**Area of Learning: Applied Design, Skills, and Technologies — Power Technology Grade 10**

**BIG IDEAS**

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| Mechanical service begins with operator safety. |  | Social, ethical,  and sustainability considerations  impact design. |  | Complex tasks require the sequencing of skills. |

**Learning Standards**

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| **Curricular Competencies** | **Content** |
| *Students are expected to be able to do the following:*  Applied Design  Understanding context   * Engage in a period of **research** and **empathetic observation**   Defining   * Identify potential users and relevant contextual factors * Identify criteria for success, intended impact, and any **constraints** * Determine whether activity is collaborative or self-directed   Ideating   * Screen ideas against criteria and constraints * Critically analyze and prioritize competing **factors** to meet community needs  for preferred futures * Maintain an open mind about potentially viable ideas   Prototyping   * Evaluate a variety of materials for effective use and potential for reuse, recycling, and biodegradability * Make changes to tools, materials, and procedures as needed | *Students are expected to know the following:*   * internal and external combustion * components of a combustion engine * non-fuel power systems * disassembly and assembly sequences * **engine terminology** * **lubrication** and **antifriction** * hydraulic and pneumatic systems * transfer and conversion of energy * hand tools and power tools specific to mechanical repair  and maintenance * torques and tolerances for specific operations * fasteners and fittings * energy transmission and **conversion systems** * technologies that reduce energy use and waste * historical and potential future impact of energy, power,  and transportation systems on society and the environment * **alternate energy sources** |

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**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Testing   * Identify **sources of feedback** * Develop an **appropriate test** * Conduct the test, collect and compile data, evaluate data, and decide on changes * Iterate the design idea   Making   * Identify and use appropriate tools, **technologies**, materials, and processes * Make a step-by-step plan and carry it out, making changes as needed * Use materials in ways that minimize waste   Sharing   * Decide on how and with whom to **share** **product** and processes * Demonstrate product to users and critically evaluate its success   Applied Skills   * Demonstrate and document an awareness of precautionary and emergency  safety procedures * Develop competency and proficiency in skills at various levels involving manual dexterity, mechanics, and maintenance * Identify the skills needed, individually or collaboratively, in relation to specific projects, and develop and refine them   Applied Technologies   * Choose, adapt, and if necessary learn more about appropriate tools and technologies to use for tasks * Evaluate **impacts**, including unintended negative consequences, of choices made about technology use * Evaluate the influences of land, natural resources, and culture on the development  and use of tools and technologies |  |