

BIG IDEAS

Vehicle operation, service, and maintenance include consideration of **social and environmental impacts**.

Personal service and maintenance interests require the evaluation and refinement of skills.

Tools and **technologies** can be adapted for specific purposes.

Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to be able to do the following:</i></p> <p>Applied Design</p> <p><i>Understanding context</i></p> <ul style="list-style-type: none"> Interpret circumstances of or factors in a particular automotive situation or challenge <p><i>Defining</i></p> <ul style="list-style-type: none"> Identify potential issues and troubleshoot Identify requirements, intended impacts, and possible unintended negative consequences of service Determine whether activity is collaborative or self-directed <p><i>Ideating</i></p> <ul style="list-style-type: none"> Generate ideas to create a range of possibilities and add to others' ideas in ways that create additional possibilities Critically analyze how competing social, ethical, and sustainability considerations impact creation and development of solutions Evaluate suitability of plans, products and processes according to intended impact of service <p><i>Prototyping</i></p> <ul style="list-style-type: none"> Evaluate and apply appropriate sources of information to develop a plan that includes key stages and resources Analyze the design for the life cycle and evaluate its impacts Consider a variety of materials for effective use and their potential for reuse, recycling, and biodegradability Make changes to tools, materials, and procedures as needed 	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> complex automotive repair and maintenance vehicle inspection standards advanced automotive tools and equipment engine and vehicle modifications vehicle diagnostic and assessment methods transmission and gearing functions electrical and control systems mechanical systems fuel systems serviceability, overhaul, and repair design for the life cycle career options and opportunities in automotive technology interpersonal skills for interacting with clients and customers

Learning Standards (continued)

Curricular Competencies	Content
<p>Testing</p> <ul style="list-style-type: none"> Identify and communicate with sources of feedback Develop an appropriate test, conduct the test, and collect and compile data Evaluate ideas based on information from feedback and testing results to make necessary changes <p>Making</p> <ul style="list-style-type: none"> Identify appropriate tools, technologies, materials, processes, and time needed Carry out updated plan, incorporating feedback from self and others and from testing results Use materials in ways that minimize waste <p>Sharing</p> <ul style="list-style-type: none"> Decide how and with whom to share their processes, to solicit and generate feedback Share final plans, products and processes and critically evaluate their success Critically reflect on plans, products and processes, and identify new goals Identify and analyze new possibilities for plans, products and processes, including how they or others might build on them <p>Applied Skills</p> <ul style="list-style-type: none"> Apply safety procedures for themselves, co-workers, and operators in both physical and digital environments Individually or collaboratively identify and assess skills needed for automotive service plans, products and processes Demonstrate competency and proficiency in skills at various levels involving manual dexterity and complex mechanics and maintenance Develop specific plans to learn or refine identified skills over time <p>Applied Technologies</p> <ul style="list-style-type: none"> Explore existing, new, and emerging tools, technologies, and systems to evaluate suitability for automotive maintenance and repair interests Evaluate impacts, including unintended negative consequences, of choices made about technology use Analyze the role that advancing technologies play in automotive contexts 	

**APPLIED DESIGN, SKILLS, AND TECHNOLOGIES – Automotive Technology
Grade 12**

Big Ideas – Elaborations

- **social and environmental impacts:** including operator and public safety; emissions and effects on the environment; manufacturing, packaging, disposal, and recycling considerations related to vehicle parts and products
- **technologies:** tools that extend human capabilities

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Curricular Competencies – Elaborations

- **design for the life cycle:** taking into account economic costs and social and environmental impacts of the product, from the extraction of raw materials to eventual reuse or recycling of component materials
- **impacts:** including the social and environmental impacts of extraction and transportation of raw materials; manufacturing, packaging, and transportation to markets; servicing or providing replacement parts; expected usable lifetime; and reuse or recycling of component materials
- **appropriate test:** includes evaluating the degree of authenticity required for the setting of the test, deciding on an appropriate type and number of trials, and collecting and compiling data
- **share:** may include showing to others or use by others, giving away, or marketing and selling

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Content – Elaborations

- **tools and equipment:** for example, charging analyzer, timing light, fuel pressure gauge, separating tool, brake lathe, alignment
- **modifications:** for example, turbocharging, supercharging, lifting, lowering, tuning
- **interpersonal skills:** for example, professional communications, active listening to identify potential problems, courtesies