

## DOCUMENT RESUME

ED 397 281

CE 072 166

TITLE Mississippi Curriculum Framework for Agriculture Production (Program CIP: 01.0301--Agricultural Prod. Workers & Mgrs.). Secondary Programs.

INSTITUTION Mississippi Research and Curriculum Unit for Vocational and Technical Education, State College.

SPONS AGENCY Mississippi State Dept. of Education, Jackson. Office of Vocational and Technical Education.

PUB DATE 1 Aug 95

NOTE 156p.; For related documents, see CE 072 162-231.

PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052)

EDRS PRICE MF01/PC07 Plus Postage.

DESCRIPTORS Academic Education; Agribusiness; \*Agricultural Education; \*Agricultural Engineering; \*Agricultural Production; \*Agronomy; \*Animal Husbandry; Behavioral Objectives; Classroom Techniques; Competence; \*Competency Based Education; Core Curriculum; Distributive Education; Educational Equipment; Employment Qualifications; Leadership; Marketing; Recordkeeping; Secondary Education; Soil Science; State Curriculum Guides; Statewide Planning; Student Evaluation; Vocational Education

IDENTIFIERS Mississippi

## ABSTRACT

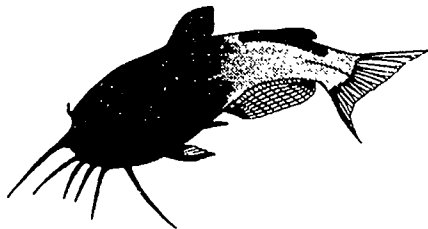
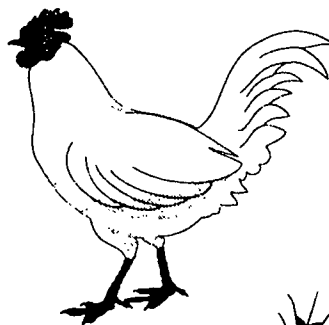
This document, which reflects Mississippi's statutory requirement that instructional programs be based on core curricula and performance-based assessment, contains outlines of the instructional units required in local instructional management plans and daily lesson plans for agriculture production I and II. Presented first are a program description and course outlines. Section I contains curriculum frameworks for both courses, and section II contains outlines of the instructional units required in each course. Units in course I are as follows: careers, leadership/FFA activities, Supervised Agricultural Experience (SAE) program, animal science and management, agricultural plant parts and classification, plant reproduction and nutrition, agricultural mechanics orientation and safety, introduction to agricultural structures, basic welding, basic cutting and welding, basic electricity, and small engines. Units in course II include the following: agricultural business organization; records and recordkeeping; taxes, insurance, and business law; agricultural economics/marketing; agricultural credit; environmental quality control; property acquisition; differential leveling; plant pest control and pesticide safety; advanced welding; oxyacetylene brazing and welding; agricultural construction; advanced electricity; and equipment operation, maintenance, and repairs. Each unit includes suggested time on tasks, competencies and objectives, teaching strategies, assessment strategies, and resources. Recommended tools and equipment are listed in section III. Appended are lists of related academic topics and workplace skills for the 21st century and student competency profiles for both courses. (YLB)

# Mississippi Curriculum Framework for Agriculture Production

ED 397 281

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**Secondary  
Vocational and Technical Education  
1995**

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MISSISSIPPI  
CURRICULUM FRAMEWORK  
FOR  
AGRICULTURE PRODUCTION

(PROGRAM CIP: 01.0301 - AGRICULTURAL PROD. WORKERS & MGRS.)

SECONDARY PROGRAMS

1995

August 1, 1995

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Published by the:

Office of Vocational and Technical  
Education  
Mississippi Department of Education  
Jackson, Mississippi

Research and Curriculum Unit for  
Vocational and Technical Education  
College of Education  
Mississippi State University  
Mississippi State, Mississippi

1995

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## FOREWORD

The courses in this document reflect the following statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended:

The State Department of Education shall provide an instructional program and establish guidelines and procedures for managing such programs in the public schools as part of the State Program of Educational Accountability and Assessment of Performance. . .

The department shall provide that such program or guidelines . . . are enforced through the performance-based accreditation system.

The local school board must adopt the objectives that will form the core curriculum that will be systematically delivered throughout the district.

Standards for student performance must be established for each core objective in the local program and those standards establish the district's definition of mastery for each objective.

There shall be an annual review of student performance in the instructional program against locally established standards.

Each secondary vocational-technical course consists of a series of instructional units which focus on a common theme. All units have been written using a common format which includes the following components:

- Unit Number and Title
- Suggested Time on Task - The number of days of instruction that should be required to teach the competencies and objectives of the unit. For secondary occupational programs, a "day" represents a two-period block of instruction.
- Competencies and Suggested Objectives
  - A **Competency** represents a general concept of performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies in the curriculum framework.
  - The **Suggested Objectives** represent the enabling and supporting knowledge and performances that will indicate mastery of the competency.
- Suggested Teaching Strategies - This section of each unit indicates strategies that can be used to enable students to master each suggested objective. Teachers should feel free to modify or enhance these suggestions based on needs of their students and resources available in order to provide optimum learning experiences for their students.

- Suggested Assessment Strategies - This section indicates strategies that can be used to measure student mastery. Examples of suggested strategies could include classroom discussions, laboratory exercises, and student assignments. Again, teachers should feel free to modify or enhance these suggested assessment strategies based on local needs and resources.
- Suggested Resources - This section indicates some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested and the list may be modified or enhanced based on needs and abilities of students and on available resources.

The following guidelines were used in developing the curriculum framework in this document and should be considered in developing local instructional management plans and daily lesson plans:

- The content of the courses in this document reflects approximately 75 percent of the time allocated to each course. For a one-year course, this means that the content of the existing units of instruction should represent approximately 135 days of instruction. The remaining 25 percent of each course should be developed at the local district level and may reflect:
  - Additional units of instruction within the course related to topics not found in the state framework.
  - Activities which develop a higher level of mastery on the existing competencies and suggested objectives.
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed/revised.
  - Activities which implement components of the Mississippi Tech Prep Initiative, including integration of academic and vocational-technical skills and coursework, school-to-work transition activities, and articulation of secondary and postsecondary vocational-technical programs.
  - Individualized learning activities, including work site learning activities, to better prepare individuals in the courses for their chosen occupational area.

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- Sequencing of the units of instruction within a course is left to the discretion of the local district. Naturally, foundation units related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other units related to specific skill areas in the course, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

## ACKNOWLEDGEMENTS

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## PROGRAM DESCRIPTION

### AGRICULTURE PRODUCTION

(Program CIP: 01.0301 - Agricultural Prod. Workers & Mgrs.)

Agriculture Production is an instructional program designed to prepare students to enter occupations related to the production of agricultural products, including crops, livestock, and specialty enterprises. These concepts are taught through applications such as the Supervised Agricultural Experience Program (SAE); FFA Contests and Proficiency Awards Programs; and Agricultural Planning and Production Project. This program relies upon computer simulations utilizing the Agricultural Satellite Information Service (ASIS). The FFA is an intra-curricular vocational student organization designed to provide a learning laboratory for the implementation of this curriculum. Graduates may become employed at the entry level or pursue careers in agriculture, agribusiness, or natural resources education in postsecondary or higher education.

## COURSE OUTLINE

## AGRICULTURE PRODUCTION I

<u>Unit No.</u>	<u>Unit Title</u>	<u>No. of Days</u>
Unit 1	Careers in Production Agriculture	5
Unit 2	Leadership/FFA Activities	10
Unit 3	Developing a SAE Program (SAE)	10
Unit 4	Animal Science and Management	15
Unit 5	Parts and Classification of Agricultural Plants	10
Unit 6	Plant Reproduction and Nutrition	10
Unit 7	Agricultural Mechanics Orientation and Safety	15
Unit 8	Introduction to Agricultural Structures	15
Unit 9	Basic Welding	15
Unit 10	Basic Cutting and Welding	10
Unit 11	Basic Electricity	10
Unit 12	Small Engines	10

## AGRICULTURE PRODUCTION II

<u>Unit No.</u>	<u>Unit Title</u>	<u>No. of Days</u>
Unit 1	Agricultural Business Organization	4
Unit 2	Records and Record Keeping	4
Unit 3	Taxes, Insurance, and Business Law	8
Unit 4	Agricultural Economics/Marketing	8
Unit 5	Agricultural Credit	8
Unit 6	Environmental Quality Control	8
Unit 7	Property Acquisition	5
Unit 8	Differential Leveling	10
Unit 9	Plant Pest Control and Pesticide Safety	15
Unit 10	Advanced Welding	15
Unit 11	Oxyacetylene Brazing and Welding	10
Unit 12	Agricultural Construction	15
Unit 13	Advanced Electricity	10
Unit 14	Agricultural Equipment Operation, Maintenance, and Repair	15

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SECTION I:  
MODEL CURRICULUM FRAMEWORK  
FOR  
AGRICULTURE PRODUCTION

## CURRICULUM FRAMEWORK

**Course Name:** Agriculture Production I

**Course CIP Code:** 01.0301

**Course Description:** Agriculture Production I is the entry level course of the secondary Agriculture Production program. Students in Agriculture Production will gain foundation competencies related to careers in production agriculture, FFA/leadership activities, supervised agricultural experience program, animal science and management, parts and classification of agricultural plants, plant reproduction and nutrition, introduction to agricultural structures, basic welding, basic cutting and welding, basic electricity, and small gas engines. (2-2½ Carnegie units, depending upon time spent in the course)

### **Competencies and Suggested Objectives:**

1. Identify careers available in production agriculture.
  - a. Describe career opportunities in production agriculture.
  - b. Describe career opportunities in agricultural mechanics.
  - c. Describe career opportunities in agricultural processing.
  - d. Describe career opportunities in forestry.
  - e. Describe career opportunities in horticulture.
  - f. Describe career opportunities in natural resources management.
  - g. Describe career opportunities in agribusiness.

*Related Academic Topics (See Appendix A):*  
C1, C4, C5

*Workplace Skills (See Appendix B):*  
WP2
2. Analyze careers in production according to the factors influencing career choices.
  - a. Describe careers available in production agriculture.
  - b. Describe educational requirements for careers in production agriculture.
  - c. Interpret earnings opportunities in agricultural production careers.
  - d. Compare working conditions in careers in production agriculture.
  - e. Describe personal interests leading to careers in production agriculture.
  - f. Compare employee benefits available to careers in agriculture.

*Related Academic Topics (See Appendix A):*  
C1, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP2, WP6
3. Prepare a written report on a tentative career choice.
  - a. Select a tentative career.
  - b. Obtain information pertaining to a career in agricultural production.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP6*

4. Explain FFA organizational activities that promote and recognize achievements in agricultural production.
  - a. Describe the history and development of the FFA.
  - b. Describe contests and awards programs.
  - c. Participate in personal development seminars.
  - d. Attend leadership conferences and conventions.
  - e. Explain national and international exchange programs.
  - f. Plan for educational experience with industry.
  - g. Determine opportunities for participation in personal and community development programs.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

5. Identify the benefits of FFA participation to an individual and to the agricultural industry.
  - a. Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.
  - b. Explain benefits of exposure to the agricultural industry environment and multicultural experiences.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

6. Explain opportunities for members in the FFA organization.
  - a. Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

7. Develop and present a 3-5 minute speech on an agricultural topic.
  - a. Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

8. Explain the purposes and functions of parliamentary procedure.
  - a. Conduct a meeting.
  - b. Describe different methods of voting and handling of motions.
  - c. Assume officer positions and describe their functions.
  - d. Demonstrate procedures for receiving and disposing of motions.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP2, WP3, WP6
9. Describe the purposes and requirements of the SAE.
  - a. Establish objectives for the SAE.
  - b. Determine the availability of time and money to invest.
  - c. Select a system of record keeping.
  - d. Determine benefits of participation in SAE.
  - e. Determine types of SAE programs.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
10. Develop a long-range personal plan for the SAE.
  - a. Set long-range goals.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
11. Develop a short-range personal plan.
  - a. Set short-range goals.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
12. Complete a training agreement for the SAE.
  - a. Establish requirements of student, parents, supervisor, and/or employer.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3, WP6
13. Describe agricultural record keeping for the SAE.
  - a. Determine which records to keep, why, and how to maintain each system.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6



14. Maintain agricultural records for the SAE.
  - a. Prepare income and expense records.
  - b. Prepare inventory records.
  - c. Compute enterprise summaries.
  - d. Maintain placement records.
  - e. Summarize the SAE program.
  - f. Maintain leadership activity records.
  - g. Compute a net worth statement.
  - h. Prepare FFA Proficiency Award application and State FFA Degree application.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

15. Select proper animal for specific farm enterprise or for participation in livestock shows and sales.
  - a. Identify types of animals for use in beef, dairy, swine, poultry, sheep, horses, and aquaculture enterprises.
  - b. Describe characteristics of breeds of livestock used in beef, dairy, swine, poultry, sheep, horses, aquaculture, and other species of local interest.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6*

*S3, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4*

16. Develop knowledge of nutrition in livestock production.
  - a. Identify terms related to animal nutrition.
  - b. Identify sources of nutrient groups and their functions.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6*

*S3, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4*

17. Apply management practices for maintaining animal health.
  - a. Determine management practices for maintaining animal health.
  - b. Determine causes and prevention of disease and parasites.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6*

*S3, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

18. Explain procedures for managing livestock reproduction.
  - a. Define terms associated with livestock reproduction.
  - b. Describe periods of estrus and gestation in livestock.

- c. Read and interpret Estimated Progeny Difference (EPD).

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

M6, M7

S1, S3, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

19. Identify the parts of a plant.

- a. Describe the vegetative parts of a plant.  
b. Describe the reproductive parts of a plant.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6

20. Explain the functions of the basic parts of a plant.

- a. Describe the function of roots for support and intake of water and nutrients.  
b. Describe the function of the plant flower for reproduction.  
c. Describe the function of the plant stem for support and uptake of water and nutrients.  
d. Describe the function of leaves for photosynthesis.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6

21. Describe how plants are classified.

- a. Classify plants by life cycle.  
b. Classify plants by longevity including annual, biennial, and perennial plants.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6

22. Explain the different classes of agricultural plants based upon their uses.

- a. Describe classes of oil crops, cereal crops, forage and pasture, fiber, and vegetable or fruit.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6

23. Explain the differences in plants including differences in seed and leaves.

- a. Describe monocotyledonous plants.
- b. Describe dicotyledonous plants.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6

24. Explain the different ways in which plants reproduce.

- a. Describe asexual reproduction.
- b. Describe sexual reproduction.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

25. Identify the parts of a complete flower.

- a. Describe the pistil.
- b. Describe the stamen.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

26. Explain the process by which seeds are produced.

- a. Describe epigeal seed production.
- b. Describe hypogeal seed production.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

27. Explain the stages in seed germination.

- a. Describe seed to moisture contact.
- b. Describe splitting of seed coat.
- c. Describe hypocotyl emergence.
- d. Describe development of radicle.
- e. Describe emergence of primary root.
- f. Describe opening of seed leaf.
- g. Describe development of terminal bud.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

28. Explain the requirements for seed germination and growth.
- Describe the effects of moisture.
  - Describe the effects of temperature.
  - Describe the effects of light.
  - Describe the effects of air.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

29. Explain possible causes of poor or no seed germination.
- Describe the effects of temperature extremes on germination.
  - Describe the effects of too much or inadequate moisture.
  - Describe the effects of poor seed quality.
  - Describe the effects of the presence of pests.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

30. Identify the major plant nutrients that are supplied through the soil and identify their functions.
- Describe the function of nitrogen in plant growth and of protein content in plant growth and leaf or bud development.
  - Describe the function of phosphorous for seed formation, winter hardening, and root development
  - Describe the function of potassium for leaf development, disease resistance, oil formation, and fiber formation.

*Related Academic Topics (See Appendix A):*

C1, C2, C4, C6

S2, S5, S8

*Workplace Skills (See Appendix B):*

WP2, WP4, WP5, WP6

31. Identify the secondary nutrients that must be present for proper growth.
- Describe the function of sulfur, magnesium, and calcium in plant growth.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

32. Explain the principles involved in determining the amounts and kinds of fertilizer to use.
- Determine the amount and kind of fertilizer based upon type of soil, type of plant, and yield desired.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

33. Interpret the analysis of a complete fertilizer.
- Determine the percent of N based upon the interpretation of a label.
  - Determine the percent of P based upon the interpretation of a label.
  - Determine the percent of K based upon the interpretation of a label.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*M7*

*S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

34. Obtain a soil sample for fertility testing.
- Select soil sampling equipment.
  - Perform soil sampling technique.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*M7*

*S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

35. Identify general safety precautions for shop work.
- Describe procedures for maintaining a clean and orderly shop.
  - Describe personal behavior and personal safety requirements.
  - Describe shop organization.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

36. Apply personal behavior required for shop and laboratory work.
- a. Demonstrate appropriate personal manners, cooperation, work attitude, and goal setting.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
37. Apply personal safety equipment required in shop and laboratory work.
- a. Demonstrate safe use of head, eye, hearing, body, hand, and foot protective devices.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
38. Apply general safety rules pertaining to hand and power tools.
- a. Demonstrate rules for hand tools including basic operation, danger points, and observer safety.
  - b. Demonstrate rules for power tools including basic operation, safeguards in place, danger points, observer safety, and electrical safety.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
39. Apply safety precautions in using stationary power tools.
- a. Demonstrate basic operation, safeguards in place, danger points, observer safety, and electrical safety.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
40. Match classes of fire to their correct description.
- a. Compare fire types A, B, C, and D.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
41. Apply rules of safety relating to different situations in the shop.
- a. Demonstrate rules of safety with fire prevention, oil and grease, lifting and hoisting, electricity, compressed air equipment, and batteries.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5, C6

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

42. Apply procedures for managing solvents and hazardous materials.  
a. Demonstrate safe storage, use, and disposition of hazardous waste.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5, C6

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

43. Apply first aid procedures to use in treating injuries resulting from using shop equipment.

- a. Demonstrate procedures to clear the airway, stop the bleeding, protect the wound, and prevent shock.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5, C6

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

44. Apply proper safety procedures with tools, equipment, and hazardous materials.

- a. Identify proper safety procedures with tools, equipment, and hazardous materials.

- b. Demonstrate proper safety procedures with tools, equipment, and hazardous materials.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

45. Select and utilize proper equipment for a specific job.

- a. Identify equipment for a specific job.

- b. Demonstrate correct procedures for use of selected hand and power tools.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

46. Develop a bill of materials for a specific job.

- a. Identify the components of a bill of materials.

- b. Prepare a bill of materials for a specific project or job.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M7

S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

47. Describe proper procedures for maintaining and storing equipment.

a. Identify procedures for maintaining equipment.

b. Identify procedures for storing equipment.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4

48. Construct a building project.

a. Perform a building project utilizing proper techniques of construction.

*Related Academic Topics (See Appendix A):*

C2, C3, C4, C5

M4, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

49. Identify common equipment and tools used in welding.

a. Describe major types of welders including electric arc, metal inert gas (MIG), and tungsten inert gas (TIG).

b. Describe tools used with each type of welding.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

*Workplace Skills (See Appendix B):*

WP1, WP2, WP6

50. Apply safety precautions used in welding.

a. Use eye protection, proper apparel, ventilation, and materials handling procedures.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3

51. Describe different welding supplies used in welding.

a. Identify low hydrogen, mild steel, and alloy welding electrodes.

b. Identify the different types of gases involved in the shielded arc welding process.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

*Workplace Skills (See Appendix B):*

WP1, WP2, WP3



52. Explain the meanings of the numbers in the electrode classification system.
- Identify electrodes based upon tensile strength, position, and special characteristics.
  - Identify different types of wire and wire sizes (example: flux cored wire).
  - Describe the function of welding flux.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M1, M8*

*Workplace Skills (See Appendix B):*

*WP1, WP2*

53. Compare the different types of welds.
- Identify bead, groove, and fillet welds.
  - Identify the types of weld joints including T, lap, corner, edge, and butt.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2*

54. Perform various welding techniques.
- Perform welding techniques including start, stop and re-start, pad construction, flat butt construction, and flat fillet.
  - Utilize various welding equipment including electric arc, MIG, and TIG.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

55. Identify parts of the oxyacetylene welding equipment.
- Assemble cutting attachment, welding attachment, and regulators and gages.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

56. Apply safety procedures for using oxyacetylene equipment.
- Demonstrate removal of flammable materials, lighting, adjustment, and operations.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

57. Identify the different types of oxyacetylene flames.
- Compare neutral, oxidizing, and carburizing flames.

*Related Academic Topics (See Appendix A):*

*C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP4*

58. Set up oxyacetylene cutting and welding equipment.

- a. Anchor cylinders to dolly or wall.
- b. Crack cylinder valves.
- c. Attach regulators.
- d. Flush regulators.
- e. Attach hoses and flush.
- d. Attach torch body and flush.
- e. Leak test connections using soapy water.
- f. Adjust regulator pressures.
- g. Select cutting or welding tips.

*Related Academic Topics (See Appendix A):*

*C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP5*

59. Operate oxyacetylene equipment.

- a. Set up and adjust oxyacetylene equipment.
- b. Make a cut in mild steel.

*Related Academic Topics (See Appendix A):*

*C2, C3*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

60. Cut metal with plasma arc cutter.

- a. Identify parts of plasma arc cutter.
- b. Perform set-up of plasma arc cutter.
- c. Perform operation of plasma arc cutter to make cuts in steel, aluminum, and stainless steel.

*Related Academic Topics (See Appendix A):*

*C2, C3*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

61. Explain the relationship between volts, amps, and watts.

- a. Describe the applications of volts, amps, and watts.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M7*

*S6*

*Workplace Skills (See Appendix B):*

*WP2, WP4*

62. Describe causes of electrical accidents.
- a. Demonstrate prevention of electrical shorts circuits, circuit overloads, improper insulation, and presence of moisture.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6
- Workplace Skills (See Appendix B):*  
WP1, WP4, WP5, WP6
63. Describe general precautions to be followed in working with electrical equipment and electricity.
- a. Demonstrate procedures for respect for electricity, use of proper tools, disconnect power when working on circuits, proper grounding and safety devices, and proper working environment.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6
- Workplace Skills (See Appendix B):*  
WP1, WP4, WP5, WP6
64. Describe the flow of electricity in a circuit.
- a. Demonstrate the application of Ohm's Law.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6
- Workplace Skills (See Appendix B):*  
WP2, WP4
65. Identify and use electrical tools.
- a. Demonstrate use of the volt meter, amp meter, pliers, screwdrivers, wire cutters, and wire strippers.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6
- Workplace Skills (See Appendix B):*  
WP1, WP4, WP5, WP6
66. Identify and use electrical materials.
- a. Demonstrate use of wires, insulation materials, control devices, overload devices, and conduit.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

M7

S6

*Workplace Skills (See Appendix B):*

WP1, WP4, WP5, WP6

67. Identify safety devices used in electrical circuits.

- a. Demonstrate use of breakers, fuses, ground fault connector interrupters, and control switches.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

M7

S6

*Workplace Skills (See Appendix B):*

WP1, WP4, WP5, WP6

68. Explain the major parts and function of a small engine.

- a. Identify ignition components, air cleaner, lubrication components, engine block, exhaust, and carburetor components.
- b. Demonstrate use of hand tools and diagnostic instruments.
- c. Trace events in the intake, compression, power, and exhaust strokes of a four cycle small engine.
- d. Trace events in the intake-compression and power-exhaust strokes of a two cycle small engine.
- e. Compare differences in two and four stroke cycle engines to indicate absence or presence of oil sump, mixed fuel, and labeling indicating stroke type.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C6

*Workplace Skills (See Appendix B):*

WP2, WP4, WP6, WP7

69. Perform preventive maintenance on a small engine.

- a. Service a crankcase breather, air cleaner, carburetor, governor, starter, and engine oil.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5, C6

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

70. Troubleshoot an inoperative small engine.

- a. Diagnose ignition, fuel, and engine control problems.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C5, C6

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

## CURRICULUM FRAMEWORK

**Course Name:** Agriculture Production II

**Course CIP Code:** 01.0391

**Course Description:** Agriculture Production II is the advanced level course of the secondary Agriculture Production program. Students in Agriculture Production II will gain foundation competencies related to agricultural business organization; records and record keeping; taxes, insurance, and business law; agricultural economics/marketing; agricultural credit; environmental quality control; property acquisition; differential levelling; plant pest control and pesticide safety; advanced welding; oxyacetylene brazing and welding; agricultural construction; advanced electricity; and agricultural equipment operation, maintenance, and repair. (2-2½ Carnegie units, depending upon time spent in the course)

**Competencies and Suggested Objectives:**

1. Describe the different types of business organizations, their advantages, and their disadvantages.
  - a. Identify the different types of business organizations, including sole proprietorship, partnership, corporate, and cooperative.
  - b. Compare the advantages and disadvantages of business organizations.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP6
2. Analyze principles of a partnership agreement.
  - a. Explain the principles of a partnership agreement.
  - b. Describe a local business partnership.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP6
3. Apply computer skills.
  - a. Demonstrate the use of word processing.
  - b. Demonstrate the use of spreadsheets.
  - c. Demonstrate the use of databases.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

M1, M2, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

4. Develop mathematical skills.
  - a. Demonstrate mathematical concepts involved in adding, subtracting, multiplying, and dividing fractions and whole numbers.
  - b. Demonstrate mathematical concepts in measuring.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5  
M1, M4, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
5. Apply record keeping skills.
  - a. Demonstrate record keeping skills involved in selecting, planning, and implementing a SAE.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M2, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
6. Prepare tax forms.
  - a. Describe the forms and elements of preparation for income tax forms.
  - b. Complete tax returns.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C6  
M1, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
7. Explain the responsibilities of the agribusiness employer concerning social security.
  - a. Describe types of social security benefits.
  - b. Identify responsibilities of the agribusiness employer concerning social security.

*Related Academic Topics (See Appendix A):*  
C1, C2, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
8. Explain the kinds of insurance with coverage needed in an individual operation.
  - a. Compare the common kinds of insurance and coverage including life, property, health, and liability.
  - b. Determine the insurance needs of an individual operator including life, property, health, and liability.

*Related Academic Topics (See Appendix A):*  
C1, C2, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

9. Explain the essential elements of a contract and associate laws and other regulations affecting agribusiness activities.
  - a. Identify the essential elements of a contract including offer and acceptance, consideration, legal parties, and unlawful practices.
  - b. Associate laws and regulations affecting agribusiness activities including negligence, workman's compensation, estate planning, and other regulations.

*Related Academic Topics (See Appendix A):*

*C1, C2, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

10. Identify factors that affect pricing.
  - a. Describe the law of supply and demand.
  - b. Describe how income, population, customer preferences, competition, and expectations affect pricing.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

11. Explain general uses of futures contracts in marketing agricultural products, crops, and livestock.
  - a. Describe the function of a futures contract.
  - b. Describe the function of a futures contract option.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

12. Utilize an Agricultural Satellite Information System (ASIS).
  - a. Identify terms and abbreviations associated with ASIS.
  - b. Retrieve commodity trading prices, specific news items, and government reports.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

13. Apply ASIS in explaining how futures contract prices relate to cash market prices.
  - a. Define the relationship between cash and futures prices (basis).
  - b. Track the price fluctuations for a particular commodity through a six-week period, futures prices vs. cash prices.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

14. Differentiate between retail and wholesale marketing.
- Identify retail and wholesale marketing.
  - Identify retail and wholesale outlets in the community.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

15. Describe the use, advantages, and disadvantages of agricultural credit.
- Identify the uses of agricultural credit.
  - Identify the advantages and disadvantages of agricultural credit.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

16. Determine established guidelines for credit rating and credit agreements.
- Identify the guidelines for credit ratings.
  - Identify the various credit agreements and their guidelines.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

17. Describe credit agencies and their sources of credit.
- Identify local credit agencies and their operational procedures.
  - Identify alternative sources of farm credit.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M7

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

18. Explain reasons why soil is important.
- Describe pedological (dealing with plants) viewpoints.
  - Describe edaphological (dealing with soil as a natural body) viewpoints.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

19. Explain the factors which affect soil formation.



- a. Describe the effects of moisture, temperature, and weathering on soil formation.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

20. Identify the two types of soil erosion.

- a. Describe the effects of wind and water on soil erosion.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

21. Identify the three types of soil erosion caused by water.

- a. Describe the effects of reel, sheet, and gully erosion on soil.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

22. Explain vegetative and mechanical management practices that aid in erosion control.

- a. Describe the use of cover crops, conservation tillage practices, contouring, and terracing in erosion control.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

23. Explain the reasons for determining land capability class.

- a. Describe procedures for matching crops with land capability and determining maximum land use.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

24. Explain factors that determine a land capability class.

- a. Describe the effects of slope, texture, structure, and location in determining a land capability class.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

25. Explain the reasoning behind water conservation.  
a. Describe the decrease in the supply of ground water and water tables.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

26. Explain irrigation practices used to conserve water.  
a. Explain use of sub and trickle irrigation.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

27. Explain the reasoning for EPA regulations on air and water quality.  
a. Describe air pollution and toxicity levels in water.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

28. Conduct contamination analyses.  
a. Test water, air, and soil for contaminants.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

29. Explain the approaches to acquiring property.  
a. Identify the approaches to acquiring property including inheritance, purchasing, and leasing.  
b. Describe the approaches to acquiring property including inheritance, purchasing, and leasing.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

30. Explain the factors to consider in lease agreements.  
a. Identify the factors to consider in lease agreements.

- b. Describe the factors to consider in lease agreements including crop-share and cash lease.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

- 31. Explain the system used in establishing the legal description of land.
  - a. Describe the system used to establish the legal description of land.
  - b. Interpret the legal description of a tract of land including section, township, and range.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

- 32. Identify the parts of a farm level, types of self-reading rods, and parts of a rod.
  - a. Assemble and disassemble survey instruments.
  - b. Demonstrate correct reading of all scales and care of the level.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

- 33. Describe the procedures required in using a level.
  - a. Perform hand motions and signals, keeping records and field notes.
  - b. Demonstrate prevention of errors contributing to incorrect measurement.

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

- 34. Use a level to solve selected agricultural problems.
  - a. Perform different leveling projects, drainage projects, and terracing projects.

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

- 35. Explain common groups of plant pests and control measures.
  - a. Describe control procedures for weeds, disease, and insects.
  - b. Describe approved cultural, biological, and chemical practices.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

36. Explain characteristics of agricultural pesticides.  
a. Describe use of herbicides, pesticides, fungicides, growth regulators, and defoliators.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

37. Explain factors to consider in selecting a pesticide for a specific pest problem.  
a. Describe cost, method of kill, method of application, tolerance of crop, and safety.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

38. Identify personal safety devices for handling and applying pesticides.  
a. Describe use of coveralls, hat, goggles, gloves, and respirator.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

39. Explain treatments for the different types of pesticide exposure.  
a. Describe treatment for skin contact, inhaling, eye contact, and swallowing of pesticides.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

40. Explain record keeping procedures for pesticides.  
a. Describe proper purchase, storage, and application of pesticides, as required by state and Federal laws and regulations.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

41. Explain factors to consider in storing and disposing of pesticides.
- Describe the use of good ventilation, lockable storage, prevention of runoff, and properly labeled containers.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

42. Explain the different methods of pesticide application.
- Describe dry, water soluble, aerosol, and suspension methods of application.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

43. Explain the different methods of pesticide application.
- Describe ground, hand, and air pesticide application.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

44. Interpret pesticide label and Materials Safety Data Sheet (MSDS) information.
- Describe the use, classification, formulation, ingredient, signal word, warning sign, precautions statement, and directions for use.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
M1, M4, M7  
S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

45. Determine the cost per acre of a pesticide.
- Calculate the cost per acre of a pesticide in an instructor generated problem.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

46. Fulfill requirements for pesticide applicator's license.

- a. Successfully fulfill examination requirements for pesticide applicator's license.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

47. Examine the factors that determine a good weld.

- a. Describe the desired penetration and uniformity of the bead.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

48. Explain the factors that determine the proper setting of a welding machine.

- a. Describe the type of machine, electrode type and size, and joint design.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

49. Identify causes of improperly formed beads.

- a. Describe the effects of incorrect amperages, incorrect travel speed, and improper arc length.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

50. Describe techniques used in making multiple passes.

- a. Demonstrate root pass, cover pass, and filler pass.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

51. Describe personal protection methods for arc welding hazards.
- Demonstrate procedures to prevent electrical shock fires, burns, and smoke inhalation.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

52. Perform welds with shielded metal arc welding (SMAW) equipment.
- Make a single-v-groove butt weld in the horizontal position.
  - Make a single-v-groove butt weld in the vertical up position.
  - Make a single v-groove butt weld in the overhead position.
  - Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

53. Perform welds with metal inert gas welding (MIG) equipment.
- Make a single-v-groove butt weld in the horizontal position.
  - Make a single-v-groove butt weld in the vertical position.
  - Make a single-v-groove butt weld in the overhead position.
  - Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

54. Perform welds with tungsten inert gas welding (TIG) equipment.
- Make a single-v-groove butt weld in the horizontal position.
  - Make a single-v-groove butt weld in the vertical position.
  - Make a single-v-groove butt weld in the overhead position.
  - Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

55. Describe the characteristics of the different types of welding and brazing flames.
- Demonstrate neutral, oxidizing, and carburizing flames.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

56. Describe properties and features of a good weld.
- a. Demonstrate the effects of penetration, heat treating, and uniformity of the bead.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

57. Describe factors that determine a good braze weld.
- a. Demonstrate correct procedures of penetration and uniformity of the bead.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

58. Explain factors to consider in selecting the proper welding tip.
- a. Describe the effects of thickness of metal and joint design.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

59. Describe factors to consider in selecting the proper welding rod.
- a. Select the proper welding rod based upon thickness of metal, molecular composition of metal, and size of tip.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

60. Perform welds with oxyacetylene welding equipment.
- a. Set up equipment and adjust regulator pressure.
  - b. Lay a bead with a filler rod in mild steel.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

S6, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6



61. Identify the components of a bill of materials.
- a. Demonstrate dimensions, kind, and amount of materials needed.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
62. Identify the parts of a framing square.
- a. Describe the use of the blade and tongue.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
63. Identify the different types of roofs.
- a. Describe gable, flat, and gambrel roofs.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
64. Explain the types of roofing materials.
- a. Describe the use of roofing materials such as tin, wood, tar, and asphalt.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
65. Describe the different types of rafters.
- a. Demonstrate procedures to prepare common and hip rafters.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
66. Demonstrate the ability to lay out and cut common rafters.
- a. Use models to lay out and cut common rafters.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6

67. Describe factors to consider in planning a farm building.
- Plan a farm building including the factors of cost, purpose, size of building, and available materials.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
68. Identify the common building materials used in farm construction.
- Describe the use of wood, metal, fasteners, wire, concrete, and roofing materials.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
69. Explain the causes of building failures.
- Describe prevention of foundation and structural problems.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
70. Explain the types of foundations and wall supports.
- Describe slab and conventional foundations.
  - Prepare foundations for frame buildings and forms for concrete slab buildings.
  - Construct framing and wall supports.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
71. Explain the safe use of power, hand, and pneumatic tools.
- Demonstrate use of power, hand, and pneumatic tools.
- Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7
- Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
72. Identify electrical wiring supplies.
- Describe different wire sizes, fuses, conduit, breakers and service entrance panels, junction box, meter box, and weather heads.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

73. Wire electrical circuits.
- Wire a lighting outlet controlled by a single pole switch.
  - Wire a duplex receptacle using non-metallic cable.
  - Wire a lighting outlet controlled by two three-way switches.
  - Wire service entrance panels and breakers.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

74. Describe items or systems of agricultural equipment that should be checked on a daily basis.
- Identify procedures for inspecting coolant, engine oil, tire pressure, hydraulic fluid, gear oil, and air filter.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

75. Perform operation, service, and maintenance checks on agricultural equipment according to manufacturer's specifications.
- Check engine oil levels.
  - Check coolant levels.
  - Check fuel levels.
  - Check tires.
  - Maintain battery.
  - Check and adjust V-belt tension.
  - Service an oil bath air cleaner.
  - Service a paper element air filter.
  - Check transmission, hydraulic, and final drive fluid levels.
  - Service front wheel bearings.
  - Change engine oil and filter.
  - Change transmission, hydraulic, and final drive fluids and filters.
  - Lubricate front end, brake and clutch pivots, three point hitch, and power take off drives.
  - Change coolant and service radiator.
  - Service power steering system.
  - Service fuel filter.
  - Bleed air from a diesel fuel system.
  - Adjust brakes.

- s. Adjust clutch.
- t. Adjust steering and front end.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

76. Perform repairs on agricultural machinery and equipment.

- a. Determine parts to repair or replace.
- b. Repair or replace required parts, reassemble, adjust, and test.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

77. Perform reconditioning of agricultural machinery and equipment.

- a. Recondition agricultural machinery and equipment.
- b. Paint agricultural machinery and equipment.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

August 1, 1995

SECTION II:  
CURRICULUM GUIDE  
FOR  
AGRICULTURE PRODUCTION

August 1, 1995

AGRICULTURE PRODUCTION I

**AGRICULTURE PRODUCTION I**  
**UNIT 1: CAREERS IN AGRICULTURE**

**(5 days)**

**Competencies and Suggested Objectives:**

1. Identify careers available in production agriculture.
  - a. Describe career opportunities in production agriculture.
  - b. Describe career opportunities in agricultural mechanics.
  - c. Describe career opportunities in agricultural processing.
  - d. Describe career opportunities in forestry.
  - e. Describe career opportunities in horticulture.
  - f. Describe career opportunities in natural resources management.
  - g. Describe career opportunities in agribusiness.

*Related Academic Topics (See Appendix A):*

*C1, C4, C5*

*Workplace Skills (See Appendix B):*

*WP2*

2. Analyze careers in production according to the factors influencing career choices.
  - a. Describe careers available in production agriculture.
  - b. Describe educational requirements for careers in production agriculture.
  - c. Interpret earnings opportunities in agricultural production careers.
  - d. Compare working conditions in careers in production agriculture.
  - e. Describe personal interests leading to careers in production agriculture.
  - f. Compare employee benefits available to careers in agriculture.

*Related Academic Topics (See Appendix A):*

*C1, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP6*

3. Prepare a written report on a tentative career choice.
  - a. Select a tentative career.
  - b. Obtain information pertaining to a career in agricultural production.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP6*

***Suggested Teaching Strategies:***

1. *Identify careers available in production agriculture.*
  - a. *Discussion and media regarding career opportunities in production agriculture.*

- b. *Discussion and media regarding career opportunities in agricultural mechanics.*
- c. *Discussion and media regarding career opportunities in agricultural processing.*
- d. *Discussion and media regarding career opportunities in forestry.*
- e. *Discussion and media regarding career opportunities in horticulture.*
- f. *Discussion and media regarding career opportunities in natural resources management.*
- g. *Discussion and media regarding career opportunities in agribusiness.*
2. *Analyze careers in agricultural production according to the factors influencing career choices.*
  - a. *Written report of careers available in production agriculture.*
  - b. *Written report of educational requirements for careers in production agriculture.*
  - c. *Written report of opportunities in agricultural production careers.*
  - d. *Written report to compare working conditions in careers in production agriculture.*
  - e. *Written report of personal interests leading to careers in production agriculture.*
  - f. *Written report of employee benefits available to careers in agriculture.*
3. *Prepare a written report on a tentative career choice.*
  - a. *Utilize career analysis reports to develop a tentative career choice.*
  - b. *Written report of information pertaining to a career in agricultural production.*

**Suggested Assessment Strategies:**

1. *Identify careers available in production agriculture.*
  - a. *Assignment - Describe career opportunities in production agriculture.*
  - b. *Assignment - Describe career opportunities in agricultural mechanics.*
  - c. *Assignment - Describe career opportunities in agricultural processing.*
  - d. *Assignment - Describe career opportunities in forestry.*
  - e. *Assignment - Describe career opportunities in horticulture.*
  - f. *Assignment - Describe career opportunities in natural resources management.*
  - g. *Assignment - Describe career opportunities in agribusiness.*
2. *Analyze careers in agricultural production according to the factors influencing career choices.*
  - a. *Assignment - Describe careers available in production agriculture.*
  - b. *Assignment - Describe educational requirements for careers in production agriculture.*
  - c. *Assignment - Interpret earnings opportunities in agricultural production careers.*



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- d. *Assignment - Compare working conditions in careers in production agriculture.*
  - e. *Assignment - Describe personal interests leading to careers in production agriculture.*
  - f. *Assignment - Compare employee benefits available to careers in agriculture.*
3. *Prepare a written report on a tentative career choice.*
- a. *Assignment - Select a tentative career.*
  - b. *Assignment - Obtain information pertaining to a career in agricultural production.*

**Suggested References:**

Careerware. Choices. [Software]. Ogdensburg, NY: Information Systems Management Corporation (IMS).

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY, Delmar. 1992.

**AGRICULTURE PRODUCTION I**  
**UNIT 2: LEADERSHIP/FFA ACTIVITIES**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Explain FFA organizational activities that promote and recognize achievements in agricultural production.
  - a. Describe the history and development of the FFA.
  - b. Describe contests and awards programs.
  - c. Participate in personal development seminars.
  - d. Attend leadership conferences and conventions.
  - e. Explain national and international exchange programs.
  - f. Plan for educational experience with industry.
  - g. Determine opportunities for participation in personal and community development programs.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

2. Identify the benefits of FFA participation to an individual and to the agricultural industry.
  - a. Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.
  - b. Explain benefits of exposure to the agricultural industry environment and multicultural experiences.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

3. Explain opportunities for members in the FFA organization.
  - a. Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

4. Develop and present a 3-5 minute speech on an agricultural topic.
  - a. Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

5. Explain the purposes and functions of parliamentary procedure.
  - a. Conduct a meeting.
  - b. Describe different methods of voting and handling of motions.
  - c. Assume officer positions and describe their functions.
  - d. Demonstrate procedures for receiving and disposing of motions.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP3, WP6*

***Suggested Teaching Strategies:***

1. *Explain FFA organizational activities that promote and recognize achievements in agricultural production.*
  - a. *Discussion and media on the history and development of the FFA.*
  - b. *Oral report on FFA contests and awards programs.*
  - c. *Assist students to participate in personal development seminars.*
  - d. *Assist students to attend leadership conferences and conventions.*
  - e. *Discussion and media on national and international exchange programs.*
  - f. *Assist students to plan for educational experience with industry.*
  - g. *Written report of opportunities for participation in personal and community development programs.*
2. *Identify the benefits of FFA participation to an individual and to the agricultural industry.*
  - a. *Written report of personal growth and development opportunities through participation in activity programs of the agricultural industry.*
  - b. *Written report of benefits of exposure to the agricultural industry environment and multicultural experiences.*
3. *Explain opportunities for members in the FFA organization.*
  - a. *Written/oral report of opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*
4. *Develop and present a 3-5 minute speech on an agricultural topic.*
  - a. *Performance exercise to develop a 3-5 minute presentation on an agricultural topic using guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
5. *Explain the purposes and functions of parliamentary procedure.*
  - a. *Performance exercise to conduct an FFA meeting.*
  - b. *Role play different methods of voting and handling of motions.*

- c. *Role play officer positions and describe their functions.*
- d. *Role play procedures for receiving and disposing of motions.*

**Suggested Assessment Strategies:**

1. *Explain FFA organizational activities that promote and recognize achievements in agricultural production.*
  - a. *Test - Describe the history and development of the FFA.*
  - b. *Test - Describe contests and awards programs.*
  - c. *Assignment - Participate in personal development seminars.*
  - d. *Assignment - Attend leadership conferences and conventions.*
  - e. *Test - Explain national and international exchange programs.*
  - f. *Assignment - Plan for educational experience with industry.*
  - g. *Assignment - Determine opportunities for participation in personal and community development programs.*
2. *Identify the benefits of FFA participation to an individual and to the agricultural industry.*
  - a. *Assignment - Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.*
  - b. *Assignment - Explain benefits of exposure to the agricultural industry environment and multicultural experiences.*
3. *Explain opportunities for members in the FFA organization.*
  - a. *Assignment - Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*
4. *Develop and present a 3-5 minute speech on an agricultural topic.*
  - a. *Performance Activity - Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
5. *Explain the purposes and functions of parliamentary procedure.*
  - a. *Performance Activity - Conduct a meeting.*
  - b. *Test - Describe different methods of voting and handling of motions.*
  - c. *Assignment - Assume officer positions and describe their functions.*
  - d. *Performance Activity - Demonstrate procedures for receiving and disposing of motions.*

**Suggested References:**

Cooper, E. L. Agriscience: Fundamentals, & Applications. Albany, NY: Delmar. 1990.

National FFA Organization. FFA Manual. Alexandria, VA: Author. 1995.

National FFA Organization. FFA Student Handbook. Alexandria, VA: Author. 1993.

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National FFA Organization. National FFA Contests (Bulletin No. 4). Alexandria, VA: Author. 1992-93.

National FFA Organization. FFA Proficiency Award and Degree Software. Alexandria, VA: Author.

Robert's Rules of Order.

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**AGRICULTURE PRODUCTION I**  
**UNIT 3: DEVELOPING A SUPERVISED AGRICULTURAL EXPERIENCE**  
**PROGRAM (SAE)**

(10 days)

**Competencies and Suggested Objectives:**

1. Describe the purposes and requirements of the SAE.
  - a. Establish objectives for the SAE.
  - b. Determine the availability of time and money to invest.
  - c. Select a system of record keeping.
  - d. Determine benefits of participation in SAE.
  - e. Determine types of SAE programs.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Develop a long-range personal plan for the SAE.
  - a. Set long-range goals.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Develop a short-range personal plan.
  - a. Set short-range goals.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
4. Complete a training agreement for the SAE.
  - a. Establish requirements of student, parents, supervisor, and/or employer.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3, WP6
5. Describe agricultural record keeping for the SAE.
  - a. Determine which records to keep, why, and how to maintain each system.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5, C6

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

6. Maintain agricultural records for the SAE.
  - a. Prepare income and expense records.
  - b. Prepare inventory records.
  - c. Compute enterprise summaries.
  - d. Maintain placement records.
  - e. Summarize the SAE program.
  - f. Maintain leadership activity records.
  - g. Compute a net worth statement.
  - h. Prepare FFA Proficiency Award application and State FFA Degree application.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Describe the purposes and requirements of the SAE.*
  - a. *Discussion and media to determine objectives for the SAE.*
  - b. *Use agricultural planning project to determine the availability of time and money to invest.*
  - c. *Select a system of record keeping suitable to the SAE.*
  - d. *Written/oral report on benefits of participation in SAE.*
  - e. *Written/oral report on types of SAE programs.*
2. *Develop a long-range personal plan for the SAE.*
  - a. *Performance exercise to set long-range goals in the SAE.*
3. *Develop a short-range personal plan.*
  - a. *Performance exercise to set short-range goals in the SAE.*
4. *Complete a training agreement for the SAE.*
  - a. *Performance exercise to determine requirements of student, parents, supervisor, and/or employer in the SAE.*
5. *Describe agricultural record keeping for the SAE.*
  - a. *Written/oral report on which records to keep in SAE, why, and how to maintain each system.*
6. *Maintain agricultural records for the SAE.*
  - a. *Performance exercise to prepare income and expense records as part of agricultural planning project and/or SAE.*
  - b. *Performance exercise to prepare inventory records as part of agricultural planning project and/or SAE.*
  - c. *Performance exercise to prepare enterprise summaries as part of agricultural planning project and/or SAE.*
  - d. *Performance exercise to prepare placement records as part of agricultural planning project and/or SAE.*

- e. *Performance exercise to prepare a summary of agricultural planning project and/or SAE.*
- f. *Performance exercise to prepare leadership activity records of agricultural planning project and/or SAE.*
- g. *Performance exercise to compute a net worth statement of agricultural planning project and/or SAE.*
- h. *Performance exercise to prepare FFA Proficiency Award application and State FFA Degree application using ASIS and computer software.*

**Suggested Assessment Strategies:**

1. *Describe the purposes and requirements of the SAE.*
  - a. *Assignment - Establish objectives for the SAE.*
  - b. *Assignment - Determine the availability of time and money to invest.*
  - c. *Assignment - Select a system of record keeping.*
  - d. *Assignment - Determine benefits of participation in SAE.*
  - e. *Assignment - Determine types of SAE programs.*
2. *Develop a long-range personal plan for the SAE.*
  - a. *Performance Activity - Set long-range goals.*
3. *Develop a short-range personal plan.*
  - a. *Performance Activity - Set short-range goals.*
4. *Complete a training agreement for the SAE.*
  - a. *Performance Activity - Establish requirements of student, parents, supervisor, and/or employer.*
5. *Describe agricultural record keeping for the SAE.*
  - a. *Assignment - Determine which records to keep, why, and how to maintain each system.*
6. *Maintain agricultural records for the SAE.*
  - a. *Performance Activity - Prepare income and expense records.*
  - b. *Performance Activity - Prepare inventory records*
  - c. *Performance Activity - Compute enterprise summaries.*
  - d. *Performance Activity - Maintain placement records.*
  - e. *Performance Activity - Summarize the SAE program.*
  - f. *Performance Activity - Maintain leadership activity records.*
  - g. *Performance Activity - Compute a net worth statement.*
  - h. *Performance Activity - Prepare FFA Proficiency Award application and State FFA Degree application.*

**Suggested References:**

Dictation Disc Company. Computer Applications for Business. New York, NY: Author. 1990.



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McCully, J. Basic Vocational Education - Section IIIB - Introduction to Agricultural Skills. Mississippi State: Research and Curriculum Unit. 1987.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

National FFA Organization. FFA Proficiency Award and Degree Software. Alexandria, VA: Author.

Newman, M. E. and Wills, W. J. Agribusiness Management and Entrepreneurship. Danville, IL: Interstate. 1994.

Stewart, Jim and Jobes, Raleigh. Farm and Ranch Business Management (3rd ed.). Moline, IL: Deere and Company. 1992.

**AGRICULTURE BUSINESS AND MANAGEMENT I  
UNIT 4: ANIMAL SCIENCE AND MANAGEMENT**

**(15 days)**

**Competencies and Suggested Objectives:**

1. Select proper animal for specific farm enterprise or for participation in livestock shows and sales.
  - a. Identify types of animals for use in beef, dairy, swine, poultry, sheep, horses, and aquaculture enterprises.
  - b. Describe characteristics of breeds of livestock used in beef, dairy, swine, poultry, sheep, horses, aquaculture, and other species of local interest.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6  
S3, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4*

2. Develop knowledge of nutrition in livestock production.
  - a. Identify terms related to animal nutrition.
  - b. Identify sources of nutrient groups and their functions.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6  
S3, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4*

3. Apply management practices for maintaining animal health.
  - a. Determine management practices for maintaining animal health.
  - b. Determine causes and prevention of disease and parasites.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6  
S3, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

4. Explain procedures for managing livestock reproduction.
  - a. Define terms associated with livestock reproduction.
  - b. Describe periods of estrus and gestation in livestock.
  - c. Read and interpret Estimated Progeny Difference (EPD).

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6  
M6, M7  
S1, S3, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

**Suggested Teaching Strategies:**

1. *Select proper animal for specific farm enterprise or for participation in livestock shows and sales.*
  - a. *Discussion and media on types of animals for use in beef, dairy, swine, poultry, sheep, horses, and aquaculture enterprises.*
  - b. *Written report on characteristics of breeds of livestock used in beef, dairy, swine, poultry, sheep, horses, aquaculture, and other species of local interest.*
  - c. *Participate in livestock shows and sales.*
2. *Develop knowledge of nutrition in livestock production.*
  - a. *Discussion and media on terms related to animal nutrition.*
  - b. *Discussion and media on sources of nutrient groups and their functions.*
3. *Apply management practices for maintaining animal health.*
  - a. *Develop a program of management practices for maintaining animal health.*
  - b. *Develop a program for determining causes and treatment of disease and parasites.*
4. *Explain procedures for managing livestock reproduction.*
  - a. *Discussion and media to define terms associated with livestock reproduction.*
  - b. *Discussion and media to describe periods of estrus and gestation in livestock.*
  - c. *Assist students to read and interpret Estimated Progeny Difference (EPD).*

**Suggested Assessment Strategies:**

1. *Select proper animal for specific farm enterprise.*
  - a. *Test - Identify types of animals for use in beef, dairy, swine, poultry, sheep, horses, and aquaculture enterprises.*
  - b. *Test - Describe characteristics of breeds of livestock used in beef, dairy, swine, poultry, sheep, horses, aquaculture, and other species of local interest.*
2. *Develop knowledge of nutrition in livestock production.*
  - a. *Test - Identify terms related to animal nutrition.*
  - b. *Test - Identify sources of nutrient groups and their functions.*
3. *Apply management practices for maintaining animal health.*
  - a. *Assignment - Determine management practices for maintaining animal health.*
  - b. *Assignment - Determine causes and treatment of disease and parasites.*
4. *Explain procedures for managing livestock production.*
  - a. *Test - Define terms associated with livestock reproduction.*
  - b. *Test - Describe periods of estrus and gestation in livestock.*
  - c. *Assignment - Read and interpret Estimated Progeny Difference (EPD).*

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**Suggested References:**

Ensminger, E. E. Animal Science. (9th ed.). Danville, IL: Interstate. 1992.

Gillespie, J. R. Livestock Production. (4th ed.). Albany, NY: Delmar. 1992.

Harp, K. and Stewart, J. Vocational Agriculture II. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1985.

McCully, J. A Reference Unit on Basic Principles of Animal Science. Mississippi State University: Research and Curriculum Unit. 1976.

**AGRICULTURE PRODUCTION I**  
**UNIT 5: PARTS AND CLASSIFICATION OF AGRICULTURAL PLANTS (10 days)**

**Competencies and Suggested Objectives:**

1. Identify the parts of a plant.
  - a. Describe the vegetative parts of a plant.
  - b. Describe the reproductive parts of a plant.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*  
WP2, WP4, WP6
2. Explain the functions of the basic parts of a plant.
  - a. Describe the function of roots for support and intake of water and nutrients.
  - b. Describe the function of the plant flower for reproduction.
  - c. Describe the function of the plant stem for support and uptake of water and nutrients.
  - d. Describe the function of leaves for photosynthesis.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*  
WP2, WP4, WP6
3. Describe how plants are classified.
  - a. Classify plants by life cycle.
  - b. Classify plants by longevity including annual, biennial, and perennial plants.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*  
WP2, WP4, WP6
4. Explain the different classes of agricultural plants based upon their uses.
  - a. Describe classes of oil crops, cereal crops, forage and pasture, fiber, and vegetable or fruit.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C6  
S2, S8

*Workplace Skills (See Appendix B):*  
WP2, WP4, WP6

5. Explain the differences in plants including differences in seed and leaves.
  - a. Describe monocotyledonous plants.
  - b. Describe dicotyledonous plants.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Identify the parts of a plant.*
  - a. *Discussion and media on the vegetative parts of a plant.*
  - b. *Discussion and media on the reproductive parts of a plant.*
2. *Explain the functions of the basic parts of a plant.*
  - a. *Discussion and media on the function of roots for support and intake of water and nutrients.*
  - b. *Discussion and media on the function of the plant flower for reproduction.*
  - c. *Discussion and media on the function of the plant stem for support and uptake of water and nutrients.*
  - d. *Discussion and media on the function of leaves for photosynthesis.*
3. *Describe how plants are classified.*
  - a. *Cooperative teaching strategies with biology and science teachers to classify plants by life cycle.*
  - b. *Cooperative teaching strategies with biology and science teachers to classify plants by longevity including annual, biennial, and perennial plants.*
4. *Explain the different classes of agricultural plants based upon their uses.*
  - a. *Discussion and media on classes of oil crops, cereal crops, forage and pasture, fiber, and vegetable or fruit.*
5. *Explain the differences in plants including differences in seed and leaves.*
  - a. *Written/oral report on monocotyledonous plants.*
  - b. *Written/oral report on dicotyledonous plants.*

***Suggested Assessment Strategies:***

1. *Identify the parts of a plant.*
  - a. *Test - Describe the vegetative parts of a plant.*
  - b. *Test - Describe the reproductive parts of a plant.*
2. *Explain the functions of the basic parts of a plant.*
  - a. *Test - Describe the function of roots for support and intake of water and nutrients.*
  - b. *Test - Describe the function of the plant flower for reproduction.*

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- c. *Test - Describe the function of the plant stem for support and uptake of water and nutrients.*
- d. *Test - Describe the function of leaves for photosynthesis.*
- 3. *Describe how plants are classified.*
  - a. *Test - Classify plants by life cycle.*
  - b. *Test - Classify plants by longevity including annual, biennial, and perennial plants.*
- 4. *Explain the different classes of agricultural plants based upon their uses.*
  - a. *Test - Describe classes of oil crops, cereal crops, forage and pasture, fiber, and vegetable or fruit.*
- 5. *Explain the differences in plants including differences in seed and leaves.*
  - a. *Assignment - Describe monocotyledonous plants.*
  - b. *Assignment - Describe dicotyledonous plants.*

**Suggested References:**

Cooper, E. L. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

Towle, A. Modern Biology. Albany, NY: Holt Rinehart and Winston. 1989.

**AGRICULTURE PRODUCTION I**  
**UNIT 6: PLANT REPRODUCTION AND NUTRITION**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Explain the different ways in which plants reproduce.
  - a. Describe asexual reproduction.
  - b. Describe sexual reproduction.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*  
*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

2. Identify the parts of a complete flower.
  - a. Describe the pistil.
  - b. Describe the stamen.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*  
*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

3. Explain the process by which seeds are produced.
  - a. Describe epigeal seed production.
  - b. Describe hypogeal seed production.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*  
*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

4. Explain the stages in seed germination.
  - a. Describe seed to moisture contact.
  - b. Describe splitting of seed coat.
  - c. Describe hypocotyl emergence.
  - d. Describe development of radicle.
  - e. Describe emergence of primary root.
  - f. Describe opening of seed leaf.
  - g. Describe development of terminal bud.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*  
*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*



5. Explain the requirements for seed germination and growth.
  - a. Describe the effects of moisture.
  - b. Describe the effects of temperature.
  - c. Describe the effects of light.
  - d. Describe the effects of air.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

6. Explain possible causes of poor or no seed germination.
  - a. Describe the effects of temperature extremes on germination.
  - b. Describe the effects of too much or inadequate moisture.
  - c. Describe the effects of poor seed quality.
  - d. Describe the effects of the presence of pests.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

7. Identify the major plant nutrients that are supplied through the soil and identify their functions.
  - a. Describe the function of nitrogen in plant growth and of protein content in plant growth and leaf or bud development.
  - b. Describe the function of phosphorous for seed formation, winter hardening, and root development
  - c. Describe the function of potassium for leaf development, disease resistance, oil formation, and fiber formation.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

8. Identify the secondary nutrients that must be present for proper growth.
  - a. Describe the function of sulfur, magnesium, and calcium in plant growth.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6*

*S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

9. Explain the principles involved in determining the amounts and kinds of fertilizer to use.
  - a. Determine the amount and kind of fertilizer based upon type of soil, type of plant, and yield desired.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6  
S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

10. Interpret the analysis of a complete fertilizer.
- Determine the percent of N based upon the interpretation of a label.
  - Determine the percent of P based upon the interpretation of a label.
  - Determine the percent of K based upon the interpretation of a label.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6  
M7  
S2, S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

11. Obtain a soil sample for fertility testing.
- Select soil sampling equipment.
  - Perform soil sampling technique.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4, C6  
M7  
S5, S8*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

- Explain the different ways in which plants reproduce.*
  - Discussion and media on asexual reproduction.*
  - Discussion and media on sexual reproduction.*
- Identify the parts of a complete flower.*
  - Label and identify parts of the pistil.*
  - Label and identify parts of the stamen.*
- Explain the process by which seeds are produced.*
  - Written report on epigeal seed production.*
  - Written report on hypogeal seed production.*
- Explain the stages in seed germination.*
  - Written report on seed to moisture contact.*
  - Written report on splitting of seed coat.*
  - Written report on hypocotyl emergence.*
  - Written report on development of radicle.*
  - Written report on emergence of primary root.*
  - Written report on opening of seed leaf.*
  - Written report on development of terminal bud.*

5. *Explain the requirements for seed germination and growth.*
  - a. *Performance exercise to demonstrate the effects of moisture.*
  - b. *Performance exercise to demonstrate the effects of temperature.*
  - c. *Performance exercise to demonstrate the effects of light.*
  - d. *Performance exercise to demonstrate the effects of air.*
6. *Explain possible causes of poor or no seed germination.*
  - a. *Performance exercise to demonstrate the effects of temperature extremes on germination.*
  - b. *Performance exercise to demonstrate the effects of too much or inadequate moisture.*
  - c. *Written report on the effects of poor seed quality.*
  - d. *Written report on the effects of the presence of pests.*
7. *Identify the major plant nutrients that are supplied through the soil and identify their functions.*
  - a. *Discussion and media on the function of nitrogen in plant growth and of protein content in plant growth and leaf or bud development.*
  - b. *Discussion and media on the function of phosphorous for seed formation, winter hardening, and root development*
  - c. *Discussion and media on the function of potassium for leaf development, disease resistance, oil formation, and fiber formation.*
8. *Identify the secondary nutrients that must be present for proper growth.*
  - a. *Discussion and media the function of sulfur, magnesium, and calcium in plant growth.*
9. *Explain the principles involved in determining the amounts and kinds of fertilizer to use.*
  - a. *Performance exercise to demonstrate the amount and kind of fertilizer based upon type of soil, type of plant, and yield desired.*
10. *Interpret the analysis of a complete fertilizer.*
  - a. *Performance exercise to demonstrate the percent of N based upon the interpretation of a label.*
  - b. *Performance exercise to demonstrate the percent of P based upon the interpretation of a label.*
  - c. *Performance exercise to demonstrate the percent of K based upon the interpretation of a label.*
11. *Obtain a soil sample for fertility testing.*
  - a. *Demonstrate soil sampling equipment.*
  - b. *Performance exercise in soil sampling technique.*

**Suggested Assessment Strategies:**

1. *Explain the different ways in which plants reproduce.*
  - a. *Test - Describe asexual reproduction.*
  - b. *Test - Describe sexual reproduction.*

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2. *Identify the parts of a complete flower.*
  - a. *Assignment - Describe the pistil.*
  - b. *Assignment - Describe the stamen.*
3. *Explain the process by which seeds are produced.*
  - a. *Test - Describe epigeal seed production.*
  - b. *Test - Describe hypogeal seed production.*
4. *Explain the stages in seed germination.*
  - a. *Assignment - Describe seed to moisture contact.*
  - b. *Assignment - Describe splitting of seed coat.*
  - c. *Assignment - Describe hypocotyl emergence.*
  - d. *Assignment - Describe development of radicle.*
  - e. *Assignment - Describe emergence of primary root.*
  - f. *Assignment - Describe opening of seed leaf.*
  - g. *Assignment - Describe development of terminal bud.*
5. *Explain the requirements for seed germination and growth.*
  - a. *Performance Activity - Demonstrate the effects of moisture.*
  - b. *Performance Activity - Demonstrate the effects of temperature.*
  - c. *Performance Activity - Demonstrate the effects of light.*
  - d. *Performance Activity - Demonstrate the effects of air.*
6. *Explain possible causes of poor or no seed germination.*
  - a. *Performance Activity - Describe the effects of temperature extremes on germination.*
  - b. *Performance Activity - Describe the effects of too much or inadequate moisture.*
  - c. *Assignment - Describe the effects of poor seed quality.*
  - d. *Assignment - Describe the effects of the presence of pests.*
7. *Identify the major plant nutrients that are supplied through the soil and identify their functions.*
  - a. *Test - Describe the function of nitrogen in plant growth and of protein content in plant growth and leaf or bud development.*
  - b. *Test - Describe the function of phosphorous for seed formation, winter hardening, and root development*
  - c. *Test - Describe the function of potassium for leaf development, disease resistance, oil formation, and fiber formation.*
8. *Identify the secondary nutrients that must be present for proper growth.*
  - a. *Test - Describe the function of sulfur, magnesium, and calcium in plant growth.*
9. *Explain the principles involved in determining the amounts and kinds of fertilizer to use.*
  - a. *Performance Activity - Determine the amount and kind of fertilizer based upon type of soil, type of plant, and yield desired.*
10. *Interpret the analysis of a complete fertilizer.*
  - a. *Performance Activity - Determine the percent of N based upon the interpretation of a label.*

- b. *Performance Activity - Determine the percent of P based upon the interpretation of a label.*
  - c. *Performance Activity - Determine the percent of K based upon the interpretation of a label.*
11. *Obtain a soil sample for fertility testing.*
- a. *Assignment - Select soil sampling equipment.*
  - b. *Performance Activity - Perform soil sampling technique.*

**Suggested References:**

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY, Delmar. 1990.

Jacks, L. P. A Reference Unit on Basic Principles of Plant Science. Mississippi State University: Research and Curriculum Unit. 1979.

Lee, J. S. and Turner, D. L. Introduction to World AgriScience and Technology. Danville, IL: Interstate. 1994.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

Towle, A. Modern Biology, Albany, NY: Holt Rinehart and Winston. 1989.

**AGRICULTURE PRODUCTION I**  
**UNIT 7: AGRICULTURAL MECHANICS ORIENTATION AND SAFETY (15 days)**

**Competencies and Suggested Objectives:**

1. Identify general safety precautions for shop work.
  - a. Describe procedures for maintaining a clean and orderly shop.
  - b. Describe personal behavior and personal safety requirements.
  - c. Describe shop organization.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
2. Apply personal behavior required for shop and laboratory work.
  - a. Demonstrate appropriate personal manners, cooperation, work attitude, and goal setting.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
3. Apply personal safety equipment required in shop and laboratory work.
  - a. Demonstrate safe use of head, eye, hearing, body, hand, and foot protective devices.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
4. Apply general safety rules pertaining to hand and power tools.
  - a. Demonstrate rules for hand tools including basic operation, danger points, and observer safety.
  - b. Demonstrate rules for power tools including basic operation, safeguards in place, danger points, observer safety, and electrical safety.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5, C6  
S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
5. Apply safety precautions in using stationary power tools.
  - a. Demonstrate basic operation, safeguards in place, danger points, observer safety, and electrical safety.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

6. Match classes of fire to their correct description.

a. Compare fire types A, B, C, and D.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

7. Apply rules of safety relating to different situations in the shop.

a. Demonstrate rules of safety with fire prevention, oil and grease, lifting and hoisting, electricity, compressed air equipment, and batteries.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

8. Apply procedures for managing solvents and hazardous materials.

a. Demonstrate safe storage, use, and disposition of hazardous waste.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

9. Apply first aid procedures to use in treating injuries resulting from using shop equipment.

a. Demonstrate procedures to clear the airway, stop the bleeding, protect the wound, and prevent shock.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

***Suggested Teaching Strategies:***

1. *Identify general safety precautions for shop work.*

a. *Discussion and media on procedures for maintaining a clean and orderly shop.*

- b. *Discussion and media on personal behavior and personal safety requirements.*
- c. *Prepare a layout of shop organization.*
- 2. *Apply appropriate personal behavior required for shop and laboratory work.*
  - a. *Performance exercise to demonstrate personal manners, cooperation, work attitude, and goal setting.*
- 3. *Apply personal safety equipment required in shop and laboratory work.*
  - a. *Performance exercise to demonstrate safe use of head, eye, hearing, body, hand, and foot protective devices.*
- 4. *Apply general safety rules pertaining to hand and power tools.*
  - a. *Performance exercise to demonstrate rules for hand tools including basic operation, danger points, and observer safety.*
  - b. *Performance exercise to demonstrate rules for power tools including basic operation, safeguards in place, danger points, observer safety, and electrical safety.*
- 5. *Apply safety precautions in using stationary power tools.*
  - a. *Performance exercise to demonstrate basic operation, safeguards in place, danger points, observer safety, and electrical safety.*
- 6. *Match classes of fire to their correct description.*
  - a. *Performance exercise to demonstrate fire types A, B, C, and D.*
- 7. *Apply rules of safety relating to different situations in the shop.*
  - a. *Performance exercise to demonstrate rules of safety with fire prevention, oil and grease, lifting and hoisting, electricity, compressed air equipment, and batteries.*
- 8. *Apply procedures for managing solvents and hazardous materials.*
  - a. *Performance exercise to demonstrate safe storage, use, and disposition of hazardous waste.*
- 9. *Apply first aid procedures to use in treating injuries resulting from using shop equipment.*
  - a. *Performance exercise to demonstrate procedures to clear the airway, stop the bleeding, protect the wound, and prevent shock.*

**Suggested Assessment Strategies:**

- 1. *Identify general safety precautions for shop work.*
  - a. *Test - Describe procedures for maintaining a clean and orderly shop.*
  - b. *Test - Describe personal behavior and personal safety requirements.*
  - c. *Assignment - Describe shop organization.*
- 2. *Apply appropriate personal behavior required for shop and laboratory work.*
  - a. *Performance Activity - Demonstrate appropriate personal manners, cooperation, work attitude, and goal setting.*
- 3. *Apply personal safety equipment required in shop and laboratory work.*
  - a. *Performance Activity - Demonstrate safe use of head, eye, hearing, body, hand, and foot protective devices.*



4. *Apply general safety rules pertaining to hand and power tools.*
  - a. *Performance Activity - Demonstrate rules for hand tools including basic operation, danger points, and observer safety.*
  - b. *Performance Activity - Demonstrate rules for power tools including basic operation, safeguards in place, danger points, observer safety, and electrical safety.*
5. *Apply safety precautions in using stationary power tools.*
  - a. *Performance Activity - Demonstrate basic operation, safeguards in place, danger points, observer safety, and electrical safety.*
6. *Match classes of fire to their correct description.*
  - a. *Performance Activity - Compare fire types A, B, C, and D.*
7. *Apply rules of safety relating to different situations in the shop.*
  - a. *Performance Activity - Demonstrate rules of safety with fire prevention, oil and grease, lifting and hoisting, electricity, compressed air equipment, and batteries.*
8. *Apply procedures for managing solvents and hazardous materials.*
  - a. *Performance Activity - Demonstrate safe storage, use, and disposition of hazardous waste.*
9. *Apply first aid procedures to use in treating injuries resulting from using shop equipment.*
  - a. *Performance Activity - Demonstrate procedures to clear the airway, stop the bleeding, protect the wound, and prevent shock.*

**Suggested References:**

Butterfield, F. Developing Shop Safety Skills: Teacher Guide. Athens, GA: American Association for Vocational Instructional Materials. 1984.

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Johnson, D. M. and Lawver, D. E. Mechanical Technology in Agriculture. Danville, IL: Interstate. 1995.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.

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Wren, J. E. & Smith, W. G. Safety Color Coding for the Shop. Athens, GA:  
American Association for Vocational Instructional Materials. 1982.

**AGRICULTURE PRODUCTION I**  
**UNIT 8: INTRODUCTION TO AGRICULTURAL STRUCTURES**

**(15 days)**

**Competencies and Suggested Objectives:**

1. Apply proper safety procedures with tools, equipment, and hazardous materials.
  - a. Identify proper safety procedures with tools, equipment, and hazardous materials.
  - b. Demonstrate proper safety procedures with tools, equipment, and hazardous materials.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

2. Select and utilize proper equipment for a specific job.
  - a. Identify equipment for a specific job.
  - b. Demonstrate correct procedures for use of selected hand and power tools.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

3. Develop a bill of materials for a specific job.
  - a. Identify the components of a bill of materials.
  - b. Prepare a bill of materials for a specific project or job.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*M7*  
*S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

4. Describe proper procedures for maintaining and storing equipment.
  - a. Identify procedures for maintaining equipment.
  - b. Identify procedures for storing equipment.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

5. Construct a building project.
  - a. Perform a building project utilizing proper techniques of construction.

*Related Academic Topics (See Appendix A):*

*C2, C3, C4, C5*

*M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Apply proper safety procedures with tools, equipment, and hazardous materials.*
  - a. *Discussion and media on proper safety procedures with tools, equipment, and hazardous materials.*
  - b. *Performance exercise to demonstrate proper safety procedures with tools, equipment and hazardous materials.*
2. *Select and utilize proper equipment for a specific job.*
  - a. *Discussion and media on equipment for a specific job.*
  - b. *Performance exercise to demonstrate correct procedures for use of selected hand and power tools.*
3. *Develop a bill of materials for a specific job.*
  - a. *Discussion and media on the components of a bill of materials.*
  - b. *Performance exercise to prepare a bill of materials for a specific project or job.*
4. *Describe proper procedures for maintaining and storing equipment.*
  - a. *Discussion and media on procedures for maintaining equipment.*
  - b. *Discussion and media on procedures for storing equipment.*
5. *Construct a building project.*
  - a. *Performance exercise to develop a building project utilizing proper techniques of construction.*

***Suggested Assessment Strategies:***

1. *Apply proper safety procedures with tools, equipment, and hazardous materials.*
  - a. *Test - Identify proper safety procedures with tools, equipment, and hazardous materials.*
  - b. *Performance Activity - Demonstrate proper safety procedures with tools, equipment and hazardous materials.*
2. *Select and utilize proper equipment for a specific job.*
  - a. *Test - Identify equipment for a specific job.*
  - b. *Performance Activity - Demonstrate correct procedures for use of selected hand and power tools.*

3. *Develop a bill of materials for a specific job.*
  - a. *Test - Identify the components of a bill of materials.*
  - b. *Performance Activity - Prepare a bill of materials for a specific project or job.*
4. *Describe proper procedures for maintaining and storing equipment.*
  - a. *Test - Identify procedures for maintaining equipment.*
  - b. *Test - Identify procedures for storing equipment.*
5. *Construct a building project.*
  - a. *Performance Activity - Perform a building project utilizing proper techniques of construction.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Harp, K. and Stewart, J. Vocational Agriculture II. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1985.

Johnson, D. M. and Lawver, D. E. Mechanical Technology in Agriculture. Danville, IL: Interstate. 1995.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

Reeder, D. Vocational Agriculture IV. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1979.

**AGRICULTURE PRODUCTION I**  
**UNIT 9: BASIC WELDING**

**(15 days)**

**Competencies and Suggested Objectives:**

1. Identify common equipment and tools used in welding.
  - a. Describe major types of welders including electric arc, metal inert gas (MIG), and tungsten inert gas (TIG).
  - b. Describe tools used with each type of welding.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP6
2. Apply safety precautions used in welding.
  - a. Use eye protection, proper apparel, ventilation, and materials handling procedures.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
3. Describe different welding supplies used in welding.
  - a. Identify low hydrogen, mild steel, and alloy welding electrodes.
  - b. Identify the different types of gases involved in the shielded arc welding process.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP3
4. Explain the meanings of the numbers in the electrode classification system.
  - a. Identify electrodes based upon tensile strength, position, and special characteristics.
  - b. Identify different types of wire and wire sizes (example: flux cored wire).
  - c. Describe the function of welding flux.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M1, M8

*Workplace Skills (See Appendix B):*  
WP1, WP2
5. Compare the different types of welds.
  - a. Identify bead, groove, and fillet welds.

- b. Identify the types of weld joints including T, lap, corner, edge, and butt.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2*

- 6. Perform various welding techniques.

- a. Perform welding techniques including start, stop and re-start, pad construction, flat butt construction, and flat fillet.

- b. Utilize various welding equipment including electric arc, MIG, and TIG.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

### ***Suggested Teaching Strategies:***

- 1. *Identify common equipment and tools used in welding.*

- a. *Discussion and media on major types of welders, including electric arc, metal inert gas (MIG), and tungsten inert gas (TIG).*

- b. *Discussion and media on tools used with each type of welding.*

- 2. *Apply safety precautions used in welding.*

- a. *Demonstrate eye protection, proper apparel, ventilation, and materials handling procedures.*

- 3. *Describe different welding supplies used in welding.*

- a. *Performance exercise to demonstrate low hydrogen, mild steel, and alloy welding electrodes.*

- b. *Written report on the different types of gases involved in the shielded arc welding process.*

- 4. *Explain the meanings of the numbers in the electrode classification system.*

- a. *Performance exercise to demonstrate electrodes based upon tensile strength, position, and special characteristics.*

- b. *Performance exercise to demonstrate different types of wire and wire sizes (example: flux cored wire).*

- c. *Written report on the function of welding flux.*

- 5. *Compare the different types of welds.*

- a. *Performance exercise to demonstrate bead, groove, and fillet welds.*

- b. *Performance exercise to demonstrate the types of weld joints including T, lap, corner, edge, and butt.*

- 6. *Perform various welding techniques.*

- a. *Performance exercise to demonstrate welding techniques including start, stop and re-start, pad construction, flat butt construction, and flat fillet.*

- b. *Performance exercise to demonstrate various welding equipment including electric arc, MIG, and TIG.*

**Suggested Assessment Strategies:**

1. *Identify common equipment and tools used in welding.*
  - a. *Test - Describe major types of welders including electric arc, metal inert gas (MIG), and tungsten inert gas (TIG).*
  - b. *Test - Describe tools used with each type of welding.*
2. *Apply safety precautions used in welding.*
  - a. *Assignment - Use eye protection, proper apparel, ventilation, and materials handling procedures.*
3. *Describe different welding supplies used in welding.*
  - a. *Performance Activity - Identify low hydrogen, mild steel, and alloy welding electrodes.*
  - b. *Assignment - Identify the different types of gases involved in the shielded arc welding process.*
4. *Explain the meanings of the numbers in the electrode classification system.*
  - a. *Performance Activity - Identify electrodes based upon tensile strength, position, and special characteristics.*
  - b. *Performance Activity - Identify different types of wire and wire sizes (example: flux cored wire).*
  - c. *Assignment - Describe the function of welding flux.*
5. *Compare the different types of welds.*
  - a. *Performance Activity - Identify bead, groove, and fillet welds.*
  - b. *Performance Activity - Identify the types of weld joints including T, lap, corner, edge, and butt.*
6. *Perform various welding techniques.*
  - a. *Performance Activity - Perform welding techniques including start, stop and re-start, pad construction, flat butt construction, and flat fillet.*
  - b. *Performance Activity - Utilize various welding equipment including electric arc, MIG, and TIG.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Harp, K. and Stewart, J. Vocational Agriculture II. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1985.

Phipps, L. J. & Reynolds, C. L. Mechanics in agriculture (4th ed.). Danville, IL: Interstate. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.



**AGRICULTURE PRODUCTION I**  
**UNIT 10: BASIC CUTTING AND WELDING**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Identify parts of the oxyacetylene welding equipment.
  - a. Assemble cutting attachment, welding attachment, and regulators and gages.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

2. Apply safety procedures for using oxyacetylene equipment.
  - a. Demonstrate removal of flammable materials, lighting, adjustment, and operations.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP3*

3. Identify the different types of oxyacetylene flames.
  - a. Compare neutral, oxidizing, and carburizing flames.

*Related Academic Topics (See Appendix A):*

*C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP4*

4. Set up oxyacetylene cutting and welding equipment.
  - a. Anchor cylinders to dolly or wall.
  - b. Crack cylinder valves.
  - c. Attach regulators.
  - d. Flush regulators.
  - e. Attach hoses and flush.
  - d. Attach torch body and flush.
  - e. Leak test connections using soapy water.
  - f. Adjust regulator pressures.
  - g. Select cutting or welding tips.

*Related Academic Topics (See Appendix A):*

*C2, C3, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP5*

5. Operate oxyacetylene equipment.
  - a. Set up and adjust oxyacetylene equipment.

- b. Make a cut in mild steel.

*Related Academic Topics (See Appendix A):*

*C2, C3*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

- 6. Cut metal with plasma arc cutter.
  - a. Identify parts of plasma arc cutter.
  - b. Perform set-up of plasma arc cutter.
  - c. Perform operation of plasma arc cutter to make cuts in steel, aluminum, and stainless steel.

*Related Academic Topics (See Appendix A):*

*C2, C3*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4*

***Suggested Teaching Strategies:***

- 1. *Identify parts of the oxyacetylene welding equipment.*
  - a. *Performance exercise to demonstrate cutting attachment, welding attachment, and regulators and gages.*
- 2. *Apply safety procedures for using oxyacetylene equipment.*
  - a. *Performance exercise to demonstrate removal of flammable materials, lighting, adjustment, and operations.*
- 3. *Identify the different types of oxyacetylene flames.*
  - a. *Demonstrate neutral, oxidizing, and carburizing flames.*
- 4. *Set up oxyacetylene cutting and welding equipment.*
  - a. *Performance exercise to demonstrate how to anchor cylinders to dolly or wall.*
  - b. *Performance exercise to crack cylinder valves.*
  - c. *Performance exercise to attach regulators.*
  - d. *Performance exercise to flush regulators.*
  - e. *Performance exercise to attach hoses and flush.*
  - d. *Performance exercise to attach torch body and flush.*
  - e. *Performance exercise to leak test connections using soapy water.*
  - f. *Performance exercise to adjust regulator pressures.*
  - g. *Performance exercise to select cutting or welding tips.*
- 5. *Operate oxyacetylene equipment.*
  - a. *Performance exercise to set up and adjust oxyacetylene equipment.*
  - b. *Performance exercise to make a cut in mild steel.*
- 6. *Cut metal with plasma arc cutter.*
  - a. *Label parts of plasma arc cutter.*
  - b. *Performance exercise to perform set-up of plasma arc cutter.*
  - c. *Performance exercise to perform operation of plasma arc cutter to make cuts in steel, aluminum, and stainless steel.*

**Suggested Assessment Strategies:**

1. *Identify parts of the oxyacetylene welding equipment.*
  - a. *Performance Activity - Assemble cutting attachment, welding attachment, and regulators and gages.*
2. *Apply safety procedures for using oxyacetylene equipment.*
  - a. *Performance Activity - Demonstrate removal of flammable materials, lighting, adjustment, and operations.*
3. *Identify the different types of oxyacetylene flames.*
  - a. *Assignment - Compare neutral, oxidizing, and carburizing flames.*
4. *Set up oxyacetylene cutting and welding equipment.*
  - a. *Performance Activity - Anchor cylinders to dolly or wall.*
  - b. *Performance Activity - Crack cylinder valves.*
  - c. *Performance Activity - Attach regulators.*
  - d. *Performance Activity - Flush regulators.*
  - e. *Performance Activity - Attach hoses and flush.*
  - d. *Performance Activity - Attach torch body and flush.*
  - e. *Performance Activity - Leak test connections using soapy water.*
  - f. *Performance Activity - Adjust regulator pressures.*
  - g. *Performance Activity - Select cutting or welding tips.*
5. *Operate oxyacetylene equipment.*
  - a. *Performance Activity - Set up and adjust oxyacetylene equipment.*
  - b. *Performance Activity - Make a cut in mild steel.*
6. *Cut metal with plasma arc cutter.*
  - a. *Assignment - Identify parts of plasma arc cutter.*
  - b. *Performance Activity - Perform set-up of plasma arc cutter.*
  - c. *Performance Activity - Perform operation of plasma arc cutter to make cuts in steel, aluminum, and stainless steel.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.

**AGRICULTURE PRODUCTION I**  
**UNIT 11: BASIC ELECTRICITY**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Explain the relationship between volts, amps, and watts.
  - a. Describe the applications of volts, amps, and watts.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6  
*Workplace Skills (See Appendix B):*  
WP2, WP4
2. Describe causes of electrical accidents.
  - a. Demonstrate prevention of electrical shorts circuits, circuit overloads, improper insulation, and presence of moisture.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6  
*Workplace Skills (See Appendix B):*  
WP1, WP4, WP5, WP6
3. Describe general precautions to be followed in working with electrical equipment and electricity.
  - a. Demonstrate procedures for respect for electricity, use of proper tools, disconnect power when working on circuits, proper grounding and safety devices, and proper working environment.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6  
*Workplace Skills (See Appendix B):*  
WP1, WP4, WP5, WP6
4. Describe the flow of electricity in a circuit.
  - a. Demonstrate the application of Ohm's Law.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
M7  
S6  
*Workplace Skills (See Appendix B):*  
WP2, WP4

5. Identify and use electrical tools.
  - a. Demonstrate use of the volt meter, amp meter, pliers, screwdrivers, wire cutters, and wire strippers.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M7*

*S6*

*Workplace Skills (See Appendix B):*

*WP1, WP4, WP5, WP6*

6. Identify and use electrical materials.
  - a. Demonstrate use of wires, insulation materials, control devices, overload devices, and conduit.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M7*

*S6*

*Workplace Skills (See Appendix B):*

*WP1, WP4, WP5, WP6*

7. Identify safety devices used in electrical circuits.
  - a. Demonstrate use of breakers, fuses, ground fault connector interrupters, and control switches.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M7*

*S6*

*Workplace Skills (See Appendix B):*

*WP1, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. *Explain the relationship between volts, amps, and watts.*
  - a. *Discussion and media on the applications of volts, amps, and watts.*
2. *Describe causes of electrical accidents.*
  - a. *Written report on prevention of electrical shorts circuits, circuit overloads, improper insulation, and presence of moisture.*
3. *Describe general precautions to be followed in working with electrical equipment and electricity.*
  - a. *Written report on procedures for respect for electricity, use of proper tools, disconnect power when working on circuits, proper grounding and safety devices, and proper working environment.*
4. *Describe the flow of electricity in a circuit.*
  - a. *Written report on the application of Ohm's Law.*

5. *Identify and use electrical tools.*
  - a. *Performance exercise to demonstrate use of the volt meter, amp meter, pliers, screwdrivers, wire cutters, and wire strippers.*
6. *Identify and use electrical materials.*
  - a. *Performance exercise to demonstrate use of wires, insulation materials, control devices, overload devices, and conduit.*
7. *Identify safety devices used in electrical circuits.*
  - a. *Performance exercise to demonstrate use of breakers, fuses, ground fault connector interrupters, and control switches.*

**Suggested Assessment Strategies:**

1. *Explain the relationship between volts, amps, and watts.*
  - a. *Test - Describe the applications of volts, amps, and watts.*
2. *Describe causes of electrical accidents.*
  - a. *Assignment - Demonstrate prevention of electrical shorts circuits, circuit overloads, improper insulation, and presence of moisture.*
3. *Describe general precautions to be followed in working with electrical equipment and electricity.*
  - a. *Assignment - Demonstrate procedures for respect for electricity, use of proper tools, disconnect power when working on circuits, proper grounding and safety devices, and proper working environment.*
4. *Describe the flow of electricity in a circuit.*
  - a. *Assignment - Demonstrate the application of Ohm's Law.*
5. *Identify and use electrical tools.*
  - a. *Performance Activity - Demonstrate use of the volt meter, amp meter, pliers, screwdrivers, wire cutters, and wire strippers.*
6. *Identify and use electrical materials.*
  - a. *Performance Activity - Demonstrate use of wires, insulation materials, control devices, overload devices, and conduit.*
7. *Identify safety devices used in electrical circuits.*
  - a. *Performance Activity - Demonstrate use of breakers, fuses, ground fault connector interrupters, and control switches.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.

**AGRICULTURE PRODUCTION I**  
**UNIT 12: SMALL ENGINES**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Explain the major parts and function of a small engine.
  - a. Identify ignition components, air cleaner, lubrication components, engine block, exhaust, and carburetor components.
  - b. Demonstrate use of hand tools and diagnostic instruments.
  - c. Trace events in the intake, compression, power, and exhaust strokes of a four cycle small engine.
  - d. Trace events in the intake-compression and power-exhaust strokes of a two cycle small engine.
  - e. Compare differences in two and four stroke cycle engines to indicate absence or presence of oil sump, mixed fuel, and labeling indicating stroke type.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C6*

*Workplace Skills (See Appendix B):*

*WP2, WP4, WP6, WP7*

2. Perform preventive maintenance on a small engine.
  - a. Service a crankcase breather, air cleaner, carburetor, governor, starter, and engine oil.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5, C6*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

3. Troubleshoot an inoperative small engine.
  - a. Diagnose ignition, fuel, and engine control problems.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C5, C6*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. *Explain the major parts and function of a small engine.*
  - a. *Discussion and media to identify ignition components, air cleaner, lubrication components, engine block, exhaust, and carburetor components.*
  - b. *Performance exercise to demonstrate use of hand tools and diagnostic instruments.*

- c. *Performance exercise to trace events in the intake, compression, power, and exhaust strokes of a four cycle small engine.*
- d. *Performance exercise to trace events in the intake-compression and power-exhaust strokes of a two cycle small engine.*
- e. *Performance exercise to compare differences in two and four stroke cycle engines to indicate absence or presence of oil sump, mixed fuel, and labeling indicating stroke type.*
2. *Perform preventive maintenance on a small engine.*
  - a. *Performance exercise to service a crankcase breather, air cleaner, carburetor, governor, starter, and engine oil.*
3. *Troubleshoot an inoperative small engine.*
  - a. *Performance exercise to diagnose ignition, fuel, and engine control problems.*

**Suggested Assessment Strategies:**

1. *Explain the major parts and function of a small engine.*
  - a. *Test - Identify ignition components, air cleaner, lubrication components, engine block, exhaust, and carburetor components.*
  - b. *Performance Activity - Demonstrate use of hand tools and diagnostic instruments.*
  - c. *Performance Activity - Trace events in the intake, compression, power, and exhaust strokes of a four cycle small engine.*
  - d. *Performance Activity - Trace events in the intake-compression and power-exhaust strokes of a two cycle small engine.*
  - e. *Performance Activity - Compare differences in two and four stroke cycle engines to indicate absence or presence of oil sump, mixed fuel, and labeling indicating stroke type.*
2. *Perform preventive maintenance on a small engine.*
  - a. *Performance Activity - Service a crankcase breather, air cleaner, carburetor, governor, starter, and engine oil.*
3. *Troubleshoot an inoperative small engine.*
  - a. *Performance Activity - Diagnose ignition, fuel, and engine control problems.*

**Suggested References:**

Briggs and Stratton. Service and Repair Instructions: Single Cylinder 4-Cycle Engines. Milwaukee, WI: Author. 1995.

Briggs and Stratton. Service and Repair Instructions: 2-Cycle Engines. Milwaukee, WI: Author. 1995.



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Briggs and Stratton. . Service and Repair Instructions: V-Twin OHV Engines. Milwaukee, WI: Author. 1995.

Burke, Stanley and Wakeman T. J. Modern Agricultural Mechanics. Danville, IL: Interstate. 1992.

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Deere & Co. Fundamentals of Service - Compact Equipment: Engines. Moline, IL: Author. 1983.

Manufacturer's Specifications and Operator's Manuals.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

Warzecha, M. Hazardous Materials: Fingertip Retrieval System. Alexandria, VA: American Vocational Association. 1991.

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AGRICULTURE PRODUCTION II

**AGRICULTURE PRODUCTION II**  
**UNIT 1: AGRICULTURAL BUSINESS ORGANIZATION**

**(4 days)**

**Competencies and Suggested Objectives:**

1. Describe the different types of business organizations, their advantages, and their disadvantages.
  - a. Identify the different types of business organizations, including sole proprietorship, partnership, corporate, and cooperative.
  - b. Compare the advantages and disadvantages of business organizations.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP6*

2. Analyze principles of a partnership agreement.
  - a. Explain the principles of a partnership agreement.
  - b. Describe a local business partnership.

*Related Academic Topics (See Appendix A):*

*C1, C2, C4*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP6*

**Suggested Teaching Strategies:**

1. *Describe the different types of business organizations, their advantages, and their disadvantages.*
  - a. *Discussion and media on the different types of business organizations, including sole proprietorship, partnership, corporate, and cooperative.*
  - b. *Written report on the advantages and disadvantages of business organizations using agricultural planning project and SAE.*
2. *Analyze principles of a partnership agreement.*
  - a. *Discussion and media on the principles of a partnership agreement.*
  - b. *Written report on a local business partnership.*

**Suggested Assessment Strategies:**

1. *Describe the different types of business organizations their advantages, and their disadvantages.*
  - a. *Test - Identify the different types of business organizations including sole proprietorship, partnership, corporate, and cooperative.*
  - b. *Assignment - Compare the advantages and disadvantages of business organizations.*

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2. *Analyze principles of a partnership agreement.*
  - a. *Test - Explain the principles of a partnership agreement.*
  - b. *Assignment - Describe a local business partnership.*

**Suggested References:**

Agricultural Satellite Information Service (ASIS).

Dictation Disc Company. Computer Applications for Business. New York, NY:  
Author. 1990.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA:  
Author. 1995.

Newman, M. E. and Wills, W. J. Agribusiness Management and Entrepreneurship.  
Danville, IL: Interstate. 1994.

Stewart, J. and Jobes, R. Farm and Ranch Business Management (3rd ed.).  
Moline, IL: Deere and Company. 1992.

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**AGRICULTURE PRODUCTION II**  
**UNIT 2: RECORDS AND RECORD KEEPING**

**(4 days)**

**Competencies and Suggested Objectives:**

1. Apply computer skills.
  - a. Demonstrate the use of word processing.
  - b. Demonstrate the use of spreadsheets.
  - c. Demonstrate the use of databases.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M2, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Develop mathematical skills.
  - a. Demonstrate mathematical concepts involved in adding, subtracting, multiplying, and dividing fractions and whole numbers.
  - b. Demonstrate mathematical concepts in measuring.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C5  
M1, M4, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Apply record keeping skills.
  - a. Demonstrate record keeping skills involved in selecting, planning, and implementing a SAE.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M2, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

***Suggested Teaching Strategies:***

1. *Apply computer skills.*
  - a. *Performance exercise to demonstrate the use of word processing.*
  - b. *Performance exercise to demonstrate the use of spreadsheets.*
  - c. *Performance exercise to demonstrate the use of databases.*
2. *Develop mathematical skills.*
  - a. *Written report on mathematical concepts involved in adding, subtracting, multiplying, and dividing fractions and whole numbers.*
  - b. *Performance exercise to demonstrate mathematical concepts in measuring.*

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3. *Apply record keeping skills.*
  - a. *Performance exercise to demonstrate record keeping skills involved in selecting, planning, and implementing a SAE.*

**Suggested Assessment Strategies:**

1. *Apply computer skills.*
  - a. *Performance Activity - Demonstrate the use of word processing.*
  - b. *Performance Activity - Demonstrate the use of spreadsheets.*
  - c. *Performance Activity - Demonstrate the use of databases.*
2. *Develop mathematical skills.*
  - a. *Assignment - Demonstrate mathematical concepts involved in adding, subtracting, multiplying, and dividing fractions and whole numbers.*
  - b. *Performance Activity - Demonstrate mathematical concepts in measuring.*
3. *Apply record keeping skills.*
  - a. *Performance Activity - Demonstrate record keeping skills involved in selecting, planning, and implementing a SAE.*

**Suggested References:**

Agricultural Satellite Information Service (ASIS).

Dictation Disc Company. Computer Applications for Business. New York, NY: Author. 1990.

McCully, J. Basic Vocational Education - Section IIIA - Introduction to Vocational Agriculture. Mississippi State: Research and Curriculum Unit. 1987.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

National FFA Organization. FFA Proficiency Award and Degree Software. Alexandria, VA: Author.

Stewart, J. and Jobes, R. Farm and Ranch Business Management (3rd ed.). Moline, IL: Deere and Company. 1992.

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**AGRICULTURE PRODUCTION II**  
**UNIT 3: TAXES, INSURANCE, AND BUSINESS LAW**

**(8 days)**

**Competencies and Suggested Objectives:**

1. Prepare tax forms.
  - a. Describe the forms and elements of preparation for income tax forms.
  - b. Complete tax returns.

*Related Academic Topics (See Appendix A):*  
C1, C2, C4, C6  
M1, M7

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Explain the responsibilities of the agribusiness employer concerning social security.
  - a. Describe types of social security benefits.
  - b. Identify responsibilities of the agribusiness employer concerning social security.

*Related Academic Topics (See Appendix A):*  
C1, C2, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Explain the kinds of insurance with coverage needed in an individual operation.
  - a. Compare the common kinds of insurance and coverage including life, property, health, and liability.
  - b. Determine the insurance needs of an individual operator including life, property, health, and liability.

*Related Academic Topics (See Appendix A):*  
C1, C2, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
4. Explain the essential elements of a contract and associate laws and other regulations affecting agribusiness activities.
  - a. Identify the essential elements of a contract including offer and acceptance, consideration, legal parties, and unlawful practices.
  - b. Associate laws and regulations affecting agribusiness activities including negligence, workman's compensation, estate planning, and other regulations.

*Related Academic Topics (See Appendix A):*  
C1, C2, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

**Suggested Teaching Strategies:**

1. *Prepare tax forms.*
  - a. *Discussion and media on the forms and elements of preparation for income tax forms.*
  - b. *Performance exercise to complete tax returns.*
2. *Explain the responsibilities of the agribusiness employer concerning social security.*
  - a. *Written report on types of social security benefits.*
  - b. *Written report on responsibilities of the agribusiness employer concerning social security.*
3. *Explain the kinds of insurance with coverage needed in an individual operation.*
  - a. *Written report on the common kinds of insurance and coverage, including life, property, health, and liability.*
  - b. *Performance exercise to determine the insurance needs of an individual operator, including life, property, health, and liability.*
4. *Explain the essential elements of a contract and associate laws and other regulations affecting agribusiness activities.*
  - a. *Discussion and media on the essential elements of a contract, including offer and acceptance, consideration, legal parties, and unlawful practices.*
  - b. *Written report on laws and regulations affecting agribusiness activities, including negligence, workman's compensation, estate planning, and other regulations.*

**Suggested Assessment Strategies:**

1. *Prepare tax forms.*
  - a. *Test - Describe the forms and elements of preparation for income tax forms.*
  - b. *Performance Activity - Complete tax returns.*
2. *Explain the responsibilities of the agribusiness employer concerning social security.*
  - a. *Test - Describe types of social security benefits.*
  - b. *Assignment - Identify responsibilities of the agribusiness employer concerning social security.*
3. *Explain the kinds of insurance with coverage needed in an individual operation.*
  - a. *Assignment - Compare the common kinds of insurance and coverage including life, property, health, and liability.*
  - b. *Performance Activity - Determine the insurance needs of an individual operator including life, property, health, and liability.*
4. *Explain the essential elements of a contract and associate laws and other regulations affecting agribusiness activities.*
  - a. *Test - Identify the essential elements of a contract including offer and acceptance, consideration, legal parties, and unlawful practices.*



- b. *Assignment - Associate laws and regulations affecting agribusiness activities, including negligence, workman's compensation, estate planning, and other regulations.*

**Suggested References:**

Agricultural Satellite Information Service (ASIS).

Lee, J. et al. Agricultural Marketing. Danville, IL: Interstate. 1994.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

Smith, M. et al. Agricultural Marketing (4th. ed.). Danville, IL: Interstate. 1991.

Stewart, B. et al. Agricultural Business Sales and Marketing. Columbia, MO: Instructional Materials Laboratory, University of Missouri.

Stewart, J. and Jobes, R. Farm and Ranch Business Management (3rd ed). Moline, IL: Deere and Company. 1992.

**AGRICULTURE PRODUCTION II**  
**UNIT 4: AGRICULTURAL ECONOMICS/MARKETING**

**(8 days)**

**Competencies and Suggested Objectives:**

1. Identify factors that affect pricing.
  - a. Describe the law of supply and demand.
  - b. Describe how income, population, customer preferences, competition, and expectations affect pricing.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

2. Explain general uses of futures contracts in marketing agricultural products, crops, and livestock.
  - a. Describe the function of a futures contract.
  - b. Describe the function of a futures contract option.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

3. Utilize an Agricultural Satellite Information System (ASIS).
  - a. Identify terms and abbreviations associated with ASIS.
  - b. Retrieve commodity trading prices, specific news items, and government reports.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

4. Apply ASIS in explaining how futures contract prices relate to cash market prices.
  - a. Define the relationship between cash and futures prices (basis).
  - b. Track the price fluctuations for a particular commodity through a six-week period, futures prices vs. cash prices.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*  
*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

5. Differentiate between retail and wholesale marketing.
  - a. Identify retail and wholesale marketing.
  - b. Identify retail and wholesale outlets in the community.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Identify factors that affect pricing.*
  - a. *Discussion and media on the law of supply and demand.*
  - b. *Written report on how income, population, customer preferences, competition, and expectations affect pricing.*
2. *Explain general uses of futures contracts in marketing agricultural products, crops, and livestock.*
  - a. *Discussion with guest speaker and media on the function of a futures contract.*
  - b. *Discussion with guest speaker and media on the function of a futures contract option.*
3. *Utilize an Agricultural Satellite Information System (ASIS).*
  - a. *Discussion and media on terms and abbreviations associated with ASIS.*
  - b. *Performance exercise to retrieve commodity trading prices, specific news items, and government reports.*
4. *Apply ASIS in explaining how futures contract prices relate to cash market prices.*
  - a. *Discussion and media on the relationship between cash and futures prices (basis).*
  - b. *Performance exercise to track the price fluctuations for a particular commodity through a six-week period, futures prices vs cash prices using ASIS.*
5. *Differentiate between retail and wholesale marketing.*
  - a. *Discussion and media on retail and wholesale marketing.*
  - b. *Written report on retail and wholesale outlets in the community.*

***Suggested Assessment Strategies:***

1. *Identify factors that affect pricing.*
  - a. *Test - Describe the law of supply and demand.*
  - b. *Assignment - Describe how income, population, customer preferences, competition, and expectations affect pricing.*

2. *Explain general uses of futures contracts in marketing agricultural products, crops, and livestock.*
  - a. *Test - Describe the function of a futures contract.*
  - b. *Test - Describe the function of a futures contract option.*
3. *Utilize an Agricultural Satellite Information System (ASIS).*
  - a. *Test - Identify terms and abbreviations associated with ASIS.*
  - b. *Performance Activity - Retrieve commodity trading prices, specific news items, and government reports.*
4. *Apply ASIS in explaining how futures contract prices relate to cash market prices.*
  - a. *Test - Define the relationship between cash and futures prices (basis).*
  - b. *Performance Activity - Track the price fluctuations for a particular commodity through a six-week period, futures prices vs. cash prices.*
5. *Differentiate between retail and wholesale marketing.*
  - a. *Test - Identify retail and wholesale marketing.*
  - b. *Assignment - Identify retail and wholesale outlets in the community.*

**Suggested References:**

Agricultural Satellite Information Service (ASIS).

Chicago Board of Trade. Community Trading Manual. Chicago, IL: Author. 1994.

Instructional Materials Service. Agribusiness Management and Marketing: Agriscience 311. (Catalog #8720). College Station, TX: Texas A&M.

Kay, R. D. and Edwards, W. (1994). Farm Management (3rd ed.). New York, NY: McGraw-Hill.

Lee, J. et al. Agricultural Marketing. Danville, IL: Interstate. 1994.

Luening, R. et al. The Farm Management Handbook (7th ed.). Danville, IL: Interstate. 1991.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

Stewart, B. et al. Agricultural Business Sales and Marketing. Columbia, MO: Instructional Materials Laboratory, University of Missouri.

Stewart, J. and Jobes, R. Farm and Ranch Business Management (3rd ed.). Moline, IL: Deere and Company. 1992.

**AGRICULTURE PRODUCTION II**  
**UNIT 5: AGRICULTURAL CREDIT**

**(8 days)**

**Competencies and Suggested Objectives:**

1. Describe the use, advantages, and disadvantages of agricultural credit.
  - a. Identify the uses of agricultural credit.
  - b. Identify the advantages and disadvantages of agricultural credit.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Determine established guidelines for credit rating and credit agreements.
  - a. Identify the guidelines for credit ratings.
  - b. Identify the various credit agreements and their guidelines.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Describe credit agencies and their sources of credit.
  - a. Identify local credit agencies and their operational procedures.
  - b. Identify alternative sources of farm credit.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

**Suggested Teaching Strategies:**

1. *Describe the use, advantages, and disadvantages of agricultural credit.*
  - a. *Discussion and media on the uses of agricultural credit.*
  - b. *Discussion and media on the advantages and disadvantages of agricultural credit.*
2. *Determine established guidelines for credit rating and credit agreements.*
  - a. *Discussion and media on the guidelines for credit ratings.*
  - b. *Discussion and media on the various credit agreements and their guidelines.*
3. *Describe credit agencies and their sources of credit.*
  - a. *Written report on local credit agencies and their operational procedures.*
  - b. *Written report on alternative sources of farm credit.*

***Suggested Assessment Strategies:***

1. *Describe the use, advantages, and disadvantages of agricultural credit.*
  - a. *Test - Identify the uses of agricultural credit.*
  - b. *Test - Identify the advantages and disadvantages of agricultural credit.*
2. *Determine established guidelines for credit rating and credit agreements.*
  - a. *Test - Identify the guidelines for credit ratings.*
  - b. *Test - Identify the various credit agreements and their guidelines.*
3. *Describe credit agencies and their sources of credit.*
  - a. *Assignment - Identify local credit agencies and their operational procedures.*
  - b. *Assignment - Identify alternative sources of farm credit.*

**Suggested References:**

Harp, K. and Stewart, J. Vocational Agriculture II. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1985

Instructional Materials Service. Agribusiness Management and Marketing: Agriscience 311. (Catalog #8720). College Station, TX: Texas A&M.

Instructional Materials Service. Advanced Agribusiness Management and Marketing: Agriscience 311H. (Catalog #8735). College Station, TX: Texas A&M.

Kay, R. D. and Edwards, W. Farm Management (3rd ed.). New York, NY: McGraw-Hill. 1994.

Luening, R. et al. The Farm Management Handbook (7th ed.). Danville, IL: Interstate. 1991.

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

**AGRICULTURE PRODUCTION II**  
**UNIT 6: ENVIRONMENTAL QUALITY CONTROL**

**(8 days)**

**Competencies and Suggested Objectives:**

1. Explain reasons why soil is important.
  - a. Describe pedological (dealing with plants) viewpoints.
  - b. Describe edaphological (dealing with soil as a natural body) viewpoints.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
2. Explain the factors which affect soil formation.
  - a. Describe the effects of moisture, temperature, and weathering on soil formation.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
3. Identify the two types of soil erosion.
  - a. Describe the effects of wind and water on soil erosion.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
4. Identify the three types of soil erosion caused by water.
  - a. Describe the effects of reel, sheet, and gully erosion on soil.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
5. Explain vegetative and mechanical management practices that aid in erosion control.
  - a. Describe the use of cover crops, conservation tillage practices, contouring, and terracing in erosion control.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

6. Explain the reasons for determining land capability class.
- Describe procedures for matching crops with land capability and determining maximum land use.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

7. Explain factors that determine a land capability class.
- Describe the effects of slope, texture, structure, and location in determining a land capability class.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

8. Explain the reasoning behind water conservation.
- Describe the decrease in the supply of ground water and water tables.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

9. Explain irrigation practices used to conserve water.
- Explain use of sub and trickle irrigation.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6

10. Explain the reasoning for EPA regulations on air and water quality.
- Describe air pollution and toxicity levels in water.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5  
S4, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP5, WP6



11. Conduct contamination analyses.
  - a. Test water, air, and soil for contaminants.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5  
S4, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. *Explain reasons why soil is important.*
  - a. *Discussion and media on pedological (dealing with plants) viewpoints.*
  - b. *Discussion and media on edaphological (dealing with soil as a natural body) viewpoints.*
2. *Explain the factors which affect soil formation.*
  - a. *Discussion and media on the effects of moisture, temperature, and weathering on soil formation.*
3. *Identify the two types of soil erosion.*
  - a. *Written report on the effects of wind and water on soil erosion.*
4. *Identify the three types of soil erosion caused by water.*
  - a. *Written report on the effects of reel, sheet, and gully erosion on soil.*
5. *Explain vegetative and mechanical management practices that aid in erosion control.*
  - a. *Written report on the use of cover crops, conservation tillage practices, contouring, and terracing in erosion control.*
6. *Explain the reasons for determining land capability class.*
  - a. *Written report on procedures for matching crops with land capability and determining maximum land use.*
7. *Explain factors that determine a land capability class.*
  - a. *Written report on the effects of slope, texture, structure, and location in determining a land capability class.*
8. *Explain the reasoning behind water conservation.*
  - a. *Written report on the decrease in the supply of ground water and water tables.*
9. *Explain irrigation practices used to conserve water.*
  - a. *Written report on use of sub and trickle irrigation.*
10. *Explain the reasoning for EPA regulations on air and water quality.*
  - a. *Written report on air pollution and toxicity levels in water.*
11. *Conduct contamination analyses.*
  - a. *Performance exercise to test water, air, and soil for contaminants.*

**Suggested Assessment Strategies:**

1. *Explain reasons why soil is important.*
  - a. *Test - Describe pedological (dealing with plants) viewpoints.*
  - b. *Test - Describe edaphological (dealing with soil as a natural body) viewpoints.*
2. *Explain the factors which affect soil formation.*
  - a. *Test - Describe the effects of moisture, temperature, and weathering on soil formation.*
3. *Identify the two types of soil erosion.*
  - a. *Assignment - Describe the effects of wind and water on soil erosion.*
4. *Identify the three types of soil erosion caused by water.*
  - a. *Assignment - Describe the effects of reel, sheet, and gully erosion on soil.*
5. *Explain vegetative and mechanical management practices that aid in erosion control.*
  - a. *Assignment - Describe the use of cover crops, conservation tillage practices, contouring, and terracing in erosion control.*
6. *Explain the reasons for determining land capability class.*
  - a. *Assignment - Describe procedures for matching crops with land capability and determining maximum land use.*
7. *Explain factors that determine a land capability class.*
  - a. *Assignment - Describe the effects of slope, texture, structure, and location in determining a land capability class.*
8. *Explain the reasoning behind water conservation.*
  - a. *Assignment - Describe the decrease in the supply of ground water and water tables.*
9. *Explain irrigation practices used to conserve water.*
  - a. *Assignment - Explain use of sub and trickle irrigation.*
10. *Explain the reasoning for EPA regulations on air and water quality.*
  - a. *Assignment - Describe air pollution and toxicity levels in water.*
11. *Conduct contamination analyses.*
  - a. *Performance Activity - Test water, air, and soil for contaminants.*

**Suggested References:**

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY: Delmar. 1990.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

**AGRICULTURE PRODUCTION II  
UNIT 7: PROPERTY ACQUISITION**

**(5 days)**

**Competencies and Suggested Objectives:**

1. Explain the approaches to acquiring property.
  - a. Identify the approaches to acquiring property including inheritance, purchasing, and leasing.
  - b. Describe the approaches to acquiring property including inheritance, purchasing, and leasing.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Explain the factors to consider in lease agreements.
  - a. Identify the factors to consider in lease agreements.
  - b. Describe the factors to consider in lease agreements including crop-share and cash lease.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Explain the system used in establishing the legal description of land.
  - a. Describe the system used to establish the legal description of land.
  - b. Interpret the legal description of a tract of land including section, township, and range.

*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5

*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

***Suggested Teaching Strategies:***

1. *Explain the approaches to acquiring property.*
  - a. *Written report on the approaches to acquiring property, including inheritance, purchasing, and leasing.*
  - b. *Discussion and media on the approaches to acquiring property, including inheritance, purchasing, and leasing.*
2. *Explain the factors to consider in lease agreements.*
  - a. *Written report on the factors to consider in lease agreements.*
  - b. *Discussion and media on the factors to consider in lease agreements, including crop-share and cash lease.*

3. *Explain the system used in establishing the legal description of land.*
  - a. *Discussion and media on the system used to establish the legal description of land.*
  - b. *Performance exercise to interpret the legal description of a tract of land, including section, township, and range.*

**Suggested Assessment Strategies:**

1. *Explain the approaches to acquiring property.*
  - a. *Assignment - Identify the approaches to acquiring property including inheritance, purchasing, and leasing.*
  - b. *Test - Describe the approaches to acquiring property including inheritance, purchasing, and leasing.*
2. *Explain the factors to consider in lease agreements.*
  - a. *Assignment - Identify the factors to consider in lease agreements.*
  - b. *Test - Describe the factors to consider in lease agreements including crop-share and cash lease.*
3. *Explain the system used in establishing the legal description of land.*
  - a. *Assignment - Describe the system used to establish the legal description of land.*
  - b. *Assignment - Interpret the legal description of a tract of land including section, township, and range.*

**Suggested References:**

National Council for Agricultural Education. Decisions and Dollars. Alexandria, VA: Author. 1995.

**AGRICULTURE PRODUCTION II**  
**UNIT 8: DIFFERENTIAL LEVELING**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Identify the parts of a farm level, types of self-reading rods, and parts of a rod.
  - a. Assemble and disassemble survey instruments.
  - b. Demonstrate correct reading of all scales and care of the level.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

2. Describe the procedures required in using a level.
  - a. Perform hand motions and signals, keeping records and field notes.
  - b. Demonstrate prevention of errors contributing to incorrect measurement.

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

3. Use a level to solve selected agricultural problems.
  - a. Perform different leveling projects, drainage projects, and terracing projects.

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Identify the parts of a farm level, types of self-reading rods, and parts of a rod.*
  - a. *Performance exercise to assemble and disassemble survey instruments*
  - b. *Performance exercise to demonstrate correct reading of all scales and care of the level.*
2. *Describe the procedures required in using a level.*
  - a. *Performance exercise to perform hand motions and signals, keeping records and field notes.*
  - b. *Performance exercise to demonstrate prevention of errors contributing to incorrect measurement.*
3. *Use a level to solve selected agricultural problems.*
  - a. *Performance exercise to perform different leveling projects, drainage projects, and terracing projects.*

**Suggested Assessment Strategies:**

1. *Identify the parts of a farm level, types of self-reading rods, and parts of a rod.*
  - a. *Performance Activity - Assemble and disassemble survey instruments*
  - b. *Performance Activity - Demonstrate correct reading of all scales and care of the level.*
2. *Describe the procedures required in using a level.*
  - a. *Performance Activity - Perform hand motions and signals, keeping records and field notes.*
  - b. *Assignment - Demonstrate prevention of errors contributing to incorrect measurement.*
3. *Use a level to solve selected agricultural problems.*
  - a. *Performance Activity - Perform different leveling projects, drainage projects, and terracing projects.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications. (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

**AGRICULTURE PRODUCTION II**  
**UNIT 9: PLANT PEST CONTROL AND PESTICIDE SAFETY**

(15 days)

**Competencies and Suggested Objectives:**

1. Explain common groups of plant pests and control measures.
  - a. Describe control procedures for weeds, disease, and insects.
  - b. Describe approved cultural, biological, and chemical practices.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 M1, M4, M7  
 S2, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
2. Explain characteristics of agricultural pesticides.
  - a. Describe use of herbicides, pesticides, fungicides, growth regulators, and defoliators.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 M1, M4, M7  
 S2, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
3. Explain factors to consider in selecting a pesticide for a specific pest problem.
  - a. Describe cost, method of kill, method of application, tolerance of crop, and safety.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 M1, M4, M7  
 S2, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
4. Identify personal safety devices for handling and applying pesticides.
  - a. Describe use of coveralls, hat, goggles, gloves, and respirator.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 M1, M4, M7  
 S2, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
5. Explain treatments for the different types of pesticide exposure.
  - a. Describe treatment for skin contact, inhaling, eye contact, and swallowing of pesticides.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

6. Explain record keeping procedures for pesticides.
  - a. Describe proper purchase, storage, and application of pesticides, as required by state and Federal laws and regulations.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

7. Explain factors to consider in storing and disposing of pesticides.
  - a. Describe the use of good ventilation, lockable storage, prevention of runoff, and properly labelled containers.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

8. Explain the different methods of pesticide application.
  - a. Describe dry, water soluble, aerosol, and suspension methods of application.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

9. Explain the different methods of pesticide application.
  - a. Describe ground, hand, and air pesticide application.

*Related Academic Topics (See Appendix A):*

C1, C2, C3, C4, C5

M1, M4, M7

S2, S8

*Workplace Skills (See Appendix B):*

WP1, WP2, WP4, WP6

10. Interpret pesticide label and Materials Safety Data Sheet (MSDS) information.
  - a. Describe the use, classification, formulation, ingredient, signal word, warning sign, precautions statement, and directions for use.



*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

11. Determine the cost per acre of a pesticide.
- a. Calculate the cost per acre of a pesticide in an instructor generated problem.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

12. Fulfill requirements for pesticide applicator's license.
- a. Successfully fulfill examination requirements for pesticide applicator's license.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*S2, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Explain common groups of plant pests and control measures.*
  - a. *Discussion and media on control procedures for weeds, disease, and insects.*
  - b. *Discussion and media on approved cultural, biological, and chemical practices.*
2. *Explain characteristics of agricultural pesticides.*
  - a. *Discussion and media on use of herbicides, pesticides, fungicides, growth regulators, and defoliators.*
3. *Explain factors to consider in selecting a pesticide for a specific pest problem.*
  - a. *Written report on cost, method of kill, method of application, tolerance of crop, and safety.*
4. *Identify personal safety devices for handling and applying pesticides.*
  - a. *Written report on use of coveralls, hat, goggles, gloves, and respirator.*
5. *Explain treatments for the different types of pesticide exposure.*
  - a. *Written report on treatment for skin contact, inhaling, eye contact, and swallowing of pesticides.*

6. *Explain record keeping procedures for pesticides.*
  - a. *Written report on proper purchase, storage, and application of pesticides, as required by state and Federal laws and regulations.*
7. *Explain factors to consider in storing and disposing of pesticides.*
  - a. *Discussion and media on the use of good ventilation, lockable storage, prevention of runoff, and properly labelled containers.*
8. *Explain the different methods of pesticide application.*
  - a. *Discussion and media on dry, water soluble, aerosol, and suspension methods of application.*
9. *Explain the different methods of pesticide application.*
  - a. *Written report on ground, hand, and air pesticide application.*
10. *Interpret pesticide label and Materials Safety Data Sheet (MSDS) information.*
  - a. *Written report on the use, classification, formulation, ingredient, signal word, warning sign, precautions statement, and directions for use.*
11. *Determine the cost per acre of a pesticide.*
  - a. *Performance exercise to calculate the cost per acre of a pesticide in an instructor generated problem.*
12. *Fulfill requirements for pesticide applicator's license.*
  - a. *Assist students to qualify for examination requirements for pesticide applicator's license.*

**Suggested Assessment Strategies:**

1. *Explain common groups of plant pests and control measures.*
  - a. *Test - Describe control procedures for weeds, disease, and insects.*
  - b. *Test - Describe approved cultural, biological, and chemical practices.*
2. *Explain characteristics of agricultural pesticides.*
  - a. *Test - Describe use of herbicides, pesticides, fungicides, growth regulators, and defoliators.*
3. *Explain factors to consider in selecting a pesticide for a specific pest problem.*
  - a. *Test - Describe cost, method of kill, method of application, tolerance of crop, and safety.*
4. *Identify personal safety devices for handling and applying pesticides.*
  - a. *Assignment - Describe use of coveralls, hat, goggles, gloves, and respirator.*
5. *Explain treatments for the different types of pesticide exposure.*
  - a. *Test - Describe treatment for skin contact, inhaling, eye contact, and swallowing of pesticides.*
6. *Explain record keeping procedures for pesticides.*
  - a. *Assignment - Describe proper purchase, storage, and application of pesticides, as required by state and Federal laws and regulations.*
7. *Explain factors to consider in storing and disposing of pesticides.*
  - a. *Test - Describe the use of good ventilation, lockable storage, prevention of runoff, and properly labelled containers.*

8. *Explain the different methods of pesticide application.*
  - a. *Test - Describe dry, water soluble, aerosol, and suspension methods of application.*
9. *Explain the different methods of pesticide application.*
  - a. *Assignment - Describe ground, hand, and air pesticide application.*
10. *Interpret pesticide label and Materials Safety Data Sheet (MSDS) information.*
  - a. *Assignment - Describe the use, classification, formulation, ingredient, signal word, warning sign, precautions statement, and directions for use.*
11. *Determine the cost per acre of a pesticide.*
  - a. *Performance Activity - Calculate the cost per acre of a pesticide in an instructor generated problem.*
12. *Fulfill requirements for pesticide applicator's license.*
  - a. *Assignment - Successfully fulfill examination requirements for pesticide applicator's license.*

**Suggested References:**

Colvin, T. & Turner, J. H. Applying Pesticides: Management, Application, and Safety. Athens, GA: AAVIM. 1980.

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY: Delmar. 1990.

**AGRICULTURE PRODUCTION II**  
**UNIT 10: ADVANCED WELDING**

**(15 days)**

**Competencies and Suggested Objectives:**

1. Examine the factors that determine a good weld.
  - a. Describe the desired penetration and uniformity of the bead.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
S6, S8  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
2. Explain the factors that determine the proper setting of a welding machine.
  - a. Describe the type of machine, electrode type and size, and joint design.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
S6, S8  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
3. Identify causes of improperly formed beads.
  - a. Describe the effects of incorrect amperages, incorrect travel speed, and improper arc length.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
S6, S8  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
4. Describe techniques used in making multiple passes.
  - a. Demonstrate root pass, cover pass, and filler pass.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
S6, S8  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6
5. Describe personal protection methods for arc welding hazards.
  - a. Demonstrate procedures to prevent electrical shock fires, burns, and smoke inhalation.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4  
S6, S8  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP6

6. Perform welds with shielded metal arc welding (SMAW) equipment.
  - a. Make a single-v-groove butt weld in the horizontal position.
  - b. Make a single-v-groove butt weld in the vertical up position.
  - c. Make a single v-groove butt weld in the overhead position.
  - d. Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4  
S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

7. Perform welds with metal inert gas welding (MIG) equipment.
  - a. Make a single-v-groove butt weld in the horizontal position.
  - b. Make a single-v-groove butt weld in the vertical position.
  - c. Make a single-v-groove butt weld in the overhead position.
  - d. Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4  
S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

8. Perform welds with tungsten inert gas welding (TIG) equipment.
  - a. Make a single-v-groove butt weld in the horizontal position.
  - b. Make a single-v-groove butt weld in the vertical position.
  - c. Make a single-v-groove butt weld in the overhead position.
  - d. Make a T-joint fillet weld in the vertical up position.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4  
S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

### ***Suggested Teaching Strategies:***

1. *Examine the factors that determine a good weld.*
  - a. *Demonstrate the desired penetration and uniformity of the bead.*
2. *Explain the factors that determine the proper setting of a welding machine.*
  - a. *Discussion and media on the type of machine, electrode type and size, and joint design.*
3. *Identify causes of improperly formed beads.*
  - a. *Demonstrate the effects of incorrect amperages, incorrect travel speed, and improper arc length.*
4. *Describe techniques used in making multiple passes.*
  - a. *Performance exercise to demonstrate root pass, cover pass, and filler pass.*

5. *Describe personal protection methods for arc welding hazards.*
  - a. *Demonstrate procedures to prevent electrical shock fires, burns, and smoke inhalation.*
6. *Perform welds with shielded metal arc welding (SMAW) equipment.*
  - a. *Performance exercise to make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance exercise to performance Activity - Make a single-v-groove butt weld in the vertical up position.*
  - c. *Performance exercise to make a single v-groove butt weld in the overhead position.*
  - d. *Performance exercise to make a T-joint fillet weld in the vertical up position.*
7. *Perform welds with metal inert gas (MIG) equipment.*
  - a. *Performance exercise to make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance exercise to make a single-v-groove butt weld in the vertical position.*
  - c. *Performance exercise to make a single-v-groove butt weld in the overhead position.*
  - d. *Performance exercise to make a T-joint fillet weld in the vertical up position.*
8. *Perform welds with tungsten inert gas welding (TIG) equipment.*
  - a. *Performance exercise to make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance exercise to make a single-v-groove butt weld in the vertical position.*
  - c. *Performance exercise to make a single-v-groove butt weld in the overhead position.*
  - d. *Performance exercise to make a T-joint fillet weld in the vertical up position.*

**Suggested Assessment Strategies:**

1. *Examine the factors that determine a good weld.*
  - a. *Assignment - Describe the desired penetration and uniformity of the bead.*
2. *Explain the factors that determine the proper setting of a welding machine.*
  - a. *Test - Describe the type of machine, electrode type and size, and joint design.*
3. *Identify causes of improperly formed beads.*
  - a. *Assignment - Describe the effects of incorrect amperages, incorrect travel speed, and improper arc length.*
4. *Describe techniques used in making multiple passes.*
  - a. *Performance Activity - Demonstrate root pass, cover pass, and filler pass.*

5. *Describe personal protection methods for arc welding hazards.*
  - a. *Assignment - Demonstrate procedures to prevent electrical shock fires, burns, and smoke inhalation.*
6. *Perform welds with shielded metal arc welding (SMAW) equipment.*
  - a. *Performance Activity - Make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance Activity - Make a single-v-groove butt weld in the vertical up position.*
  - c. *Performance Activity - Make a single v-groove butt weld in the overhead position.*
  - d. *Performance Activity - Make a T-joint fillet weld in the vertical up position.*
7. *Perform welds with metal inert gas (MIG) equipment.*
  - a. *Performance Activity - Make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance Activity - Make a single-v-groove butt weld in the vertical position.*
  - c. *Performance Activity - Make a single-v-groove butt weld in the overhead position.*
  - d. *Performance Activity - Make a T-joint fillet weld in the vertical up position.*
8. *Perform welds with tungsten inert gas welding (TIG) equipment.*
  - a. *Performance Activity - Make a single-v-groove butt weld in the horizontal position.*
  - b. *Performance Activity - Make a single-v-groove butt weld in the vertical position.*
  - c. *Performance Activity - Make a single-v-groove butt weld in the overhead position.*
  - d. *Performance Activity - Make a T-joint fillet weld in the vertical up position.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

**AGRICULTURE PRODUCTION II**  
**UNIT 11: OXYACETYLENE BRAZING AND WELDING**

(10 days)

**Competencies and Suggested Objectives:**

1. Describe the characteristics of the different types of welding and brazing flames.
  - a. Demonstrate neutral, oxidizing, and carburizing flames.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 S6, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
2. Describe properties and features of a good weld.
  - a. Demonstrate the effects of penetration, heat treating, and uniformity of the bead.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 S6, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
3. Describe factors that determine a good braze weld.
  - a. Demonstrate correct procedures of penetration and uniformity of the bead.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 S6, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
4. Explain factors to consider in selecting the proper welding tip.
  - a. Describe the effects of thickness of metal and joint design.

*Related Academic Topics (See Appendix A):*  
 C1, C2, C3, C4, C5  
 S6, S8

*Workplace Skills (See Appendix B):*  
 WP1, WP2, WP4, WP6
5. Describe factors to consider in selecting the proper welding rod.
  - a. Select the proper welding rod based upon thickness of metal, molecular composition of metal, and size of tip.



*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

6. Perform welds with oxyacetylene welding equipment.
  - a. Set up equipment and adjust regulator pressure.
  - b. Lay a bead with a filler rod in mild steel.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*S6, S8*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

***Suggested Teaching Strategies:***

1. *Describe the characteristics of the different types of welding and brazing flames.*
  - a. *Demonstrate how to adjust for neutral, oxidizing, and carburizing flames.*
2. *Describe properties and features of a good weld.*
  - a. *Demonstrate the effects of penetration, heat treating, and uniformity of the bead.*
3. *Describe factors that determine a good braze weld.*
  - a. *Demonstrate correct procedures of penetration and uniformity of the bead.*
4. *Explain factors to consider in selecting the proper welding tip.*
  - a. *Demonstrate the effects of thickness of metal and joint design.*
5. *Describe factors to consider in selecting the proper welding rod.*
  - a. *Demonstrate the proper welding rod based upon thickness of metal, molecular composition of metal, and size of tip.*
6. *Perform welds with oxyacetylene welding equipment.*
  - a. *Performance exercise to set up equipment and adjust regulator pressure.*
  - b. *Performance exercise to lay a bead with a filler rod in mild steel.*

***Suggested Assessment Strategies:***

1. *Describe the characteristics of the different types of welding and brazing flames.*
  - a. *Assignment - Demonstrate neutral, oxidizing, and carburizing flames.*
2. *Describe properties and features of a good weld.*
  - a. *Assignment - Demonstrate the effects of penetration, heat treating, and uniformity of the bead.*

3. *Describe factors that determine a good braze weld.*
  - a. *Assignment - Demonstrate correct procedures of penetration and uniformity of the bead.*
4. *Explain factors to consider in selecting the proper welding tip.*
  - a. *Assignment - Describe the effects of thickness of metal and joint design.*
5. *Describe factors to consider in selecting the proper welding rod.*
  - a. *Assignment - Select the proper welding rod based upon thickness of metal, molecular composition of metal, and size of tip.*
6. *Perform welds with oxyacetylene welding equipment.*
  - a. *Performance Activity - Set up equipment and adjust regulator pressure.*
  - b. *Performance Activity - Lay a bead with a filler rod in mild steel.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

**AGRICULTURE PRODUCTION II**  
**UNIT 12: AGRICULTURAL CONSTRUCTION**

**(15 days)**

**Competencies and Suggested Objectives:**

1. Identify the components of a bill of materials.
  - a. Demonstrate dimensions, kind, and amount of materials needed.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
2. Identify the parts of a framing square.
  - a. Describe the use of the blade and tongue.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
3. Identify the different types of roofs.
  - a. Describe gable, flat, and gambrel roofs.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
4. Explain the types of roofing materials.
  - a. Describe the use of roofing materials such as tin, wood, tar, and asphalt.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
5. Describe the different types of rafters.
  - a. Demonstrate procedures to prepare common and hip rafters.  
*Related Academic Topics (See Appendix A):*  
C1, C2, C3, C4, C5  
M1, M4, M7  
*Workplace Skills (See Appendix B):*  
WP1, WP2, WP4, WP5, WP6
6. Demonstrate the ability to lay out and cut common rafters.
  - a. Use models to lay out and cut common rafters.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

7. Describe factors to consider in planning a farm building.
  - a. Plan a farm building including the factors of cost, purpose, size of building, and available materials.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

8. Identify the common building materials used in farm construction.
  - a. Describe the use of wood, metal, fasteners, wire, concrete, and roofing materials.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

9. Explain the causes of building failures.
  - a. Describe prevention of foundation and structural problems.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

10. Explain the types of foundations and wall supports.
  - a. Describe slab and conventional foundations.
  - b. Prepare foundations for frame buildings and forms for concrete slab buildings.
  - c. Construct framing and wall supports.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

11. Explain the safe use of power, hand, and pneumatic tools.
  - a. Demonstrate use of power, hand, and pneumatic tools.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. *Identify the components of a bill of materials.*
  - a. *Provide an example of a bill of materials with dimensions, kind, and amount of materials needed.*
2. *Identify the parts of a framing square.*
  - a. *Demonstrate the use of the blade and tongue.*
3. *Identify the different types of roofs.*
  - a. *Written report on gable, flat, and gambrel roofs.*
4. *Explain the types of roofing materials.*
  - a. *Demonstrate the use of roofing materials such as tin, wood, tar, and asphalt.*
5. *Describe the different types of rafters.*
  - a. *Written report on procedures to prepare common and hip rafters.*
6. *Demonstrate the ability to layout and cut common rafters.*
  - a. *Performance exercise to use models to layout and cut common rafters.*
7. *Describe factors to consider in planning a farm building.*
  - a. *Performance exercise to plan a farm building including the factors of cost, purpose, size of building, and available materials.*
8. *Identify the common building materials used in farm construction.*
  - a. *Written report on the use of wood, metal, fasteners, wire, concrete, and roofing materials.*
9. *Explain the causes of building failures.*
  - a. *Written report on prevention of foundation and structural problems.*
10. *Explain the types of foundations and wall supports.*
  - a. *Written report on slab and conventional foundations.*
  - b. *Performance exercise to prepare foundations for frame buildings and forms for concrete slab buildings.*
  - c. *Performance exercise to construct framing and wall supports.*
11. *Explain the safe use of power, hand, and pneumatic tools.*
  - a. *Performance exercise to demonstrate use of power, hand, and pneumatic tools.*

***Suggested Assessment Strategies:***

1. *Identify the components of a bill of materials.*
  - a. *Assignment - Demonstrate dimensions, kind, and amount of materials needed.*

2. *Identify the parts of a framing square.*
  - a. *Assignment - Describe the use of the blade and tongue.*
3. *Identify the different types of roofs.*
  - a. *Assignment - Describe gable, flat, and gambrel roofs.*
4. *Explain the types of roofing materials.*
  - a. *Assignment - Describe the use of roofing materials such as tin, wood, tar, and asphalt.*
5. *Describe the different types of rafters.*
  - a. *Assignment - Demonstrate procedures to prepare common and hip rafters.*
6. *Demonstrate the ability to lay out and cut common rafters.*
  - a. *Performance Activity - Use models to lay out and cut common rafters.*
7. *Describe factors to consider in planning a farm building.*
  - a. *Performance Activity - Plan a farm building including the factors of cost, purpose, size of building, and available materials.*
8. *Identify the common building materials used in farm construction.*
  - a. *Assignment - Describe the use of wood, metal, fasteners, wire, concrete, and roofing materials.*
9. *Explain the causes of building failures.*
  - a. *Assignment - Describe prevention of foundation and structural problems.*
10. *Explain the types of foundations and wall supports.*
  - a. *Assignment - Describe slab and conventional foundations.*
  - b. *Performance Activity - Prepare foundations for frame buildings and forms for concrete slab buildings.*
  - c. *Performance Activity - Construct framing and wall supports.*
11. *Explain the safe use of power, hand, and pneumatic tools.*
  - a. *Performance Activity - Demonstrate use of power, hand, and pneumatic tools.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in agriculture (4th ed.). Danville, IL: Interstate. 1991.

**AGRICULTURE PRODUCTION II**  
**UNIT 13: ADVANCED ELECTRICITY**

**(10 days)**

**Competencies and Suggested Objectives:**

1. Identify electrical wiring supplies.
  - a. Describe different wire sizes, fuses, conduit, breakers and service entrance panels, junction box, meter box, and weather heads.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

2. Wire electrical circuits.
  - a. Wire a lighting outlet controlled by a single pole switch.
  - b. Wire a duplex receptacle using non-metallic cable.
  - c. Wire a lighting outlet controlled by two three-way switches.
  - d. Wire service entrance panels and breakers.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4*

*M1, M4, M7*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. *Identify electrical wiring supplies.*
  - a. *Discussion and media on different wire sizes, fuses, conduit, breakers and service entrance panels, junction box, meter box, and weather heads.*
2. *Wire electrical circuits.*
  - a. *Performance exercise to wire a lighting outlet controlled by a single pole switch.*
  - b. *Performance exercise to wire a duplex receptacle using non-metallic cable.*
  - c. *Performance exercise to wire a lighting outlet controlled by two three-way switches.*
  - d. *Performance exercise to wire service entrance panels and breakers.*

***Suggested Assessment Strategies:***

1. *Identify electrical wiring supplies.*
  - a. *Test - Describe different wire sizes, fuses, conduit, breakers and service entrance panels, junction box, meter box, and weather heads.*

2. *Wire electrical circuits.*
  - a. *Performance Activity - Wire a lighting outlet controlled by a single pole switch.*
  - b. *Performance Activity - Wire a duplex receptacle using non-metallic cable.*
  - c. *Performance Activity - Wire a lighting outlet controlled by two three-way switches.*
  - d. *Performance Activity - Wire service entrance panels and breakers.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.



**AGRICULTURE PRODUCTION II**  
**UNIT 14: AGRICULTURAL EQUIPMENT OPERATION, MAINTENANCE, AND**  
**REPAIRS** (15 days)

**Competencies and Suggested Objectives:**

1. Describe items or systems of agricultural equipment that should be checked on a daily basis.
  - a. Identify procedures for inspecting coolant, engine oil, tire pressure, hydraulic fluid, gear oil, and air filter.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP6*

2. Perform operation, service, and maintenance checks on agricultural equipment according to manufacturer's specifications.
  - a. Check engine oil levels.
  - b. Check coolant levels.
  - c. Check fuel levels.
  - d. Check tires.
  - e. Maintain battery.
  - f. Check and adjust V-belt tension.
  - g. Service an oil bath air cleaner.
  - h. Service a paper element air filter.
  - i. Check transmission, hydraulic, and final drive fluid levels.
  - j. Service front wheel bearings.
  - k. Change engine oil and filter.
  - l. Change transmission, hydraulic, and final drive fluids and filters.
  - m. Lubricate front end, brake and clutch pivots, three point hitch, and power take off drives.
  - n. Change coolant and service radiator.
  - o. Service power steering system.
  - p. Service fuel filter.
  - q. Bleed air from a diesel fuel system.
  - r. Adjust brakes.
  - s. Adjust clutch.
  - t. Adjust steering and front end.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

3. Perform repairs on agricultural machinery and equipment.
  - a. Determine parts to repair or replace.

b. Repair or replace required parts, reassemble, adjust, and test.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

4. Perform reconditioning of agricultural machinery and equipment.

a. Recondition agricultural machinery and equipment.

b. Paint agricultural machinery and equipment.

*Related Academic Topics (See Appendix A):*

*C1, C2, C3, C4, C5*

*Workplace Skills (See Appendix B):*

*WP1, WP2, WP4, WP5, WP6*

***Suggested Teaching Strategies:***

1. Describe items or systems of agricultural equipment that should be checked on a daily basis.
  - a. Discussion and media on procedures for inspecting coolant, engine oil, tire pressure, hydraulic fluid, gear oil, and air filter.
2. Perform operation, service, and maintenance checks on agricultural equipment according to manufacturer's specifications.
  - a. Performance exercise to check engine oil levels.
  - b. Performance exercise to check coolant levels.
  - c. Performance exercise to check fuel levels.
  - d. Performance exercise to check tires.
  - e. Performance exercise to maintain battery.
  - f. Performance exercise to check and adjust V-belt tension.
  - g. Performance exercise to service an oil bath air cleaner.
  - h. Performance exercise to service a paper element air filter.
  - i. Performance exercise to check transmission, hydraulic, and final drive fluid levels.
  - j. Performance exercise to service front wheel bearings.
  - k. Performance exercise to change engine oil and filter.
  - l. Performance exercise to change transmission, hydraulic, and final drive fluids and filters.
  - m. Performance exercise to lubricate front end, brake and clutch pivots, three point hitch, and power take off drives.
  - n. Performance exercise to change coolant and service radiator.
  - o. Performance exercise to service power steering system.
  - p. Performance exercise to service fuel filter.
  - q. Performance exercise to bleed air from a diesel fuel system.
  - r. Performance exercise to adjust brakes.
  - s. Performance exercise to adjust clutch.
  - t. Performance exercise to adjust steering and front end.

3. *Perform repairs on agricultural machinery and equipment.*
  - a. *Performance exercise to determine parts to repair or replace.*
  - b. *Performance exercise to repair or replace required parts, reassemble, adjust, and test.*
4. *Perform reconditioning of agricultural machinery and equipment.*
  - a. *Performance exercise to recondition agricultural machinery and equipment.*
  - b. *Performance exercise to paint agricultural machinery and equipment.*

***Suggested Assessment Strategies:***

1. *Describe items or systems of agricultural equipment that should be checked on a daily basis.*
  - a. *Test - Identify procedures for inspecting coolant, engine oil, tire pressure, hydraulic fluid, gear oil, and air filter.*
2. *Perform operation, service, and maintenance checks on agricultural equipment according to manufacturer's specifications.*
  - a. *Performance Activity - Check engine oil levels.*
  - b. *Performance Activity - Check coolant levels.*
  - c. *Performance Activity - Check fuel levels.*
  - d. *Performance Activity - Check tires.*
  - e. *Performance Activity - Maintain battery.*
  - f. *Performance Activity - Check and adjust V-belt tension.*
  - g. *Performance Activity - Service an oil bath air cleaner.*
  - h. *Performance Activity - Service a paper element air filter.*
  - i. *Performance Activity - Check transmission, hydraulic, and final drive fluid levels.*
  - j. *Performance Activity - Service front wheel bearings.*
  - k. *Performance Activity - Change engine oil and filter.*
  - l. *Performance Activity - Change transmission, hydraulic, and final drive fluids and filters.*
  - m. *Performance Activity - Lubricate front end, brake and clutch pivots, three point hitch, and power take off drives.*
  - n. *Performance Activity - Change coolant and service radiator.*
  - o. *Performance Activity - Service power steering system.*
  - p. *Performance Activity - Service fuel filter.*
  - q. *Performance Activity - Bleed air from a diesel fuel system.*
  - r. *Performance Activity - Adjust brakes.*
  - s. *Performance Activity - Adjust clutch.*
  - t. *Performance Activity - Adjust steering and front end.*
3. *Perform repairs on agricultural machinery and equipment.*
  - a. *Performance Activity - Determine parts to repair or replace.*
  - b. *Performance Activity - Repair or replace required parts, reassemble, adjust and test.*

4. *Perform reconditioning of agricultural machinery and equipment.*
  - a. *Performance Activity - Recondition agricultural machinery and equipment.*
  - b. *Performance Activity - Paint agricultural machinery and equipment.*

**Suggested References:**

Cooper, Elmer L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Manufacturer's Service and Operator's Manuals for Equipment Serviced.

Phipps, L. J. & Reynolds, C. L. Mechanics in Agriculture (4th ed.). Danville, IL: Interstate. 1991.

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SECTION III:  
RECOMMENDED TOOLS AND EQUIPMENT

## RECOMMENDED TOOLS AND EQUIPMENT FOR AGRICULTURE PRODUCTION

1. A-Frame w/10 ton chain hoist (1)
2. Air compressor (1)
3. Air compressor, portable (10)
4. Air quality test kit (1)
5. Anvil (1)
6. Bandsaw (1)
7. Bender (Hossfield) (1)
8. Blower/dryer, large animal (1)
9. Bolt cutter (1)
10. Booth, welding (4)
11. Briggs & Stratton engine, 3-5 hp, horizontal shaft (6)
12. Briggs & Stratton tool kits (3)
13. Brush, wire (10)
14. C-Clamp, assorted sizes (10)
15. C-Clamp, vise grip (6)
16. Cabinet, flammable materials (1)
17. Calculator, tape (3)
18. Can, gasoline (spill proof) (1)
19. Cash register (1)
20. Cement mixer, gas or electric powered (1)
21. Chute, blocking (Optional) (1)
22. Circular saw 7 1/2" (1)
23. Clamp, bar (4)
24. Clippers, large animal (1)
25. Clippers, small animal (1)
26. Computer w/multimedia kit and modem (10)
27. Conduit bender (3/8" and 1/2" VSR) (1)
28. Creeper (1)
29. Drill press, 14" w/vise (1)
30. Drill, cordless w/drives (2)
31. Drill, pneumatic (1)
32. Dust collection system for shop (1)
33. Eye protection & sterilization chest (1)
34. Fire extinguisher (1)
35. Flaring tool (1)
36. Floor jack, hydraulic, 4 ton (2)
37. Gloves (12 pr)
38. Gloves, welder (10 pr)
39. Goggles, oxyacetylene cutting w/lens (5)
40. Greenhouse (Business and Plant Science) 25' x 50' (Optional) (1)
41. Greenhouse - shade cloth (1)

42. Greenhouse - plant bench (10)
43. Greenhouse - chipper/shredder (1)
44. Greenhouse - thermometer, high/low
45. Greenhouse - Irrigation system, fans, heaters, and drip pad (w/greenhouse) (1)
46. Greenhouse - plant flats (100)
47. Greenhouse - probe, moisture (1)
48. Greenhouse - sprayer, 3 gal (1)
49. Grinder, die (1)
50. Grinder, pedestal (1)
51. Grinder, side, 4-6" (2)
52. Grinder, side, 7-9" (2)
53. Grinder, pneumatic (1)
54. Grinder, bench, 6" (2)
55. Hacksaw (2)
56. Hammer, curved (2)
57. Hammer, sledge (1)
58. Hammer, chipping (10)
59. Hammer, straight (2)
60. Hammer, ball peen (4)
61. Handsaw, rip (1)
62. Handsaw, crosscut (1)
63. Helmet, welder (10)
64. Jack stand (4)
65. Jig saw (2)
66. Jig saw, orbital (1)
67. Jointer (1)
68. Level, 48" (1)
69. Level, 24" (1)
70. Livestock panels, portable (4' x 12') (Optional)
71. Livestock trailer (Optional) (1)
72. Metal punches, set (1)
73. Metal chisels, set (1)
74. Meter, pH (1)
75. Micrometer, set (1)
76. Nailer, pneumatic (1)
77. Oxyacetylene cutting and welding set w/heating tips (2)
78. Paint spray gun (1)
79. Pipe wrenches (12"-24") (3)
80. Pipe cutter (1)
81. Planer, 16" (1)
82. Plasma arc cutter (1)
83. Pliers, vice grip (2)
84. Pliers, slip joint (5)
85. Pliers, needlenose (5)

86. Pliers, lineman's (5)
87. Printer (bubblejet) w/cables and switches (1)
88. Printers (wide carriage) Dot Matrix w/cables and switches (4)
89. Reamer (1)
90. Respirator (2)
91. Safety kit (OSHA approved) (1)
92. Sander, belt (1)
93. Sander, finish (1)
94. Saw, radial arm (1)
95. Saw, table (1)
96. Saw, metal cut off (1)
97. Saw, coping (2)
98. Scales, small animal (Optional) (1)
99. Screwdriver, electric (1)
100. Screwdrivers, Phillips, assorted sizes (5)
101. Screwdrivers, flat blade, assorted sizes (10)
102. Shield, safety (5)
103. Socket sets w/ratchets and pull handles (Metric  $\frac{1}{4}$ "  $\frac{3}{8}$ ", and  $\frac{1}{2}$ " drive) (2)
104. Socket sets w/ratchets and pull handles (SAE  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ", and  $\frac{3}{4}$ " drive) (2)
105. Soil test kit (1)
106. Solder gun (1)
107. Sparklighter (2)
108. Square, framing (4)
109. Squeeze chute, portable (Optional) (1)
110. Stand, small engine (6)
111. String trimmer (weed eater) (1)
112. Table, oxyacetylene cutting (4)
113. Table, metal shop (4)
114. Threading dies, set (1)
115. Tiller (8 hp), rear tines (1)
116. Tip cleaners, torch (3)
117. Transit level w/tripod and leveling rod (1)
118. Trim table (Optional) (1)
119. Tubing cutter (1)
120. Tubing bender (1)
121. Vacuum, shop (wet-dry) (1)
122. Vernier caliper (1)
123. Vice, machinist, 4" (4)
124. Vice, machinist, 6" (4)
125. Vise, pipe (1)
126. Volt-Ohmmeter (1)
127. Water quality test kit (1)
128. Welder, AC/DC 300 amp (4)
129. Welder, AC 225 amp (2)



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- 130. Welder, MIG (1)
- 131. Welder, TIG (1)
- 132. Wheel barrow, brick (1)
- 133. Wheelbarrow, 6 cu. ft. (1)
- 134. Wire stripper (5)
- 135. Wiring demonstrator (1)
- 136. Wrench, air impact, set w/sockets ( $\frac{1}{2}$ " ) (1)
- 137. Wrench, set combination (Metric) (2)
- 138. Wrench set, combination (SAE) (3)

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## SUGGESTED INSTRUCTIONAL AIDS

1. Agricultural Satellite Information System (ASIS)
2. Camcorder w/tripod and carrying case (1)
3. Cart, AV (for TV-VCR) (1)
4. Cart, AV (for overhead projector) (1)
5. Computer LCD display panel (to show computer on overhead projector) (1)
6. Digital camera, compatible with microcomputer video system (1)
7. Display easel (1)
8. Microcomputer video system (1)
9. Overhead projector (High intensity compatible with LCD panel) (1)
10. Phone service for Internet connection (1)
11. Slide projector (1)
12. TV-VCR (1)
13. Video out (Microcomputer to TV monitor)

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APPENDIX A:  
RELATED ACADEMIC TOPICS

## APPENDIX A

### RELATED ACADEMIC TOPICS FOR COMMUNICATIONS

- C1 Interpret written material.
- C2 Interpret visual materials (maps, charts, graphs, tables, etc.).
- C3 Listen, comprehend, and take appropriate actions.
- C4 Access, organize, and evaluate information.
- C5 Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.
- C6 Communicate ideas and information effectively using various oral and written forms for a variety of audiences and purposes.

### EXPANDED TOPICS FOR COMMUNICATIONS

#### TOPIC C1: Interpret written material.

- C1.01 Read and follow complex written directions.
- C1.02 Recognize common words and meanings associated with a variety of occupations.
- C1.03 Adjust reading strategy to purpose and type of reading.
- C1.04 Use sections of books and reference sources to obtain information.
- C1.05 Compare information from multiple sources and check validity.
- C1.06 Interpret items and abbreviations used in multiple forms.
- C1.07 Interpret short notes, memos, and letters.
- C1.08 Comprehend technical words and concepts.
- C1.09 Use various reading techniques depending on purpose for reading.
- C1.10 Find, read, understand, and use information from printed matter or electronic sources.

#### TOPIC C2: Interpret visual materials (maps, charts, graphs, tables, etc.).

- C2.01 Use visuals in written and in oral presentations.
- C2.02 Recognize visual cues to meaning (layout, typography, etc.).
- C2.03 Interpret and apply information using visual materials.

#### TOPIC C3: Listen, comprehend, and take appropriate action.

- C3.01 Identify and evaluate orally-presented messages according to purpose.
- C3.02 Recognize barriers to effective listening.
- C3.03 Recognize how voice inflection changes meaning.
- C3.04 Identify speaker signals requiring a response and respond accordingly.
- C3.05 Listen attentively and take accurate notes.
- C3.06 Use telephone to receive information.

C3.07 Analyze and distinguish information from formal and informal oral presentations.

TOPIC C4: Access, organize, and evaluate information.

C4.01 Distinguish fact from opinion.

C4.02 Use various print and non-print sources for specialized information.

C4.03 Interpret and distinguish between literal and figurative meaning.

C4.04 Interpret written or oral communication in relation to context and writer's point of view.

C4.05 Use relevant sources to gather information for written or oral communication.

TOPIC C5: Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.

C5.01 Select appropriate words for communication needs.

C5.02 Use reading, writing, listening, and speaking skills to solve problems.

C5.03 Compose inquiries and requests.

C5.04 Write persuasive letters and memos.

C5.05 Edit written reports, letters, memos, and short notes for clarity, correct grammar, and effective sentences.

C5.06 Write logical and understandable statements, phrases, or sentences for filling out forms, for correspondence or reports.

C5.07 Write directions or summaries of processes, mechanisms, events, or concepts.

C5.08 Select and use appropriate formats for presenting reports.

C5.09 Convey information to audiences in writing.

C5.10 Compose technical reports and correspondence that meet accepted standards for written communications.

TOPIC C6: Communicate ideas and information using oral and written forms for a variety of audiences and purposes.

C6.01 Give complex oral instructions.

C6.02 Describe a business or industrial process/mechanism.

C6.03 Participate effectively in group discussions and decision making.

C6.04 Produce effective oral messages utilizing different media.

C6.05 Explore ideas orally with partners.

C6.06 Participate in conversations by volunteering information when appropriate and asking relevant questions when appropriate.

C6.07 Restate or paraphrase a conversation to confirm one's own understanding.

C6.08 Gather and provide information utilizing different media.

- C6.09 Prepare and deliver persuasive, descriptive, and demonstrative oral presentations.

### RELATED ACADEMIC TOPICS FOR MATHEMATICS

- M1 Relate number relationships, number systems, and number theory.
- M2 Explore patterns and functions.
- M3 Explore algebraic concepts and processes.
- M4 Explore the concepts of measurement.
- M5 Explore the geometry of one-, two-, and three-dimensions.
- M6 Explore concepts of statistics and probability in real world situations.
- M7 Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

### EXPANDED TOPICS FOR MATHEMATICS

TOPIC M1: Relate number relationships, number systems, and number theory.

- M1.01 Understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific notation) in real world and mathematical problem situations.
- M1.02 Develop number sense for whole numbers, fractions, decimals, integers, and rational numbers.
- M1.03 Understand and apply ratios, proportions, and percents in a wide variety of situations.
- M1.04 Investigate relationships among fractions, decimals, and percents.
- M1.05 Compute with whole numbers, fractions, decimals, integers, and rational numbers.
- M1.06 Develop, analyze, and explain procedures for computation and techniques for estimations.
- M1.07 Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
- M1.08 Use computation, estimation, and proportions to solve problems.
- M1.09 Use estimation to check the reasonableness of results.

TOPIC M2: Explore patterns and functions.

- M2.01 Describe, extend, analyze, and create a wide variety of patterns.
- M2.02 Describe and represent relationships with tables, graphs, and rules.
- M2.03 Analyze functional relationships to explain how a change in one quantity results in a change in another.
- M2.04 Use patterns and functions to represent and solve problems.
- M2.05 Explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.

- M2.06 Use a mathematical idea to further their understanding of other mathematical ideas.
- M2.07 Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as art, music, and business.

TOPIC M3: Explore algebraic concepts and processes.

- M3.01 Represent situations and explore the interrelationships of number patterns with tables, graphs, verbal rules, and equations.
- M3.02 Analyze tables and graphs to identify properties and relationships and to interpret expressions and equations.
- M3.03 Apply algebraic methods to solve a variety of real world and mathematical problems.

TOPIC M4: Explore the concepts of measurement.

- M4.01 Estimate, make, and use measurements to describe and compare phenomena.
- M4.02 Select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
- M4.03 Extend understanding of the concepts of perimeter, area, volume, angle measure, capacity, and weight and mass.
- M4.04 Understand and apply reasoning processes, with special attention to spatial reasoning and reasoning with proportions and graphs.

TOPIC M5: Explore the geometry of one-, two-, and three-dimensions.

- M5.01 Identify, describe, compare, and classify geometric figures.
- M5.02 Visualize and represent geometric figures with special attention to developing spatial sense.
- M5.03 Explore transformations of geometric figures.
- M5.04 Understand and apply geometric properties and relationships.
- M5.05 Classify figures in terms of congruence and similarity and apply these relationships.

TOPIC M6: Explore the concepts of statistics and probability in real world situations.

- M6.01 Systematically collect, organize, and describe data.
- M6.02 Construct, read, and interpret tables, charts, and graphs.
- M6.03 Develop an appreciation for statistical methods as powerful means for decision making.
- M6.04 Make predictions that are based on exponential or theoretical probabilities.

M6.05 Develop an appreciation for the pervasive use of probability in the real world.

TOPIC M7: Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

M7.01 Use computers and/or calculators to process information for all mathematical situations.

M7.02 Use problem-solving approaches to investigate and understand mathematical content.

M7.03 Formulate problems from situations within and outside mathematics.

M7.04 Generalize solutions and strategies to new problem situations.

### RELATED ACADEMIC TOPICS FOR SCIENCE

S1 Explain the Anatomy and Physiology of the human body.

S2 Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.

S3 Relate the nine major phyla of the kingdom anomaly according to morphology, anatomy, and physiology.

S4 Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.

S5 Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.

S6 Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.

S7 Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance, population genetics, the structure and function of DNA, and current applications of DNA technology.

S8 Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

### EXPANDED TOPICS FOR SCIENCE

TOPIC S1: Explain the Anatomy and Physiology of the human body.

S1.01 Recognize common terminology and meanings.

S1.02 Explore the relationship of the cell to more complex systems within the body.



- S1.03 Summarize the functional anatomy of all the major body systems.
- S1.04 Relate the physiology of the major body systems to its corresponding anatomy.
- S1.05 Compare and contrast disease transmission and treatment within each organ system.
- S1.06 Explore the usage of medical technology as related to human organs and organ systems.
- S1.07 Explain the chemical composition of body tissue.

TOPIC S2: Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.

- S2.01 Identify the major types and structures of plants, viruses, monera, algae protista, and fungi.
- S2.02 Explain sexual and asexual reproduction.
- S2.03 Describe the ecological importance of plants as related to the environment.
- S2.04 Analyze the physical chemical and behavioral process of a plant.

TOPIC S3: Relate the nine major phyla of the kingdom anomaly according to morphology, anatomy, and physiology.

- S3.01 Explain the morphology, anatomy, and physiology of animals.
- S3.02 Describe the characteristics, behaviors, and habitats of selected animals.

TOPIC S4: Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.

- S4.01 Examine minerals and their identification, products of the rock cycle, byproducts of weathering, and the effects of erosion.
- S4.02 Relate the Hydrologic Cycle to include groundwater its zones, movement, and composition; surface water systems, deposits, and runoff.
- S4.03 Consider the effects of weather and climate on the environment.
- S4.04 Examine the composition of seawater; wave, tides, and currents; organisms, environment, and production of food; energy, food and mineral resources of the oceans.

TOPIC S5: Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.

- S5.01 Examine the science of chemistry to include the nature of matter, symbols, formulas and nomenclature, and chemical equations.

- S5.02 Identify chemical reactions including precipitation, acids-bases, and reduction-oxidation.
- S5.03 Explore the fundamentals of chemical bonding and principles of equilibrium.
- S5.04 Relate the behavior of gases.
- S5.05 Investigate the structure, reactions, and uses of organic compounds; and investigate nuclear chemistry and radiochemistry.

TOPIC S6: Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.

- S6.01 Examine fundamentals of motion of physical bodies and physical dynamics.
- S6.02 Explore the concepts and relationships among work, power, and energy.
- S6.03 Explore principles, characteristics, and properties of electricity, magnetism, light energy, thermal energy, and wave energy.
- S6.04 Identify principles of modern physics related to nuclear physics.

TOPIC S7: Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance; population genetics, the structure and function of DNA, and current applications of DNA technology.

- S7.01 Examine principles, techniques, and patterns of traits and inheritance in organisms.
- S7.02 Apply the concept of population genetics to both microbial and multicellular organism.
- S7.03 Identify the structure and function of DNA and the uses of DNA technology in science, industry, and society.

TOPIC S8: Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

- S8.01 Apply the components of scientific processes and methods in classroom and laboratory investigations.
- S8.02 Observe and practice safe procedures in the classroom and laboratory.
- S8.03 Demonstrate proper use and care for scientific equipment.
- S8.04 Investigate science careers, and advances in technology.
- S8.05 Communicate results of scientific investigations in oral, written, and graphic form.

August 1, 1995

APPENDIX B:  
WORKPLACE SKILLS

APPENDIX B  
WORKPLACE SKILLS FOR THE 21ST CENTURY

- WP1 Allocates resources (time, money, materials and facilities, and human resources).
- WP2 Acquires, evaluates, organizes and maintains, and interprets/communicates information, including the use of computers.
- WP3 Practices interpersonal skills related to careers including team member participation, teaching other people, serving clients/customers, exercising leadership, negotiation, and working with culturally diverse.
- WP4 Applies systems concept including basic understanding, monitoring and correction system performance, and designing and improving systems.
- WP5 Selects, applies, and maintains/troubleshoots technology.
- WP6 Employs thinking skills including creative thinking, decision making, problem solving, reasoning, and knowing how to learn.

August 1, 1995

APPENDIX C:  
STUDENT COMPETENCY PROFILE

## STUDENT COMPETENCY PROFILE FOR AGRICULTURE PRODUCTION I

Student: \_\_\_\_\_

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

### Unit 1: Careers in Agriculture

- \_\_\_\_\_ 1. Identify careers available in production agriculture.
- \_\_\_\_\_ 2. Analyze careers in production according to the factors influencing career choices.
- \_\_\_\_\_ 3. Prepare a written report on a tentative career choice.

### Unit 2: Leadership/FFA Activities

- \_\_\_\_\_ 1. Explain FFA organizational activities that promote and recognize achievements in agricultural production.
- \_\_\_\_\_ 2. Identify the benefits of FFA participation to an individual and to the agricultural industry.
- \_\_\_\_\_ 3. Explain opportunities for members in the FFA organization.
- \_\_\_\_\_ 4. Develop and present a 3-5 minute speech on an agricultural topic.
- \_\_\_\_\_ 5. Explain the purposes and functions of parliamentary procedure.

### Unit 3: Developing a Supervised Agricultural Experience Program (SAE)

- \_\_\_\_\_ 1. Describe the purposes and requirements of the SAE.
- \_\_\_\_\_ 2. Develop a long-range personal plan for the SAE.
- \_\_\_\_\_ 3. Develop a short-range personal plan.
- \_\_\_\_\_ 4. Complete a training agreement for the SAE.
- \_\_\_\_\_ 5. Describe agricultural record keeping for the SAE.
- \_\_\_\_\_ 6. Maintain agricultural records for the SAE.

### Unit 4: Animal Science and Management

- \_\_\_\_\_ 1. Select proper animal for specific farm enterprise or for participation in livestock shows and sales.

- \_\_\_\_\_ 2. Develop knowledge of nutrition in livestock production.
- \_\_\_\_\_ 3. Apply management practices for maintaining animal health.
- \_\_\_\_\_ 4. Explain procedures for managing livestock reproduction.

**Unit 5: Parts and Classification of Agricultural Plants**

- \_\_\_\_\_ 1. Identify the parts of a plant.
- \_\_\_\_\_ 2. Explain the functions of the basic parts of a plant.
- \_\_\_\_\_ 3. Describe how plants are classified.
- \_\_\_\_\_ 4. Explain the different classes of agricultural plants based upon their uses.
- \_\_\_\_\_ 5. Explain the differences in plants including differences in seed and leaves.

**Unit 6: Plant Reproduction and Nutrition**

- \_\_\_\_\_ 1. Explain the different ways in which plants reproduce.
- \_\_\_\_\_ 2. Identify the parts of a complete flower.
- \_\_\_\_\_ 3. Explain the process by which seeds are produced.
- \_\_\_\_\_ 4. Explain the stages in seed germination.
- \_\_\_\_\_ 5. Explain the requirements for seed germination and growth.
- \_\_\_\_\_ 6. Explain possible causes of poor or no seed germination.
- \_\_\_\_\_ 7. Identify the major plant nutrients that are supplied through the soil and identify their functions.
- \_\_\_\_\_ 8. Identify the secondary nutrients that must be present for proper growth.
- \_\_\_\_\_ 9. Explain the principles involved in determining the amounts and kinds of fertilizer to use.
- \_\_\_\_\_ 10. Interpret the analysis of a complete fertilizer.
- \_\_\_\_\_ 11. Obtain a soil sample for fertility testing.

**Unit 7: Agricultural Mechanics Orientation and Safety**

- \_\_\_\_\_ 1. Identify general safety precautions for shop work.
- \_\_\_\_\_ 2. Apply personal behavior required for shop and laboratory work.
- \_\_\_\_\_ 3. Apply personal safety equipment required in shop and laboratory work.
- \_\_\_\_\_ 4. Apply general safety rules pertaining to hand and power tools.
- \_\_\_\_\_ 5. Apply safety precautions in using stationary power tools.
- \_\_\_\_\_ 6. Match classes of fire to their correct description.
- \_\_\_\_\_ 7. Apply rules of safety relating to different situations in the shop.
- \_\_\_\_\_ 8. Apply procedures for managing solvents and hazardous materials.
- \_\_\_\_\_ 9. Apply first aid procedures to use in treating injuries resulting from using shop equipment.

### Unit 8: Introduction to Agricultural Structures

- \_\_\_\_\_ 1. Apply proper safety procedures with tools, equipment, and hazardous materials.
- \_\_\_\_\_ 2. Select and utilize proper equipment for a specific job.
- \_\_\_\_\_ 3. Develop a bill of materials for a specific job.
- \_\_\_\_\_ 4. Describe proper procedures for maintaining and storing equipment.
- \_\_\_\_\_ 5. Construct a building project.

### Unit 9: Basic Welding

- \_\_\_\_\_ 1. Identify common equipment and tools used in welding.
- \_\_\_\_\_ 2. Apply safety precautions used in welding.
- \_\_\_\_\_ 3. Describe different welding supplies used in welding.
- \_\_\_\_\_ 4. Explain the meanings of the numbers in the electrode classification system.
- \_\_\_\_\_ 5. Compare the different types of welds.
- \_\_\_\_\_ 6. Perform various welding techniques.

### Unit 10: Basic Cutting and Welding

- \_\_\_\_\_ 1. Identify parts of the oxyacetylene welding equipment.
- \_\_\_\_\_ 2. Apply safety procedures for using oxyacetylene equipment.
- \_\_\_\_\_ 3. Identify the different types of oxyacetylene flames.
- \_\_\_\_\_ 4. Set up oxyacetylene cutting and welding equipment.
- \_\_\_\_\_ 5. Operate oxyacetylene equipment.
- \_\_\_\_\_ 6. Cut metal with plasma arc cutter.

### Unit 11: Basic Electricity

- \_\_\_\_\_ 1. Explain the relationship between volts, amps, and watts.
- \_\_\_\_\_ 2. Describe causes of electrical accidents.
- \_\_\_\_\_ 3. Describe general precautions to be followed in working with electrical equipment and electricity.
- \_\_\_\_\_ 4. Describe the flow of electricity in a circuit.
- \_\_\_\_\_ 5. Identify and use electrical tools.
- \_\_\_\_\_ 6. Identify and use electrical materials.
- \_\_\_\_\_ 7. Identify safety devices used in electrical circuits.

### Unit 12: Small Engines

- \_\_\_\_\_ 1. Explain the major parts and function of a small engine.
- \_\_\_\_\_ 2. Perform preventive maintenance on a small engine.
- \_\_\_\_\_ 3. Troubleshoot an inoperative small engine.



STUDENT COMPETENCY PROFILE  
FOR AGRICULTURE PRODUCTION II

Student: \_\_\_\_\_

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Agricultural Business Organization

- \_\_\_\_\_ 1. Describe the different types of business organizations, their advantages, and their disadvantages.
- \_\_\_\_\_ 2. Analyze principles of a partnership agreement.

Unit 2: Records and Record Keeping

- \_\_\_\_\_ 1. Apply computer skills.
- \_\_\_\_\_ 2. Develop mathematical skills.
- \_\_\_\_\_ 3. Apply record keeping skills.

Unit 3: Taxes, Insurance, and Business Law

- \_\_\_\_\_ 1. Prepare tax forms.
- \_\_\_\_\_ 2. Explain the responsibilities of the agribusiness employer concerning social security.
- \_\_\_\_\_ 3. Explain the kinds of insurance with coverage needed in an individual operation.
- \_\_\_\_\_ 4. Explain the essential elements of a contract and associate laws and other regulations affecting agribusiness activities.

Unit 4: Agricultural Economics/Marketing

- \_\_\_\_\_ 1. Identify factors that affect pricing.
- \_\_\_\_\_ 2. Explain general uses of futures contracts in marketing agricultural products, crops, and livestock.
- \_\_\_\_\_ 3. Utilize an Agricultural Satellite Information System (ASIS).
- \_\_\_\_\_ 4. Apply ASIS in explaining how futures contract prices relate to cash market prices.
- \_\_\_\_\_ 5. Differentiate between retail and wholesale marketing.

**Unit 5: Agricultural Credit**

- \_\_\_\_\_ 1. Describe the use, advantages, and disadvantages of agricultural credit.
- \_\_\_\_\_ 2. Determine established guidelines for credit rating and credit agreements.
- \_\_\_\_\_ 3. Describe credit agencies and their sources of credit.

**Unit 6: Environmental Quality Control**

- \_\_\_\_\_ 1. Explain reasons why soil is important.
- \_\_\_\_\_ 2. Explain the factors which affect soil formation.
- \_\_\_\_\_ 3. Identify the two types of soil erosion.
- \_\_\_\_\_ 4. Identify the three types of soil erosion caused by water.
- \_\_\_\_\_ 5. Explain vegetative and mechanical management practices that aid in erosion control.
- \_\_\_\_\_ 6. Explain the reasons for determining land capability class.
- \_\_\_\_\_ 7. Explain factors that determine a land capability class.
- \_\_\_\_\_ 8. Explain the reasoning behind water conservation.
- \_\_\_\_\_ 9. Explain irrigation practices used to conserve water.
- \_\_\_\_\_ 10. Explain the reasoning for EPA regulations on air and water quality.
- \_\_\_\_\_ 11. Conduct contamination analyses.

**Unit 7: Property Acquisition**

- \_\_\_\_\_ 1. Explain the approaches to acquiring property.
- \_\_\_\_\_ 2. Explain the factors to consider in lease agreements.
- \_\_\_\_\_ 3. Explain the system used in establishing the legal description of land.

**Unit 8: Differential Leveling**

- \_\_\_\_\_ 1. Identify the parts of a farm level, types of self-reading rods, and parts of a rod.
- \_\_\_\_\_ 2. Describe the procedures required in using a level.
- \_\_\_\_\_ 3. Use a level to solve selected agricultural problems.

**Unit 9: Plant Pest Control and Pesticide Safety**

- \_\_\_\_\_ 1. Explain common groups of plant pests and control measures.
- \_\_\_\_\_ 2. Explain characteristics of agricultural pesticides.
- \_\_\_\_\_ 3. Explain factors to consider in selecting a pesticide for a specific pest problem.
- \_\_\_\_\_ 4. Identify personal safety devices for handling and applying pesticides.
- \_\_\_\_\_ 5. Explain treatments for the different types of pesticide exposure.

- \_\_\_\_\_ 6. Explain record keeping procedures for pesticides.
- \_\_\_\_\_ 7. Explain factors to consider in storing and disposing of pesticides.
- \_\_\_\_\_ 8. Explain the different methods of pesticide application.
- \_\_\_\_\_ 9. Explain the different methods of pesticide application.
- \_\_\_\_\_ 10. Interpret pesticide label and Materials Safety Data Sheet (MSDS) information.
- \_\_\_\_\_ 11. Determine the cost per acre of a pesticide.
- \_\_\_\_\_ 12. Fulfill requirements for pesticide applicator's license.

**Unit 10: Advanced Welding**

- \_\_\_\_\_ 1. Examine the factors that determine a good weld.
- \_\_\_\_\_ 2. Explain the factors that determine the proper setting of a welding machine.
- \_\_\_\_\_ 3. Identify causes of improperly formed beads.
- \_\_\_\_\_ 4. Describe techniques used in making multiple passes.
- \_\_\_\_\_ 5. Describe personal protection methods for arc welding hazards.
- \_\_\_\_\_ 6. Perform welds with shielded metal arc welding (SMAW) equipment.
- \_\_\_\_\_ 7. Perform welds with metal inert gas welding (MIG) equipment.
- \_\_\_\_\_ 8. Perform welds with tungsten inert gas welding (TIG) equipment.

**Unit 11: Oxyacetylene Brazing and Welding**

- \_\_\_\_\_ 1. Describe the characteristics of the different types of welding and brazing flames.
- \_\_\_\_\_ 2. Describe properties and features of a good weld.
- \_\_\_\_\_ 3. Describe factors that determine a good braze weld.
- \_\_\_\_\_ 4. Explain factors to consider in selecting the proper welding tip.
- \_\_\_\_\_ 5. Describe factor to consider in selecting the proper welding rod.
- \_\_\_\_\_ 6. Perform welds with oxyacetylene welding equipment.

**Unit 12: Agricultural Construction**

- \_\_\_\_\_ 1. Identify the components of a bill of materials.
- \_\_\_\_\_ 2. Identify the parts of a framing square.
- \_\_\_\_\_ 3. Identify the different types of roofs.
- \_\_\_\_\_ 4. Explain the types of roofing materials.
- \_\_\_\_\_ 5. Describe the different types of rafters.
- \_\_\_\_\_ 6. Demonstrate the ability to lay out and cut common rafters.
- \_\_\_\_\_ 7. Describe factors to consider in planning a farm building.
- \_\_\_\_\_ 8. Identify the common building materials used in farm construction.
- \_\_\_\_\_ 9. Explain the causes of building failures.
- \_\_\_\_\_ 10. Explain the types of foundations and wall supports.
- \_\_\_\_\_ 11. Explain the safe use of power, hand, and pneumatic tools.

Unit 13: Advanced Electricity

- \_\_\_\_\_ 1. Identify electrical wiring supplies.
- \_\_\_\_\_ 2. Wire electrical circuits.

Unit 14: Agricultural Equipment Operation, Maintenance, and Repairs

- \_\_\_\_\_ 1. Describe items or systems of agricultural equipment that should be checked on a daily basis.
- \_\_\_\_\_ 2. Perform operation, service, and maintenance checks on agricultural equipment according to manufacturer's specifications.
- \_\_\_\_\_ 3. Perform repairs on agricultural machinery and equipment.
- \_\_\_\_\_ 4. Perform reconditioning of agricultural machinery and equipment.