

Auburn High School Framework: Small Gas Engines

Course: Power Equipment Small Engine Technology/Technician

Total Framework Hours: 180 Hours

CIP Code: 470606

Type: Preparatory

Career Cluster: Transportation Distribution and Logistics

Date Last Modified: Friday, April 15, 2016

Resources and Standard used in Framework Development:

Standards used for this framework are from the OSPI Model Framework for 470606 Power Equipment Small Engine Technology/Technician

Unit 1 CAREER PLANNING

Hours: 4

Performance Assessment(s):

Create a High School and beyond plan and a portfolio for a career in an area of choice. Using a career research tools (such as Career Cruising, ASVAB, WOIS), students will prepare a report covering their personal interest, aptitudes and abilities and cross reference potential career pathways that appeal to them. The report should include an assessment of personal strengths for success in that particular field.

Leadership Alignment:

Goals for Personal Development: To provide students with the opportunity to set personal goals based on self-assessment.

Cover Letter Writing: To help students understand the importance of cover letters and guide them through the practice of writing them.

Resume Writing: To help students understand the import

Think Creatively

1.A.1 Use a wide range of idea creation techniques (such as brainstorming)

Communicate Clearly

3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts

Standards and Competencies

Standard WR 1: Career Planning

WR-1.1 Complete, discuss, and analyze the results of personality, career interest, and aptitude assessments;

WR-1.2 Explore the career clusters as defined by the U.S. Department of Education and summarize the career opportunities in a cluster of personal interest;

WR-1.3 Create a personal career portfolio including academic, certification and technical-skill requirement, career opportunities, expected wages, skills and aptitude necessary and the impact of technology on careers of personal interest.

WR-1.4 Determine academic/training or certification requirements for transition from one learning level to the next and explore opportunities for earning credit/certifications in high school such as advanced placement, tech prep, International Baccalaureate, college in the high school, military and apprenticeship opportunities.

WR-1.5 Develop and analyze tables, charts, and graphs related to career interests and make oral presentation regarding the career pathway of your choice.

WR-1.6 Develop an awareness of financial aid, scholarships, and other sources of income to support postsecondary education/training and discuss the impact of effective college and career planning.

WR-1.7 Identify how performance on assessments such as the SAT®, ACT®, ASVAB®, COMPASS® and ACCUPLACER® impact personal academic and career goals.

WR-1.8 Prepare a personal budget reflecting desired lifestyle and compare and contrast at least three careers of interest in regards to salary expectations and education/training costs.

WR-1.9 Prepare a program of study for at least one career of interest

WR-1.10 Apply knowledge gained from individual assessment to a set of goals and a career plan

WR-1.11 Develop strategies to make an effective transition from school to career

WR-1.13 Identify industry certification opportunities

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Craft and Structure

4 - Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape

Science

Social Studies

Writing

CC: Writing (9-10)

Research to Build and Present Knowledge

7 - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 2 PERSONAL SUCCESS**Hours: 6****Performance Assessment(s):**

Show up to class on time and ready to work and will generate a resume and keep a portfolio of quality work.
 Research positions open within a variety of companies and compare/contrast their descriptions, duties, and expectations. Prepare responses to standard interview question.
 Participate in a WOIS or other Career Research assignment.

Leadership Alignment:

Local leadership activity: Students will reason effectively, communicate clearly, access and evaluate information, adapt to change and be flexible while being a self-directed learner researching professionalism and timeliness in the work place activity.
 Students will be responsible to others by presenting their project from unit 1.
 Reason Effectively
 2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Standards and Competencies

Standard WR 2: Personal Success
 WR-2.1 Implement effective study skills for academic success;
 WR-2.2 Develop personal goals using SMART (Specific Measurable Attainable Realistic Timely), objectives and strategies.
 WR-2.3 Use interpersonal skills to facilitate effective teamwork;
 WR-2.4 Use a problem-solving model and critical-thinking skills to make informed decisions;
 WR-2.5 Use effective time-management and goal-setting strategies;
 WR-2.6 Effectively use information and communication technology tools; and
 WR-2.7 Identify skills that can be transferable among a variety of careers.
 WR-2.8 Create and complete appropriate documents such as electronic portfolio, personal resumé, employment application, letter of intent, letters of recommendation and thank you letters.
 WR-2.9 Complete job search documents, including job applications and W-4 forms;
 WR-2.10 Demonstrate proper interview techniques in various situations;

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language****Mathematics****Reading**CC: College and Career Readiness Anchor Standards for ReadingKey Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn

Craft and Structure

4 - Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape

Science

Social Studies

Writing

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

2 - Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
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Creative Thinking and Problem Solving

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- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 3 EMPLOYABILITY**Hours: 4****Performance Assessment(s):**

Using a career research tool (such as Career Cruising, ASVAB, WOIS), students will prepare a report covering the requirements for training, certification, licensing and the personal characteristics required for employment in that career. The report should include an assessment of personal strengths for success in that particular field

Leadership Alignment:

Local leadership activity: Students will reason effectively, communicate clearly, access and evaluate information, adapt to change and be flexible while being a self-directed learner researching professionalism and timeliness in the work place activity.

Students will be responsible to others by presenting their project, combined with other units.

Work Creatively with Others

1.B.1 Develop, implement and communicate new ideas to others effectively

Make Judgments and Decisions

2.C.1 Effectively analyze and evaluate evidence, arguments, claims and beliefs

Standards and Competencies

Standard WR 3: Employability and Entrepreneurship

WR-3.1 Demonstrate effective verbal, nonverbal, written, and electronic communication skills;

WR-3.2 Evaluate the impact of positive and negative personal choices, including use of electronic communications such as social networking sites;

WR-3.3 Model characteristics of effective leadership, teamwork, and conflict management;

WR-3.4 Recognize the importance of a healthy lifestyle, including the ability to manage stress;

WR-3.5 Explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and

WR-3.6 Complete activities using project- and time-management techniques.

WR-3.7 Identify and model appropriate grooming and appearance for the workplace;

WR-3.8 Demonstrate dependability, punctuality, and initiative;

WR-3.9 Research positive interpersonal skills, including respect for diversity;

WR-3.10 Model appropriate business and personal etiquette in the workplace;

WR-3.11 Exhibit productive work habits, ethical practices, and a positive attitude;

WR-3.12 Demonstrate the ability to work with the other employees to support the organization and complete assigned tasks;

WR-3.13 Demonstrate willingness to learn and further develop skills

WR-3.14 Describe the importance of having a positive attitude and techniques that boost morale

WR-3.15 Show initiative by coming up with unique solutions and taking on extra responsibilities

WR-3.16 Explain the importance of setting goals and demonstrate the ability to set, reach, and evaluate goals

WR-3.17 Explain the importance of taking pride in work accomplished and extrinsic and intrinsic motivators that can be used to increase pride

WR-3.18 Identify how to prioritize work to fulfill responsibilities and meet deadlines;

WR-3.19 Research and compare published workplace policies and procedures;

WR-3.20 Summarize provisions of the Fair Labor Standards Act;

WR-3.21 Describe the consequences of breach of confidentiality;

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

Craft and Structure

4 - Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 4 PROBLEM SOLVING**Hours: 4****Performance Assessment(s):**

Students will employ critical thinking skills independently and in teams to solve problems and make decisions while analyzing small engine problems.

Leadership Alignment:

Students will think creatively while using skills USA contest guidelines and rubrics for problem solving, they will solve problems, access and evaluate information while they use and manage information to complete a professional industry-specific problem solving exam that is part of the Skills USA contest, scoring and process with committee and employers from industry.

2.D.2 Identify and ask significant questions that clarify various points of view and lead to better solutions

Produce Results

10.B.1 Demonstrate additional attributes associated with producing high quality products

Standards and Competencies

Standard WR 4: Problem Solving

WR-4.1 Employ critical thinking skills independently and in teams to solve problems and make decisions.

WR-4.2 Employ critical thinking and interpersonal skills to resolve conflicts.

WR-4.3 Identify and document workplace performance goals and monitor progress toward those goals

WR-4.4 Conduct technical research to gather information necessary for decision-making

WR-4.5 Explain the importance and dynamics of individual and teamwork approaches of problem solving

WR-4.6 Describe methods of researching and validating reliable information relevant to the problem

WR-4.7 Explain strategies used to formulate ideas, proposals and solutions to problems

WR-4.8 Select potential solutions based on reasoned criteria

WR-4.9 Implement and evaluate solution(s)

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language**

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2 - Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Mathematics**Reading**

CC: Reading Informational Text

Key Ideas and Details (9-10)

1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Performance Assessment(s):

Performance Assessments: Working in teams, students will develop and conduct a comprehensive work environment assessment of the classroom. WISHA/OSHA standards and other available environmental guidelines will be used (lighting, noise, keyboards, etc.) to develop the assessment instrument. The assessment will include a written report outlining standards met and suggestions for improvement.

Students will create design projects according to set criteria, including environmental, safety, health, and other requirements/restrictions. They will do requisite research and mathematical computations in designing their projects. Students will submit written and/or oral presentations of their final design projects. Projects will be assessed in terms of environmental, physical, and other needs and restrictions.

The instructor will conduct day to day observations of students using proper ergonomic considerations at their workstations.

Students will locate, interpret, and apply MSDS information, when asked by instructor, e.g., a site evaluation/inspection as occurs in industry.

Leadership Alignment:

Students will use systems thinking, problem solving and clear communication while using skills USA contest guidelines and rubrics for workplace health and safety, they will communicate clearly and problem solve while they use and manage information to complete a professional industry-specific safety exam that is part of the mock interview process with committee and employers from industry.

Use Systems Thinking

2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex

Use and Manage Information

4.B.1 Use information accurately and creatively for the issue or problem at hand

Standards and Competencies

Standard WR 5: Health and Safety

WR-5.1 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.

WR-5.2 Explain emergency procedures to follow in response to workplace accidents.

WR-5.3 Create a disaster and/or emergency response plan.

WR-5.4 Identify and apply OSHA and other health and safety regulations that apply to specific tasks and jobs in the occupational area

WR-5.5 Identify and apply EPA and other environmental protection regulations that apply to specific tasks and jobs in the occupational area

WR-5.6 Identify and apply Right-To-Know (Hazard Communication Policy) and other communicative regulations that apply to specific tasks and jobs in the occupational area

WR-5.7 Explain procedures for documenting and reporting hazards to appropriate authorities

WR-5.8 List penalties for non-compliance with appropriate health and safety regulations

WR-5.9 Identify contact information for appropriate health and safety agencies and resources

WR-5.10 Create a systematic safety program which would achieve OSHA compliance and promote a safe working environment

WR-5.11 Illustrate a safe environment for students in printing

WR-5.12 Identify, describe and demonstrate the effective use of Material Safety Data Sheets (MSDS)

WR-5.13 Read chemical, product, and equipment labels to determine appropriate health and safety considerations

WR-5.14 Identify, describe and demonstrate personal, shop and job site safety practices and procedures

WR-5.15 Demonstrate safe dress and use of relevant safety gear and personal protective equipment (PPE), including wrist rests, adjustable workspaces and equipment, gloves, boots, earplugs, eye protection, and breathing apparatus

WR-5.16 Illustrate appropriate safe body mechanics, including proper lifting techniques and ergonomics

WR-5.17 Locate emergency equipment in your lab, shop, and classroom, including (where appropriate) eyewash stations, shower facilities, sinks, fire extinguishers, fire blankets, telephone, master power switches, and emergency exits

WR-5.18 Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop, and classroom

WR-5.19 Describe safety practices and procedures to be followed when working with and around electricity

WR-5.20 Illustrate proper handling and storage practices, including working with hazardous materials, disposal, and recycling

WR-5.21 Demonstrate proper workspace cleaning procedures

WR-5.22 Illustrate First Aid procedures for potential injuries and other health concerns in the occupational area

WR-5.23 Describe the importance of emergency preparedness and an emergency action plan

WR-5.24 Illustrate procedures used to handle emergency situations and accidents, including identification, reporting, response, evacuation plans, and follow-up procedures

WR-5.25 Identify practices used to avoid accidents

WR-5.26 Identify and describe fire protection, precautions and response procedures

WR-5.27 Discuss the role of the individual and the company/organization in ensuring workplace safety

WR-5.28 Discuss ways to identify and prevent workplace/school violence

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Health 2.3: Understands the concepts of prevention and control of disease.

2.3.1 Analyzes personal health practices, and how they affect communicable diseases.

Health 2.4: Acquires skills to live safely and reduce health risks.

2.4.2 Evaluates emergency situations, ways to prevent injuries, and demonstrates skills to respond appropriately and safely.

Health 3.2: Evaluates health and fitness information.

3.2.1 Evaluates health and fitness information, products, and services.

Language

Mathematics

Reading

CC: Reading Informational Text

Key Ideas and Details (9-10)

1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 6 TEAMWORK AND COOPERATION**Hours: 4****Performance Assessment(s):**

Working in teams, students will select and complete a comprehensive group project on engine assembly, i.e., one that requires using such leadership skills as goal setting, advocacy, communication, parliamentary procedure, etc. to assure project success. Peer assessment shall be an integral component of the project.

Leadership Alignment:

Students will think creatively, communicate clearly use and manage information to complete a comprehensive group project using skills USA contest guidelines and rubrics for teamwork, they will manage goals and time and work effectively in diverse teams to complete the teamwork portion of a professional industry-specific team activity that is part of the Skills contest with committee and employers from industry scoring.

- 1.A.3 Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts
- 4.B.2 Manage the flow of information from a wide variety of sources

Standards and Competencies

Standard WR 6: Teamwork and Cooperation

- WR-6.1 Employ leadership skills to accomplish organizational goals and objectives.
- WR-6.2 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.
- WR-6.3 Conduct and participate in meetings to accomplish work tasks.
- WR-6.4 Employ mentoring skills to inspire and teach others.
- WR-6.5 Cooperates rather than compete with team members
- WR-6.6 Offers/seeks suggestions, opinions, and information to team members.
- WR-6.7 Listens to and considers the ideas of team members.
- WR-6.8 Supports group decision even if not in total agreement.
- WR-6.9 Communicates changes or problems to team members.
- WR-6.10 Treat everybody with respect and understanding
- WR-6.11 Employ mentoring skills to inspire and teach others.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language**

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

- 1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Knowledge of Language

- 3 - Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when

Mathematics**Reading****Science****Social Studies****Writing**

CC: College and Career Readiness Anchor Standards for Writing

Research to Build and Present Knowledge

7 - Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

21st Century Skills**LEARNING AND INNOVATION****Creativity and Innovation**

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS**Information Literacy**

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS**Flexibility and Adaptability**

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 7 ETHICS AND LEGAL RESPONSIBILITIES

Hours: 4

Performance Assessment(s):

Students will evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.

Conduct research on the Internet and correctly identify and list sources in bibliography.

Leadership Alignment:

Students will reason effectively and make judgments and decisions while conducting research on the internet and correctly identify it's sources in a bibliography for skills USA contest using the guidelines and rubrics for Ethics in the workplace, they will collaborate with others, access and evaluate information and manage information to complete the Ethics portion of a professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Collaborate with Others

3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams

11.A.2 Leverage strengths of others to accomplish a common goal

Standards and Competencies

Standard WR 7: Ethics and Legal responsibilities

WR-7.1 Evaluate and justify decisions based on ethical reasoning.

WR-7.2 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.

WR-7.3 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.

WR-7.4 Interpret and explain written organizational policies and procedures.

WR-7.5 Collaborate with classmates in researching or reviewing an Acceptable Use Policy

WR-7.6 Internet search (optional)

WR-7.7 Responsibilities of Internet use (using the Internet efficiently and ethically for work, identifying the risks of posting personal and work information on the internet, social networking sites, job search sites, taking measures to avoid internet security risks such as viruses, malware)

WR-7.8 Discuss legal issues associated with locating and retrieving information from the internet

WR-7.9 Understand Acceptable Use Policy, Copyright and Fair Use Laws

WR-7.10 Conduct research on the Internet and correctly identify sit sources in bibliography

WR-7.11 Utilize information from electronic communication sources

WR-7.12 WR-7. Understand End User License Agreements (EULA)

WR-7.13 Understand Intellectual Properties rights

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1 - Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and

2 - Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Health and Fitness

Language

Mathematics

Reading

CC: Reading Informational Text

Key Ideas and Details (9-10)

1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 8 COMPARE AND CONTRAST FASTENERS

Hours: 4

Performance Assessment(s):

Students will correctly identify commonly used threaded fasteners and be able to find fastener torque specifications on a variety of fasteners.

Leadership Alignment:

Students will think creatively, communicate clearly use and manage information to correctly attach parts to an engine using skills USA contest guidelines and rubrics for fasteners, they will work independently and manage their project to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Reason Effectively

2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Standards and Competencies

Standard: Compare and contrast fasteners

- Identify commonly used threaded fasteners.
- Identify SAE bolt head markings.
- Identify metric bolt head markings.
- Identify commonly used nuts.
- Identify commonly used washers.
- Explain the need for flat washers and lock washers.
- Identify and describe machine screws.
- Identify and describe commonly used snap rings.
- Explain the concept of fastener torque.
- Explain how to find fastener torque specifications.
- Explain when to use a general fastener torque chart.
- Explain what torque sequence refers to.
- Describe the various types of torque wrenches.
- Explain the basic rules to follow when using a torque wrench.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

5 - Demonstrate understanding of word relationships and nuances in word meanings.

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career

Mathematics

Reading

CC: Reading Informational Text

1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 9 PROPER MEASURING PROCEDURES

Hours: 6

Performance Assessment(s):

Students will identify a variety of measuring procedures and explain what specific task each tool is and how it is used in industry. Measurement tests on using the micrometer.

Leadership Alignment:

Skills USA to present oneself and ideas in a manner that will increase success.

To improve listening and speaking skills in small groups. Students will think creatively, communicate clearly use and access and evaluate information to correctly identify a variety of measuring tools using Skills USA contest guidelines and rubrics for measuring, they will be flexible and manage goals and time to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Solve Problems

2.D.1 Solve different kinds of non-familiar problems in both conventional and innovative ways

4.A.2 Evaluate information critically and competently

Standards and Competencies

Standard: Demonstrate proper measuring procedures.

- Describe commonly used low precision measuring tools (steel rule, tape measure, ruler, and combination square)
- Identify an outside caliper and explain what it is used.
- Identify an inside caliper and explain what it is used.
- Identify a feeler gauge and explain what it is used.
- Identify a hole gauge and explain what it is used.
- Identify a telescoping/snap gauge and explain what it is used.
- Identify a vernier caliper and explain what it is used.
- Identify an outside micrometer and explain what it is used.
- Identify an inside micrometer and explain what it is used.
- Identify a depth indicator gauge and explain what it is used.
- Identify a dial indicator and explain what it is used.
- Identify a go/no go gauge and explain what it is used.
- Identify a plastic gauge and what it is used.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

CC: Mathematical Practices (MP)

- 1 - Make sense of problems and persevere in solving them.
- 2 - Reason abstractly and quantitatively.
- 3 - Construct viable arguments and critique the reasoning of others.
- 4 - Model with mathematics.
- 5 - Use appropriate tools strategically.

- 6 - Attend to precision.
- 7 - Look for and make use of structure.
- 8 - Look for and express regularity in repeated reasoning.

CC: Functions (F)

Interpreting Functions (F-IF)

2 - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION	INFORMATION, MEDIA AND TECHNOLOGY SKILLS	LIFE AND CAREER SKILLS
<p>Creativity and Innovation</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Think Creatively <input type="checkbox"/> Work Creatively with Others <input type="checkbox"/> Implement Innovations <p>Creative Thinking and Problem Solving</p> <ul style="list-style-type: none"> <input type="checkbox"/> Reason Effectively <input type="checkbox"/> Use Systems Thinking <input type="checkbox"/> Make Judgements and Decisions <input checked="" type="checkbox"/> Solve Problems <p>Communication and Collaboration</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communicate Clearly <input type="checkbox"/> Collaborate with Others 	<p>Information Literacy</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Access and Evaluate Information <input type="checkbox"/> Use and Manage Information <p>Media Literacy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyze Media <input type="checkbox"/> Create Media Products <p>Information, Communications, and Technology (ICT Literacy)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Apply Technology Effectively 	<p>Flexibility and Adaptability</p> <ul style="list-style-type: none"> <input type="checkbox"/> Adapt to Change <input checked="" type="checkbox"/> Be Flexible <p>Initiative and Self-Direction</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Manage Goals and Time <input type="checkbox"/> Work Independently <input type="checkbox"/> Be Self-Directed Learners <p>Social and Cross-Cultural</p> <ul style="list-style-type: none"> <input type="checkbox"/> Interact Effectively with Others <input type="checkbox"/> Work Effectively in Diverse Teams <p>Productivity and Accountability</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Manage Projects <input checked="" type="checkbox"/> Produce Results <p>Leadership and Responsibility</p> <ul style="list-style-type: none"> <input type="checkbox"/> Guide and Lead Others <input type="checkbox"/> Be Responsible to Others

Performance Assessment(s):

Students will identify a wide variety of industry hand tools and demonstrate their safe and proper use in the shop.

Leadership Alignment:

Skills USA to present oneself and ideas in a manner that will increase success.

Students will think creatively, solve problems and access and evaluate information to demonstrate proper tool use. They use and manage information, work independently and be self-directed learners while demonstrating the proper use of hand tools in a Skills USA contest, using guidelines and rubrics for tool use, they will manage the project and produce results to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Use Systems Thinking

2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex

Works Independently

8.B.1 Monitor, define, prioritize and complete tasks without direct oversight

Standards and Competencies

Standard: Demonstrate the use of hand tools.

- Identify types of screwdrivers
- Identify types of pliers
- Identify types of combination wrenches
- Identify open-end wrenches
- Identify box end wrenches
- Identify types of punches
- Identify types of chisel
- Identify types of hammers
- Identify types of pipe wrenches
- Identify types of adjustable wrenches
- Identify types of sockets
- Identify types of extensions
- Identify types of torque wrenches
- Identify types of Allen wrenches
- Identify various types of files
- Identify types of hacksaws
- Identify various types of thread cutting taps
- Identify various types of thread cutting dies
- Identify a tubing cutter
- Identify a double flaring tool
- Identify an ISO flaring tool
- Identify different types of gasket scrapers
- Identify types of wire brushes
- Identify types of bench vises

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

2 - Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 11 PROPER USE OF POWER TOOLS

Hours: 5

Performance Assessment(s):

Students will identify a variety of power tools used in the SGE industry. They will demonstrate or describe the proper use of each of the power tools.

Leadership Alignment:

Skills USA to present oneself and ideas in a manner that will increase success.

Students will think creatively, solve problems and access and evaluate information to demonstrate proper power tool use. They access and evaluate information, apply technology effectively, make judgments and decisions, work ineffectively in diverse teams and be responsible to others while demonstrating the proper use of power tools in a Skills USA contest, using guidelines and rubrics for power tool use, to complete the professional industry-specific activity that is part of the SkillsUSA contest with committee and employers from industry scoring.

Communicate Clearly

3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts

Work Effectively in Diverse Teams

9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds

Standards and Competencies

Standard: Demonstrate the use of power tools.

- Drill holes to given specifications using an electric drill
- Identify types of drill bits
- Describe the difference in drilling speed for different metals
- Describe safety procedures to be followed when using an electric drill
- Identify and explain the purpose of an air impact wrench
- Identify and explain the purpose of impact sockets
- Describe maintenance needs of an impact wrench
- Describe safety procedures to follow when using an air impact wrench
- Identify and explain the purpose of an electric soldering iron
- Describe safety procedures to be followed when using an electric soldering iron
- List the type of solder to use when soldering electrical component
- Identify and explain the purpose of a bench grinder
- Describe safety procedures to follow when using a bench grinder

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Health 2.1: Understands dimensions and indicators of health.

2.1.1 Evaluates dimensions of health and relates to personal health behaviors.

Health 2.4: Acquires skills to live safely and reduce health risks.

2.4.2 Evaluates emergency situations, ways to prevent injuries, and demonstrates skills to respond appropriately and safely.

Health 3.2: Evaluates health and fitness information.

3.2.1 Evaluates health and fitness information, products, and services.

Language

Mathematics

Reading

CC: Reading for Literacy in Science and Technical Subjects

Key Ideas and Details (9-10)

1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 12 IDENTIFY AND USE TECHNICAL PUBLICATIONS (SERVICE MANUALS, IPL'S, CD)**Hours: 4****Performance Assessment(s):**

Students will accurately maintain parts and shop supplies on shop inventory lists and work orders. -Students will document service work on work orders and complete various OEM warranty forms.

Leadership Alignment:

Local leadership: Idea Generation: To generate as many ideas as possible from all members of a group utilizing the technique publications provided in class and on line.

Local leadership Group

Good Meetings: To increase student understanding of the factors involved in holding effective meetings (includes basics of parliamentary procedure)

Skills USA to present oneself and ideas in a manner that will increase success.

Students will think creatively, communicate clearly, use and manage information while demonstrating the proper use of technical publications that is part of the Skills USA contest with committee and employers from industry scoring.

Manage Goals and Time

8.A.1 Set goals with tangible and intangible success criteria

Standards and Competencies

Standard: Maintain Records.

- Document service work on work orders.
- Maintain parts and shop supplies on shop inventory lists and work orders.
- Complete various OEM warranty forms.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language****Mathematics****Reading****Science****Social Studies****Writing**

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6 - Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

8 - Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 13 SPECIALITY AND DIAGNOSTIC TOOL IDENTIFICATION AND DIAGNOSTIC TOOL IDENTIFICATI Hours: 10

Performance Assessment(s):

Student will solve a variety of small engine problems following a diagnostic and troubleshooting manual.

Leadership Alignment:

Skills USA to present oneself and ideas in a manner that will increase success.

Students will think creatively, solve problems and use and manage information to identify proper diagnostic tools. They will work independently, manage projects and produce results while identifying diagnostic tools in a Skills USA contest, using guidelines and rubrics for diagnostic tool use, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Reason Effectively

2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Standards and Competencies

Standard: Identify and use technical publications (service manuals, IPL's, Microfiche, CD).

- Describe types of service and parts manual formats and their applications.
- Reference information in manuals and materials correctly.
- Define industry specific terminology and nomenclature.
- Calculate time using labor time guides and flat rate time.
- Solve problems following a diagnostic and troubleshooting manual.
- Identify manufacturer, model, serial number, and type of a part.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 14 DEMONSTRATE PROCEDURES TO LIFT EQUIPMENT**Hours: 8****Performance Assessment(s):**

Students will properly and safely lift materials with lifting and hoisting equipment used in the shop or field location. Students will demonstrate the proper and safe use of a hydraulic press and pullers.

Leadership Alignment:

Local leadership plan: Health & safety. Students will think creatively, communicate clearly assess and evaluate information while creating a safe work experience presentation including lifting equipment procedures. They will manage goals and time, interact effectively with others, work effectively in diverse teams and produce results to complete and present their presentation.

Use Systems Thinking

2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex

Standards and Competencies

Standard: Demonstrate procedures used to lift equipment

- Identify the various types of lifting and hoisting equipment.
- Properly and safely lift materials with lifting and hoisting equipment used in the shop or field location.
- Demonstrate the proper and safe use of a hydraulic press and pullers.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

Reading

CC: Reading Informational Text

Key Ideas and Details (9-10)

1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 15 CLEANING PROCEDURES

Hours: 4

Performance Assessment(s):

Students will identify basic cleaning equipment and wash parts and components of machines using cleaning equipment such as a solvent tank, pressure washer, and steam cleaner.

Students will demonstrate or describe proper disposal of cleaning material based on EPA and local regulations.

Leadership Alignment:

Local leadership: Individual or Group Energy Problem Solving: Students will think creatively, communicate clearly, access and evaluate information to demonstrate an understanding of the Technological Problem Solving method, and will be able to apply the method to a real life problem regarding tool maintenance and cleaning.

Individual
Quality Leadership: Students will work independently, be self-directed learners to determine the components of quality leader through an introductory leadership activity.

The Gift: Students will guide and lead others and be responsible to others as they promote creative team problem solving activities such as recycling used fluids.

2.C.5 Reflect critically on learning experiences and processes

Standards and Competencies

Standard: Demonstrate procedures used to clean equipment.

- Identify basic cleaning equipment.
- Wash parts and components of machines using cleaning equipment such as a solvent tank, pressure washer, and steam cleaner.
- Dispose of cleaning materials based on EPA and local regulations.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Health 2.1: Understands dimensions and indicators of health.

2.1.1 Evaluates dimensions of health and relates to personal health behaviors.

Health 2.3: Understands the concepts of prevention and control of disease.

2.3.2 Analyzes personal health practices, and how they affect non-communicable diseases.

Health 3.1: Understands how family, culture, and environmental factors affect personal health.

3.1.2 Analyzes how environmental factors impact health.

Language

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

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- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 16 PROCEDURES USED TO CLEAN EQUIPMENT**Hours: 4****Performance Assessment(s):**

Correct cleaning procedures would be:

Personal cleanliness while performing a specific task, ability to use MSDS to insure a safe working environment and proper disposal of all waste material. Ability to keep shop and classroom clean and maintain clean tools upon completion of a task.

Leadership Alignment:

Individual or group Energy Problem Solving: Students will implement innovations; use systems thinking collaborate with others and access and evaluate information to demonstrate an understanding of the Technological Problem Solving method, and will be able to apply the method to a real life problem.

Individual Quality Leadership: To determine the components of quality leadership through an introductory leadership activity.

Group the Gift: To promote creative team problem solving.

Collaborate with Others

3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams

Standards and Competencies

Standard: Demonstrate procedures used to clean equipment.

- Identify basic cleaning equipment.
- Wash parts and components of machines using cleaning equipment such as a solvent tank, pressure washer, and steam cleaner.
- Dispose of cleaning materials based on EPA and local regulations.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness**

Fitness 1.2: Acquires the knowledge and skills to safely participate in a variety of developmentally appropriate physical activities.

1.2.1 (Year One) Applies how to perform activities and tasks safely and appropriately. CBA: Concepts of Health and Fitness

Fitness 4.1: Analyzes personal health and fitness information.

4.1.1 (Year One) Analyzes daily health and fitness habits.

Language

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

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- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

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- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 17 TWO AND FOUR STROKE CYCLE ENGINE OPERATION

Hours: 6

Performance Assessment(s):

Students will compare and contrast two and four stroke cycle engines.

Leadership Alignment:

Skills USA to present oneself and ideas in a manner that will increase success.

Students will think creatively, work independently, communicate clearly, use and manage information and produce results to demonstrate the differences between two and four stroke cycle engines, in a Skills USA contest, using guidelines and rubrics for two and four stroke engines use, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Use Systems Thinking

2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex

Standards and Competencies

Standard: Explain the operations of two stroke and four stroke cycle.

- Explain two stroke cycle engine operation theory.
- Explain piston ported type operation.
- Explain reed valve type operation.
- Describe normal combustion process.
- Describe pre-ignition and its effects.
- Describe detonation and its effects.
- Explain four stroke cycle engine operation theory.
- Describe normal combustion process.
- Identify four stroke cycle engine components and parts and explain their purpose.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

Reading

Science

Physical Science

Force and Motion (Newton's Laws)

9-11 PS1A: Average velocity is defined as a change in position with respect to time. Velocity includes both speed and direction.

Systems (Predictability and Feedback)

Application (Science, Technology, and Society)

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 18 PROPER CUSTOMER SERVICE AND DIAGNOSE

Hours: 4

Performance Assessment(s):

Students will evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.

Students will demonstrate practices used to communicate with a customer regarding the cause and the prevention of future problems.

Leadership Alignment:

Students will reason effectively and make judgments and decisions while conducting research on the internet to correctly diagnose a specific engine problem. for a skills USA contest using the guidelines and rubrics for service diagnosis in the workplace, they will collaborate with others, communicate clearly access and evaluate information, manage goals and time and be responsible to others to complete the Diagnosis portion of a professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Use and Manage Information

4.B.1 Use information accurately and creatively for the issue or problem at hand

Manage Goals and Time

8.A.1 Set goals with tangible and intangible success criteria

Standards and Competencies

Standard: Demonstrate proper customer service when determining a problem.

- Interview a customer and/or the operator for information.
- Identify exact symptoms of a problem.
- Accurately separate systems.
- Complete a thorough physical examination.
- Replicate or simulate a given problem.
- Determine and classify all symptoms of a problem.
- Record the results of testing on a worksheet.
- Make repairs, then retest to verify the repair.
- Demonstrate practices used to communicate with a customer regarding the cause and the prevention of future problems.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2 - Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3 - Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when

Vocabulary Acquisition and Use

- 4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and
- 6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Performance Assessment(s):

Students will remove and inspect and replace points and condenser, replace ignition armature (ignition coil, ignition module).
Students will demonstrate timing procedure solid/electronic style distributors, static governor adjustment. -
Students will check engine for top end compression, operate the engine to check for proper starting and acceleration and perform a fuel pump pressure test and a cylinder balance test and explain findings.

Leadership Alignment:

Students will reason effectively, problem solve, access and evaluate information, manage goals and time, apply technology effectively use and manage information manage goals and time, manage projects and produce results to a troubleshooting and testing activity at a skills USA contest, using guidelines and rubrics for troubleshooting to complete the professional industry-specific activity that is part of the SkillsUSA contest with committee and employers from industry scoring.

Reason Effectively

2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Solve Problems

2.D.1 Solve different kinds of non-familiar problems in both conventional and innovative ways

Standards and Competencies

Standard: Demonstrate use of diagnostics, troubleshooting, and testing equipment.

- Describe principles of troubleshooting.
- Identify systems and their components.
- List the sequence of events in a system.
- Test the ignition system using a spark tester.
- Illustrate the effect of a partially sheared flywheel key.
- Remove and inspect and replace points and condenser.
- Remove and replace ignition armature (ignition coil, ignition module).
- Test and replace ignition armature assembly.
- Test and replace high tension leads.
- Test solid transistor controlled discharge system.
- Test capacitive ignition system.
- Demonstrate timing procedure for points style distributors.
- Demonstrate timing procedure solid/electronic style distributors.
- Measure primary and secondary resistance.
- Check/replace engine ignition kill.
- Demonstrate static governor adjustment.
- Install an engine following given specifications and procedures.
- Check top no-load speed.
- Check safety related devices for proper operation, correct all problems, and provide written documentation of repairs.
- Identify the effects of abrasive ingestion on engine components.
- Identify the entrance path of abrasives on several engine failure examples.
- Identify the effects of overheating on engine components parts.
- Define the root cause of failure on several engine failure examples.
- Identify overheating effects on two stroke engines due to poor exhaust system maintenance: i.e. piston carbon scoring.
- Identify detonation, pre ignition and effects on engine components.
- Identify two stroke engine failures caused by stale fuel varnish.
- Identify engine failure caused by lean mixture.

- Identify the effects of over-speeding on engine component parts.
- Identify the signature break on a connecting or on several engine failure examples.
- Identify exhaust port piston scoring and large end bearings due to over-speeding.
- Identify the effects of excessive vibration on engine block and mounting base.
- Check engine for top end compression.
- Check engine for base/primary compression (bottom end).
- Inspect the fuel system for proper operations and perform carburetor pressure test.
- Inspect the ignition system for proper operation and perform three point spark test.
- Inspect the exhaust system/port of carbon obstruction.
- Check crankcase integrity with pressure/vacuum pump.
- Operate the engine to check for proper starting and power output under load.
- Perform a fuel pump pressure test.
- Pressure test the carburetor.
- Operate the engine to check for proper starting and acceleration.
- Differentiate hunting/surging symptoms between fuel system or governor system.
- Perform cylinder balance test and explain findings.
- Perform cylinder compression test.
- Perform cylinder leak down test.
- Perform engine crank case vacuum test.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Integration of Knowledge and Ideas

9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Performance Assessment(s):

Students will correctly identify the engine block, valve train, crankcase, cylinder and head and their components of a small gas engine and service a crankcase breather assembly.

Leadership Alignment:

Students will reason effectively, problem solve communicate clearly, use and manage information and produce results to service a crankcase breather assembly in a skills USA contest, using guidelines and rubrics for Crankcase service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Solve Problems

2.D.1 Solve different kinds of non-familiar problems in both conventional and innovative ways

Standards and Competencies

Standard: Identify the components of an engine block, valve train, crankcase, cylinder, and head.

- Describe engine block nomenclature and function.
- Describe crankcase nomenclature and function.
- Describe cylinder nomenclature and function.
- Describe cylinder head nomenclature and function.
- Describe types of pistons, wrist pins, and rings.
- Describe connecting rod, bearing, and crankshaft nomenclature and function.
- Describe engine bearing types and service applications.
- Describe crankshaft types and service applications.
- Describe engine oil seal types.
- Describe valve train nomenclature and function.
- Describe valve retainer types.
- Explain crankshaft angle and valve timing degrees.
- Describe valve overlap and its function.
- List the benefits of positive crankcase ventilation.
- Identify the components and function of a crankcase ventilation breather assembly.
- Service a crankcase breather assembly.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language**

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Conventions of Standard English

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- 2 - Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

- 3 - Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when

Vocabulary Acquisition and Use

- 4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and
- 6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 21 APPLY PROPER LUBRICATION OF APPROPRIATE PARTS

Hours: 4

Performance Assessment(s):

Students will change engine oil and filter on a variety of selected equipment. They will label types of oil filters used on power equipment and list common oil contaminants.

Leadership Alignment:

Students will implement innovations, communicate clearly, use and manage information, work independently and be responsible to others while performing an engine oil and filter change at a skills USA contest, using guidelines and rubrics for oil change service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Communicate Clearly

3.A.1 Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts

Standards and Competencies

Standard: Apply proper lubrication to appropriate parts.

- Describe the lubrication systems nomenclature and function.
- Describe the theory of lubrication.
- Describe (generally) API oil ratings.
- Describe the meaning of SAE viscosity ratings.
- Describe the classification of 2 stroke oils.
- Describe ISO/LEG 2 stroke oil standard A,B,C,D.
- Describe Jasco oil standard, classification pc, pcw-1,-2,-5.
- List common oil contaminants.
- Label types of oil filters used on power equipment.
- State guidelines for selecting and using oils.
- Classify types of lubrication systems as for wither 2 or 4 stroke cycle engines.
- Identify terms associated with an engine lubrication system.
- List the functions of engine oil.
- Interpret engine oil application charts used in owners/operators manuals.
- Describe splash lubrication systems.
- Describe pressure lubrication systems.
- Describe oil filtration system.
- Describe methods of checking oil level in an engine.
- Change engine oil and filter on a variety of selected equipment.
- Identify the effects of insufficient lubrication on engine components pistons, cylinders, etc.
- Define cause of failure on several engine failure examples.
- Identify two stroke lubrication/fuel quality failure root cause.
- Identify the use of incorrect/no lubrication.
- Identify and describe engine failures caused by "phase separation" of fuel.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1 - Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and

2 - Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

3 - Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task,

Health and Fitness

Language

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 22 REPAIR COOLING SYSTEMS

Hours: 8

Performance Assessment(s):

Students will perform cooling system cleaning for air-cooled engines and perform cooling system flush and cleaning of liquid cooled engine to demonstrate their understanding or cooling system repair.

Leadership Alignment:

Students will reason effectively, problem solve communicate clearly, use and manage information, adapt to change and produce results while demonstrating their ability to repair a cooling system at a skills USA contest, using guidelines and rubrics for cooling system service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Reason Effectively

2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Standards and Competencies

Standard: Repair cooling systems.

- Illustrate the concepts of heat transfer.
- Define the purpose of a cooling system.
- Define the major types of cooling systems used on power equipment.
- Describe air cooled system nomenclature and function.
- List major causes of air-cooled engine overheating.
- Describe normal service procedures performed on an air-cooled engine.
- Describe proper cooling system cleaning methods.
- Perform cooling system cleaning for air-cooled engines.
- Perform cooling system flush and cleaning of liquid cooled engine.
- Remove and replace a water pump.
- Remove and replace a thermostat.
- Inspect the cooling system.
- Check for damage to the fins or fan.
- Identify debris clogging air fins.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Knowledge of Language

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 23 REPAIR FUEL SYSTEMS**Hours: 4****Performance Assessment(s):**

Students will describe potential problems for oil/fuel mixtures and repair a fuel system for a small gas engine.

Leadership Alignment:

Students will think creatively, reason effectively, problem solve communicate clearly with others, use and manage information, work independently and produce results to service a SGE fuel system at a skills USA contest, using guidelines and rubrics for fuel service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

2.D.2 Identify and ask significant questions that clarify various points of view and lead to better solutions

Standards and Competencies

Standard: Repair fuel systems

- Identify types and grades of gasoline used in power equipment.
- Describe the use of a fuel additive for storage.
- Describe proper method of carburetor cleaning.
- Identify the common types of fuel filters.
- Describe the difference between micron and mesh.
- Prepare pre-mixed fuel for a two stroke cycle engine.
- Describe potential problems for oil/fuel mixtures.
- Describe effects of using alcohol based fuels.
- Identify proper order of fuel system assembly.
- Remove and replace intake manifold.
- Identify common types of fuel pumps.
- Define fuel pump nomenclature and function.
- Define accelerator pump nomenclature and function.
- Explain the theory and function of fuel injection.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language**

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 24 REPAIR AIR AND EXHAUST SYSTEM COMPONENTS

Hours: 5

Performance Assessment(s):

Students will remove and disassemble, clean, install a repair kit in a carburetor and reassemble the carburetors.

Leadership Alignment:

Students will think creatively, work creatively with others, make judgments and decisions, problem solve apply technology effectively interact effectively with other, and produce results to repaired and exhaust system at a Skills USA contest, using guidelines and rubrics for exhaust system service, to complete the professional industry-specific activity that is part of the Skill Usa contest with committee and employers from industry scoring.

Work Creatively with Others

1.B.1 Develop, implement and communicate new ideas to others effectively

Standards and Competencies

Standard: Repair air and exhaust system components.

- Describe air filter system nomenclature and function.
- List five types of air filters used on small engines.
- Describe normal service procedures performed on each type of air filter system.
- Describe exhaust system nomenclature and function.
- Identify terms associated with exhaust systems.
- Describe types of exhaust systems.
- Describe proper service cleaning procedures for exhaust ports and spark arrestor screens.
- Describe theory and function of single stage catalyst.
- Remove and replace a carburetor on a small gasoline engine.
- Disassemble, clean, and reassemble carburetors.
- Install a repair kit in a carburetor.
- Inspect internal carburetor parts for wear.
- Remove, replace and repair fuel lines and hoses.
- Remove and replace the fuel tank, filters, caps, and lines.
- Adjust carburetor choke linkage.
- Adjust carburetor mixture screws per OEM specifications.
- Adjust carburetor float level.
- Adjust carburetor metering levers.
- Adjust the engine idle speed.
- Describe equipment problems that can occur from operating equipment with a removed/damaged exhaust system.
- State the danger of operating a power product in a closed area.
- Describe the purpose of an exhaust deflector.
- Describe the purpose of a spark arrestor screen.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1 - Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task,

Health and Fitness

Language

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Performance Assessment(s):

Students will perform current drain test using a DC shunt and perform specific gravity test on battery cell electrolyte and demonstrate applicable test procedures for testing series and parallel circuits.

Students will remove, test and replace a starter motor.

Leadership Alignment:

Students will implement innovations, reason effectively, communicate clearly, access and evaluate information, work independently and produce results to repair an ignition at a skills USA contest, using guidelines and rubrics for Ignition systems service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Use Systems Thinking

2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex

Standards and Competencies

Standard: Repair ignition, starting, and electrical systems.

- Describe the purpose of an ignition system.
- Define engine starting systems nomenclature and function.
- Describe ignition system nomenclature and function.
- Identify the components and function of a battery ignition system.
- Identify the components and function of a magneto ignition system.
- Identify the components of a recoil starting system and describe the function of each.
- Identify the components of a DC electric starting system and describe the function of each.
- Identify the components of a AC electric starting system and describe the function of each.
- Describe the operation of a break-away clutch used on AC and DC electric starter motors.
- Perform 12 volt DC starter motor current draw test.
- Remove and replace a starter motor.
- Remove, test & replace starter relay (solenoid).
- Repair three different styles of rewind starters.
- Replace starter drive gear.
- Disassemble and reassemble 12 volt DC -120 volt AC starter motor.
- Explain electrical/electronic terms that are common to the power equipment industry.
- Describe charging system nomenclature and function.
- Identify types of charging systems including under, flywheel, and belt driven.
- Describe a DC amps test.
- Describe an AC volts test.
- Describe the function of a diode.
- Describe a resistance test.
- Perform current drain test using a DC shunt.
- Remove and replace regulator/rectifier.
- Describe a series circuit.
- Describe a parallel circuit.
- Explain different types of circuit failures.
- Demonstrate applicable test procedures for testing series and parallel circuits.
- Check continuity in circuits and electrical system components.

- Check current flow in electrical systems and components.
- Inspect, test, and replace fusible links, fuses, and circuit breakers.
- Identify terminals and connectors used in electrical systems.
- Identify electrical wire sizes and selection based on anticipated current load.
- Identify sending units used in an electrical circuit and explain their function.
- Explain storage battery theory and operation.
- Remove, clean, and replace battery.
- Perform specific gravity test on battery cell electrolyte.
- Determine battery state of charge using a digital multimeter.
- Explain proper procedure for battery disposal based on EPA and local ordinance.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Comprehension and Collaboration (9-10)

1 - Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues,

Comprehension and Collaboration (11-12)

1 - Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues,

1a - Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on

Presentation of Knowledge and Ideas (11-12)

4 - Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 26 REPAIR GOVERNOR SYSTEMS**Hours: 4****Performance Assessment(s):**

Students will identify and describe governor system nomenclature and function including pneumatic (air vane) governor system and mechanical governor system.

Leadership Alignment:

Students will reason effectively, collaborate with others use and manage information be flexible and produce results to repair a governor system at a skills USA contest, using guidelines and rubrics for governor system service, to complete the professional industry-specific activity/ contest with committee and employers from industry scoring.
2.C.3 Synthesize and make connections between information and arguments

Standards and Competencies

Standard: Repair Governor Systems

- Identify the purpose of the governor system.
- Describe governor system nomenclature and function including pneumatic (air vane) governor system and mechanical governor system.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language**

CC: College and Career Readiness Anchor Standards for Language

Knowledge of Language

3 - Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career

Mathematics

Reading

Science

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Others
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboration

- Communicate Clearly
- Collaborate with Others

INFORMATION, MEDIA AND TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
- Use and Manage Information

Media Literacy

- Analyze Media
- Create Media Products

Information, Communications, and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 27 SERVICE AND MAINTAIN A CHAIN SAW**Hours: 4****Performance Assessment(s):**

Students will diagnose a specific problem for a chain saw and repair the existing problem. They also will sharpen a rotary blade; saw chain and hedge trimmer blade and replace a cutting attachment on a small gas engine,

Leadership Alignment:

Students will think creatively, problem solve, communicate clearly, manage goals and time, be self-directed information and produce results to maintain a chain saw at a skills USA contest, using guidelines and rubrics for chain saw service, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

1.A.3 Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Use and Manage Information

4.B.1 Use information accurately and creatively for the issue or problem at hand

Standards and Competencies

Standard: Service and Maintain Chain Saws

- Summarize and demonstrate generic power equipment safety.
- Operate and replace a cutting attachment.
- Sharpen rotary blade, saw chain, and hedge trimmer.
- Explain ANSI standards such as kick back, operator presence, etc.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening**

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1 - Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task,

6 - Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Health and Fitness
Language
Mathematics
Reading
Science
Social Studies
Writing

21st Century Skills

LEARNING AND INNOVATION	INFORMATION, MEDIA AND TECHNOLOGY SKILLS	LIFE AND CAREER SKILLS
<p>Creativity and Innovation</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Think Creatively <input type="checkbox"/> Work Creatively with Others <input type="checkbox"/> Implement Innovations <p>Creative Thinking and Problem Solving</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reason Effectively <input checked="" type="checkbox"/> Use Systems Thinking <input checked="" type="checkbox"/> Make Judgements and Decisions <input checked="" type="checkbox"/> Solve Problems <p>Communication and Collaboration</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communicate Clearly <input type="checkbox"/> Collaborate with Others 	<p>Information Literacy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Access and Evaluate Information <input checked="" type="checkbox"/> Use and Manage Information <p>Media Literacy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyze Media <input type="checkbox"/> Create Media Products <p>Information, Communications, and Technology (ICT Literacy)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Apply Technology Effectively 	<p>Flexibility and Adaptability</p> <ul style="list-style-type: none"> <input type="checkbox"/> Adapt to Change <input type="checkbox"/> Be Flexible <p>Initiative and Self-Direction</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Manage Goals and Time <input type="checkbox"/> Work Independently <input checked="" type="checkbox"/> Be Self-Directed Learners <p>Social and Cross-Cultural</p> <ul style="list-style-type: none"> <input type="checkbox"/> Interact Effectively with Others <input type="checkbox"/> Work Effectively in Diverse Teams <p>Productivity and Accountability</p> <ul style="list-style-type: none"> <input type="checkbox"/> Manage Projects <input checked="" type="checkbox"/> Produce Results <p>Leadership and Responsibility</p> <ul style="list-style-type: none"> <input type="checkbox"/> Guide and Lead Others <input type="checkbox"/> Be Responsible to Others

Unit 28 OVERHAUL AN ENGINE**Hours: 10****Performance Assessment(s):**

Students will disassemble an engine inspect the condition and evaluate all moving parts for replacement or repair.

Leadership Alignment:

Students will make judgments and decisions, communicate clearly, collaborate with others, apply technology effectively, interact effectively with others, manage projects and produce results to overhaul an engine at a skills USA contest or school contest, using guidelines and rubrics for Engine overhaul, to complete the professional industry-specific activity that is part of the Skills USA/ local contest with committee and employers from industry scoring.

Access and Evaluate Information

4.A.1 Access information efficiently (time) and effectively (sources)

8.A.3 Utilize time and manage workload efficiently

Standards and Competencies

Standard: Overhaul an Engine

- Disassemble engine.
- Inspect, measure, service, and repair components.
- Remove, service, and replace an exhaust system.
- Remove the cylinder and demonstrate de-carboning techniques.
- Remove and inspect the connecting rod and piston.
- Remove and inspect the crankshaft.
- Remove and replace needle bearings.
- Remove and replace main ball bearings.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening****Health and Fitness****Language****Mathematics****Reading****Science**

Physical Science

Inquiry (Conducting Analysis and Thinking Logically)

9-12 INQB: Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

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- Solve Problems

Communication and Collaboration

- Communicate Clearly
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INFORMATION, MEDIA AND TECHNOLOGY SKILLS

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- Access and Evaluate Information
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- Apply Technology Effectively

LIFE AND CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
- Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 29 INSPECT AND ENGINE**Hours: 4****Performance Assessment(s):**

Students will inspect and repair damaged spark plug thread using heli-coil and demonstrate two cycle ring installation and two cycle ring groove cleaning.

Leadership Alignment:

Students will reason effectively, problem solve communicate clearly, be flexible use and manage information be responsible to others and produce results to properly inspect and engine at a Skills USA contest, using guidelines and rubrics for Engine inspection, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Manage Goals and Time

8.A.1 Set goals with tangible and intangible success criteria

Produce Results

10.B.1 Demonstrate additional attributes associated with producing high quality products

Standards and Competencies

Standard: Inspect an Engine

- Inspect the crankcase and components.
- Demonstrate two cycle ring installation.
- Demonstrate two cycle ring groove cleaning.
- Inspect reed valves.
- Inspect intake side of piston skirt on piston ported engines valves.
- Repair damaged spark plug thread using heli-coil.
- Inspect and repair the recoil starting system.
- Inspect and service clutch assembly.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening**

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

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Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task,

Health and Fitness
Language
Mathematics
Reading
Science
Social Studies
Writing

21st Century Skills

LEARNING AND INNOVATION	INFORMATION, MEDIA AND TECHNOLOGY SKILLS	LIFE AND CAREER SKILLS
<p>Creativity and Innovation</p> <p><input type="checkbox"/> Think Creatively</p> <p><input type="checkbox"/> Work Creatively with Others</p> <p><input type="checkbox"/> Implement Innovations</p> <p>Creative Thinking and Problem Solving</p> <p><input checked="" type="checkbox"/> Reason Effectively</p> <p><input type="checkbox"/> Use Systems Thinking</p> <p><input checked="" type="checkbox"/> Make Judgements and Decisions</p> <p><input checked="" type="checkbox"/> Solve Problems</p> <p>Communication and Collaboration</p> <p><input checked="" type="checkbox"/> Communicate Clearly</p> <p><input type="checkbox"/> Collaborate with Others</p>	<p>Information Literacy</p> <p><input type="checkbox"/> Access and Evaluate Information</p> <p><input checked="" type="checkbox"/> Use and Manage Information</p> <p>Media Literacy</p> <p><input type="checkbox"/> Analyze Media</p> <p><input type="checkbox"/> Create Media Products</p> <p>Information, Communications, and Technology (ICT Literacy)</p> <p><input type="checkbox"/> Apply Technology Effectively</p>	<p>Flexibility and Adaptability</p> <p><input type="checkbox"/> Adapt to Change</p> <p><input checked="" type="checkbox"/> Be Flexible</p> <p>Initiative and Self-Direction</p> <p><input checked="" type="checkbox"/> Manage Goals and Time</p> <p><input checked="" type="checkbox"/> Work Independently</p> <p><input type="checkbox"/> Be Self-Directed Learners</p> <p>Social and Cross-Cultural</p> <p><input type="checkbox"/> Interact Effectively with Others</p> <p><input type="checkbox"/> Work Effectively in Diverse Teams</p> <p>Productivity and Accountability</p> <p><input type="checkbox"/> Manage Projects</p> <p><input checked="" type="checkbox"/> Produce Results</p> <p>Leadership and Responsibility</p> <p><input type="checkbox"/> Guide and Lead Others</p> <p><input checked="" type="checkbox"/> Be Responsible to Others</p>

Unit 30 DISASSEMBLE AND REASSEMBLE A FOUR STROKE ENGINE

Hours: 12

Performance Assessment(s):

Students will inspect and evaluate the functions of a four stroke engine and replace valve stem seals inspect valve seats, resurface or replace worn parts and assemble and test run engine.

Students will perform and explain valve lapping operation. .

Leadership Alignment:

Students will think creatively implement innovations collaborate with others problem solve, use and manage information, work independently, be responsible to others and produce results to disassemble and reassemble a four stroke engine at a skills USA contest, using guidelines and rubrics Four stroke engine assembly, to complete the professional industry-specific activity that is part of the Skills USA contest with committee and employers from industry scoring.

Implement Innovations

1.C.1 Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur

2.C.5 Reflect critically on learning experiences and processes

Standards and Competencies

Standard: Disassemble and Reassemble Four Stroke Engines

- Inspect hydraulic or mechanical lifters.
- Replace valve stem seals.
- Inspect valve guides for wear.
- Inspect valves; resurface or replace.
- Inspect valve seats, resurface or replace.
- Perform and explain valve lapping operation.
- Remove ridge from cylinder bore.
- De-glaze and clean cylinder bore using a rigid hone.
- Demonstrate the proper cleaning of the engine block.
- Explain OEM cylinder reuse specification.
- Inspect and measure camshaft bearings for wear and damage.
- Inspect valve train including, valves, rocker arms, lifters, studs, and push rods.
- Inspect balance system.
- Inspect shafts and support bearings for damage and wear.
- Measure and determine values for engine bearings.
- Use Plastic-gage to determine bearing clearances in an engine.
- Install all engine components, assemblies and gaskets: torque according to manufacturer's specifications and procedures.
- Install the crankshaft with its bearings.
- Measure crankshaft end play.
- Measure crankshaft run-out.
- Verify camshaft timing according to manufacturer's specifications and procedure.
- Adjust valves (mechanical and hydraulic).
- Assemble and test run engine.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

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Health and Fitness

Language

Mathematics

CC: Mathematical Practices (MP)

- 1 - Make sense of problems and persevere in solving them.
- 2 - Reason abstractly and quantitatively.
- 3 - Construct viable arguments and critique the reasoning of others.
- 5 - Use appropriate tools strategically.
- 7 - Look for and make use of structure.

Reading

Science

Social Studies

Writing

21st Century Skills

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- Be Responsible to Others