



CURRICULUM MAPPING WORKSHEET

Course Title: _____

Directions:

Review each content area on the list. Under each content area you will find standards numbered in the gray area. Place an (X) at all benchmarks you cover in the course listed above.

CONTENT AREA: ANIMAL SCIENCE

1. IMPACTS OF ANIMAL SCIENCE

- 1.1 Identify cultural and societal uses of animals locally and globally
- 1.2 Graph historical timelines of technological advances in animal science
- 1.3 Describe ways in which animals have and continue to contribute to the standard of living
- 1.4 Describe the positive and negative impacts of animal agriculture on the environment

2. SAFETY

- 2.1 Demonstrate safe animal handling techniques for production, laboratory and recreation purposes
- 2.2 Identify and demonstrate the proper use, maintenance and storage of livestock/poultry/laboratory animal equipment
- 2.3 Safely handle animal products (health products, meat, milk, wastes)

3. CAREERS IN ANIMAL SCIENCE

- 3.1 Identify career opportunities in animal science
- 3.2 Identify advanced training and postsecondary education options in animal science

4. ECONOMICS OF ANIMAL SCIENCE

- 4.1 Compare and contrast local and global marketing and distribution of animal use, products and related services
- 4.2 Identify industry and commodity groups as resources
- 4.3 Develop a marketing plan for a value-added animal product
- 4.4 Explain the influence of local and global conditions on market values
- 4.5 Research the world food outlook, effects of natural phenomena (e.g., drought), population growth trends and global trade issues
- 4.6 Describe the diversity of the animal industry and its impact on local, state and the national economy

5. TECHNOLOGICAL ADVANCES

- 5.1 Describe current biotechnology techniques in animal science
- 5.2 Describe environmental, food, medicines, public safety and biosecurity issues related to animal health
- 5.3 Analyze the impact of new and emerging technologies on the marketing and management of animals

6. INDUSTRY STANDARDS, BREED IMPROVEMENT AND SELECTION

- 6.1 Identify species, breeds and associated products and uses
- 6.2 Research and utilize breed associations, commodity groups and associated groups
- 6.3 Analyze trends and the effect of industry standards on consumer preferences and vice versa
- 6.4 Identify basic anatomy of animals

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6.5	Evaluate a group of animals for a specific purpose
6.6	Interpret trial performance data based on species/industry criteria
6.7	Describe personal conduct and code of ethics regarding fitting/showing techniques for specific species

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7. REPRODUCTION

- | | |
|-----|--|
| 7.1 | Explain the physiology of animal reproduction |
| 7.2 | Identify the organs and functions of the reproduction systems |
| 7.3 | Use associated reproductive equipment |
| 7.4 | Describe animal reproductive behavior |
| 7.5 | Interpret technical publications, charts and tools relating to animal reproduction |
| 7.6 | Compare and contrast artificial insemination, embryo transfer, cloning, as well as future emerging technologies |
| 7.7 | Describe current reproductive management techniques (i.e., heat detection, estrous synchronization, etc.) |
| 7.8 | Identify genetic engineering techniques in animal agriculture and describe their potential benefits and consequences |

8. GENETICS

- | | |
|-----|---|
| 8.1 | Explain animal pedigrees and family lines |
| 8.2 | Predict genetic types using the punnet square method |
| 8.3 | Explain the principles of animal genetics |
| 8.4 | Describe the heritability of character traits |
| 8.5 | Describe animal cell structure, function and division |

9. NUTRITION

- | | |
|------|--|
| 9.1 | Identify the essential nutrients for animal growth, performance, maintenance and reproduction |
| 9.2 | Identify feeds and feed components |
| 9.3 | Analyze feed tags and labels |
| 9.4 | Formulate feed rations |
| 9.5 | Interpret feed trial results |
| 9.6 | Calculate feed ration costs using the least cost formula |
| 9.7 | Determine the economic impacts of various feeding programs |
| 9.8 | Identify the organs and functions of the digestive system |
| 9.9 | Explain and compare digestive systems and physiology of digestion between various species |
| 9.10 | Identify the advantages and disadvantages of the use of hormones, growth regulations and medications in animal agriculture |

10. BEHAVIOR AND PSYCHOLOGY

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|------|---|
| 10.1 | Describe normal animal behavior by species, along with causes and potential results of abnormal behavior (social, sexual and ingestive) |
| 10.2 | Explain behavioral modification and its use in managing animals |
| 10.3 | Demonstrate proper handling techniques and describe the related psychological/behavioral principles |

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11. ANIMAL MANAGEMENT

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|--|--|
| | 11.1 Explain the appropriate use of various animal management record keeping methods |
| | 11.2 Identify animal identification techniques and their proper application |
| | 11.3 Describe the purposes of animal management practices used to control animal behavior, handling safety and housing |

12. HOUSING AND SANITATION

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|--|--|
| | 12.1 Describe housing systems |
| | 12.2 Demonstrate the safe use of housing and sanitation equipment |
| | 12.3 Research the various water and waste management systems and analyze their limitations |
| | 12.4 Develop a nutrient management plan |

13. HEALTH MANAGEMENT

- | | |
|--|--|
| | 13.1 Identify the organs and functions of the pulmonary, circulatory and immune systems |
| | 13.2 Recognize, identify and evaluate the effects of common diseases, parasites and poisons |
| | 13.3 Describe preventative animal health and treatment techniques |
| | 13.4 Explain local, state, federal and international laws and regulations which govern animal health |
| | 13.5 Develop a preventative health management plan for a specific species |
| | 13.6 Interpret animal health product labels |
| | 13.7 Demonstrate safe and proper application and administration of animal health products |

14. ANIMAL PRODUCTS AND PROCESSING (ALSO SEE FOOD SCIENCE)

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|--|--|
| | 14.1 Identify by-products of animals and their uses |
| | 14.2 Explain animal product labeling and packaging |
| | 14.3 Describe the uses of animal products for human and animal consumption |

15. CONSUMER SAFETY AND CONCERNS

- | | |
|--|--|
| | 15.1 Research and describe current consumer food trends |
| | 15.2 Identify the various animal welfare groups and describe their purposes |
| | 15.3 Research the state and federal legislation which governs animal issues |
| | 15.4 Explain local and global consumer concerns of animal agriculture over food safety and animal welfare |
| | 15.5 Analyze the impact of bioterrorism on animal agriculture from both the consumer and producers perspective |

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CONTENT AREA: BIOTECHNOLOGY

1. IMPACTS OF BIOTECHNOLOGY

- | | |
|-----|---|
| 1.1 | Analyze the public benefits and risks of biotechnology from the environmental, health and ethical aspects |
| 1.2 | Analyze and research the social, political and economic impact of the use of biotechnology in agricultural production |
| 1.3 | List the regulatory agencies and describe the laws and attitudes about foods produced through biotechnology |
| 1.4 | Survey and assess consumers knowledge and attitudes about foods produced through biotechnology |

2. SAFETY

- | | |
|-----|---|
| 2.1 | Explain human safety issues related to genetically engineered foods and their impact on agricultural production |
| 2.2 | Understand the laws and regulations regarding the use of bioengineered products |
| 2.3 | Demonstrate proper lab procedures, including aseptic technique and use of all laboratory equipment |

3. CAREERS IN BIOTECHNOLOGY

- | | |
|-----|---|
| 3.1 | Examine career pathways in biotechnology |
| 3.2 | Identify advanced training and postsecondary education in biotechnology |

4. BASIC BIOTECHNOLOGY CONCEPTS

- | | |
|-----|---|
| 4.1 | Define biotechnology and describe key historical events in its development |
| 4.2 | Demonstrate the steps in the scientific method |
| 4.3 | Understand product modifications via biotechnology and their origins (i.e., wool, cotton, peanuts, mushrooms, etc.) |

5. GENETICS AND GENETIC ENGINEERING

- | | |
|-----|--|
| 5.1 | Describe the levels of organization of living material |
| 5.2 | Identify basic cell structures |
| 5.3 | Recognize the types of cell reproduction |
| 5.4 | Describe the structure of genetic material |
| 5.5 | Explain the basic stages involved in the transfer of genetic information |
| 5.6 | Define genetic engineering |
| 5.7 | Describe the various methods of gene transfer |

6. BIOTECHNOLOGY IN PLANT SCIENCE

- | | |
|-----|--|
| 6.1 | Describe the purposes of plant biotechnology |
| 6.2 | Analyze the differences between traditional plant breeding and genetic engineering of plants |
| 6.3 | List the requirements for, and conduct laboratory micropropagation and plant culture(s) |
| 6.4 | Describe animal applications of plant culture |

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7. BIOTECHNOLOGY IN ANIMAL SCIENCE

- | | |
|-----|--|
| 7.1 | Identify the purposes of biotechnology in animal science |
| 7.2 | Compare the differences between traditional animal breeding and genetic engineering of animals |
| 7.3 | Describe the uses of biotechnology in the genetic engineering of animals and animal products |
| 7.4 | Define the terminology related to immunology |
| 7.5 | Demonstrate methods of stimulating an immune response |
| 7.6 | Describe the types of immunity |
| 7.7 | Define and describe the uses for monoclonal antibodies |

8. MICROBIAL BIOTECHNOLOGY IN AGRICULTURE

- | | |
|-----|--|
| 8.1 | Describe the types of microorganisms used in biotechnology |
| 8.2 | Describe the purposes and steps of the fermentation process |
| 8.3 | Describe the types and components of fermentation systems |
| 8.4 | Identify the products of fermentation |
| 8.5 | Analyze the cost and benefits of microbial biotechnology to production agriculture, the food processing industry and the environment |

9. BIOTECHNOLOGY AND THE ENVIRONMENT

- | | |
|-----|--|
| 9.1 | Identify and describe techniques used for detecting environmental pollutants |
| 9.2 | Identify biotechnology techniques used for bioremediation |
| 9.3 | Describe how natural and genetically engineered plants clean up toxic wastes |
| 9.4 | Describe how microbes can be used to clean up the environment |

10. RESOURCE RECOVERY

- | | |
|------|---|
| 10.1 | Define and describe biomass conversion, as it relates to fuels and energy |
| 10.2 | Identify regulations that affect the management of agricultural waste |
| 10.3 | Explain how biotechnological changes of agricultural products may change waste management options |
| 10.4 | Describe the use of genetically altered bacteria in human and animal waste management |
| 10.5 | Identify the appropriate disposal process for bioengineered products |

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CONTENT AREA: FOOD SCIENCE

1. TRENDS IN FOOD SCIENCE

- | | |
|-----|--|
| 1.1 | Identify emerging technologies and their impact on food products and processing |
| 1.2 | Define trends in food production, world population and supply and demand for food products |
| 1.3 | Describe the historical development of food processing and preservation |
| 1.4 | Analyze steps required in food research for developing new food products, testing food products, food packaging, transportation and marketing of foods |
| 1.5 | Examine how food production, processing and packaging techniques affect the environment |
| 1.6 | Identify food safety issues and consumer concerns affecting food science |

2. SAFETY

- | | |
|-----|---|
| 2.1 | Explain federal and state regulations and guidelines for food safety and inspection |
| 2.2 | Analyze and demonstrate food handling safety |
| 2.3 | Identify food borne diseases, their symptoms and effect |
| 2.4 | Demonstrate safe food production, food processing and preservation techniques |

3. CAREERS IN FOOD SCIENCE

- | | |
|-----|--|
| 3.1 | Examine career pathways in food science |
| 3.2 | Identify advanced training and postsecondary education opportunities in food science |

4. FOOD ECONOMICS

- | | |
|-----|--|
| 4.1 | Describe the global economic and political implications of food science technology |
| 4.2 | Determine how international trade of food products affects the producer |
| 4.3 | Recognize the importance of maintaining and expanding the food supply for the homeland and also for developing nations |
| 4.4 | Recognize value-added products and their impact on consumer purchasing trends |
| 4.5 | Describe the process that an agricultural product takes from producer to consumer |
| 4.6 | Explain food cost trends locally, regionally, nationally and internationally |
| 4.7 | Identify marketing strategies to deliver quality food products to consumers |

5. FOOD CHEMISTRY, BIOLOGY AND NUTRITION

- | | |
|-----|--|
| 5.1 | Explain the food nutrition pyramid guide |
| 5.2 | Identify food borne microorganisms |
| 5.3 | Describe the positive and negative effects of pesticides, chemicals and preservatives on foods |
| 5.4 | Describe the biochemistry of digestion and assimilation of food |
| 5.5 | Explain the physical and chemical processes involved in various food production and food processing techniques |

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6. FOOD PROCESSING TECHNOLOGY

- | | |
|-----|--|
| 6.1 | Identify various food products common in the agriculture industry |
| 6.2 | Identify and explain equipment and procedures utilized for food processing |
| 6.3 | Explain the impact customer demand has on food production, processing and presentation |
| 6.4 | Describe the use of biotechnology in food processing |

7. QUALITY AND ASSURANCE

- | | |
|-----|--|
| 7.1 | Identify how the quality of global foods is assured |
| 7.2 | Identify food industry standards and grades |
| 7.3 | Describe safe food preparation techniques, along with the food inspection system |
| 7.4 | Identify food additives and enhancers by examining food labels for content |

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CONTENT AREA: FORESTRY

1. INTRODUCTION TO FORESTRY

- | | |
|-----|---|
| 1.1 | Describe the history of Pennsylvania's forests |
| 1.2 | Describe the varied and multiple uses of forests |
| 1.3 | Identify current issues and policies in forest management |

2. SAFETY

- | | |
|-----|---|
| 2.1 | Identify and demonstrate the use of personal safety equipment |
| 2.2 | Identify unsafe acts or conditions at a logging site or in the forest |
| 2.3 | Use a fire extinguisher |
| 2.4 | Use a first aid kit |
| 2.5 | Understand the forest fire danger rating system |
| 2.6 | Maintain equipment in safe working order |

3. CAREERS IN FORESTRY

- | | |
|-----|---|
| 3.1 | Examine career pathways in forestry |
| 3.2 | Identify advance training and postsecondary education in forestry |

4. ECONOMICS OF FORESTRY

- | | |
|-----|--|
| 4.1 | Describe the role of forestry in the local, state, national and international economy |
| 4.2 | Discuss issues related to full-cycle utilization of products (e.g., raw to manufactured) |
| 4.3 | Understand the role of trade and regulatory pressures on forest businesses |
| 4.4 | Describe how incentives and penalties are used in the forestry industry |
| 4.5 | Describe the impact of local policies (e.g., noise, no trucks, etc.) on forest economics |

5. FOREST ECOLOGY AND CONSERVATION

- | | |
|-----|--|
| 5.1 | Describe basic concepts of forest ecology and conservation |
| 5.2 | Describe sources of forest ecosystem variability and diversity |
| 5.3 | Describe the effects of temperature, moisture, soil and solar radiation on tree growth |
| 5.4 | Describe competition and successions role in forest ecology |
| 5.5 | Describe basic forest conservation policies and practices that lead to sustainability |

6. DENDROLOGY

- | | |
|-----|--|
| 6.1 | List and describe the U.S. forest types |
| 6.2 | Identify trees and shrubs |
| 6.3 | Identify range, tolerance and site requirements for major forest species |

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7. FOREST MEASUREMENT

- | | |
|-----|---|
| 7.1 | Scale and grade logs |
| 7.2 | Measure tree diameter and height |
| 7.3 | Perform a timber cruise (inventory), and describe its purpose |
| 7.4 | Determine a tree's age and health |
| 7.5 | Demonstrate surveying techniques |
| 7.6 | Calculate elevation, slope and acreage |
| 7.7 | Interpret map scales and symbols |

8. SILVICULTURE

- | | |
|-----|---|
| 8.1 | Describe methods of planting trees |
| 8.2 | Perform thinning and pruning techniques |
| 8.3 | Describe situations utilizing prescribed burns |
| 8.4 | Describe the methods used for natural and planted forest regeneration |
| 8.5 | Identify tree stand cultivation, growth and management practices |
| 8.6 | Identify forest pests, diseases and their management |

9. HARVESTING

- | | |
|-----|---|
| 9.1 | Describe various harvesting methods, as well as when and why they are appropriate |
| 9.2 | Demonstrate felling, limbing and bucking techniques |
| 9.3 | Demonstrate safe loading and hauling practices |

10. MANUFACTURING LUMBER

- | | |
|------|--|
| 10.1 | Sort logs by species and grade |
| 10.2 | Saw logs for value and product specifications |
| 10.3 | Measure, edge and trim lumber for grade and volume |
| 10.4 | Demonstrate safe operation of a sawmill |
| 10.5 | Describe the various processes for seasoning lumber |
| 10.6 | Plane, sort and sticker lumber |
| 10.7 | Prepare lumber for shipment |
| 10.8 | List basic lumber sizes |
| 10.9 | Compare manufacturing and marketing of hardwoods and softwoods |

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11. FOREST PRODUCTS

11.1 Recognize, name and describe the processing of the major forest products

11.2 Describe species utilization

12. URBAN FORESTRY

12.1 Describe the benefits and roles of urban forestry

12.2 Identify and select proper trees and shrubs for urban setting

12.3 Plant, fertilize and trim trees and shrubs

12.4 Demonstrate safe tree climbing techniques

12.5 Practice safe removal of limbs and trees

12.6 Identify traits of hazardous trees and common problems of urban trees and shrubs

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CONTENT AREA: LEADERSHIP AND CAREER DEVELOPMENT

1. FUNDAMENTALS OF LEADERSHIP AND CAREER DEVELOPMENT

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|-----|---|
| 1.1 | Identify and describe leadership styles |
| 1.2 | Identify the factors in developing effective leaders |
| 1.3 | Identify traits of effective leaders |
| 1.4 | Identify and relate various learning styles to leadership development |
| 1.5 | Describe changing trends in agriculture and how they affect career opportunities |
| 1.6 | Identify transferable skills from one career pathway to another within agriculture |
| 1.7 | Design a continuing education plan to assist someone to move up a career ladder in a particular pathway |
| 1.8 | Research salary and benefits for a chosen career path and compare to target lifestyle |
| 1.9 | Establish personal and professional short- and long-term goals |

2. EMPLOYABILITY SKILLS

- | | |
|-----|---|
| 2.1 | Research career information and resources for use in career decision making |
| 2.2 | Compile a career portfolio including a resume and samples of highlighted projects, personal newspaper clippings, etc. |
| 2.3 | Understand the necessity of continuing education and lifelong learning to enhance career ladder development |
| 2.4 | Participate in a mock interview, including the completion of a sample application |

3. JOB READINESS AND RETENTION SKILLS

- | | |
|-----|---|
| 3.1 | Understand appropriate workplace attire and etiquette |
| 3.2 | Demonstrate ability to work successfully within a team atmosphere |
| 3.3 | Demonstrate problem-solving techniques |
| 3.4 | Understand diversity and work effectively with all individuals |
| 3.5 | Work independently and be self motivated |
| 3.6 | Demonstrate conflict resolution techniques |

4. CITIZENSHIP

- | | |
|-----|---|
| 4.1 | Identify and describe various community-based youth, civic and professional organizations |
| 4.2 | Participate in selected community-based youth, civic or professional organization |
| 4.3 | Develop an understanding of the purpose, structure and function of governmental units at all levels |
| 4.4 | Describe how public policy and laws are developed at the local, state and national level |
| 4.5 | Identify the limits of local government and the impact of state and federal laws on local governments |

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5. THE PURPOSE, STRUCTURE AND FUNCTION OF FFA

5.1	Identify the aims, purposes and structures of the FFA
5.2	Explain FFA tradition and principles
5.3	Describe the historical development of the FFA
5.4	Participate in Career Development Events
5.5	Understand the role of the FFA Foundation and Alumni
5.6	Understand the intracurricular connection between FFA and agriculture education
5.7	Recognize the role FFA plays in personal and professional development
5.8	Understand the practical application of the FFA motto

6. INDIVIDUAL AND GROUP LEADERSHIP

6.1	Demonstrate the ability to use parliamentary procedure
6.2	Identify the key factors in building successful teams
6.3	Conduct successful meetings
6.4	Develop and implement an annual program of activities for the FFA chapter
6.5	Analyze personal strengths and weaknesses
6.6	Identify personality traits and how these affect relationships with others in the workplace

7. COMMUNICATION AND PUBLIC SPEAKING

7.1	Demonstrate effective communication skills, including oral, written, listening and questioning
7.2	Create and deliver a prepared and extemporaneous speech demonstrating proper public speaking skills and etiquette
7.3	Memorize and recite the FFA creed and motto
7.4	Demonstrate basic journalism and writing skills
7.5	Demonstrate the appropriate techniques for writing press releases and working with the press
7.6	Demonstrate the use of current and emerging technologies as a tool for increasing effective communication

8. INFORMATION RESEARCH SKILLS

8.1	Conduct extensive research on a selected topic using a variety of sources
8.2	Identify techniques used for conducting market research, including surveys and studies
8.3	Develop alternative solution scenarios for a problem using sound research methods
8.4	Understand the importance of utilizing diverse and reliable information

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9. SUPERVISED AGRICULTURAL EXPERIENCE

9.1	Develop short, mid- and long-range project plans
9.2	Develop a Supervised Agricultural Experience (SAE) based upon individual interest/career goals
9.3	Maintain complete and accurate records
9.4	Analyze records to determine strengths and areas for improvement
9.5	Conduct a research project using the scientific method

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CONTENT AREA: MANAGEMENT, ECONOMICS AND MARKETING

1. IMPACT OF AGRIBUSINESS ON THE ECONOMY

- 1.1 Discuss the historical significance of agriculture to U.S. and global economic strength
- 1.2 Identify and describe agribusiness in the community and its importance/role in the local economy
- 1.3 Explain the current and future role agribusiness plays in the economy of the state and nation

2. SAFETY

- 2.1 Identify and describe state and federal agencies that regulate business safety issues
- 2.2 Describe the cost and benefits of a safe workplace
- 2.3 Describe generic worker safety notification procedures, as well as the appropriate worker safety notification procedure, for a sample business
- 2.4 Develop a workplace safety program

3. CAREERS IN AGRIBUSINESS

- 3.1 Examine agribusiness career pathways
- 3.2 Identify advanced training and postsecondary education in agribusiness

4. BUSINESS ORGANIZATIONS

- 4.1 Discuss and describe the four types of operational organization of businesses
- 4.2 Discuss the roles and responsibilities of employees within a business
- 4.3 Examine entrepreneurship principles for agribusiness
- 4.4 Analyze successful and unsuccessful business practices
- 4.5 Explain agricultural cooperatives, their role and current trends
- 4.6 Evaluate agribusiness operations and set strategies for the future
- 4.7 Describe the various types of business/professional associations and the roles that they play

5. ESTABLISHING A BUSINESS

- 5.1 Demonstrate techniques for goal setting and production planning
- 5.2 Identify and analyze business inputs and resources by enterprise
- 5.3 Develop a business and marketing plan specific to a certain enterprise
- 5.4 Describe various methods of capitalizing a business and its importance in supporting the establishment phase
- 5.5 Describe the role of estate planning and planning for intergeneration transfer
- 5.6 Describe the role of information technology in business operations

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6. AGRICULTURAL BUSINESS MANAGEMENT PROCEDURES

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|-----|---|
| 6.1 | Identify functions, role and purpose of management in a business |
| 6.2 | Describe business organizational charts and lines of reporting |
| 6.3 | Identify and define business expansion through vertical or horizontal integration |
| 6.4 | Describe the pros and cons of consolidations, monopolies and mergers |
| 6.5 | Describe profit center management |
| 6.6 | Explain various methods of risk management and diversification |
| 6.7 | Analyze supply and demand, the relationship between them and price and how they affect management decisions |
| 6.8 | Describe the role of the decision-making process in effective management |
| 6.9 | Describe the critical role of business ethics in management |

7. ACCOUNTING AND FINANCIAL SYSTEMS

- | | |
|-----|---|
| 7.1 | Maintain accurate business and financial records |
| 7.2 | Construct and analyze financial statements |
| 7.3 | Analyze financial ratios |
| 7.4 | Calculate a break-even point |
| 7.5 | Utilize budgets and conduct budget analysis |
| 7.6 | Analyze financial data to determine business opportunities and the cost of doing business |
| 7.7 | Calculate, summarize and integrate financial data into standard business documents |

8. SAVINGS AND INVESTMENT

- | | |
|-----|---|
| 8.1 | List the reasons for savings and investments |
| 8.2 | Compare characteristics of various types of investments |
| 8.3 | Explain the concept of interest costs and interest income |
| 8.4 | Describe how investments can grow in value, and calculate the present and future value of money |

9. CREDIT

- | | |
|-----|--|
| 9.1 | Discuss the reasons people have for obtaining credit |
| 9.2 | Discuss the importance of the ability to obtain credit |
| 9.3 | Identify possible types and sources of credit |
| 9.4 | List advantages/disadvantages of credit cards and loans |
| 9.5 | Identify sources where personal and business loans are available |
| 9.6 | Differentiate between secured and unsecured loans (recourse and nonrecourse) |

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Course Title: _____

Directions:

Review each content area on the list. Under each content area you will find standards numbered in the gray area. Place an (X) at all benchmarks you cover in the course listed above.

	9.7	Compare interest rates of various personal and business loans and their repercussions
	9.8	Obtain and organize the information generally necessary to obtain credit cards, personal loans, business loans and lines of credit
	9.9	Explain the factors that should influence the decision to obtain credit and the resulting business implications
	9.10	Discuss the critical link between credit worthiness and credit availability
10. INVENTORY CONTROL AND WAREHOUSING		
	10.1	Describe inventory records
	10.2	Describe the relationship between inventory and lost sales
	10.3	Determine the cost of warehousing (overhead and commodity)
	10.4	Identify advantages and disadvantages of handling products in bulk
	10.5	Describe how storage affects quality
11. MARKETING		
	11.1	Describe the elements of marketing
	11.2	Explain the concept of product utility and consumer satisfaction
	11.3	Analyze and evaluate supply and demand functions
	11.4	Conduct market research for a specific product/service
	11.5	Develop a marketing plan for a specific product/service
	11.6	Identify industry standards, grades and inspection procedures for agricultural products as they affect marketing
	11.7	Describe the various types of multi-level marketing
	11.8	Explain the role customer relations has in marketing
	11.9	Describe the role of agricultural commodity (futures) and options markets as a marketing tool
12. HUMAN RESOURCE MANAGEMENT		
	12.1	Describe jobs that contribute to achieving an organization's mission
	12.2	Identify methods for recruiting qualified personnel
	12.3	Design and conduct an employee selection process
	12.4	Describe an employee orientation program
	12.5	Describe an employee policies and procedures manual
	12.6	Describe various compensation and benefit plans
	12.7	Describe the process for evaluating employees (subjective vs. objective)
	12.8	Identify methods to improve employee relations and employee self improvement
	12.9	Identify factors associated with a successful personnel training program
	12.10	Describe the termination process and rationale

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13. AGRIBUSINESS SUPPORT SERVICES

13.1 Identify and describe the purposes and importance of various agribusiness support resources

13.2 Collect, calculate and analyze agricultural information

13.3 Formulate agricultural issue and policy statements and ideas

14. AGRICULTURAL LAW AND REGULATION

14.1 Investigate the origins of a specific regulation

14.2 Describe how laws, rules and regulations are made

14.3 Identify and describe the major laws and new legislation that relate to agriculture and the circumstances that brought about new legislative efforts

14.4 Identify the role of a lobbyist

14.5 Identify groups that lobby on agricultural issues

14.6 Identify required governmental agency reports required to be filed by an agribusiness

15. INTERNATIONAL AGRIBUSINESS

15.1 Describe the U.S. and foreign import/export policy for agricultural products

15.2 Identify and describe the purposes of key organizations involved in U.S. and foreign import/export policy for agricultural products

15.3 Describe the impact global markets have on agricultural production and pricing

15.4 Identify current and future global market trends for agricultural products and services

15.5 Analyze the economic impact of food imports and food exports on domestic producers

CURRICULUM MAPPING WORKSHEET

Course Title: _____

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CONTENT AREA: NATURAL RESOURCES MANAGEMENT

1. NATURAL RESOURCE CONSERVATION AND PRESERVATION

- 1.1 Describe the history of conservation in the United States through the present time
- 1.2 Identify renewable and non-renewable natural resources
- 1.3 Demonstrate conservation and preservation practices
- 1.4 Explain the relationships among organisms, populations, habitats, ecosystems and the impact of human activities on these relationships
- 1.5 Describe and demonstrate the concept of stewardship on natural resources
- 1.6 Describe current issues and public concerns in natural resource conservation

2. SAFETY

- 2.1 Demonstrate outdoor safety techniques
- 2.2 Identify safe hazardous waste disposal techniques
- 2.3 Demonstrate the safe use of natural resource tools

3. CAREERS IN NATURAL RESOURCE MANAGEMENT

- 3.1 Examine career pathways in natural resource management
- 3.2 Identify advanced training and postsecondary education in natural resource management
- 3.3 Demonstrate technological awareness and computer competence, as it relates to careers in natural resources

4. ENVIRONMENTAL PROTECTION

- 4.1 Identify natural resources and how they are protected both voluntarily and by law
- 4.2 Define and identify pollutants, toxins and safe environmental practices
- 4.3 Know the roles of conservation, protection and preservation organizations
- 4.4 Understand the effect of economics and social trends on the implementation of environmental protection
- 4.5 Identify potential terrorism/biosecurity threats to municipal water supplies, impoundments, waterways, food system, etc.

5. FORESTS AND VEGETATED AREAS

- 5.1 Describe the history of human impact on forestry resources
- 5.2 Identify non-consumptive uses of forests and vegetated areas
- 5.3 Describe conservation practices for forests and vegetated areas

6. FISH AND WILDLIFE

- 6.1 Describe the history of human impact on fish and wildlife management in Pennsylvania
- 6.2 Identify fish and wildlife found in Pennsylvania
- 6.3 Explain and identify fish and wildlife management techniques
- 6.4 Understand the impact of land use on fisheries and wildlife

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6.5 Plan and install a habitat improvement project

7. SOILS AND SOIL CONSERVATION

7.1 Demonstrate the use of the County Soil Survey

7.2 Describe the major soil characteristics and how they affect soil usage

7.3 Define soil erosion and what causes soil erosion

7.4 Explain how to control farm and non-farm soil erosion

7.5 Describe soil health and soil fertility

8. WATER

8.1 Explain the hydrologic cycle

8.2 Investigate water pollution and ways to control and prevent it

8.3 Explain the importance of water use planning

8.4 Examine water quantity use and trends

8.5 Identify alternative water collection methods (rainwater, greywater, etc.)

8.6 Examine stormwater impact and management in rural, suburban and urban settings

9. AIR

9.1 Identify basic chemical components of air

9.2 Identify sources of air pollution

9.3 Analyze air pollution's affect on the environment and humans

9.4 Describe air quality improvements and pollution prevention practices

9.5 Identify issues surrounding air-borne odors

10. LAND USE

10.1 Identify the various types of land uses

10.2 Use County Soil Survey information to identify appropriate land use of various soil types

10.3 Describe land use planning and growth management methods, and stress importance of land use planning to allow for agriculture, residential, commercial, etc. usage

10.4 Explain the history of land use in Pennsylvania

10.5 Explain the effects of technology on land use in urban and rural settings

10.6 Describe the various programs used to deal with the preservation of valuable agricultural land, such as tax breaks, agricultural security areas, nuisance law protection, sale or transfer of development rights, etc.

11. ENERGY AND MINERALS

11.1 Describe the energy industry in terms of non-renewable and renewable sources

11.2 Develop working models of, and compare alternative energy sources, such as biofuels, biomass, solar, geothermal and wind

11.3 Understand impacts of limited supplies of fossil fuels and cost of extraction on human activity

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Review each content area on the list. Under each content area you will find standards numbered in the gray area. Place an (X) at all benchmarks you cover in the course listed above.

	11.4 Describe the usage of metals and minerals in today's society
	11.5 Describe the impacts of resource extraction and best management practices used in recovery/remediation of these sites.
12. OUTDOOR RECREATIONAL SYSTEMS	
	12.1 Identify and describe the federal, state and local recreational structure and facilities
	12.2 Identify various mandatory and voluntary safety courses (hunting, trapping, boating, ATVs, etc.)
	12.3 Analyze recreational uses and their impact on the environment
	12.4 Discuss competition for resources and the impact on private property rights and responsibilities
	12.5 Analyze the impact of declining purchases of hunter, trapper and fishing licenses on agencies who manage wildlife resources
	12.6 Understand the causes of injuries/death from unsafe use of recreational vehicles (ATVs, boats, horses, mountain bikes, etc.)
	12.7 Describe the role of outdoor recreation on development of a child's physical, emotional and mental health
13. LAWS, STATUTES AND REGULATIONS	
	13.1 Identify and analyze legislation that affects natural resources
	13.2 Defend an opinion on a natural resource issue in a simulated county, state or federal political setting
	13.3 Demonstrate an understanding of the legislative process
	13.4 Describe the role of legislative laws and power held by the independent Game Commission and Fish/Boat Commission
14. SUSTAINABILITY	
	14.1 Define the multiple and various definitions of sustainability
	14.2 Identify ethical issues in the sustainability of natural resources
	14.3 Describe how local practices link to sustainability at the national/international level
	14.4 Explain the tie between preserving farmland, and preserving the farmer and agribusiness infrastructure
	14.5 Describe the application of appropriate technologies, including integrated alternative energy systems and modified lifestyles
	14.6 Draw connections between natural resource issues at local, state, national and global levels and sustainability of the planet
	14.7 Integrate basic elements of humanity (food, water, shelter, transportation, institutions and energy) into a local plan for increased sustainability
15. WASTE MANAGEMENT	
	15.1 Understand waste management hierarchy of prevention, re-use, recycling and safe disposal
	15.2 Identify waste management practices and describe how they affect water quality
	15.3 Describe the importance of manure management (storage, handling and utilization)
	15.4 Explain the importance of solid waste management and the NIMBY (not in my backyard) attitude
	15.5 Understand the beneficial reuse of biosolids/human waste management system

CURRICULUM MAPPING WORKSHEET

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16. AQUATIC HABITATS

	16.1 Define a watershed
	16.2 Describe the various elements of aquatic ecosystems
	16.3 Describe abiotic water quality parameters and perform water tests
	16.4 Calculate biotic index of a waterway by collecting, identifying and classifying aquatic macro-invertebrates
	16.5 Examine the physical components of a stream to determine stream flow
	16.6 Examine a waterway for various effects of human impact such as acid mine drainage, sedimentation and over use
	16.7 Describe effects of human development, such as impervious surface construction, on flood plains

CURRICULUM MAPPING WORKSHEET

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CONTENT AREA: PLANT AND SOIL SCIENCE

1. IMPACTS OF PLANT AND SOIL SCIENCE

- | | |
|-----|--|
| 1.1 | Describe the historical development of plant science |
| 1.2 | Compare/contrast the effect mankind has made on various plants, including invasive plant material |
| 1.3 | Determine how development of certain plant species has affected cultural development |
| 1.4 | Describe the role plant science plays in the economy of the state and nation |
| 1.5 | Identify current issues regarding plant and soil management that impacts agronomic and horticultural practices |
| 1.6 | Explain the psychological impact of plants on people and society |
| 1.7 | Discuss the benefits of organic plant production and organic weed and pest controls |

2. SAFETY

- | | |
|-----|--|
| 2.1 | Identify dangerous plants |
| 2.2 | Identify safety laws, regulations and procedures that affect plant science enterprises |
| 2.3 | Describe crop production food safety procedures that ensure safe food for consumers |
| 2.4 | Demonstrate the use of protective clothing and equipment |
| 2.5 | Demonstrate workplace safety, including proper use of protective clothing, equipment and first aid |
| 2.6 | Explain the components of a pesticide label and be able to interpret an MSDS sheet |

3. CAREERS IN PLANT AND SOIL SCIENCE

- | | |
|-----|---|
| 3.1 | Examine career opportunities in plant science |
| 3.2 | Identify advanced training and postsecondary education in plant science |

4. BOTANY AND PHYSIOLOGY

- | | |
|-----|--|
| 4.1 | Describe the process of photosynthesis, respiration, translocation and transpiration |
| 4.2 | Identify cell structure, organization and function |
| 4.3 | Identify plant structures and explain their functions |
| 4.4 | Identify flower structure and describe the events in pollination |
| 4.5 | Identify seeds and seed structures and explain their functions |
| 4.6 | Identify elements essential for germination |
| 4.7 | Explain the environmental factors that affect the growth and development of a plant |
| 4.8 | Demonstrate the use and affects of plant regulators |

5. PLANT REPRODUCTION

- | | |
|-----|--|
| 5.1 | Demonstrate sexual and asexual plant propagation methods |
| 5.2 | Research and manipulate vegetative and sexual plant growth processes |

CURRICULUM MAPPING WORKSHEET

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Directions:

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6. PLANT NUTRITION

- 6.1 Identify plant nutrient requirements
- 6.2 Select appropriate nutrient supplements to correct a specific plant nutrient deficiency
- 6.3 Describe the composition of commercial fertilizers and calculate their usage

7. MANAGING AGRICULTURAL SOILS

- 7.1 Identify and describe soil characteristics
- 7.2 Analyze and interpret soil surveys
- 7.3 Identify soil nutrients
- 7.4 Conduct basic soil testing
- 7.5 Interpret commercial soil test reports
- 7.6 Identify physical limitations of soils using soil profiles
- 7.7 Describe criteria for selecting fertilizers and other soil amendments
- 7.8 Describe factors influencing fertilizer application
- 7.9 Identify potential land use based on soil limitations
- 7.10 Plan a crop rotation using field histories
- 7.11 Plan a cropping system for a specific crop and soil type

8. ENVIRONMENTAL FACTORS

- 8.1 Identify environmental factors that affect plant growth
- 8.2 Describe techniques used to control environmental factors
- 8.3 Explain the types of irrigation systems and techniques
- 8.4 Explain the types of cultural systems and techniques
- 8.5 Determine plant populations and area calculations
- 8.6 Describe how weather and climate impact growing conditions and crop selection

9. PLANT IDENTIFICATION

- 9.1 Classify plants and use appropriate taxonomic terminology
- 9.2 Identify plant material, including herbaceous and woody plant material
- 9.3 Demonstrate knowledge of plant sensitivities (shade, sun, moisture, etc.)

10. ENTOMOLOGY

- 10.1 Identify insects which benefit plant reproduction and food production
- 10.2 Identify insect classifications
- 10.3 Compare beneficial vs. non-beneficial insects
- 10.4 Identify stages of insect development

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11. INTEGRATED PEST MANAGEMENT

11.1	Identify and differentiate pests and diseases as variables in plant production
11.2	Utilize pheromone traps to assess insect population levels
11.3	Analyze various techniques which serve to reduce pest and disease problems
11.4	Describe the use of agricultural chemicals
11.5	Determine pesticide toxicity and formulations
11.6	Analyze the affect of insect growth regulators on populations
11.7	Analyze the economics of various methods of pest control
11.8	Develop an integrated pest management plan
11.9	Monitor and control plant pests
11.10	Define economic threshold and calculate for a specific crop with a specific pest

12. PLANT SCIENCE EQUIPMENT

12.1	Identify equipment, tools and materials and their hazards
12.2	Demonstrate safe use of plant science equipment
12.3	Safely store and handle equipment, tools, materials and chemicals
12.4	Calibrate spreaders and sprayers for effective application
12.5	Correctly measure and determine area, perimeter and volume

13. FIELD CROP AND SPECIALTY CROP PRODUCTION (CORN, FORAGES, SOYBEANS, SMALL GRAINS, GRAPES, POTATOES, MUSHROOMS AND TOBACCO)*

13.1	Identify crops and develop a cropping plan
13.2	Identify and select seed and seedlings
13.3	Design a fertility program for specific crops
13.4	Demonstrate seedbed preparation techniques for specific crops
13.5	Demonstrate planting and transplanting techniques
13.6	Identify weed control options
13.7	Identify crop diseases and control measures
13.8	Demonstrate techniques used to check crop yield
13.9	Identify harvesting, storage and curing options
13.10	Develop a crop production budget and understand risk management tools
13.11	Understand the marketing of field and specialty crops
13.12	Understand the new technologies incorporated into seeds and the regulations for their usage

CURRICULUM MAPPING WORKSHEET

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14. FRUIT AND VEGETABLE PRODUCTION*

14.1	Identify kinds, varieties and uses of fruits and vegetables
14.2	Demonstrate knowledge of commercial seedbed preparation, planting and spacing methods
14.3	Describe the use of proper cultivation techniques and their scheduling
14.4	Determine appropriate harvesting schedules, techniques and crop rotation
14.5	Judge specimens for maturity and fresh market sale
14.6	Identify and control insects, diseases and weeds that affect fruit and vegetables
14.7	Identify and describe the use of fruit and vegetable tools and equipment
14.8	Identify common fruit and vegetable marketing methods

15. GREENHOUSE MANAGEMENT*

15.1	Properly identify and label plant material
15.2	Determine growing conditions for cuttings and seedlings
15.3	Describe the kinds and uses of plant growth regulators and hormones
15.4	Demonstrate propagation techniques
15.5	Maintain plants (watering, pruning, fertilizing, repotting, insect, disease and weed control)\
15.6	Demonstrate knowledge and use of greenhouse environment requirements and their control
15.7	Evaluate various growing media and describe their uses
15.8	Demonstrate knowledge of disease, insect, pest and weed control that affect greenhouse crops
15.9	Identify and describe the use of greenhouse tools and equipment, including the calibration of sprayers and spreaders

16. FLORAL DESIGN*

16.1	Identify floral varieties used by the floral industry
16.2	Identify and describe the characteristics/use of cut flowers and fillers
16.3	Identify and describe the use of containers and floral supplies
16.4	Demonstrate use of wire/tape in floral design
16.5	Prepare cut flowers for storage
16.6	Demonstrate floral design techniques for display and wearable arrangements
16.7	Identify and demonstrate use of floral design tools and equipment

17. NURSERY MANAGEMENT PRODUCTION*

17.1	Identify and demonstrate knowledge of grading standards for nursery stock
17.2	Receive and handle nursery stock
17.3	Demonstrate an understanding of basic irrigation techniques
17.4	Maintain nursery stock (watering, pruning, fertilizing, weed control and overwintering)

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17.5	Identify and control insects, diseases and weeds that affect nursery stock
17.6	Prepare nursery stock for marketing
17.7	Identify and describe the use of nursery tools and equipment, including the calibration of sprayers and spreaders
17.8	Propagate nursery stock
17.9	Evaluate various production techniques (pot in pot, container growing, etc.)
17.10	Demonstrate the ability to produce woody and herbaceous plant material

18. TURFGRASS PRODUCTION*

18.1	Identify typical northeastern U.S. turfgrasses
18.2	Evaluate and select grasses and seed mixes/blends for particular purposes and areas
18.3	Plan the preparation of a new turf area for a particular purpose
18.4	Describe grading and installation of drainage and irrigation system
18.5	Prepare and install a seed bed incorporating selective herbicides and fertilizers
18.6	Install and establish sod
18.7	Describe hydroseeding techniques
18.8	Demonstrate the methods and procedures for turf maintenance
18.9	Determine/maintain soil fertility and pH
18.10	Identify and control lawn insects, weeds and diseases
18.11	Identify and describe the use of turfgrass tools and equipment, including the calibration of sprayers and spreaders

19. LANDSCAPE DESIGN, INSTALLATION AND MAINTENANCE*

19.1	Describe the basic principles of landscape design
19.2	Measure site and develop scaled drawings
19.3	Interpret blueprint or site plan to include calculating areas and volumes
19.4	Identify utility locations and right of ways
19.5	Determine drainage/elevations
19.6	Level and grade soil
19.7	Prepare and plant turf using seed or sod
19.8	Select kinds and sizes of plant materials
19.9	Demonstrate planting and transplanting plant material
19.10	Demonstrate knowledge of various mulches and proper application and installation
19.11	Identify the appropriate type of irrigation system and installation method

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	19.12 Identify and describe the use of landscaping tools and equipment, including the calibration of sprayers and spreaders
	19.13 Demonstrate proper pruning techniques
	19.14 Determine maintenance schedules as appropriate for various turf and ornamental installations
	19.15 Demonstrate the principles of job cost estimating
	19.16 Identify the environmental impact of landscape projects
20. HORTICULTURAL CONSTRUCTION*	
	20.1 Identify and describe the use of various hardscape materials
	20.2 Apply construction mathematics to solve design and installation problems
	20.3 Construct wooden features
	20.4 Install retaining walls
	20.5 Install block, brick pavers, flagstone, concrete and tile materials
	20.6 Identify and describe the use of horticulture construction tools and equipment

*Due to the diversity of the Plant and Soil Science Content Area, these Standards may be selected based on the type of program being offered. For example, a program offering a plant science program focused on ornamental horticulture, may only address Standards 1-11 and 13, 14, 15.

CURRICULUM MAPPING WORKSHEET

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CONTENT AREA: POWER AND SYSTEMS TECHNOLOGY

1. HISTORICAL APPLICATIONS AND FUTURE IMPLICATIONS OF AGRICULTURAL POWER AND SYSTEMS TECHNOLOGIES

- 1.1 Describe and discuss the historical development of agricultural power and systems technologies
- 1.2 Identify global applications of agricultural power and systems technologies
- 1.3 Identify emerging technologies and their potential impact
- 1.4 Identify methods of changing appropriate technology for various applications (size, social and cultural)

2. SAFETY

- 2.1 Demonstrate positive safety attitudes and responsibilities
- 2.2 Recognized and demonstrate safety rules and regulations
- 2.3 Describe safety regulations and consumer safety protection opportunities

3. CAREERS IN AGRICULTURAL POWER AND SYSTEMS TECHNOLOGY

- 3.1 Examine career opportunities in agricultural power and systems technologies
- 3.2 Identify advanced training and postsecondary education in agricultural engineering and systems technologies

4. TOOLS, EQUIPMENT AND HARDWARE

- 4.1 Identify, select, adjust, maintain and safely use common hand tools and power tools
- 4.2 Adjust, maintain and safely use common agricultural power shop equipment.
- 4.3 Identify and select hardware used in the agricultural industry
- 4.4 Demonstrate accurate use of measurement devices and techniques for calculating measurement

5. MATERIAL FABRICATION AND WELDING

- 5.1 Identify and select various types of metals and plastics, and welding and cutting equipment
- 5.2 Select, adjust and operate oxy-fuel and plastic equipment with and without appropriate filler rods
- 5.3 Select and safely operate the appropriate electric and oxy-acetylene welding equipment
- 5.4 Demonstrate and identify the various types of quality welds and cuts and their components to insure quality products

6. ENGINE SYSTEMS

- 6.1 Identify principles of small engine operation
- 6.2 Demonstrate the use of measuring devices for small engines
- 6.3 List the component parts of a small engine
- 6.4 Disassemble and reassemble a small engine using all diagnostic tools
- 6.5 Troubleshoot an engine and adjust to industry specifications
- 6.6 Maintain a small engine

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	6.7 Select engine coolants, lubricants, fuels, engine additives, electrical components and drive systems needed for various applications
	6.8 Identify how the concern with engine emissions have affected the development of engine technologies
	6.9 Identify new technology in diesel applications, such as common rail and computerized fuel systems
	6.10 Identify biofuels and describe their effect on engine and fuel system maintenance
7. MACHINERY AND EQUIPMENT SYSTEMS	
	7.1 Review service schedules and conduct procedures
	7.2 Select, measure, use and calibrate testing devices for agricultural machines
	7.3 Perform disassembly and assembly procedures
	7.4 Select and safely connect, engage and operate machinery and power units
	7.5 Demonstrate the correct selection and safe use of agricultural machinery and equipment systems
	7.6 Demonstrate the use of auxiliary systems, including hydraulics, pneumatics and electronics
	7.7 Conduct troubleshooting procedures
8. ENERGY SYSTEMS	
	8.1 Identify the parts and functions of the specific energy systems of mechanical power, solar power, wind power, electrical power and chemical power systems
	8.2 Perform energy system maintenance, testing and evaluation
	8.3 Discuss and explain the operating principles for energy systems
	8.4 Explain and describe the principles of power transmission, heat transfer, evaporation, fluid movement, conductivity, satellite transmission, conservation, sensing and regulation
	8.5 Use computer applications in energy systems management
	8.6 Identify and investigate emerging technologies and their economic impact on energy systems
	8.7 Select appropriate industry standards for energy systems
9. STRUCTURAL SYSTEMS	
	9.1 Conduct a site evaluation and determine elevation, slope and cut and fill requirements
	9.2 Design, draw and interpret plans and drawings for structures with consideration to building codes, regulations and inspection requirements
	9.3 Develop an itemized bill of materials, determine costs, delivery, storage requirements and construction time
	9.4 Layout a structure foundation, erect batter boards frames or forms
	9.5 Identify and evaluate building construction materials, methods and styles
	9.6 Calculate ventilation, insulation, heating, cooling, lighting, electrical, water and waste handling needs based on the enterprise considered (i.e., dairy, veal, hogs, plants, etc.)
	9.7 Calculate, mix and finish concrete and masonry units
	9.8 Design and construct wall and roofing systems
	9.9 Demonstrate skills in the construction of an agricultural structure

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10. PLUMBING, IRRIGATION AND WATER SYSTEMS

10.1	Identify the various plastic and metal components and their functions within water supply, waste and vent systems
10.2	Cut, assemble and pressure test components within various types of water supply systems
10.3	Determine pump and pipe size, based on water requirements, head and friction losses for water and irrigation systems
10.4	Construct and identify the components in agricultural irrigation systems based on crop, greenhouse or landscaping needs
10.5	Identify the requirements of a safe water supply and necessary water treatment procedures

11. ENVIRONMENTAL AND NATURAL RESOURCE SYSTEMS

11.1	Identify environmental problems and use equipment and tools needed to measure the problems in livestock, crop handling, processing, nursery and landscaping, aquaculture, forestry and agribusiness industries
11.2	Use various map types and aerial photos for land use, soil, watershed, wildlife, natural resource management and conservation
11.3	Use global positioning systems, remote sensing and collection equipment for agricultural applications
11.4	Read legal land descriptions and determine land areas using maps and on-site measuring techniques
11.5	Identify, construct and evaluate storage and waste disposal systems and procedures
11.6	Assemble environmental and natural resource systems equipment and structures