Small Gasoline Engines

Academic Content Area: Mathematics – Grade 11

Career Development Event Content
1. Written examination covering selection, engine theory and principles of operation, maintenance, repair, adjustment and services of two-stroke and four-stroke cycle multi-fuel engines. 2. Use a service manual and parts manual. 3. Identify small gasoline engine parts and service tools. 4. Inventory required tools. 5. Complete a troubleshooting checklist indicating their strategy for repairing the engine. 6. Troubleshoot and repair a "bugged" engine. 7. Complete a job sheet for required maintenance. 8. Present an oral report including a meeting with the customer to present the bill, explain the services performed and answer customer questions.
Related Academic Standards/Anchors
Objectives 1-8: **2.2.11.A,B; 2.3.11.A,C; 2.5.11.A,B,C**
Connecting Examples: CDE Objectives and Standards/Anchors
Ex. 1 – Related to: 2.2.11.A: Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations. **Students must have a diverse knowledge of computation concepts, operations and procedures that require real numbers for problem-solving in engine troubleshooting.** Ex. 2 – Related to: 2.3.11.A: Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations. **Students are required to use specific small engine service tools to a particular degree of accuracy. For example, students must know and be able to use the proper formula for determining piston displacement: displacement = bore2/4 x 3.14 x stroke. Also, when an engine is operating at 3000 rpm, each valve opens and closes in approximately how many seconds?**

Small Gasoline Engines

Academic Content Area: Reading, Writing, Speaking and Listening – Grade 11

Career Development Event Content
1. Written examination covering selection, engine theory and principles of operation, maintenance, repair, adjustment and services of two-stroke and four-stroke cycle multi-fuel engines. 2. Use a service manual and parts manual. 3. Identify small gasoline engine parts and service tools. 4. Inventory required tools. 5. Complete a troubleshooting checklist indicating their strategy for repairing the engine. 6. Troubleshoot and repair a "bugged" engine. 7. Complete a job sheet for required maintenance. 8. Present an oral report including a meeting with the customer to present the bill, explain the services performed and answer customer questions.
Related Academic Standards/Anchors
Objectives 1-8: **1.1.11.A,C,E,F; 1.4.11.B; 1.5.11.A,C,F; 1.6.11.A,C,D,E**
Connecting Examples: CDE Objectives and Standards/Anchors
Ex. 1 – Related to 1.1.11.F: Understand the meaning of and apply key vocabulary across the various subject areas. **Students must develop a proficient knowledge of the vocabulary used in the small gasoline engine industry and across other subject areas for the purpose of relating to the customer.** Ex. 2 – Related to 1.4.11.B: Write complex informational pieces. **Students must be able to write an informational piece that educates the customer on services that took place on the engine (job sheet).** Ex. 3 – Related to 1.6.11.A: Listen to others. **Students are required to listen to their partners during the career development event for advice and suggestions. They should be asking clarifying questions, synthesizing information, ideas and opinions to determine relevancy and take appropriate notes. For example, students work together in pairs to complete all activities except the written examination.**

Small Gasoline Engines

Academic Content Area: Science and Technology – Grade 10

Career Development Event Content

1. Written examination covering selection, engine theory and principles of operation, maintenance, repair, adjustment and services of two-stroke and four-stroke cycle multi-fuel engines.
2. Use a service manual and parts manual.
3. Identify small gasoline engine parts and service tools.
4. Inventory required tools.
5. Complete a troubleshooting checklist indicating their strategy for repairing the engine.
6,. Troubleshoot and repair a "bugged" engine.
7. Complete a job sheet for required maintenance.
8. Present an oral report including a meeting with the customer to present the bill, explain the services performed and answer customer questions.

Related Academic Standards/Anchors

Objectives 1-8: **3.1.10.A,D; 3.2.10.B,D; 3.4.10.C; 3.6.10.C; 3.7.10.A,B**

Connecting Examples: CDE Objectives and Standards/Anchors

Ex. 1 – Related to 3.1.10.A: Discriminate among the concepts of systems, subsystem, feedback, and control in solving technological problems. Sub-point, identify the function of subsystems within a larger system (e.g., role of thermostat in an engine, pressure switch). Students must have a proficient knowledge of small engine systems, how they function and how to repair them. For example, one component of the career development event is engine repair. Students are required to look up part numbers and order the needed replacement parts for the troubleshot systems.

Ex. 2 – Related to 3.2.10.D: Identify and apply the technological design process to solve problems. **Students must be able to examine problems with the engine, rank all necessary information and answer all related questions. In addition, students must propose and implement a solution and communicate the process of the solution.**

Ex. 3 – Related to 3.7.10.A: Identify and safely use a variety of tool, basic machines, materials and techniques to solve problems and answer questions. **Students are required to identify small engine service tools and utilize such tools for the performance of system repair and maintenance on small engines.**