**Area of Learning: Applied Design, Skills, and Technologies —
Automotive Technology Grade 11**

**BIG IDEAS**

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| 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**

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| **Curricular Competencies** | **Content** |
| *Students are expected to be able to do the following:*Applied DesignUnderstanding context* Interpret circumstances of or factors in a particular automotive situation or challenge

Defining* Identify potential issues and troubleshoot
* Identify requirements, intended impacts, and possible unintended negative consequences of service
* Determine whether activity is collaborative or self-directed

Ideating* 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
* Choose an idea to pursue and maintain an open mind about other potentially viable ideas

Prototyping* Identify and apply a variety of 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
 | *Students are expected to know the following:** simple automotive repair and maintenance
* social, legal, and ethical responsibilities associated with vehicle operation
* use of technical information and manuals for the purpose of **diagnostics** and repair
* **fundamental automotive tools and equipment**
* **lifting equipment** and **procedures**
* chassis and body
* enginediagnosticsupport systems
* emerging and alternative energy sources used to power automotive vehicles
* fundamentals of engine operation
* **vehicle systems**
* **vehicle safety systems**
* design for the life cycle
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**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Testing* Identify and communicate with sources of feedback
* Develop an **appropriate test**, conduct the test, and collect and compile data
* Apply information based on feedback and testing results to make necessary changes

Making* 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

Sharing* Decide how and with whom to **share** their processes, to solicit and generate feedback
* Share final plans, products and processes to 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

Applied Skills* 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
* Develop competency and proficiency in skills at various levels involving manual dexterity, mechanics, and maintenance
* Develop specific plans to learn or refine identified skills over time

Applied Technologies* 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
* Examine the role that advancing technologies play in automotive contexts
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|  **APPLIED DESIGN, SKILLS, AND TECHNOLOGIES – Automotive Technology Big Ideas – Elaborations Grade 11** |
| * **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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|  **APPLIED DESIGN, SKILLS, AND TECHNOLOGIES – Automotive Technology Curricular Competencies – Elaborations Grade 11** |
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| * **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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|  **APPLIED DESIGN, SKILLS, AND TECHNOLOGIES – Automotive Technology Content – Elaborations Grade 11** |
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| * **diagnostics:** onboard diagnostic systems, external diagnostic systems
* **fundamental automotive tools and equipment:** hand, power, and pneumatic tools and equipment (e.g., wheel balancer, tire changer)
* **lifting equipment:** for example, jacks, hoists, stands
* **procedures:** planning, integrity, stability
* **vehicle systems:** for example, driveline, suspension, steering, electric
* **vehicle safety systems:** for example, air bags, crumple zones, restraints
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