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PROGRAM CONCENTRATION:

Agriculture

CAREER PATHWAY:

***Additional Course for**

Agricultural Mechanics Pathway

COURSE TITLE:

Agricultural Metal Fabrication

Course Description: This course is designed to provide students with a more in-depth study of agricultural metal fabrication. Students interested in agricultural mechanics will have the opportunity to explore the many career possibilities in the field of agricultural metal fabrication. Additionally, hands-on-laboratory activities enhance the classroom learning experience and provide students with the skills needed to participate in Supervised Agricultural Experience Programs and FFA Career Development Events.

AG-AGF-1. Students will become oriented to the comprehensive program of agricultural education, learn to work safely in the agriculture lab and work sites, demonstrate selected competencies in leadership through the FFA and agricultural industry organizations, and develop plans for a supervised agricultural experience program (SAEP).

- a. Explain the role of the Agriculture Education program and the FFA in personal development.
- b. Demonstrate knowledge learned through a Supervised Agricultural Experience Program (SAEP).
- c. Develop leadership and personal development skills through participation in the FFA.
- d. Explore career opportunities in Agriscience through the FFA and Agriculture Education Program.
- e. Explore the professional agricultural organizations associated with the course content.
- f. Explore the history and background of the FFA.

Academic Standards:

ELA10C1 The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.

SCSh6 The student communicates scientific investigations and information clearly.

SCSh9 The student enhances reading in all curriculum areas.

ELA10LSV1 (d) The student actively solicits another person's comments or opinion. (e) The student offers own opinion forcefully without domineering.

ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines

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problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).

ELA10LSV1 (e) The student offers own opinion forcefully without domineering. (f) The student contributes voluntarily and responds directly when solicited by teacher or discussion leader. (g) The student gives reasons in support of opinions expressed.

AG-AGF-2. Students will demonstrate metal fabrication techniques to industry standards.

- a. Describe the job entry employment opportunities available in the metal fabrication industry.
- b. Research the technical occupations available to students in the metal fabrication industry.
- c. Identify the professional careers available to students in the metal fabrication industry.
- d. Describe a safe work environment.
- e. Recognize hazards in metal working.
- f. List the areas identified by various safety colors and the importance of coding.
- g. Describe safety color coding in metal fabrication.
- h. Wear proper dress and protective devices for lab activities.
- i. Identify metal working hand tools and their use.
- j. Demonstrate the proper care and storage of hand tools.
- k. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.
- l. Identify the different types of metals.
- m. Compare sizes of metal for purchase.
- n. Operate metal fabrication tools to industry standards.
- o. Demonstrate safe techniques in operating metal fabrication tools.

Academic Standards:

SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.

SCSh3 The student identifies and investigates problems scientifically.

MM1P3 The student communicates mathematically.

MM1P4 The student makes connections among mathematical ideas and to other disciplines.

MM1P5 The student represents mathematics in multiple ways.

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ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.

ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA9RC4 The student establishes a context for information acquired by reading across subject.

AG-AGF-3. Students will cut metals, join metals, condition tools, and utilize materials used in metal fabrication.

- a. Identify metal fabrication equipment.
- b. Describe adjustments and settings for metal fabrication equipment.
- c. Adjust metal fabrication equipment for optimum performance.
- d. Use metal working equipment for cutting as described by the manufacturer.
- e. Use metal working equipment for welding as described by the manufacturer.
- f. Perform the safety practices that should be observed in performing Oxy-Acetylene welding and cutting according to industry standards.
- g. Perform welding and cutting operations to standards set by the instructor.
- h. Perform the safety practices that should be observed in performing Shielded Metallic Arc Welding according to industry standards.

Academic Standards:

SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.

SCSh3 The student identifies and investigates problems scientifically.

MM1P3 The student communicates mathematically.

MM1P4 The student makes connections among mathematical ideas and to other disciplines.

MM1P5 The student represents mathematics in multiple ways.

ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.

ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA9RC4 The student establishes a context for information acquired by reading across subject.

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AG-AGF-4. Students will join metals together using the metal inert gas and/or tungsten inert gas welding process, and cut metal using the plasma arc torch.

- a. Describe adjustments and controls for welding and cutting equipment.
- b. Select appropriate materials for welding and cutting equipment.
- c. Adjust welding and cutting equipment for optimum performance.
- d. Select appropriate materials to perform welding and cutting operations.
- e. Practice welding and cutting operations to the standards set by the instructor.

Academic Standards:

SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.

SCSh3 The student identifies and investigates problems scientifically.

MM1P3 The student communicates mathematically.

MM1P4 The student makes connections among mathematical ideas and to other disciplines.

MM1P5 The student represents mathematics in multiple ways.

ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.

ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA9RC4 The student establishes a context for information acquired by reading across subject

AG-AGF-5. Students will plan and construct a metal fabrication project.

- a. Plan and draw a metal project.
- b. Formulate a bill of materials.
- c. Compare the cost of the building project using different types of metals.
- d. Fabricate a metal project.

Academic Standards:

ELA10LSV1 (d) The student actively solicits another person's comments or opinion. (e) The student offers own opinion forcefully without domineering.

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ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).

SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.

SCSh3 The student identifies and investigate problems scientifically.

MM1P3 The student communicates mathematically.

MM1P4 The student makes connections among mathematical ideas and to other disciplines.

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ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.

ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA9RC4 The student establishes a context for information acquired by reading across subject.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in *context*.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students

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explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

CTAE-RC-1 Students will enhance reading in all curriculum areas by:

Reading in All Curriculum Areas

- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

Discussing Books

- Discuss messages and themes from books in all subject areas.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

Building Vocabulary Knowledge

- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

Establishing Context

- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

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The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

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CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.