Agricultural Science I

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

Unit: VI. Oxyfuel Cutting

Unit Objective:

Students will apply principles of oxyfuel cutting by making basic cuts with an oxyfuel outfit as part of a class-wide contest.

Show-Me Standards: 2.5, CA3

References:

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

American Welding Society. Accessed November 18, 2003, from http://www.aws.org/.

Hobart Institute of Welding Technology. Accessed November 17, 2003, from http://www.welding.org/.

Machinery Safety: Welding. National Ag Safety Database. Accessed November 17, 2003, from http://www.cdc.gov/nasd/menu/topic/machinery_welding.html.

Missouri CDE Handbook. Accessed November 14, 2003, from http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.

Missouri FFA Agricultural Mechanics Career Development Event. Accessed November 19, 2003, from http://web.missouri.edu/~pavt0689/statecon.html.

Thermadyne. Victor. Accessed November 18, 2003, from http://www.thermadyne.com/vec/index.asp?div=vec.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 and 2.
- Students will complete AS 2.1, Cutting a Straight Line Using an Oxyfuel Outfit; AS 2.2, Cutting a Bevel Using an Oxyfuel Outfit; and AS 2.3, Cutting a Circle Using an Oxyfuel Outfit.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following location: p. VI-4 (2).

Performance-Based Assessment:

Students will be divided into groups. The groups will represent teams and will participate in a contest that is similar to the oxyacetylene competency portion of the Agricultural Mechanics Career Development Event. Each student will use an oxyfuel outfit to make common cuts presented in the unit and discussed in class.

Assessment will be based on the ability to safely and correctly make the assigned cuts using the oxyfuel outfit.

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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 or adapt the activity sheets found in the unit to assess student competency at cutting with oxyfuel. Review or supplement these activities as needed, based on student mastery of the procedures and equipment 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 by making basic cuts with an oxyfuel outfit as part of a class-wide contest.

3. Divide the class into groups and assign students a series of cutting procedures to perform using the oxyfuel outfit, such as making a straight cut and a 45° bevel cut and cutting out a circle.
   a. Each student should perform all of the assigned procedures.
   b. Assign students cutting procedures that they have mastered as part of the instructional activities for this unit.

4. This activity will help prepare students for the oxyacetylene portion of the Agricultural Mechanics Career Development Event.
   a. Explain or review event guidelines as needed.
   b. Refer to the *Missouri CDE Handbook* for guidelines regarding the Agricultural Mechanics Career Development Event. The *Missouri CDE Handbook* is available from the Missouri Department of Elementary and Secondary Education at http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.

5. Have students perform the assigned cutting procedures.
   a. Performance in the oxyfuel competency contest will determine the student's individual score.
   b. Combine the individual scores of the group members to determine the team score for each group.

6. The final assessment score will be based on the ability to safely and correctly make the assigned cuts using the oxyfuel outfit.

7. Present an appropriate award to the high-scoring team and individual, if desired.

8. NOTE: The following units in this curriculum guide also include material and competencies that are addressed by the Agricultural Mechanics Career Development Event: Unit I, Common Hand Tools; Unit IV, Tool Sharpening and Reconditioning; and Unit V, Arc Welding. Some or all of the performance-based assessment activities for these units could be combined to form a mini Agricultural Mechanics Career Development Event, if desired. To conduct a mini Agricultural Mechanics Career Development Event, maintain the same student groups for all of the performance-based assessment activities. An expanded score sheet is included at the end of each of these units that can be used to track individual and group performance in the mini CDE.

9. ADDITIONAL ACTIVITY: Create a display board using the students' work. Possible display board themes include the following: each student's best work using the oxyfuel outfit, the best example of each type of procedure performed by the class, and the best work of the week.

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Unit VI—Oxyfuel Cutting
Student Handout

1. The instructor will divide the class into groups and give you a series of oxyfuel cutting procedures to perform as part of a class-wide contest.

2. Your group will compete in the contest as a team.

3. Perform the assigned cuts using the oxyfuel outfit.
   - ❑ Wear appropriate safety equipment at all times.
   - ❑ Follow all assigned safety procedures. You can lose points for not following safety precautions and other assigned procedures.
   - ❑ Inspect the equipment, materials, and work area to ensure safe and correct operation.
   - ❑ Perform the cuts using the assigned procedure.
   - ❑ Inspect your work.
   - ❑ Follow shutdown and cleanup procedures and return all equipment and materials to their assigned places.
   - ❑ Turn in your work to the instructor.

4. Your final assessment score will be based on your ability to safely and correctly make the assigned cuts using the oxyfuel outfit.

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Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Equipment Setting	Torch flame was properly adjusted	Failed	Poor	Fair	Good	Excellent	X 5	
Uniformity	All cuts are uniform	Failed	Poor	Fair	Good	Excellent	X 5	
Straight Cut	Cut is straight	Failed	Poor	Fair	Good	Excellent	X 5	
Bevel Cut	Bevel is 45°	Failed	Poor	Fair	Good	Excellent	X 5	
Circle Cut	Cut is properly positioned and the correct diameter	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								

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

Comments:

Agricultural Mechanics I Score Sheet

Team Members	Tool ID	Tool Sharpening/ Reconditioning	Arc Welding	Oxyfuel Cutting	Score
Team A					
					Total:
Team B					
					Total:
Team C					
					Total:
Team D					
					Total:
Team E					
					Total:
Team F					
					Total: