Agricultural Science II

Standards, Competencies, & Evidence of Mastery

This document accompanies the Missouri Agricultural Science II Instructional Framework and lists the standards and competencies from the Agriculture, Food, and Natural Resources standards relevant to the Missouri Agricultural Science II Instructional Framework. Also included are evidence of mastery statements aligned to the instructional framework. The standards and competencies are listed and coded according to their order in the Agriculture, Food, and Natural Resources standards, published by the States' Career Clusters Initiative.

Life Knowledge and Cluster Skills

Cluster Content Standard: The student will demonstrate competence in the application of leadership, personal growth, and career success skills necessary for a chosen profession while effectively contributing to society.

CS.01 Premier Leadership: Acquire the skills necessary to positively influence others.

Describe how FFA is an integral part of the complete Ag Ed program and how to operate a successful FFA chapter.

Demonstrate FFA, SAE, and classroom instruction as an intracurricular part of the Agricultural Education Program.

Revise their personal plan of study for their Agricultural Education Program including classroom instruction, FFA and SAE.

Demonstrate proper parliamentary procedure.

Demonstrate effective public speaking and communication skills by leading a group discussion.

CS.01.01 Exhibit the skills and competencies needed to achieve a desired result.

CS.01.01.01.b Demonstrate the ability to complete a task without assistance.

CS.01.01.01.c Work independently and in group settings to accomplish a task.

CS.01.01.02.b Create measurable objectives for a given situation.

CS.01.01.02.c Assess outcomes to determine success for a task.

CS.01.01.03.b Assess individual strengths and weaknesses in planning.

CS.01.01.03.c Implement an effective project plan.

CS.01.01.04.b Use appropriate and reliable resources to complete an action or project.

CS.01.01.06.a Identify the strengths/talents of team members needed to achieve a desired task.

Identify techniques used to work with and manage team members with varying strengths and weaknesses.

CS.01.02 Build a constituency through listening, coaching, understanding and appreciating others.

CS.01.02.01.a Explain human relation skills such as compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.

CS.01.02.02.a Engage in a conversation with others to identify their interests and aspirations.

CS.01.02.03.a Identify the steps/strategies to successfully coach/mentor others.

CS.01.04 Conduct professional and personal activities based on virtues.

CS.01.04.02.a Describe personal values.

CS.01.04.03.a Identify the consequences of personal actions.

CS.01.04.04.a Explain the benefits of mutual respect.

CS.01.04.06.a Describe the benefits of serving others.

CS.01.06 Pursue learning and growth opportunities related to professional and personal aspirations.

CS.01.06.01.a Explain the reasons for having a leadership/personal growth plan.

CS.01.06.01.b Develop a plan that includes specific goals for leadership and personal growth.

CS.01.06.05.a Describe the value of being a life-long learner and the need for continuous development.

CS.03 Career Success: Demonstrate those qualities, attributes and skills necessary to succeed in, or further prepare for, a chosen career while effectively contributing to society.

CS.03.01 Communication: Demonstrate oral, written and verbal skills.

CS.03.01.01.a Use basic technical and business writing skills.

CS.03.01.01.b Select the appropriate form of technical and business writing or communication for a specific situation.

CS.03.01.02.a Describe the various types and uses of resumes.

CS.03.01.02.b Prepare a resume.

CS.06 Examine the importance of health, safety, and environmental management systems in organizations and their importance to performance and regulatory compliance.

CS.06.02 Develop a plan to maintain and improve health, safety and environmental compliance and performance.

CS.06.02.01.a Use proper safety practices/personal protective equipment.

CS.06.03 Provide health, safety, and environmental operating guidelines.

CS.06.03.01.a Demonstrate the importance of safety, health, and environmental practices in the workplace.

CS.08 Technical Skills: Use tools, equipment, machinery and technology appropriate to work within areas related to AFNR.

CS.08.01 Evaluate and select the appropriate tool to perform a given task.

CS.08.01.01.a Identify standard tools, equipment, and safety procedures related to a specific task.

CS.08.01.01.b Set up/adjust tools and equipment related to complete a specific task.

CS.08.01.01.c Use tools and equipment appropriately to complete a specific task.

CS.08.01.02.a Follow operating instructions related to specific tools and equipment needed to complete a task.

CS.08.02 Use appropriate protective equipment and handle AFNR tools and equipment to demonstrate safe and proper use of the tools and equipment.

CS.08.02.01.a Use the appropriate procedures for the use and operation of specific tools and equipment.

CS.08.02.01.b Demonstrate safety precautions when using tools for a specific task around bystanders.

Agribusiness Systems

Content Standard: The student will demonstrate competence in the application of principles and techniques for the development and management of agribusiness systems.

ABS.03 Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.

Prepare and maintain all files needed to accomplish effective SAE record keeping utilizing the Missouri Ag. Record Book for Secondary Students.

Complete receipt and expenditure forms, cash flows, beginning and ending inventory, financial, and net worth statements.

Fill out supplemental and leadership pages.

Evaluate SAE Programs through FFA Awards and Degree Programs.

ABS.05 Assess accomplishment of goals and objectives by an AFNR business.

ABS.05.01 Maintain and interpret financial information (income statements, balance sheets, inventory, purchase orders, accounts receivable and cash-flow analyses) for businesses.

Maintain accounting information utilizing the Missouri Ag. Record Book for Secondary Students to prepare an income statement, balance sheet and cash-flow analysis.

Interpret financial information for an SAE Project to determine profitability, net worth position, financial ratios, performance measures and ability to meet cash-flow requirements.

Environmental Service Systems

The student will demonstrate competence in the application of scientific principles and techniques to the management of environmental service systems.

ESS.03 Apply scientific principles to environmental service systems.

ESS.03.02 Apply soil science principles to environmental service systems.

Explain the process of soil formation.

ESS.03.02.02.a Describe the biodiversity found in soil and the contribution of biodiversity to the physical and chemical characteristics of soil.

ESS.03.02.02.b Relate the activities of microorganisms in soil to environmental service systems.

ESS.03.02.03.a Explain how the physical qualities of the soil influence the infiltration and percolation of water.

ESS.03.02.03.b Identify the physical qualities of the soil that determine its use for environmental service systems.

National Resource System

Content Standard: The student will demonstrate competence in the application of scientific principles and techniques to the management of natural resources.

NRS.04 Demonstrate techniques used to protect natural resources.

NRS.04.03 Manage insect infestations of natural resources.

Identify common insects and their characteristics.

Plant Systems

Content Standard: The student will demonstrate competence in the application of scientific principles and techniques to the production and management of plants.

PS.01 Apply knowledge of plant classification, plant anatomy and plant physiology to the production and management of plants.

PS.01.01 Classify agricultural plants according to taxonomy systems.

PS.01.01.01.a Explain systems used to classify plants.

PS.01.01.01.b Compare and contrast the hierarchical classification of agricultural plants.

PS.01.01.01.c Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.

PS.01.01.02.a Describe the morphological characteristics used to identify agricultural plants.

PS.01.01.02.b Identify agriculturally important plants by common names.

PS.01.02 Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.

Identify plant cell organelles and their functions.

PS.01.02.02.a Identify the components, the types and the functions of plant roots.

PS.01.02.02.b Identify root tissues and explain the pathway of water and nutrients into and through the root tissues.

PS.01.02.03.a Identify the components and the functions of plant stems.

PS.01.02.03.b Describe the processes of translocation.

PS.01.02.04.a Discuss leaf morphology and the functions of leaves.

PS.01.02.04.b Explain how leaves capture light energy and allow for the exchange of gases.

PS.01.02.05.a Identify the components of a flower, the functions of a flower and the functions of flower components.

PS.01.02.05.b Identify the different types of flowers and flower forms.

PS.01.02.06.a Explain the functions and components of seeds and fruit.

PS.01.03 Apply knowledge of plant physiology and energy conversion to plant systems.

PS.01.03.01.b Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.

PS.01.03.02.a Explain cellular respiration and its importance to plant life.

PS.01.03.02.b Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration.

PS.01.03.03.a Define primary growth and the role of the apical meristem.

PS.01.03.03.b Explain the process of secondary plant growth.

PS.02 Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.

PS.02.01 Determine the influence of environmental factors on plant growth.

PS.02.01.01.a Describe the qualities of light that affect plant growth.

PS.02.01.02.a Describe the effects air, temperature and water have on plant metabolism and growth.

PS.03 Propagate, culture and harvest plants.

PS.03.01 Demonstrate plant propagation techniques.

PS.03.01.01.a Explain pollination, cross-pollination and self-pollination of flowering plants.

PS.03.01.01.b Diagram the process of plant fertilization.

PS.03.01.02.a Demonstrate sowing techniques and provide favorable conditions for seed germination.

PS.03.02 Develop and implement a plant management plan for crop production.

PS.03.02.01.a Explain the importance of starting with pest- and disease-free propagation material.

Identify the differences between monocot and dictos.

Describe why planting techniques are different for monocots and dicots.

PS.03.03 Develop and implement a plan for integrated pest management.

PS.03.03.01.a Identify types of plant pests and disorders.

PS.03.03.01.b Identify major local weeds, insect pests and infectious and noninfectious plant diseases.

Describe life cycles and damage caused by plant pests and diseases.

Power, Structural and Technical Systems

Content Standard: The student will demonstrate competence in the application of principles and techniques for the development and management of power, structural and technical systems.

PST.04 Plan, build and maintain agricultural structures.

PST.04.03 Examine structural requirements for materials and procedures and estimate construction cost.

PST.04.03.01.a Identify criteria in selecting materials in agricultural construction/fabrication.

PST.04.04 Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.

PST.04.04.01.b Demonstrate skills for working with wood and/or metal.

Codes for the Agriculture, Food, and Natural Resources standards are as follows:

ABS = Agribusiness Systems

CS = Life Knowledge and Cluster Skills

ESS = Environmental Service Systems

PS = Plant Systems

PST = Power, Structural, and Technical Systems