Updated 1.2017

Mt. Baker High School – Intro to Metals

Course: Intro to Metals		**Total Framework Hours: 62**
CIP Code: 10201	☒**Exploratory** ☐**Preparatory**	**Date Last Modified:4/30/2021**
Career Cluster:	**Agriculture Food and Natural Resource Systems**	**Cluster Pathway:** **Power, Structural, Technical**

To duplicate this blank table (for additional units), select the table, select copy, place cursor below the first table, and select paste.

COMPONENTS AND ASSESSMENTS

Performance Assessments:
Pass all safety tests with 100%.

Leadership Alignment:
Students will develop the ability to work efficiently and safely.
Safe and proper use of equipment.
Students will increase productivity and responsibility by safely using equipment and identifying any issues and reporting them.
Weekly safety meetings for 10 minutes by shop foremen.

Standards and Competencies

Unit: Safety

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 10**

AFNR – POWER STRUCTURAL TECHNICAL STANDARDS

- **PST.02.01.01.a.** Maintain the cleanliness and appearance of equipment, machinery and power units used in AFNR power, structural and technical systems to assure proper functionality.
- PST.02.01.01.c. Devise a strategy to communicate to different audiences, preventative maintenance and service schedule for equipment, machinery and power units used in AFNR power, structural and technical systems.
- PST.02.02.02.a. Examine and identify safety hazards associated with equipment, machinery and power units used in AFNR power, structural, and technical systems (e.g., caution, warning, danger, etc.).
- **PST.02.02.02.b.** Apply safety principles and applicable regulations to operate equipment, machinery and power units used in AFNR power, structural and technical systems.
- **PST.02.02.02.c.** Adjust equipment, machinery and power units for safe and efficient operation in AFNR power, structural and technical systems.

Precision Exams – Knowledge Standards

Standard 2 - UNDERSTAND AND USE WELDING SAFETY AND FIRST AID.

Standard 3 - IDENTIFY WELDING TOOLS AND EQUIPMENT.

Precision Exams – Performance Standards

1 – Follow safe practices and successfully complete safety tests.

2 – Perform housekeeping duties.

Aligned Washington State Learning Standards	
Arts	
Computer Science	
Educational Technology	
English Language Arts	**CC ELA Anchor Reading Standards** **Key Ideas and Details (6-12)** 1 - Read closely and 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 from the text. **Craft and Structure (6-12)** 4-Interpret words and phrases as they are used in the text, including determine technical, connotative and figurative meanings, and analyze how specific word choices shape meaning or tone.
Environment & Sustainability	
Financial Education	
Health and Physical Education	2.4 Acquires skills to live safely and reduce health risks.
Mathematics	
Science	
Social Studies	

COMPONENTS AND ASSESSMENTS	
Performance Assessments: SAE Project on the AET System Identify opportunities in FFA related to classroom content.	
Leadership Alignment: Students will use and manage information and manage goals and time to understand FFA and start/continue their SAE. Students will apply technology effectively by starting and maintaining their SAE project on the AET system	
Standards and Competencies	
Unit: FFA AND SAE	
Industry Standards and/or Competencies	**Total Learning Hours for Unit: 6**
SAE.01.01: The Students will establish and conduct Supervised Agriculture Experience Projects (SAE). SAE.01.01.a. Explain the history of SAE. SAE.01.01.b. Explain the benefits of SAE projects to skill development, leadership and career success. SAE.01.01.c. Explain the connection between SAE and FFA. SAE.01.01.d. Explain the five types of SAE. (Entrepreneurship, Placement, Research, Exploratory, Improvement) SAE.01.01.e. Explore ideas for SAE projects. SAE.01.01.g. Select and establish an SAE project. SAE.01.01.h. Explain and keep records on established SAE projects.	

SAE.01.01.l. Explain the three circle concept for SAE, FFA Leadership, and Classroom/Laboratory in an Agriculture Education program.	
Aligned Washington State Learning Standards	
Arts	
Computer Science	
Educational Technology	
English Language Arts	CC ELA Anchor Standards Production and Distribution of Writing (6-12) 4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose 6 - Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	CC: Mathematical Practices (MP) 1 - Make sense of problems and persevere in solving them. 2 - Reason abstractly and quantitatively. 4 - Model with mathematics. 6 - Attend to precision.
Science	
Social Studies	

COMPONENTS AND ASSESSMENTS	
Performance Assessments: **Weld symbols identification quiz** **Locally Developed Standards on ¼" steel plate:** **SMAW 6010 Pad, 6010 butt weld , 6010 Lap 2F, 6010 fillet 2F, 7018 pad, 7018 butt weld**	
Leadership Alignment: Students will access and evaluate information, produce results, manage projects, reason effectively, use systems thinking, apply technology effectively, manage goals and time, and be self directed learners while completing SMAW skills.	
Standards and Competencies	
Unit: Shielded Metal Arc Welding	
Industry Standards and/or Competencies	**Total Learning Hours for Unit: 22**
Precision Exams Knowledge Standards:	

UNDERSTAND AND USE WELDING SAFETY AND FIRST AID.
7 - USE SHIELDED METAL ARC WELDING (SMAW) PROCESSES. – 1F, 2F, 1G, 2G positions

Precision Exams Performance Standards:
5 – Set up and operate Shielded Metal Arc Welding (SMAW) equipment. – 1F, 2F, 1G, 2G

Power, Structural, Technical Standards - AFNR
PST.01.03.01.c. Evaluate the quality of metal fabrication procedures (e.g., SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch, etc.).
PST.01.03.01.b. Analyze the situation and determine the best welding and cutting process to be used in metal fabrication.
PST.01.03.02.b. Assess and select the proper electrode for use in various shielded metal arc welding situations.
PST.01.03.02.c. Construct and/or repair metal structures and equipment using metal fabrication procedures.
PST.02.02. Operate machinery and equipment while observing all safety precautions in AFNR settings
PST.03.02.01.a. Compare and contrast basic units of electricity (e.g., volts, amps, watts, and ohms) and the principles that describe their relationship (e.g., Ohm's Law, Power Law, etc.).

Aligned Washington State Learning Standards	
Arts	
Computer Science	
Educational Technology	
English Language Arts	CC: Reading for Literacy in Science and Technical Subjects Key Ideas and Details (9-10) 3 - Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions Range of Reading and Level of Text Complexity (9-10) 10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	CC: Number and Quantity (N) Quantities (N-Q) 1 -Reason quantitatively and use units to solve problems CC: Mathematical Practices (MP) 1 - Make sense of problems and persevere in solving them. 6 - Attend to precision. 7 - Look for and make use of structure.
Science	Science Physical Science Matter Properties and Change (Chemical Reactions) 9-11 PS2I: The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure.
Social Studies	

COMPONENTS AND ASSESSMENTS

Performance Assessments:

OA Beads without rod

OA beads with rod

OA cutting skills – straight cut, bevel & pierce, wrench cut

Leadership Alignment: Students will demonstrate 21st Century Skills by reasoning effectively, work independently, and manage projects. They will also produce results of progress through the completion of the Oxy-Acetylene skills: Beads with rod, Beads without rod and OA torch straight, bevel, and pierce cutting.

Standards and Competencies

Unit:
OXY-ACETYLENE WELDING AND CUTTING

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 12**

American Welding Society Annex C Level 1 Entry Level Welder Oxy Fuel Cutting
8.1.3 Sets up for manual OFC operations on carbon steel.
8.1.4 Operates manual OFC equipment on carbon steel
8.1.5 Performs straight, square edge cutting operations in the flat position on carbon steel. American Welding Society Annex C Level 1 Entry Welders Safety and Health of Workers
2.1 Demonstrate proper use and inspection of PPE.
2.2 Demonstrate proper safe operation practices in work area
2.3 Demonstrates proper use and inspection of ventilation equipment
2.6 Demonstrates proper use of precautionary labeling and MSDS Information
Precision Exams Performance Skills Standards
6-Set up and operate manual oxy-fuel gas cutting equipment.

Aligned Washington State Learning Standards

Arts	
Computer Science	
Educational Technology	
English Language Arts	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 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
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	CC: Mathematical Practices (MP) 1 - Make sense of problems and persevere in solving them.

	6 - Attend to precision. 7 - Look for and make use of structure.
Science	Science Physical Science Matter Properties and Change (Chemical Reactions) 9-11 PS2I: The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure. Systems (Predictability and Feedback) 9-12 SYSD: Systems can be changing or in equilibrium.
Social Studies	

COMPONENTS AND ASSESSMENTS
Performance Assessments: Sheet Metal Toolbox, Tap and Die skill
Leadership Alignment: Students will access and evaluate information, produce results, manage projects, reason effectively, use systems thinking, apply technology effectively, manage goals and time, and be self directed learners while completing GMAW skills.
Standards and Competencies
Unit: Sheet Metal Toolbox and Tap & Die and Bill of Materials

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 12**

AFNR Power Structural Technical Skill Standards
PST.04.01.01.b. Apply scale measurement and dimension to develop sketches of agricultural structures.
PST.04.02.01.b. Analyze a project plan to prepare a bill of materials and an estimate of material costs.

Precision Exams Knowledge Standards – Entry Level Welder
Standard 4 – USE BASIC MATH AND MEASURING SKILLS
Standard 5 READ AND INTERPRET WELDING BLUEPRINTS.
Precision Exams Performance Standards
3 – Read and correctly use a tape measure, rule, and square.

Aligned Washington State Learning Standards	
Arts	
Computer Science	
Educational Technology	
English Language Arts	
Environment & Sustainability	
Financial Education	
Health and Physical Education	

Mathematics	CC: Mathematical Practices (MP) 1 - Make sense of problems and persevere in solving them. 2 Reason abstractly and quantitatively. 4 Model with mathematics. 6 - Attend to precision. 7 - Look for and make use of structure.
Science	
Social Studies	

The 21st Century Skills should be taught and assessed throughout the course.This table should be included at the end of this document.

21st Century Skills		
Check those that students will demonstrate in this course:		
LEARNING & INNOVATION **Creativity and Innovation** ☒Think Creatively ☐Work Creatively with Others ☒Implement Innovations **Critical Thinking and Problem Solving** ☒Reason Effectively ☒**U**se Systems Thinking ☒Make Judgments and Decisions ☒Solve Problems **Communication and Collaboration** ☐Communicate Clearly ☐Collaborate with Others	**INFORMATION, MEDIA & 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 & 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