Implementation date
Fall 2009

PROGRAM CONCENTRATION: **Agriculture**

CAREER PATHWAY: ***Additional Course for Agricultural Mechanics Pathway**

COURSE TITLE: **Agricultural Power and Machinery**

Course Description: This course is designed to provide students with a more in-depth study of agricultural power and machinery. Students interested in agricultural mechanics will have the opportunity to explore the many career possibilities in the field of agricultural power and machinery. 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-AGP-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.

Implementation date
Fall 2009

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).

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-AMP-2. Students will implement a tractor maintenance and operation program.

a. Explain a tractor maintenance program.
b. Develop a detailed tractor maintenance calendar using the manufacturer's service recommendations.
c. Interpret service manual for tractor maintenance.
d. Interpret a service manual for a tractor.
e. Perform basic service and maintenance recommendations on a tractor.
f. Identify operating instructions and safety procedures for operating a tractor.
g. Operate the tractor and/or lawn equipment safely as recommended by the manufacturer.

Academic Standards:

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

ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10W3 The student uses research and technology to support writing.

MM1A3 The student solves simple equations.

MA1P1 The student solves problems (using appropriate technology).

MA1P3 The student communicates mathematically.

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

Implementation date
Fall 2009

SCSh3 The student identifies and investigates problems scientifically.

SCSh4 The student uses tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.

SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.

SPS7 The student relates transformations and flow of energy within a system.

AG-AMP-3. Students will recondition, calibrate, and maintain agricultural machinery in a safe and efficient manner.

a. Describe the procedures for preparing metal for painting.
b. Identify the parts of a paint spray gun.
c. Prepare paint for spraying.
d. Operate a paint spray gun.
e. Prepare a paint spray gun for storage.
f. Recognize skills needed in adjustment and maintenance of agricultural equipment used in the agribusiness industry.
g. Explore career opportunities in the area of assembling, adjusting, and maintaining agricultural equipment.
h. Demonstrate skills necessary for assembling agricultural equipment under field conditions.
i. Practice skills necessary to diagnose maintenance problems, lubricate machines, and make repairs.

Academic Standards:

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

ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10W3 The student uses research and technology to support writing.

MM1A3 The student solves simple equations.

Implementation date
Fall 2009
MA1P1 The student solves problems (using appropriate technology).

MA1P3 The student communicates mathematically.

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

SCSh3 The student identifies and investigates problems scientifically.

SCSh4 The student uses tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.

SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.

SPS7 The student relates transformations and flow of energy within a system.

AG-AMP-4. Students will service, maintain, repair, and operate internal combustion engines.

a. Explain the operating theories of spark ignition and compression ignition engines.
b. Interpret service and parts manuals for engines.
c. Describe the importance of servicing engines to manufacturer's recommendations.
d. Set up a maintenance calendar using the manufacturer's service recommendations.
e. Perform basic service recommendations on an engine.
f. Identify tools for engine repair.
g. Disassemble and reassemble an engine.
h. Troubleshoot and repair basic engine problems.
i. Identify operating instructions and safety procedures for operating engines.
j. Demonstrate proper operation of an engine.

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

ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

Implementation date
Fall 2009

ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10W3 The student uses research and technology to support writing.

MM1A3 The student solves simple equations.

MA1P1 The student solves problems (using appropriate technology).

MA1P3 The student communicates mathematically.

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

SCSh3 The student identifies and investigates problems scientifically.

SCSh4 The student uses tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.

SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.

SPS7 The student relates transformations and flow of energy within a system.

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

Implementation date
Fall 2009

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.

Implementation date
Fall 2009

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.

Implementation date
Fall 2009

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.