

<p>Grade/Subject/Course: Agriculture Mechanics I</p>	
<p>Unit: Arc Welding (SMAW - Shielded Metal Arc Welding)</p>	<p><u> X </u> Essential <u> </u> Important <u> </u> Compact</p>
<p>Big Idea: Metal can be joined together with electricity to produce the heat and pressure needed to cause coalescence.</p>	
<p>AFNR (Agriculture, Food, & Natural Resources) National Content Standards: AFNR Content Standards - Power, Structural, and Technical Systems - PST.01.03 (PST.01.03.01a-c and PST.01.03.02a-c) - Apply principles of physical science to metal fabrication using a variety of welding and cutting processes.</p>	<p>Interdisciplinary Standards (if applicable):</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> ● How do I join two pieces of metal together using SMAW? ● How do I select the correct electrode for the welding situation? ● How do I use PPE to stay safe when welding. 	<p>Understandings: Students will know:</p> <ul style="list-style-type: none"> ● How electricity (welding machine) produces heat and pressure to melt metals. ● How arc length, electrode angle, amperage, and speed of travel affect weld quality. ● How metal can be fit together (5 common joints). ● How to differentiate between welding electrodes based on wire core and flux coating. ● The hazards related to SMAW and ways to protect themselves from those hazards.
<p>Vocabulary: SMAW Coalescence Ultraviolet Light Electrode Ground Clamp Molten Puddle Arc/Arc Length Metallurgy Amp/Volt/Watt</p>	<p>Do/Skills: Students will be able to:</p> <ul style="list-style-type: none"> ● Calculate amps, volts, and watts. ● Identify the parts of an arc welder. ● Adjust and apply arc length, electrode angle, amperage, and travel speed to fit the weld situation. ● Select electrodes based on welding application and project type. ● Apply safety procedures and PPE while welding. ● Apply welding concepts to design and construct various welding projects.

<p><u>Assessments:</u></p> <ul style="list-style-type: none"> ● Quiz/Test ● End of unit exam ● Textbook guides ● Required welds - bead, butt, lap, T-weld ● End of unit project (ex. c-clamp) 	<p><u>Resources:</u></p> <p>Arc welders, electrodes, metal coupons, welding helmets, leather gloves, welding jackets, safety glasses, various shop tools, textbook/online support materials, and shop supplies (bolts, hex nuts, nails, wire, paint, etc.)</p>
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Elizabethtown Area School District Curriculum

<p><u>Grade/Subject/Course:</u> Agriculture Mechanics I</p>	
<p><u>Unit:</u> Small Gasoline Engine Operation</p>	<p><input checked="" type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Compact</p>
<p><u>Big Idea:</u> Small gasoline engines are made up of various parts and systems that work together to provide rotary power to complete smaller tasks.</p>	
<p><u>AFNR (Agriculture, Food, & Natural Resources) National Content Standards:</u> AFNR Content Standards - Power, Structural, and Technical Systems - PST.02.01 and PST.03.01 (PST.02.01.01a-c) Perform maintenance and service to equipment, machinery, and power units. (PST.03.01.01a-c, PST.03.01.02a-c) Troubleshoot, service, and repair components of internal combustion engines using manufacturer guidelines.</p>	<p><u>Interdisciplinary Standards (if applicable):</u></p>
<p><u>Essential Questions:</u></p> <ul style="list-style-type: none"> ● How does a small gasoline engine operate? ● How do I service/troubleshoot a small gasoline engine for best performance? 	<p><u>Understandings:</u> Students will know:</p> <ul style="list-style-type: none"> ● The events in a four-stroke and a two-stroke engine. ● The major parts and systems working within a small engine. ● The steps involved in servicing a small engine.

<p><u>Vocabulary:</u> Intake Compression Power Exhaust Stroke Timing Horsepower Displacement Atomization</p>	<p><u>Do/Skills:</u> Students will be able to:</p> <ul style="list-style-type: none">● Differentiate between the major events in a four-stroke and a two-stroke engine.● Identify the major parts of a small engine.● Analyze the function of the major parts and systems that operate within a small engine.● Consult a service/troubleshooting key to appraise small engine operation and make adjustments/corrections.● Utilize precision measuring tools to assess engine part wear.● Perform a small gasoline engine service - (change oil, clean air filter, re-gap spark plug, sharpen/balance blades).
<p><u>Assessments:</u></p> <ul style="list-style-type: none">● Quiz/Test● End of unit exam● Textbook guides● Engine parts group project● Engine teardown and assembly report● Engine measurement analysis sheet● Teamwork observation form● Customer invoice report	<p><u>Resources:</u> Briggs & Stratton engines (school supplied), small engine specialty tools, safety glasses, engine manuals, gasoline, SAE 30 oil, shop coat, hand cleaner (Fast Orange), and online industry support (Briggs Power Portal).</p>

<p>Grade/Subject/Course: Agriculture Mechanics I</p>	
<p>Unit: Oxy-Acetylene Brazing and Cutting</p>	<p><input checked="" type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Compact</p>
<p>Big Idea: Burning gases can be used to join smaller pieces of metal and cut metal.</p>	
<p>AFNR (Agriculture, Food, & Natural Resources) National Content Standards: AFNR Content Standards - Power, Structural, and Technical Systems - PST.01.03 (PST.01.03.01a-c and PST.01.03.02c) - Apply principles of physical science to metal fabrication using a variety of welding and cutting processes.</p>	<p>Interdisciplinary Standards (if applicable):</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> ● How do I use burning gasses to safely join and/or cut metal? ● What is brazing? How is it different from welding? ● How is oxygen used to cut metals? 	<p>Understandings: Students will know:</p> <ul style="list-style-type: none"> ● The parts and function of a basic oxy-acetylene rig. ● The correct steps/procedures for setting up, lighting, adjusting, and shutting down a basic oxy-acetylene rig. ● How capillary action and thermal conductivity apply to brazing metals together. ● How oxygen is used to oxidize (cut) metal.
<p>Vocabulary: Acetylene Cylinders Regulators PSI Torch Body Cutting Torch Dross Brazing Heat Capacity/Thermal Conductivity Filler/Flux</p>	<p>Do/Skills: Students will be able to:</p> <ul style="list-style-type: none"> ● Demonstrate safe procedures for setting up, lighting, adjusting, and shutting down an oxy-acetylene rig. ● Braze metals together to construct a small/thin metal project. ● Cut metals (mild steel) using an oxy-acetylene cutting torch.

Assessments:

Quiz/Test

End of unit exam

Textbook guides

Torch setup demo

Brazing demo

Cutting demo

End of unit brazing Project

Resources:

Oxy-Acetylene rigs, #5 goggles, safety glasses, filler rod, flux, metal, hardware (hex nuts, bolts, washers, nails, etc.), paint, textbook/online support materials, and shop coat/leather gloves.