Wisconsin Agriculture, Food and Natural Resources

Grades PK-5

Agriculture Business Standards ABS

1 **Students will use economic principles to establish and manage an AFNR enterprise.** ABS1

- a Apply principles of capitalism in the business environment. ABS1.A
  - 1 Recognize the use of money as a medium for exchange in a capitalistic system. ABS1.A.1.E
- b Apply principles of entrepreneurship in businesses. ABS1.B
  - 1 Describe the meaning, importance and economic impact of entrepreneurship. ABS1.B.1.E

2 **Students will use appropriate management planning principles in AFNR business enterprise.** ABS2

- a Compose and analyze a business plan for an enterprise. ABS2.A
  - 1 Recognize the importance of setting goals for success of a business. ABS2.A.1.E
  - 2 Connect DATCP to consumer safety standards. ABS2.A.2.E
- b Read, interpret, evaluate and write a mission statement to guide business goals, objectives and resource allocation. ABS2.B
  - 1 Recognize goals or purposes of a club. ABS2.B.1.E
  - 2 Make the connection between goals, means and outcomes. ABS2.B.2.E
- c Apply appropriate management skills to organize a business. ABS2.C
  - 1 Recognize the roles in a business owners and employees. ABS2.C.1.E
- d Recruit, train and retain appropriate and productive human resources for businesses. ABS2.D
  - 1 Identify types of skills that people can contribute to a business. ABS2.D.1.E
  - 2 Consider how someone might develop skills and grow in a business. ABS2.D.2.E
  - 3 Explain why it is important to get along with others you work with. ABS2.D.3.E
  - 4 Identify dangers that exist in work places. ABS2.D.4.E

3 **Students will use record keeping to accomplish AFNR business objectives while complying with laws and regulations.** ABS3

- a Prepare and maintain all files needed to accomplish effective record keeping. ABS3.A
  - 1 Describe the income and expenses of a business. ABS3.A.1.E
- b Implement appropriate inventory management practices. ABS3.B
  - 1 Consider items a business might own or borrow to operate. ABS3.B.1.E

4 **Students will apply generally accepted accounting principles and skills to manage cash budgets, credit budgets and credit for AFNR businesses.** ABS4

- a Use accounting fundamentals to accomplish dependable bookkeeping and fiscal management. ABS4.A
  - 1 Create a budget for earning and spending allowance money. ABS4.A.1.E

5 **Students will access accomplishment of goals and objectives by an AFNR business.** ABS5

- a Maintain and interpret financial information (i.e., income statements, balance sheets, inventory, purchase orders, accounts receivable and cash-flow analyses) for businesses. ABS5.A
  - 1 Keep track of expenses and deposits on a checkbook ledger. ABS5.A.1.E
  - 2 Determine the value of a commodity by considering the yield and commodity price. ABS5.A.2.E
  - 3 Identify expenses and incomes that might be incurred by a business. ABS5.A.3.E

6 **Students will use industry-accepted marketing principles to accomplish AFNR business objectives.** ABS6

- a Conduct appropriate market and marketing research. ABS6.A
  - 1 Consider ways of marketing products of a business. ABS6.A.1.E
  - 2 Identify agricultural products that consumers purchase. ABS6.A.2.E
- b Develop a marketing plan. ABS6.B
  - 1 Identify places that consumers purchase agricultural products. ABS6.B.1.E
- c Develop strategies for marketing plan implementation. ABS6.C
  - 1 Consider how you would convince others to buy your goods if you had a business. ABS6.C.1.E
- d Develop specific tactics to market AFNR products and services. ABS6.D
  - 1 Identify the people involved in bring agricultural products to consumers. ABS6.D.1.E

7 **Students will create a production system plan.** ABS7

a Prepare a step-by-step production plan that identifies needed resources. ABS7.A

1 Explain what a business flowchart is and how it works. ABS7.A.1.E

b Develop a production and operational plan. ABS7.B

1 Consider the use of a plan to conduct an activity. ABS7.B.1.E

c Use appropriate techniques to determine the most likely strengths, weaknesses and inconsistencies in a business plan and relate these to risk management strategies. ABS7.C

d Manage risk and uncertainty. ABS7.D

1 Identify risks of having a business. ABS7.D.1.E

Animal Systems AS

1 **Students will examine the components, historical development, global implications and future trends of the animal systems industry.** AS1

a Evaluate the development and implications of animal origin, domestication and distribution. AS1.A

1 Identify domesticated animals used in production agriculture and pets by sight and/or sounds. AS1.A.1.E

2 Recognize products and the animals that the products are derived from. AS1.A.2.E

2 **Students will classify, evaluate, select and manage animals based on anatomical and physiological characteristics.** AS2

a Classify animals according to hierarchical taxonomy and agricultural use. AS2.A

1 Identify major animal species by sight and/or sound. AS2.A.1.E

b Apply principles of comparative anatomy and physiology to uses within various animal systems. AS2.B

1 Identify body parts of domestic food animals and pets. AS2.B.1.E

c Select animals for specific purposes and maximum performance based on anatomy and physiology. AS2.C

1 Identify a sick animal by sight and/or sound. AS2.C.1.E

3 **Students will provide for the proper health care of animals.** AS3

- a Prescribe and implement a prevention treatment program for animal diseases, parasites and other disorders. AS3.A
  - 1 Explain basic care of animals and how it affects their health. AS3.A.1.E
  - 2 Identify agriculture careers in animal health (small and large). AS3.A.2.E
  - 3 Identify photos of healthy cats, dogs, other pets and equipment used to keep them healthy. AS3.A.3.E
- b Identify bio-security threats and provide for the bio-security of agricultural animals and production facilities. AS3.B
  - 1 Define “bio-security” as it relates to the animal industry and its importance to humans. AS3.B.1.E

4 **Students will apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.** AS4

- a Formulate feed rations to provide for the nutritional needs of animals. AS4.A
  - 1 Understand that food and fiber can originate from animals. AS4.A.1.E
- b Prescribe and administer animal feed additives and growth promotants in animal production. AS4.B
  - 1 Identify foods fed to domestic food animals and pets. AS4.B.1.E

5 **Students will evaluate and select animals based on scientific principles of animal production.** AS5

- a Evaluate the male and females reproductive systems in selecting animals. AS5.A
  - 1 Identify differences between babies and adults species of pets and production animals. AS5.A.1.E
- b Evaluate animals for breeding readiness and soundness. AS5.B
- c Describe how selection and geographical regions impact the economic decisions of our livestock business. AS5.C
  - 1 Identify livestock raised in different geographic regions. AS5.C.1.E
- d Apply scientific principles in the selection and breeding of animals. AS5.D
  - 1 Explain the selection of animals for “specific traits”. AS5.D.1.E
- f Compare and contrast scientific methods associated with animal reproduction. AS5.F
  - 1 Identify ways that animal reproduction is science based. AS5.F.1.E

6 **Students will prepare and implement animal handling procedures for the safety of animals, producers and consumers of animal products.** AS6

- a Demonstrate safe animal handling and management techniques. AS6.A
  - 1 Demonstrate safe practices around animals. AS6.A.1.E
- b Implement procedures to ensure that animal products are safe. AS6.B
  - 1 Identify safety hazards effecting animals. AS6.B.1.E

7 **Students will select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.** AS7

- a Design animal housing, equipment and handling facilities for the major systems of animal production. AS7.A
  - 1 Identify animal facilities and equipment used in animal husbandry. AS7.A.1.E
- b Comply with government regulations and safety standards for facilities used in animal production. AS7.B

8 **Students will analyze environmental factors associated with animal production.** AS8

- a Reduce the effects of animal production on the environment. AS8.A
  - 1 Understands that the food and fiber system uses natural resources. AS8.A.1.E
- b Evaluate the effects of environmental conditions on animals. AS8.B

Biotechnology Systems BT

1 **Students will recognize the historical, social, cultural and potential applications of biotechnology.** BT1

- a Distinguish major innovators, historical developments and potential applications of biotechnology in agriculture. BT1.A
  - 1 Define biotechnology; identify examples of agricultural products and processes created through biotechnology. BT1.A.1.E
- b Analyze the ethical, legal, social and cultural issues relating to biotechnology. BT1.B
  - 1 List reasons why biotechnology should be regulated by the government. BT1.B.1.E
  - 2 Identify reasons why people would either support or not support breakthroughs in biotechnology. BT1.B.2.E

2 **Students will demonstrate laboratory skills as applied to biotechnology.** BT2

- a Demonstrate safe and proper laboratory procedures and record keeping using biological materials. BT2.A
  - 1 Recall what you did to complete a scientific experiment. BT2.A.1.E
  - 2 Demonstrate how to measure a substance in a scientific experiment. BT2.A.2.E
  - 3 Recognize that microbes can grow on any surface. BT2.A.3.E
  - 4 Demonstrate how to properly follow instructions in an experiment. BT2.A.4.E
  - 5 Recognize that some laboratory chemicals can be very dangerous. BT2.A.5.E
  - 6 Explain how to prevent accidents when doing scientific experiments. BT2.A.6.E
- b Perform microbiology, molecular biology, enzymology and immunology procedures. BT2.B
  - 1 Recognize that microbes are living organisms like animals and plants. BT2.B.1.E
  - 2 Describe what all living organisms (including microbes) need to survive. BT2.B.2.E
  - 3 State why DNA and proteins are needed by living organisms. BT2.B.3.E
  - 4 Recognize that biotechnology can be used to improve human health. BT2.B.4.E
  - 5 Distinguish between examples of helpful and harmful microbes. BT2.B.5.E
- c Evaluate the application of genetic engineering to improve products of AFNR systems. BT2.C
  - 1 Recognize that scientists can change the DNA of living organisms. BT2.C.1.E
  - 2 Identify products, medicines and services created by changing the DNA of organisms. BT2.C.2.E
- d Perform biotechnology processes used in AFNR systems. BT2.D
  - 1 Define hormones. BT2.D.1.E
  - 2 Define fermentation. BT2.D.2.E
  - 3 List a product created by fermentation. BT2.D.3.E
  - 4 Recognize that we can use plants to make fuel. BT2.D.4.E
  - 5 Distinguish between renewable and nonrenewable resources. BT2.D.5.E
  - 6 Recognize that we can obtain energy from waste. BT2.D.6.E
- f Use biotechnology to monitor and evaluate procedures performed in AFNR systems. BT2.F
  - 1 Summarize how a plant reproduces. BT2.F.1.E
  - 2 Identify how animals are kept healthy. BT2.F.2.E
  - 3 Recognize that biotechnology can be used to clean up pollution and waste. BT2.F.3.E
  - 4 Explain the importance of biodiversity. BT2.F.4.E

5 Give examples of human impact on various ecosystems and wild populations. BT2.F.5.E

6 Describe how they use natural resources in their everyday lives. BT2.F.6.E

Environmental Service Systems ESS

1 **Students will use analytical procedures to plan and evaluate environmental service systems while assessing the impact of policies and regulations on environmental service systems.** ESS1

a Analyze and interpret samples. ESS1.A

1 Identify items to sample and basic tools to use during sampling and testing procedures. ESS1.A.1.E

2 Actively participate in basic sampling and measuring procedures with one activity connected to the indoors and one to the outdoors. ESS1.A.2.E

b Interpret laws affecting environmental service systems. ESS1.B

1 Be able to identify a law connected to the environment. ESS1.B.1.E

2 **Students will apply scientific principles to environmental service systems.** ESS2

a Apply meteorology principles to environmental service systems. ESS2.A

1 Explain the rain cycle in a format that correlates to grade level. ESS2.A.1.E

2 Describe weather conditions and identify factors that influence quality of water and air. ESS2.A.2.E

3 Decide on indicators that may signal a change in weather and the general climate of an area. ESS2.A.3.E

4 Compare and contrast how the earth's energy changes. ESS2.A.4.E

b Apply soil science and microbiology principles to environmental service systems. ESS2.B

1 Describe soil and compare and contrast different soil types. ESS2.B.1.E

2 Identify the basic make-up of soil biodiversity. ESS2.B.2.E

3 Participate in a demonstration of water percolating through different soil types. ESS2.B.3.E

4 Compare and contrast land and how it is used. ESS2.B.4.E

5 Identify a simple organism. ESS2.B.5.E

6 List how pollution affects organisms. ESS2.B.6.E

c Apply hydrology principles to environmental service systems. ESS2.C

1 List ways water is used in daily life tracking its source. ESS2.C.1.E

2 Define ground and surface water and reinforce the difference by comparing and contrasting. ESS2.C.2.E

3 Explain the source of drinking water. ESS2.C.3.E

4 Match environmental hazards with the natural resource that could be potentially damaged. ESS2.C.4.E

5 Explain how water moves through an open channel. ESS2.C.5.E

6 Describe what happens when a fluid moves through a hose or group of pipes. ESS2.C.6.E

d Apply best management techniques associated with the properties, classifications and functions of wetlands. ESS2.D

1 Define wetlands and list reasons and why they are important. ESS2.D.1.E

2 Compare and contrast what organisms might live in a wetland verses some other type of habitat. ESS2.D.2.E

3 List ways to improve a wetland. ESS2.D.3.E

4 Explain how chemistry helps the world. ESS2.D.4.E

3 **Students will operate environmental service systems to manage a facility environment.** ESS3

- a Use pollution control measures to maintain a safe facility environment. ESS3.A
  - 1 Identify different types of pollution. ESS3.A.1.E
  - 2 List types of pollution that can be found in the country vs. city and ways it can be prevented. ESS3.A.2.E
- b Manage safe disposal of all categories of solid waste. ESS3.B
  - 1 Define solid waste. ESS3.B.1.E
  - 2 Identify solid waste and its sources. ESS3.B.2.E
  - 3 Identify a sanitary landfill. ESS3.B.3.E
  - 4 Describe how items decay in nature. ESS3.B.4.E
  - 5 Compare and contrast solid waste handling. ESS3.B.5.E
  - 6 Generate a list of items that are recycled. ESS3.B.6.E
- c Apply the principles of public drinking water treatment operations to ensure safe water at a facility. ESS3.C
  - 1 Explain what safe drinking water is. ESS3.C.1.E
  - 2 List important reasons for water testing. ESS3.C.2.E
- d Apply principles of wastewater treatment to manage wastewater disposal in keeping with rules and regulations. ESS3.D
  - 1 List sources of wastewater. ESS3.D.1.E
  - 2 Define hazardous. ESS3.D.2.E

4 **Students will examine the relationships between energy sources and environmental service system with a basic understanding of the use of tools, equipment, machinery and technology to accomplish tasks in environmental service systems.** ESS4

- a Compare and contrast the impact of conventional and alternative energy sources on the environment. ESS4.A
  - 1 Explain energy and ways in which it can be used. ESS4.A.1.E
  - 2 List ways energy is created that is friendly to the earth. ESS4.A.2.E
- b Use technological and mathematical tools to map land, facilities and infrastructure with inclusion of basic maintenance knowledge related to tools, equipment and machinery in safe working order for tasks in environmental service systems. ESS4.B
  - 1 Compare and contrast map types. ESS4.B.1.E
  - 2 Identify hand tools and what they are used for. ESS4.B.2.E

Food Production and Processing FFP

1 **Students will examine components of the food industry and historical development of food products and processing.** FFP1

a Evaluate the significance and implications of changes and trends in the food products and processing industry. FFP1.A

1 Identify where food is produced and why it is processed. FFP1.A.1.E

2 Identify and explain environmental and safety concerns about the food supply. FFP1.A.2.E

b Work effectively with industry organizations, groups and regulatory agencies affecting the food products and processing industry. FFP1.B

1 Explain how food production is monitored and inspected. FFP1.B.1.E

2 Explain the importance and usage of guidelines in food products and processing. FFP1.B.2.E

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2 **Students will apply safety principles; recommend equipment and facility management techniques to the food products and processing industry.** FFP2

a Manage operational procedures and create equipment and facility maintenance plans. FFP2.A

1 Demonstrate how to properly clean a food preparation work space. FFP2.A.1.E

2 Discuss the importance of food processors hygiene expectation (i.e., hair nets, gloves, hand washing, equipment sanitation, etc.). FFP2.A.2.E

b Implement Hazard Analysis and Critical Control Point (HACCP) procedures to establish operating parameters. FFP2.B

1 Describe the dangers associated with food borne illness. FFP2.B.1.E

2 Determine optimum refrigerator and freezer temperatures. FFP2.B.2.E

c Apply safety and sanitation procedures in the handling, processing and storing of food products. FFP2.C

1 Explain techniques and procedures for the safe handling of food products. FFP2.C.1.E

2 Explore the sensory aspects of various foods (taste, touch, smell, etc.). FFP2.C.2.E

3 Describe the effects food-borne pathogens have on food products and humans. FFP2.C.3.E

4 Explain the importance of record keeping in a food product and processing system. FFP2.C.4.E

d Demonstrate worker safety procedures with food product and processing equipment and facilities. FFP2.D

1 Explain safety standards in the food industry. FFP2.D.1.E

3 **Students will apply principles of science to the food products and processing industry.** FFP3

a Apply principles of science to food processing to provide a safe, wholesome and nutritious food supply FFP3.A

1 Create a timeline showing how food processing evolved over the past century. FFP3.A.1.E

2 Observe changes in food during processing. FFP3.A.2.E

3 Illustrate which food products provide the essential nutrients in the human diet. FFP3.A.3.E

5 Examine food labels to identify common food additives (e.g., preservatives, colors, flavors). FFP3.A.5.E

4 Discuss common food components (e.g., proteins, carbohydrates, fats, vitamins, minerals). FFP3.A.4.E

6 Explain the importance of food labeling to the consumer. FFP3.A.6.E

7 Describe factors in planning and developing a new food product (i.e., regulation, creativity and economics). FFP3.A.7.E

4 **Students will select and process food products for storage, distribution and consumption.** FFP4

a Use harvesting, selection and inspection techniques to obtain quality food products for processing. FFP4.A

1 Identify techniques used to sort and classify of food products (i.e., size, color, maturity, etc.). FFP4.A.1.E

2 Compare and contrast fresh, frozen, canned or other forms of processed food products. FFP4.A.2.E

3 Identify proper care of production animals and describe accepted animal treatment and harvesting techniques. FFP4.A.3.E

4 Describe the purpose and importance of meat inspection. FFP4.A.4.E

b Evaluate, grade and classify processed food products. FFP4.B

1 Identify and describe foods derived from meat, egg, poultry, fish and dairy products. FFP4.B.1.E

2 Identify and describe products derived from fruits and vegetables. FFP4.B.2.E

3 Identify and describe products derived from grains, legumes and oilseeds. FFP4.B.3.E

c Process, preserve, package and present food and food products for sale and distribution. FFP4.C

1 Identify and explain common weights and measures used in the food products and processing industry. FFP4.C.1.E

2 Explain methods and materials for processing foods for sale as fresh-food products. FFP4.C.2.E

3 Identify methods of food preservation and give examples of foods preserved by each method. FFP4.C.3.E

4 Explain techniques for preparing ready-to-eat food products (Various categories of ready to eat food, such as snack food, convince meals, microwaveable meal). FFP4.C.4.E

5 Explain materials and methods of food packaging and presentation. FFP4.C.5.E

6 Identify and explain methods used to store food. FFP4.C.6.E

Natural Resources NR

1 **Students will explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.** NR1

- a Apply knowledge of natural resource components to the management of natural resource systems. NR1.A
  - 1 Identify natural resources. NR1.A.1.E
  - 2 Compare and contrast different ecosystems. NR1.A.2.E
- b Classify natural resources. NR1.B
  - 1 List and describe differences in trees. NR1.B.1.E
  - 2 Match names to basic herbaceous plants. NR1.B.2.E
  - 3 Match names to wildlife species. NR1.B.3.E
  - 4 Match names to aquatic species. NR1.B.4.E
  - 5 Match names to rock, mineral and soil types. NR1.B.5.E

2 **Students will apply scientific principles to natural resource management activities.** NR2

a Use cartographic skills to aid in developing, implementing and evaluating natural resource management plans, measure and survey for natural resource status in developing related plans with interpretation of laws related to natural resource management and protection. NR2.A

1 Identify hazards associated with the outdoor environment. NR2.A.1.E

2 Explain biohazard materials. NR2.A.2.E

3 Differentiate different types of maps. NR2.A.3.E

b Apply ecological concepts and principles to natural resource systems. NR2.B

1 Categorize natural resource inventories and/or population studies. NR2.B.1.E

2 Explain why laws are needed for natural resource systems. NR2.B.2.E

3 Identify natural resource systems that are at risk. NR2.B.3.E

c Demonstrate natural resource enhancement techniques. NR2.C

1 Illustrate a stream. NR2.C.1.E

2 Describe different types of forests. NR2.C.2.E

3 Illustrate a healthy wildlife habitat. NR2.C.3.E

4 Illustrate a healthy rangeland. NR2.C.4.E

5 Compare and contrast natural resources used for recreational purposes. NR2.C.5.E

6 Compare and contrast healthy marine and coastal natural resources. NR2.C.6.E

d Apply ecological concepts and principles to natural resource systems. NR2.D

1 Label the parts of a biogeochemical cycle. NR2.D.1.E

2 Identify parts of a watershed. NR2.D.2.E

3 Match groundwater and surface-water flow to sources. NR2.D.3.E

4 Illustrate a riparian zone. NR2.D.4.E

5 Recognize illustrations of succession. NR2.D.5.E

6 Recognize populations within natural resource systems. NR2.D.6.E

7 Explain why invasive species have negative impacts on natural resource systems with recognition of polluted illustrations and a description of the climate you live in. NR2.D.7.E

3 **Students will apply knowledge of natural resources to production and processing industries.** NR3

- a Produce, harvest, process and use natural resource products. NR3.A
  - 1 Define harvesting related to tree products. NR3.A.1.E
  - 2 Match names to corresponding aquatic and wildlife species. NR3.A.2.E
  - 3 Compare and contrast wildlife and aquatic products from other products. NR3.A.3.E
  - 4 Recognize a mineral and ore. NR3.A.4.E
  - 5 Match names with corresponding fossil fuels. NR3.A.5.E
  - 6 List benefits of a hydroelectric dam as a power source. NR3.A.6.E
  - 7 List ways to enjoy natural resources. NR3.A.7.E

4 **Students will demonstrate techniques used to protect natural resources.** NR4

- a Manage fires in natural resource systems. NR4.A
  - 1 Recognize forest fire types. NR4.A.1.E
- b Diagnose plant and wildlife diseases and follow protocol to prevent their spread while acquiring management protocol of insect infestations of natural resources. NR4.B
  - 1 Illustrate or recognize a diseased plant. NR4.B.1.E
  - 2 Choose a safe practice or procedure around a diseased wildlife animal. NR4.B.2.E
  - 3 Recognize insect damage within natural resources. NR4.B.3.E

5 **Students will use effective methods and venues to communicate natural resource processes to the public.** NR5

- a Communicate natural resource information to the public. NR5.A
  - 1 Recognize messages that relate natural resources and the message being sent. NR5.A.1.E

Plant Systems PS

1. **Students will apply knowledge of plant classification, anatomy and physiology to the production and management of plants.** PS1
   - a Classify agricultural plants according to taxonomy systems. PS1.A
     1. Identify how people use plants and match plant products to the appropriate plant class. PS1.A.1.E
     2. Observe and describe changes in plants as the seasons change. PS1.A.2.E
     3. Prepare a chart categorizing plants or plant products by similar characteristics. PS1.A.3.E
   - b Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems. PS1.B
     1. Draw the life cycle of a plant. PS1.B.1.E
     2. Match fruit to the plant structure that produces it and compare seeds of plants. PS1.B.2.E
   - c Apply energy conversion to plant systems. PS1.C
     1. Identify plants that require all sun, partial sun or shade. PS1.C.1.E
     2. Identify environmental products from plants. PS1.C.2.E
   - d Apply knowledge of plant physiology to plant systems. PS1.D
     1. Observe seed and plant growth and changes in seed and plant characteristics. PS1.D.1.E
     2. Observe the effects of light on plant growth. PS1.D.2.E

2. **Students will prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.** PS2
   - a Determine the influence of environmental factors on plant growth. PS2.A
     1. Define the elements that plants need to grow successfully. PS2.A.1.E
     2. Identify the different ways that land is used to grow plants. PS2.A.2.E
   - b Prepare growing media for use in plant systems. PS2.B
     1. Demonstrate how to properly prepare media for plant growth. PS2.B.1.E
     2. Distinguish between media that is too dry or too wet for seeds or plants to grow efficiently. PS2.B.2.E
   - c Develop and implement a fertilization plan for specific plants, field crops and/or greenhouse crops. PS2.C
     1. Describe what elements plants use for food. PS2.C.1.E
     2. Distinguish between healthy and unhealthy plants. PS2.C.2.E

3 **Students will propagate, culture and harvest plants.** PS3

- a Demonstrate plant propagation techniques. PS3.A
  - 1 Demonstrate sowing techniques and provide favorable conditions for seed germination. PS3.A.1.E
  - 2 Conduct tests associated with seed germination rates, viability and vigor. PS3.A.2.E
- b Develop and implement a plant management plan for crop production. PS3.B
  - 1 Identify acceptable medias for growing plants. PS3.B.1.E
  - 2 Prepare growing media for planting. PS3.B.2.E
  - 3 Demonstrate proper planting procedures and post-planting care. PS3.B.3.E
- c Develop and implement a plan for integrated pest management. PS3.C
  - 1 Identify the ways chemicals are used safely in the growing of plants. PS3.C.1.E
  - 2 Identify helpful insects as an alternative to chemicals. PS3.C.2.E
- d Apply principles and practices of sustainable agriculture to plant production. PS3.D
- e Harvest, handle and store crops. PS3.E
  - 1 Identify important agricultural crops. PS3.E.1.E
  - 2 Describe how agricultural crops get from the farm to the table. PS3.E.2.E

4 **Students will employ elements of design to enhance an environment.** PS4

- a Create designs using plants. PS4.A
  - 1 Draw a picture using the elements of design. PS4.A.1.E
  - 2 Explain how plants can be used to improve the appearance of an environment. PS4.A.2.E

5 **Students will recognize different systems in which plants grow.** PS5

- a Investigate various means to grow plants. PS5.A
  - 1 Identify the various places plants grow. PS5.A.1.E

Power, Structural and Technical Systems PST

1 **Students will demonstrate competence in the application of principles and techniques for the development and management of power, structural and technical systems.** PST1

- a Select energy sources in power generation appropriate to the situation. PST1.A
  - 1 Identify renewable and nonrenewable energy sources. PST1.A.1.E
- b Apply physical science laws and principles to identify, classify and use lubricants. PST1.B
  - 1 Identify the sources of lubricants and its importance. PST1.B.1.E
- c Identify and use hand and power tools and equipment for service, construction and fabrication. PST1.C
  - 1 Identify risks of using hand tools and power tools. PST1.C.1.E
- d Perform service routines to maintain power units and equipment. PST1.D
  - 1 Identify Agricultural Equipment such as: tractors, mowers, discs and wagons. PST1.D.1.E
  - 2 Maintain the cleanliness and appearance of power units and equipment to assure functionality. PST1.D.2.E
  - 3 Demonstrate safe practices around power units and equipment. PST1.D.3.E
- e Identify the principles of operation and the systems of small engines. PST1.E
  - 1 Discuss the use of small engines. PST1.E.1.E
- f Troubleshoot and repair internal combustion engines. PST1.F
  - 1 Identify components and systems of internal combustion engines. PST1.F.1.E
  - 2 Describe the operation of internal combustion engines by types of fuel used. PST1.F.2.E
  - 3 Be safe around internal combustion engines. PST1.F.3.E
- g Use manufacturers' guidelines to service and repair the power transmission systems of equipment. PST1.G
  - 1 Identify and describe applications of simple machines in power systems. PST1.G.1.E
- h Service and repair hydraulic and pneumatic systems. PST1.H
  - 1 Describe the features, benefits and applications of common types of hydraulic and pneumatic systems. PST1.H.1.E
- i Troubleshoot and service electrical systems. PST1.I
  - 1 Identify the kinds and applications of electricity and its impact on your life. PST1.I.1.E
- j Create sketches and plans of agricultural structures. PST1.J
  - 1 Identify and sketch various agriculture structures. PST1.J.1.E
- k Apply structural plans, specifications and building codes. PST1.K
  - 1 Identify major parts of a construction drawing. PST1.K.1.E

l Examine structural requirements for materials and procedures and estimate construction cost. PST1.L

1 Identify materials used in agricultural construction/fabrication. PST1.L.1.E

m Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities. PST1.M

1 Construct models of Agricultural Buildings with wood and metal. PST1.M.1.E

2 Identify various fencing materials. PST1.M.2.E

3 Be aware of energy conservation in your world. PST1.M.3.E

n Use arc, MIG/TIG welders, equipment and materials needed to weld. PST1.N

1 Describe the shielded metal arc welding process. PST1.N.1.E

2 Identify welding equipment. PST1.N.2.E

3 Identify safety equipment and protective clothing for welding. PST1.N.3.E

4 Point out various welds. PST1.N.4.E

o Use gas welding equipment and materials to weld. PST1.O

1 Be safe around welding equipment. PST1.O.1.E

p Apply the use of welding to agricultural related industries. PST1.P

1 Identify kinds and characteristics of metal materials. PST1.P.1.E

q Apply electrical wiring principles in agricultural applications. PST1.Q

1 Discuss various types and sources of electricity. PST1.Q.1.E

2 Identify uses of electrical sensors and controls (Thermostat, light sensors etc.). PST1.Q.2.E

3 Identify hazards and safety when using electricity. PST1.Q.3.E

r Apply technology principles in the use of agricultural technical systems. PST1.R

1 Identify the importance and uses of computer-based systems in agriculture, food and natural resources. PST1.R.1.E

s Use geospatial technologies in agricultural applications. PST1.S

1 Identify geospatial technologies, including global positioning, geographical information and remote sensing. PST1.S.1.E