actual dimensions.</li> <li>• the difference between board feet and linear feet.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>• understand rough drawings and sketches.</li> <li>• explain and use fractional dimensions.</li> <li>• identify, use and maintain measuring, layout, and marking tools.</li> <li>• measure accurately to a sixteenth of an inch.</li> </ul>

<b>Unit Number and Title:</b>	Unit 3: Framing and Layout
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables.
<b>Unit Overview:</b>	Students will learn about residential framing and the techniques and vocabulary used when framing.
<b>Learning Goals</b>	
<b>Standard(s):</b>	BC.05.10 Explain and demonstrate site layout procedures. BC.05.11 Describe the phases of residential and commercial construction. BC.06.02 Create ideas, proposals, and solutions to building construction problems. BC.06.03 Evaluate ideas, proposals, and solutions to building construction problems. BC.05 Describe characteristics and determine appropriate applications for various building material selections.
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● What are the proper procedures for creating a structure?</li> <li>● How are residential structures assembled?</li> <li>● How do I translate the information in architectural drawings into a structure?</li> <li>● How do I select materials appropriate for the job at hand?</li> <li>● How do I overcome unforeseen obstacles that arise during construction?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Laying out a floor plan properly is an essential part of construction.</li> <li>● Knowing the parts for wood framing is essential when constructing a building.</li> <li>● There is a specific sequence to framing the floors, walls, and the ceiling of any structure.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning to:</i>	<b>Content:</b> (Students will know...) <ul style="list-style-type: none"> <li>● the different types of construction in stud lumber.</li> <li>● how to determine which framing system to use for a specific structure.</li> <li>● the various types of building materials and their uses to frame a residential structure.</li> </ul>



(Content/ Skills)	<ul style="list-style-type: none"> <li>● how to interpret and use architectural drawings to construct floors, walls, and ceilings for a residential structure.</li> <li>● the physical and mechanical properties of building materials, fasteners, anchors, and adhesives used in construction.</li> <li>● the advantages and disadvantages of building materials.</li> <li>● the uses of various types of hardwoods and softwoods.</li> <li>● the safety precautions associated with building materials.</li> <li>● the correct specialty tools, procedures, and techniques to complete wall and ceiling framing.</li> <li>● the similarities and differences between structural and non-structural walls.</li> <li>● the primary methods/styles used for framing walls, floors and ceilings in residential construction.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● cut and join studs, joists, footers, and headers.</li> <li>● identify and use non-ferrous metals based upon its material properties.</li> <li>● identify the different types of framing systems and nail stud lumber correctly in a frame.</li> <li>● read and interpret drawings and specifications to determine floor system requirements.</li> <li>● identify floor and sill framing and support members.</li> <li>● layout and construct a floor assembly.</li> <li>● construct and install sills, floor joists, and subflooring.</li> <li>● identify and describe the components of a steel wall and ceiling layout.</li> <li>● layout and install a steel stud structural wall and non-structural wall with openings.</li> </ul>
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<b>Unit Number and Title:</b>	Unit 4: Residential Wiring and Electronics
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables.
<b>Unit Overview:</b>	Students will learn about wiring residential electrical circuits.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>BC.02 Describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices.</p> <p>BC.05 Describe characteristics and determine appropriate applications for various building material selections.</p> <p>BC.05.12 Explain the processes and materials (e.g., structural, electrical, mechanical, finish) appropriate to the architectural design and residential construction. Layout, install, and select typical electrical devices and systems.</p> <p>BC.06.01 Identify common tasks that require employees to use problem-solving skills.</p> <p>BC.06.03 Describe the value of using problem solving and critical thinking skills to improve a situation or process.</p> <p>EKS.05.02 Analyze elements of a problem to develop creative solutions. EKS.05.03 Describe the value of using problem solving and critical thinking skills to improve a situation or process.</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● What are the tools used in residential electric work?</li> <li>● How is electricity integrated into residential structures?</li> <li>● What items are integrated into every electrical circuit?</li> <li>● How does an individual work on electrical circuits in a safe manner?</li> <li>● What is the correct way to wire electrical outlets and light switches?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Various electrical systems are embedded within residential construction.</li> <li>● Proper installation techniques must be followed to integrate electrical systems in residential structures.</li> </ul>

	<ul style="list-style-type: none"> <li>• Electrical principles used in residential construction must be compatible with National Building Codes.</li> </ul>
<p><b>Learning Goal(s):</b>  <i>Students will know and will be able to use their learning to:</i>          (Content/ Skills)</p>	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>• basic components and materials that make up a typical electrical installation.</li> <li>• the materials and tools used in electrical system wiring and maintenance.</li> <li>• how electrical service is distributed within a residential structure.</li> <li>• basic electron theory and how it applies to wiring a structure.</li> <li>• how to differentiate between conductors and insulators.</li> <li>• the relationship between voltage, current, and resistance.</li> <li>• the proper selection and use of specialty tools used by electricians.</li> <li>• there are safety devices and mechanisms that are incorporated into electrical circuits which help reduce the risk of injury to the operator.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>• name tools and material used in electrical work including, sizes of wire, outlets and fixtures.</li> <li>• identify and describe building systems needed to complete a construction project.</li> <li>• describe the function of each component of an electrical system.</li> <li>• layout, install, and select typical electrical devices and systems.</li> <li>• use problem solving and critical thinking skills to identify problems in a system and improve a situation or process.</li> </ul>

<b>Unit Number and Title:</b>	Unit 5: Residential Plumbing
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables.
<b>Unit Overview:</b>	Students will learn about residential plumbing installation and maintenance.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>BC.05.10 Explain and demonstrate site layout procedures.</p> <p>BC.05.11 Describe the phases of residential and commercial construction.</p> <p>BC.06.02 Create ideas, proposals, and solutions to building construction problems.</p> <p>BC.06.03 Evaluate ideas, proposals, and solutions to building construction problems.</p> <p>BC.05.12 Explain the processes and materials (e.g., structural, electrical, mechanical, finish) appropriate to the architectural design and residential construction. Layout, install, and select typical electrical devices and systems.</p> <p>BC.06.01 Identify common tasks that require employees to use problem-solving skills.</p> <p>BC.06.03 Describe the value of using problem solving and critical thinking skills to improve a situation or process.</p> <p>EKS.05.02 Analyze elements of a problem to develop creative solutions.</p> <p>EKS.05.03 Describe the value of using problem solving and critical thinking skills to improve a situation or process.</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● How does an individual work on a plumbing system in a safe manner?</li> <li>● What can be done to turn off a plumbing system safely during a repair?</li> <li>● What systems are integrated into every plumbing system?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Various plumbing systems are embedded within residential construction structures.</li> <li>● Proper installation techniques must be followed to integrate plumbing systems in residential structures.</li> </ul>

	<ul style="list-style-type: none"> <li>● Plumbing principles used in residential construction must follow National Building Codes.</li> </ul>
<p><b>Learning Goal(s):</b>  <i>Students will know and will be able to use their learning to:</i>          (Content/ Skills)</p>	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● the processes and materials appropriate to architectural design and residential construction.</li> <li>● the problem-solving and critical thinking skills needed to improve a situation or process and develop creative solutions.</li> <li>● safe use of plumbing tools and materials.</li> <li>● mathematics is used extensively to plan, layout, and install plumbing systems.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● use plumbing tools safely.</li> <li>● use mathematics to plan, layout, and install plumbing systems including: plumbing fittings, valves, pipe and hangers.</li> <li>● identify basic specialized hand and power tools used in the plumbing trade.</li> <li>● identify major plumbing systems of drain, waste, and vent.</li> <li>● hang pipe systems with appropriate pitch.</li> <li>● work with copper pipe.</li> <li>● work with PVC pipe.</li> </ul>

<b>Unit Number and Title:</b>	Unit 6: Sheathing and Sheet Rock
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables
<b>Unit Overview:</b>	Students will learn about residential sheathing material (exterior) and sheetrock (interior), its installation and finishing techniques.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>BC.05.10 Explain and demonstrate site layout procedures.</p> <p>BC.05.11 Describe the phases of residential and commercial construction.</p> <p>BC.06.02 Create ideas, proposals, and solutions to building construction problems.</p> <p>BC.06.03 Evaluate ideas, proposals, and solutions to building construction problems.</p> <p>BC.05.12 Explain the processes and materials (e.g., structural, electrical, mechanical, finish) appropriate to the architectural design and residential construction. Layout, install, and select typical electrical devices and systems.</p> <p>BC.06.01 Identify common tasks that require employees to use problem-solving skills.</p> <p>BC.06.03 Describe the value of using problem-solving and critical thinking skills to improve a situation or process.</p> <p>EKS.05.02 Analyze elements of a problem to develop creative solutions. EKS.05.03 Describe the value of using problem solving and critical thinking skills to improve a situation or process</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● What is the primary material used for sheathing (closing up exterior walls) in residential construction?</li> <li>● What is the primary material used for closing up interior walls in residential construction?</li> <li>● What hardware is utilized to attach External or Internal materials to the structure of a house?</li> <li>● What tools and materials are necessary for patching holes in sheetrock</li> <li>● What are the correct techniques for taping sheetrock joints?</li> </ul>
<b>Enduring</b>	<ul style="list-style-type: none"> <li>● Plywood is the primary exterior sheathing material in residential construction.</li> </ul>

<b>Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Other materials such as OSB and cementitious board are also used for residential construction sheathing and many factors such as weather and geography affect selection of material.</li> <li>• Specific tools specialized by material may be used to install sheathing both internally and externally.</li> <li>• There are specific techniques one should use when installing material and it is best to follow manufacturers' instructions or industry standards.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning to:</i> (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>• architectural drawings allow one to construct floors, walls, and ceilings in buildings.</li> <li>• physical and mechanical properties of building materials.</li> <li>• advantages and disadvantages of building materials.</li> <li>• safety precautions associated with building materials.</li> <li>• fasteners, anchors, and adhesives used in sheet rocking.</li> <li>• specialty tools, procedures, and techniques to complete wall and ceiling sheet rocking.</li> <li>• characteristics and applications of plywood.</li> <li>• components of building systems and subsystems needed to complete a construction project.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>• incorporate appropriate building systems into a construction project.</li> <li>• identify and use ferrous metals based upon its material properties.</li> <li>• identify the different types of sheet rocking techniques.</li> <li>• read and interpret drawings and specifications to determine floor system requirements.</li> <li>• layout electrical and plumbing fixture on sheathing materials</li> <li>• construct and install walls, access for electrical outlets and plumbing fixture connections.</li> <li>• generate new and creative ideas to solve problems by brainstorming possible solutions.</li> </ul>

<b>Unit Number and Title:</b>	Unit 7: Introduction and Safety in the Automobile Repair Lab
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables
<b>Unit Overview:</b>	Students will learn how to safely work in the automobile laboratory using generally accepted safety practices.
<b>Learning Goals</b>	
<b>Standard(s):</b>	AUTO.01 Students demonstrate the value and necessity of practicing personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards. AUTO.01.01, AUTO.01.02, AUTO.01.04, AUTO.01.05 Transportation Technology. TRAN.01 Identify historical, social, economic, environmental, and government regulations impact transportation technology. TRAN.01.01, TRAN.01.02, TRAN.01.03
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>• How can I use materials and processes in accordance with manufacturer and industry standards to ensure personal and occupational safety in the Lab?</li> <li>• How can I use materials and processes in accordance with manufacturer and industry standards to protect the environment in the Lab?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Transportation systems use energy sources to work.</li> <li>• Technology and engineering are fundamental human activities requiring a range of skills.</li> <li>• Technology and engineering are interdisciplinary, requiring the application of knowledge and skills related to Math, Science and the Arts.</li> </ul>
<b>Learning Goal(s):</b>	<b>Content:</b> (Students will know...)



*Students will know and will be able to use their learning to:*  
(Content/ Skills)

- safety rules and procedures for the Transportation/Auto shop
- application of selected tools for working on engines
- energy sources used in transportation systems and their impact on the worker and the work environment.

**Skills:** (Students will be able to...)

- demonstrate proper tool use.
- demonstrate proper safety skills.
- demonstrate several measuring techniques.

<b>Unit Number and Title:</b>	Unit 8: Engine construction and principles of Operation for 2-cycle and 4-cycle engines
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables
<b>Unit Overview:</b>	In this unit, students will learn simple engine operation while developing an understanding of the functioning and operation of 2 cycle and 4 cycle engines.
<b>Learning Goals</b>	
<b>Standard(s):</b>	Automotive Technology AUTO.03 Explain scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems. AUTO.03.01, AUTO.03.02, AUTO.03.03
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>• What are the technical differences between a 2-cycle and 4-cycle engine?</li> <li>• What are the four strokes of the 4-cycle engine and how does each stroke function?</li> <li>• What systems are used in lubricating 4-cycle engines?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Transportation systems use energy sources to work.</li> <li>• Technology and engineering are fundamental human activities requiring a range of skills.</li> <li>• Technology and engineering are interdisciplinary, requiring the application of knowledge and skills related to science, math, and the arts.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning to:</i> (Content/ Skills)	<b>Content:</b> (Students will know...) <ul style="list-style-type: none"> <li>• safety rules and procedures for the Transportation/Auto lab.</li> <li>• application of selected tools for working on engines</li> <li>• energy sources used in transportation systems and their impact on the world.</li> </ul>

**Skills:** (Students will be able to...)

- identify the basic components of a small engine and describe the function of each part.
- describe 4-stroke cycle engine operation and Explain the function of each stroke.
- describe 2-stroke cycle engine operation and Explain the function of each stroke.
- explain the advantages and disadvantages of 2-cycle and 4-cycle engine.

<b>Unit Number and Title:</b>	Unit 9: Tires and Wheels
<b>Duration:</b>	2 weeks
<b>Resource(s):</b>	Equipment and consumables.
<b>Unit Overview:</b>	Students will be able to identify and apply proper tools and techniques for the selection, service and maintenance of Tires and Wheels on a vehicle.
<b>Learning Goals</b>	
<b>Standard(s):</b>	Automotive Technology AUTO.08.04 Identify factors that cause abnormal tire wear. AUTO.09 Demonstrate function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with portable national industry standards.
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>• Why is it important to understand relationships between wheels, tires and brakes on a car?</li> <li>• How does knowledge from other content areas (Math, Science, and other areas), help us solve problems?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Having properly sized tires on your car’s wheels is essential to operating a motor vehicle safely.</li> <li>• Maintaining the condition of the tires on your car’s wheels is essential to operating a motor vehicle safely.</li> <li>• Technology and engineering are fundamental human activities requiring a range of skills.</li> <li>• Technology and engineering are interdisciplinary, requiring the application of knowledge and skills related to science, math, and the arts</li> </ul>
<b>Learning Goal(s):</b> <i>Students will know and will be able to use their learning</i>	<b>Content:</b> (Students will know...) <ul style="list-style-type: none"> <li>• the parts of a tire and wheel assembly</li> <li>• different methods of tire construction.</li> </ul>

<p><i>to:</i> (Content/ Skills)</p>	<ul style="list-style-type: none"><li>• types and sizes of tires, tire ratings and designations.</li><li>• different types of wheels.</li><li>• parts of a tire assembly including: valve stems, valve cores, lug nuts, lug studs and lug bolts.</li><li>• parts of driving and non-driving hub and wheel bearing assemblies.</li></ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"><li>• demonstrate the proper and safe changing of a tire on a vehicle.</li><li>• evaluate the condition of a tire and wheel assembly.</li><li>• utilize the tire changer and wheel balancer to create a balanced wheel and tire assembly.</li><li>• demonstrate how to evaluate and properly maintain tire pressure.</li><li>• assess the condition of wheel bearing assemblies.</li><li>• properly torque wheels on a vehicle and describe the importance of doing this correctly.</li></ul>
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