

Agricultural Science II

Curriculum Guide: *Agricultural Mechanics Unit for Agricultural Science II*

Unit: V. Cold Metal Work

Unit Objective:

Students will apply principles of cold metal work by constructing an appropriate metalworking project.

Show-Me Standards: 2.5, CA3

References:

Agricultural Construction Volume II. University of Missouri-Columbia, Instructional Materials Laboratory, 1989.

Agricultural Mechanics Building Plans. University of Missouri-Columbia, Instructional Materials Laboratory, 1994.

Agricultural Mechanics Plans (Set). University of Missouri-Columbia, Instructional Materials Laboratory.

Agricultural Mechanics Unit for Agricultural Science II. University of Missouri-Columbia, Instructional Materials Laboratory, 2002.

Instructional Strategies/Activities:

- Students will engage in study questions in lesson 1.
- Students will observe instructor demonstrations of the following activities and perform the activities at the instructor's discretion: AS 1.1, Techniques for Bending Cold Metal; AS 1.2, Fastening Metal With Rivets and Pop Rivets; and AS 1.3, Using a Tap and Die Set.

Performance-Based Assessment:

Students will use common metalworking tools and procedures discussed in class to lay out and construct an appropriate metalworking project.

Assessment will be based on the overall quality of the work and the ability to safely and correctly complete the project within the available time.

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Instructor Guide**

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Use the activity sheets to demonstrate techniques for working with cold metal. Adapt these sheets as needed and use them to assess student competency at performing basic metalworking procedures. Review or supplement these activities as needed, based on student mastery of the procedures and the tools the students will be using. **NOTE: Students should only complete this performance-based activity if they have mastered all the relevant competencies and have the instructor’s permission to perform the activity.**
2. For the performance-based assessment activity, have students apply the skills and procedures discussed in the unit to construct an appropriate metalworking project.
 - a. See the Unit V Activity, *Metalworking Plans*, pp. V-43–V-44, for a project plan and additional details. The activity includes a plan for a small shelf bracket.
 - b. For additional project plans, see *Agricultural Mechanics Building Plans* and *Agricultural Mechanics Plans (Set)*, available from the Instructional Materials Laboratory, University of Missouri-Columbia, accessed November 13, 2003, at <http://www.iml.coe.missouri.edu/>.
3. The student handout for this activity is a Project Completion Checklist and Project Evaluation Checklist. Students can use the checklists to track the progress of their project and evaluate their work. Supplement or modify the student handout to reflect actual projects as needed.
4. Have students turn in their completed projects.
5. The final assessment score will be based on the overall quality of the work and the ability to safely and correctly complete the project within the available time.

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6. **ADDITIONAL ACTIVITY:** If all students are building the same project, a display board can be made as a teaching aid for the project. To make a display board, mount correctly made examples of each project piece on a board. Label each piece and indicate the number of pieces needed. Have students compare their project pieces with the correctly made examples. Students should make sure their pieces match the examples before proceeding.

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Student Handout**

Name _____

Use the Project Completion Checklist and Project Evaluation Checklist to track the progress of your project.

Project Completion Checklist

Procedure	Date Due
<input type="checkbox"/> Master all competencies necessary to complete the project.	
<input type="checkbox"/> Receive instructor approval to build the project.	
<input type="checkbox"/> Review safety precautions for tools to be used. You can lose points for not following safety precautions and other assigned procedures.	
<input type="checkbox"/> Perform a quality control inspection of the project during construction. Use the Project Evaluation Checklist.	
<input type="checkbox"/> Complete project construction.	
<input type="checkbox"/> Perform a quality control inspection of the project following completion. Use the Project Evaluation Checklist.	
<input type="checkbox"/> Turn in the completed project. Your final assessment score will be based on the overall quality of the work and your ability to safely and correctly complete the project within the available time.	

Project Evaluation Checklist

Quality Control and Shop Procedures	Criteria
Quality of Work	<ul style="list-style-type: none"><input type="checkbox"/> Fasteners are correct type and size.<input type="checkbox"/> Holes and cut edges are deburred and there are no sharp edges.<input type="checkbox"/> Measurements are correct.<input type="checkbox"/> Cuts are accurate.<input type="checkbox"/> Parts fit well for optimum strength.<input type="checkbox"/> Project is square and straight.<input type="checkbox"/> Work was completed on time.
Design and Suitability	<ul style="list-style-type: none"><input type="checkbox"/> Project is well balanced, proportional, and pleasing to the eye.<input type="checkbox"/> Project is the right size for its use.<input type="checkbox"/> Project is suitable for its intended purpose.<input type="checkbox"/> Project is good enough to sell.
Safety and Work Habits: Observe these safety procedures whenever you are in the shop.	<ul style="list-style-type: none"><input type="checkbox"/> Know how to use the equipment before you attempt to use it. Only use tools and materials the instructor has approved you to use.<input type="checkbox"/> Wear appropriate personal protective equipment.<input type="checkbox"/> Follow safety guidelines from your instructor and safety information on labels, equipment, and signs in the work area.<input type="checkbox"/> Follow assigned setup and cleanup procedures.<input type="checkbox"/> Return equipment and materials to their assigned places.<input type="checkbox"/> Do not use equipment that does not function properly.<input type="checkbox"/> Tell the instructor about any damaged or malfunctioning equipment.

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Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Quality of Work	<input type="checkbox"/> Fasteners are correct <input type="checkbox"/> Holes and cut edges are deburred and there are no sharp edges <input type="checkbox"/> Cuts and measurements are accurate <input type="checkbox"/> Parts fit well <input type="checkbox"/> Project is square and straight <input type="checkbox"/> Work was completed on time	Failed	Poor	Fair	Good	Excellent	X 20	
Design and Suitability	<input type="checkbox"/> Project is well balanced and pleasing to the eye <input type="checkbox"/> Project is the right size for its use <input type="checkbox"/> Project is suitable for its intended purpose <input type="checkbox"/> Project is good enough to sell	Failed	Poor	Fair	Good	Excellent	X 5	
Safety and Work Habits	Student followed all safety precautions	Passed				Failed	X (-25)	Negative Points *
	Student followed all assigned procedures	Excellent	Good	Fair	Poor	Failed	X (-10)	Negative Points *
TOTAL								

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Final Assessment Total _____/100 pts.
 * Overall combined score cannot be lower than 0.

Comments:

