

Implementation date  
Fall 2009

**Program Concentration:**

**Agriculture**

**Career Pathway:**

**Agricultural Mechanics**

**Course Title:**

**Basic Agricultural Science and Technology**

**Course Description:** This course is the recommended foundation course for the Agricultural Mechanics Pathway. It is also the foundation course for the Agriscience Pathway that was approved by the Georgia Board of Education in September, 2006. The standards for this course can be found at:

<http://www.georgiastandards.org/DMGetDocument.aspx/Basic%20Agricultural%20Science%20and%20Technology.pdf?p=6CC6799F8C1371F6906804E169EB8EEC6ABE99EA3D1A0594E485588F0D876418&Type=D>

**PROGRAM CONCENTRATION:**

**Agriculture**

**CAREER PATHWAY:**

**Agricultural Mechanics**

**COURSE TITLE:**

**Agricultural Mechanics I**

**Course Description:** This laboratory course is designed to provide students with introductory level experiences in selected major areas of agricultural mechanics technology which may include small engine maintenance and repair, metal fabrication, wood working, electrical wiring, and maintenance of agricultural machinery, equipment, and tractors. Learning activities include information, skill development, and problem solving.

**AG-AMI-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.

Implementation date  
Fall 2009

**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.*

*ELA9RL5 The student researches the life of a particular person as it is represented in a variety of texts.*

*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 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-AMI-2. Students will identify careers in the Agricultural Mechanics Industry in the areas of woodworking, welding, small engines, electrical wiring, and agriculture machinery and operation.**

- a. Describe occupations in agricultural mechanics.
- b. Describe employment skills in agricultural mechanics.
- c. Explain requirements necessary to secure a job in the agricultural mechanics industry.
- d. Describe the job entry employment opportunities available in agricultural mechanics.
- e. Identify the professional careers available in agricultural mechanics.

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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).*

Implementation date  
Fall 2009

**AG-AMI-3. Students will demonstrate the skills necessary for wiring basic circuits safely to industry standards.**

- a. Justify fundamental safety rules of electricity.
- b. Demonstrate safety procedures for electricity to teacher's standards.
- c. Explain the purpose of the National Electrical Code.
- d. Identify tools commonly used in the electrical industry.
- e. Demonstrate the proper use of electrical tools.
- f. Select conductors of electricity.
- g. Identify switches, receptacles, and lighting outlets.
- h. Select solder less connector, and grounding materials to be used in basic circuits.
- i. Prepare and connect wires to receptacles, switches, and fixtures to standards of the electrical industry.
- j. Demonstrate the proper technique for grounding devices in a basic circuit.
- k. Describe and identify the basic principles of electrical theory.
- l. Define electrical terms.
- m. Identify electrical symbols used in diagrams and floor plans.

**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.*

*SCSh3 The student identifies and investigates problems scientifically.*

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

Implementation date  
Fall 2009

DRAFT

*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-AMI-4. Students will demonstrate the proper woodworking safety.**

- a. Describe a safe work environment.
- b. Eliminate hazards in woodworking.
- c. Distinguish the areas identified by various safety colors and the importance of the coding.
- d. Describe the meaning of each safety color.
- e. Exhibit proper dress and protective devices for laboratory activities.

**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.*

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

**AG-AMI-5. Students will identify and maintain woodworking hand tools used in the woodworking industry.**

- a. Demonstrate the use of woodworking hand tools.
- b. Demonstrate the proper care and storage of hand tools.
- c. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.

**Academic Standards:**

*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).*

Implementation date  
Fall 2009

*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.*

*MA1P3 The student communicates mathematically.*

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

**AG-AMI-6. Students will identify types and grades of lumber used in today's woodworking industry.**

- a. Describe common woods, including hardness and uses.
- b. Grade wood materials.
- c. Classify common dimension of wood materials for industry standards.

**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.*

*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.*

*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.*

Implementation date  
Fall 2009

DRAFT

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

**AG-AMI-7. Students will identify fasteners and glues used in today's woodworking industry.**

- a. Identify screws, nails, bolts, and other fasteners.
- b. Select screws, nails, bolts, and other fasteners for various uses.
- c. Identify three types of glues.
- d. Display proper techniques for making basic glue joints.

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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).*

*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.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

**AG-AMI-8. Students will identify and explain proper maintenance requirements on a typical small gasoline engine as recommended by the manufacturer.**

- a. Practice appropriate safety precautions when operating and servicing small engines to industry standards.
- b. Interpret proper maintenance procedures using a service manual.
- c. Describe major systems of a small engine.
- d. Identify small engine parts.

Implementation date  
Fall 2009

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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).*

*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.*

*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.*

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

Implementation date  
Fall 2009

**AG-AMI-9. Students will properly demonstrate the skills necessary to safely and efficiently operate a tractor and related equipment.**

- a. Describe occupations in agricultural power and machinery.
- b. Describe employment skills in agricultural power and machinery.
- c. Identify operating instructions and safety procedures for operating agricultural machinery.
- d. Describe the importance of servicing machinery and equipment to manufacturers' recommendations.
- e. Set up a maintenance calendar using the manufacturer's service recommendations.
- f. Demonstrate basic service recommendation on agricultural machinery and equipment.
- g. Interpret service manual for tractor and farm machinery equipment.
- h. Identify common types of machinery used in the agricultural industry.
- i. Describe the functions and purposes of common types of machinery used in the agricultural industry.
- j. Select and procure machinery for agricultural industries.

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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).*

*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.*

*MA1P1 The student solves problems (using appropriate technology).*

*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.*

**AG-AMI-10. Students will demonstrate metal fabrication safety.**

- a. Describe a safe work environment.
- b. Recognize hazards in metal working.
- c. List the areas identified by various safety colors and the importance of coding.
- d. Describe safety color coding in metal fabrication.
- e. Wear proper dress and protective devices for lab activities.

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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).*

*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.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

Implementation date  
Fall 2009

*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.*

**AG-AMI-11. Students will identify and properly use metal fabrication hand tools.**

- a. Identify metal working hand tools and their use.
- b. Demonstrate the proper care and storing of hand tools.
- c. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.

**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.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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 acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P1 The student solves problems (using appropriate technology).*

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

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

Implementation date  
Fall 2009

**AG-AMI-12. Students will identify metal based on its characteristics.**

- a. Identify the different types of metals.
- b. Compare sizes of metal for purchase.

**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.*

*ELA9RL5 The student researches the life of a particular person as it is represented in a variety of texts.*

*SCSh9 The student enhances reading in all curriculum areas.*

*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 (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.*

*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 acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P1 The student solves problems (using appropriate technology).*

*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.*

Implementation date  
Fall 2009

DRAFT

*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.*

## 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 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.

Implementation date  
Fall 2009

DRAFT

- 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.

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.

Implementation date  
Fall 2009

DRAFT

**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.

**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.

**PROGRAM CONCENTRATION:**  
**CAREER PATHWAY:**  
**COURSE TITLE:**

**Agriculture**  
**Agricultural Mechanics**  
**Agricultural Mechanics II**

**Course Description:** The goal of this laboratory course is to offer students intermediate level experiences in selected major areas of agricultural mechanics technology which may include small engine maintenance and repair, metal fabrication, concrete construction, building construction, plumbing, electrical wiring, soil and water conservation, and maintenance of agricultural machinery, equipment and tractors. Learning activities include information, skill development, and problem solving.

**AG-AMII-1. Students will service, maintain, repair, and operate small air-cooled engines.**

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

Implementation date

Fall 2009

- j. Demonstrate proper operation of a small 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.*

*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.*

**AG-AMII -2. Students will demonstrate skills in basic electrical wiring.**

- a. Describe the theory of electricity.
- b. Define electrical terms.
- c. Identify electrical symbols used in diagrams and floor plans.
- d. Select service entrance equipment for different jobs.
- e. Explain the theory of operation for branch circuits.
- f. Identify types of circuits and outlets.

Implementation date

Fall 2009

- g. Plan electrical circuits.
- h. Select service entrance equipment for a specific job.
- i. Select materials to wire a branch circuit.
- j. Select appropriate grounding materials for a specific wiring system.
- k. Draw a wiring diagram using appropriate symbols according to National Electrical Code.
- l. Install service entrance equipment.
- m. Install branch circuits.
- n. Install grounding materials.
- o. Determine electrical testing equipment for specific applications.
- p. Use electrical testing equipment to determine the working condition of the equipment.

**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.*

*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.*



Implementation date  
Fall 2009

**AG-AMII-3. 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.*

*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.*

Implementation date  
Fall 2009

**AG-AMII-4. Students will plan, design, draw, construct, and preserve a woodworking project.**

- a. Create woodworking project plans using simple drawing techniques.
- b. State the use and format of a bill of materials.
- c. Calculate the bill of materials.
- d. Select and plan projects that develop woodworking skills with hand tools.
- e. Handle and use woodworking tools without causing injury.
- f. Demonstrate proper techniques for using hand tools to the standards set by the instructor.
- g. Select and use wood filler for a woodworking project.
- h. Prepare wood projects for finishing by hand sanding with appropriate materials.
- i. Select and use paint, varnish, and stains on woodworking projects.

**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.*

*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.*

Implementation date  
Fall 2009

DRAFT

*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-AMII-5. Students will describe basic stationary power woodworking machines.**

- a. Perform basic procedures for using stationary power woodworking machines.
- b. Describe major parts of specified machines.
- c. Analyze the main uses and safety precautions for each woodworking machine.
- d. Demonstrate the proper operation of basic power woodworking equipment.

**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.*

*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.*

Implementation date  
Fall 2009

**AG-AMII-6. 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.

**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.*

*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.*

Implementation date  
Fall 2009

**AG-AMII-7. Students will demonstrate welding and cutting with Oxy-Acetylene.**

- a. Perform the safety practices that should be observed in performing Oxy-Acetylene welding and cutting according to industry standards.
- b. Perform welding and cutting operations to standards set by the industry.

**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.*

*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.*

Implementation date  
Fall 2009

**AG-AMII-8. Students will plan, design, draw, construct, and preserve a metal working project.**

- a. Create metal working project plans using simple drawing techniques.
- b. State the use and format of a bill of materials.
- c. Calculate the bill of materials.
- d. Select and plan projects that develop metal working skills with hand tools.
- e. Handle and use metal working tools without causing injury.
- f. Demonstrate proper techniques for using hand tools to the standards set by the instructor.
- g. Prepare metal projects for finishing by hand sanding with appropriate materials.
- h. Explain how to select and use paint, varnish, and stains on metal projects.
- i. Prepare metal projects for finishing by selecting and using appropriate materials.

**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.*

*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.*

Implementation date  
Fall 2009

DRAFT

*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-AMII-9. 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.
- g. Explore the professional agricultural organizations associated with the course content.
- h. Explore the history and background of the FFA.

## 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 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

Implementation date  
Fall 2009

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.

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.



Implementation date  
Fall 2009

DRAFT

**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.

**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.

Implementation date  
Fall 2009

DRAFT

**PROGRAM CONCENTRATION:**  
**CAREER PATHWAY:**

**Agriculture**  
**\*Additional Course for**  
**Agricultural Mechanics Pathway**  
**Agricultural Mechanics III**

**COURSE TITLE:**

**Course Description:** This laboratory course is designed to prepare students with advanced level experiences in selected major areas of agricultural mechanics technology which may include small engine maintenance and repair, metal fabrication, concrete construction, building construction, plumbing, electrical wiring, soil and water conservation, and maintenance of agricultural machinery, equipment and tractors. Learning activities include information, skill development, and problem solving.

**AG-AMIII-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.*

*ELA9RL5 The student researches the life of a particular person as it is represented in a variety of texts.*

*SCSh9 The student enhances reading in all curriculum areas.*

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

Implementation date  
Fall 2009

DRAFT

*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-AMIII-2. Students will service, maintain, repair, and operate small, two-cycle, air cooled engines.**

- a. Explain theories of operation of two-cycle engines.
- b. Identify parts and functions of two-cycle engines.
- c. Report operating systems of two-cycle engines.
- d. Develop a schedule of routine maintenance in accordance with manufacturer's manual.
- e. Perform routine service of two-cycle engines.
- f. Prepare two-cycle engine for seasonal use.
- g. Troubleshoot two-cycle engines for repair.
- h. Disassemble two-cycle engines according to manufacturer's specifications.
- i. Assemble two-cycle engine according to manufacturer's specifications.
- j. Describe hazards involved in using equipment with two-cycle engines.
- k. Operate equipment with a two-cycle engine in a safe and efficient manner.

**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-AMIII-3. 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. Practice welding and cutting operations to the standards set by the instructor.
- e. Plan, draw, and estimate materials for a metal project.
- f. Fabricate a metal project.

**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-AMIII-4. Students will construct an agricultural structure on a prepared site.**

- a. Interpret property maps to determine boundary lines.
- b. Analyze the impact of topography, climate, and utilities upon building construction.
- c. Analyze the environmental effects of the building being constructed.
- d. Interpret local codes and regulations for building construction.
- e. Interpret a blueprint and specifications of a building.
- f. Apply basic math skills to estimate construction materials.
- g. Identify construction materials for agricultural buildings.
- h. Prepare a materials list for estimating construction materials.
- i. Measure construction materials using measuring tools or instruments.
- j. Record each estimate.
- k. Analyze owner needs and purposes for the building.
- l. Determine storage space requirements.
- m. Design a cost efficient building.
- n. Design an energy efficient building.
- o. Design a building for the weather conditions of the local area.
- p. Set up and manipulate a builder's level and engineer's rod.
- q. Record accurate notes of elevation readings taken.
- r. Describe the importance of accuracy in measurements and calculations.
- s. Analyze building site for possible problems.
- t. Construct batter boards for laying out an agricultural building.
- u. Read a building site plan.
- v. Read measuring devices.
- w. Manipulate tools in the carpenter's tool kit.
- x. Demonstrate carpenter skills used in the building industry.

Implementation date  
Fall 2009

DRAFT

**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.*

*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-AMIII-5. Students will demonstrate skills necessary for safe operations of electric motors and controls that are used in the agricultural industry.**

- a. Explain the theory and operations of electric motors.
- b. List advantages of electrical motor power.
- c. Explain the use of different types of electric motors.
- d. Describe the parts of an electric motor.
- e. List factors in selecting electric motors.
- f. Recognize types of motor bearings.

Implementation date

Fall 2009

- g. Identify types of motor enclosures.
- h. Demonstrate ability to collect and interpret name plate information.
- i. Select motor control for various agricultural related jobs.
- j. Maintain motor controls.
- k. Interpret a motor control schematic diagram.
- l. Calculate total motor current required.
- m. Analyze proper conductor size based on capacity requirements.
- n. Determine conductor size based on voltage drop.
- o. Select conductor size to meet both capacity and voltage drop requirements.
- p. Determine motor protection load.
- q. Check continuity of the starting and running winds.
- r. Determine the difference between starting and running winds.
- s. Calculate the amount of current drawn.
- t. Identify proper techniques for checking the voltage on electric motors.

**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.*

*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.*

Implementation date  
Fall 2009

*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-AMIII-6. 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 simple 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.*

*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-AMIII-7. Students will demonstrate proper plumbing techniques.**

- a. Identify the types of drain and waste pipe used in agricultural and residential installations.
- b. Select the proper fittings for the planned plumbing installation.
- c. Prepare drain and waste plumbing material for installation.
- d. Install drain and waste plumbing.
- e. Replace worn or broken seals.
- f. Maintain pumping source.
- g. Maintain control systems.
- h. Maintain drainage lines.

**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.*

Implementation date  
Fall 2009

*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 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.

Implementation date  
Fall 2009

**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.

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.

Implementation date  
Fall 2009

**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.

**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.

**PROGRAM CONCENTRATION:**

**CAREER PATHWAY:**

**COURSE TITLE:**

**Agriculture**  
**\*Additional Course for**  
**Agricultural Mechanics Pathway**  
**Agricultural Electricity and**  
**Electrical Controls**

**Course Description:** This course is designed to provide students with a more in-depth study of agricultural electricity and electrical controls. Students interested in agricultural mechanics will have the opportunity to explore the many career possibilities in the field of agricultural electricity and electrical controls. Additionally, hands-on laboratory activities enhance the classroom

Implementation date  
Fall 2009

learning experience and provide students with the skills needed to participate in Supervised Agricultural Experience Programs and FFA Career Development Events

**AG-AME-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 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.*

Implementation date  
Fall 2009

**AG-AME-2. Students will demonstrate the skills necessary for safely wiring electrical circuits to industry standards.**

- a. Justify fundamental safety rules of electricity.
- b. Demonstrate safety procedures for electricity to teacher's standards.
- c. Explain the purpose of the National Electrical Code.
- d. Identify tools commonly used in the electrical industry.
- e. Demonstrate the proper use of electrical tools.
- f. Select conductors of electricity.
- g. Identify single pole switches, duplex receptacles, and ceiling outlets.
- h. Select wire nuts and grounding materials to be used in basic circuits.
- i. Prepare and connect wires to receptacles, switches, and fixtures to the standards of the electrical industry.
- j. Demonstrate the proper technique for grounding devices in a basic circuit.
- k. Describe the theory of electricity.
- l. Define electrical terms.
- m. Identify electrical symbols used in diagrams and floor plans.
- n. Select service entrance equipment for different jobs.
- o. Explain the theory of operation for branch circuits.
- p. Identify types of circuits and outlets.
- q. Plan electrical circuits.
- r. Select service entrance equipment for a specific job.
- s. Select materials to wire a branch circuit.
- t. Select appropriate grounding materials for a specific wiring system.
- u. Draw a wiring diagram using appropriate symbols according to the National Electrical Code.
- v. Install service entrance equipment.
- w. Install branch circuits.
- x. Install grounding materials.

**Academic Standards:**

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

*SCSh3 The student identifies and investigates problems scientifically.*

*SP3 The student evaluates the forms and transformations of energy.*

*SP5 The student evaluates relationships between electrical and magnetic forces*

*MM1P3 The student communicates mathematically.*

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

Implementation date  
Fall 2009

*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 areas.*

**AG-AME-3. Students will demonstrate skills necessary for safe operations of electric motors and controls that are used in the agricultural industry.**

- a. Explain the theory and operations of electric motors.
- b. List advantages of electrical motor power.
- c. Explain the use of different types of electric motors.
- d. Describe the parts of an electric motor.
- e. List factors in selecting electric motors.
- f. Recognize types of motor bearings.
- g. Identify types of motor enclosures.
- h. Demonstrate the ability to collect and interpret name plate information.
- i. Select motor control for various agricultural related jobs.
- j. Install and maintain motor controls.
- k. Interpret a motor control schematic diagram.
- l. Calculate total motor current required.
- m. Analyze proper conductor size based on capacity requirements.
- n. Determine conductor size based on voltage drop.
- o. Select conductor size to meet both capacity and voltage drop requirements.
- p. Determine motor protection load.
- q. Check continuity of the starting and running winds.
- r. Determine the difference between starting and running winds.
- s. Calculate the amount of current drawn.
- t. Identify proper techniques for checking the voltage on electric motors.

**Academic Standards:**

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

*SCSh3 The student identifies and investigates problems scientifically.*

*SP3 The student evaluates the forms and transformations of energy.*

Implementation date  
Fall 2009

*SP5 The student evaluates relationships between electrical and magnetic forces.*

*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 areas.*

## 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 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.



Implementation date  
Fall 2009

***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.

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.

Implementation date  
Fall 2009

DRAFT

**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.

**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.

**PROGRAM CONCENTRATION:**  
**CAREER PATHWAY:**

**Agriculture**  
**\*Additional Course for**  
**Agricultural Mechanics Pathway**  
**Agricultural Construction**

**COURSE TITLE:**

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

Implementation date  
Fall 2009

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-AGC-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. Explains the role of the Agriculture Education program and the FFA in personal development.
- b. Demonstrates knowledge learned through a Supervised Agricultural Experience Program (SAEP).
- c. Develops leadership and personal development skills through participation in the FFA.
- d. Explores career opportunities in Agriscience through the FFA and Agriculture Education Program.
- e. Explores 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 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.*

Implementation date  
Fall 2009

**AG-AGC-2. Students will demonstrate woodworking skills.**

- a. Describe 10 careers in the woodworking industry.
- b. Explain requirements necessary to secure a job in the woodworking industry.
- c. Describe a safe work environment.
- d. Eliminate hazards in woodworking.
- e. Distinguish the areas identified by various safety colors and the importance of the coding.
- f. Describe the meaning of each safety color.
- g. Exhibit proper dress and protective devices for laboratory activities.
- h. Demonstrate the use of woodworking hand tools.
- i. Demonstrate the proper care and storage of hand tools.
- j. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.
- k. Describe common woods, including hardness and uses.
- l. Grade wood materials.
- m. Classify common dimension of wood materials for industry standards.
- n. Identify screws, nails, bolts, and other fasteners.
- o. Select screws, nails, bolts, and other fasteners for various uses.
- p. Identify three types of glues.
- q. Display proper techniques for making basic glue joints.
- r. Create woodworking project plans using simple drawing techniques.
- s. State the use and format of a bill of materials.
- t. Calculate the bill of materials.
- u. Select and plan projects that develop woodworking skills with hand tools.
- v. Handle and use woodworking tools without causing injury.
- w. Demonstrate proper techniques for using hand tools to the standards set by the instructor.
- x. Select and use wood filler for a woodworking project.
- y. Prepare wood projects for finishing by hand sanding with appropriate materials.
- z. Explain how to select and use paint, varnish, and stains on woodworking projects.

**Academic Standards:**

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

*SCSh6 The student communicates scientific investigations and information clearly.*

*SCSh3 The student identifies and investigates problems scientifically.*

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

*MM1P3 The student communicates mathematically.*

Implementation date  
Fall 2009

*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 areas.*

**AG-AGC-3. Students will select, adjust, and use woodworking machines.**

- a. Describe basic stationary power woodworking machines.
- b. Perform basic procedures for using stationary power woodworking machines.
- c. Describe the major parts of specified machines.
- d. Analyze the main uses and safety precautions for each woodworking machine.
- e. Demonstrate the proper operation of basic power woodworking equipment.
- f. Assemble a project to plan specifications using power woodworking equipment.

**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 areas.*

Implementation date  
Fall 2009

**AG-AGC-4. Students will construct an agricultural structure.**

- a. Interpret property maps to determine boundary lines.
- b. Analyze the impact of topography, climate, and utilities upon building construction.
- c. Analyze the environmental effects of the buildings being constructed.
- d. Interpret local codes and regulations for building construction.
- e. Interpret a blueprint and specifications of a building.
- f. Apply basic math skills to estimate construction materials.
- g. Identify construction materials for agricultural buildings.
- h. Prepare a materials list for estimating construction materials.
- i. Measure construction materials using measuring tools or instruments
- j. Design a cost efficient building.
- k. Design an energy efficient building.
- l. Design a building for the weather conditions of the local area.
- m. Set up and manipulate a builder's level and engineer's rod.
- n. Record accurate notes of elevation readings taken.

**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 areas.*

**AG-AGC-4. Students will demonstrate the skills necessary for wiring basic circuits safely to industry standards.**

- a. Justify fundamental safety rules of electricity.
- b. Demonstrate safety procedures for electricity to teacher's standards.
- c. Explain the purpose of the National Electrical Code.

Implementation date  
Fall 2009

- d. Demonstrate the proper use of electrical tools.
- e. Select conductors of electricity.
- f. Identify single pole switches, duplex receptacles, and ceiling outlets.
- g. Select wire nuts and grounding materials to be used in basic circuits.
- h. Prepare and connect wires to receptacles, switches, and fixtures to standards of the electrical industry.
- i. Demonstrate the proper technique for grounding devices in a basic circuit.
- j. Describe the theory of electricity.
- k. Define electrical terms.
- l. Identify electrical symbols used in diagrams and floor plans.
- m. Select service entrance equipment for different jobs.
- n. Explain the theory of operation for branch circuits.
- o. Identify types of circuits and outlets.
- p. Plan electrical circuits.
- q. Select service entrance equipment for a specific job.
- r. Select materials to wire a branch circuit.
- s. Select appropriate grounding materials for a specific wiring system.
- t. Draw a wiring diagram using appropriate symbols according to the National Electrical Code.
- u. Install service entrance equipment.
- v. Install branch circuits.
- w. Install grounding materials.

**Academic Standards:**

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

*SCSh3 The student identifies and investigates problems scientifically.*

*SP3 The student evaluates the forms and transformations of energy.*

*SP5 The student evaluates relationships between electrical and magnetic forces.*

*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.*

Implementation date  
Fall 2009

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

**AG-AGC-5. Students will demonstrate the plumbing skills for agricultural structures.**

- a. Perform the safety practices that should be observed in performing plumbing work in accordance to industry standards.
- b. Identify the proper tools to be used when plumbing with plastic materials.
- c. Maintain plumbing tools used in plumbing with plastic.
- d. Identify the standard plastic fittings used in plumbing.
- e. Select the correct plastic plumbing materials for plumbing installation.
- f. Select the correct plastic plumbing fittings for plumbing installation
- g. Demonstrate the proper uses of plumbing tools to standards set by the instructor.
- h. Prepare plastic plumbing materials for installation.
- i. Measure and cut plastic pipe to the standard set by the instructor.
- j. Select the proper fitting for the planned plumbing installation.
- k. Select the proper glues to use in different plumbing installations.
- l. Demonstrate the proper method to install plumbing.

**Academic Standards:**

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

*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 areas.*

**AG-AGC-6. Students will demonstrate concrete construction techniques to industry standards.**

- a. Practice construction safety practices.
- b. Identify safety equipment to use in concrete work.
  - c. Identify hand tools used for concrete work.



Implementation date  
Fall 2009

- d. Demonstrate the proper skills of maintaining concrete hand tools.
- e. Differentiate the notations and symbols on plans and specifications for concrete.
- f. Apply the procedure for determining concrete in cubic yards.
- g. Identify the importance of estimating waste allowance.
- h. Apply precision skills with measuring tools.
- i. Explain the requirement for accuracy of measurement and estimates.
- j. Interpret the building plans and specifications regarding concrete mix ratio and quality.
- k. Lay out concrete forms.
- l. Install concrete forms using carpenter's tool kit.
- m. Lay out reinforcement using steel, wire mesh, and other materials with carpenter's tool kit.
- n. Install steel, wire mesh, and other materials with carpenter's tool kit.
- o. Apply safety procedures when using portable circular saw, hammers, sledges, and sharp edges.
- p. Measure cement, sand, gravel, and water.
- q. Prepare concrete mix for different types of weather conditions.
- r. Perform a slump test.
- s. Interpret plans for preparation of forms, delivery, placement, and consolidation of concrete into form.
- t. Describe procedures to screed wet concrete.
- u. Demonstrate the use of various types of hand finishing tools for concrete finishing.
- v. Describe the procedures to cure concrete.
- w. Select the proper ingredients for mixing concrete.
- x. Select the proper ingredients for mixing mortar.
- y. Demonstrate the proper procedures for mixing concrete.
- z. Demonstrate the proper procedure for mixing mortar.
- aa. Locate tools needed for laying blocks.
- bb. Describe tools needed for mixing mortar.
- cc. Construct a corner for a block wall.
- dd. Demonstrate the proper procedures for using concrete tools in laying blocks.

**Academic Standards:**

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

*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.*

Implementation date  
Fall 2009

DRAFT

*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 areas.*

## 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 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.

Implementation date  
Fall 2009

DRAFT

- 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.

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.

Implementation date

DRAFT

Fall 2009

**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.

**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.

**PROGRAM CONCENTRATION:**

**CAREER PATHWAY:**

**COURSE TITLE:**

**Agriculture**  
**\*Additional Course for**  
**Agricultural Mechanics Pathway**  
**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.

Implementation date  
Fall 2009

- 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 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.

Implementation date  
Fall 2009

- 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.*

*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.*

Implementation date  
Fall 2009

*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-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*

Implementation date  
Fall 2009

DRAFT

**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.*

*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.*

*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.*

**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*.



Implementation date  
 Fall 2009

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 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

DRAFT

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.

**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.

Implementation date  
Fall 2009

DRAFT

**PROGRAM CONCENTRATION:**  
**CAREER PATHWAY:**

**Agriculture**  
**\*Additional Course for**  
**Agricultural Mechanics Pathway**  
**Agricultural Power and Machinery**

**COURSE TITLE:**

**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.*

*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).*

Implementation date  
Fall 2009

*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.*

*SCSh3 The student identifies and investigates problems scientifically.*

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

Implementation date  
Fall 2009

*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.*

*MA1P1 The student solves problems (using appropriate technology).*

*MA1P3 The student communicates mathematically.*

Implementation date  
Fall 2009

*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.*

*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

DRAFT

*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 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.

Implementation date  
Fall 2009

***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.

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.



Implementation date  
Fall 2009

**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.

**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.