

STATE OF WYOMING
AGRICULTURE & NATURAL RESOURCES CLUSTER AND
PLANT SCIENCE PATHWAY COMPETENCIES

AGRICULTURE COMPETENCIES

Cluster Level Core Competencies & Objectives

COMPETENCY

AS1 **Students will demonstrate knowledge of impacts of agriculture on society.**

OBJECTIVES

- AS1-1 Students will identify careers in agriculture/ industries
- Identify occupations in agriculture
 - Identify individual agriculture career interests
- AS1-2 Students will recognize the role of agriculture in society
- Trace major changes and accomplishments in the history of agriculture
 - Analyze the importance of agriculture to society
 - Demonstrate understanding of the scope of world agricultural production
 - Describe the role of consumers in world agriculture systems
 - Describe the use of science and technology in world food and fiber production

COMPETENCY

AS2 **Students will demonstrate written and verbal communication skills.**

OBJECTIVES

- AS2-1 Students will demonstrate public speaking skills
- Demonstrate effective speaking techniques
 - Organize and present a persuasive message
- AS2-2 Students will read, comprehend, and interpret technical materials/publications
- AS2-3 Students will produce
- Technical report/research paper
 - Resume, letter of job application, cover letter application, cover letter and/or job application form

COMPETENCY

AS3 **Students will demonstrate an understanding of agribusiness principles and skills.**

OBJECTIVES

- AS3-1 Students will describe personal finance management
- Demonstrate the components of personal finances and goal making
 - Distinguish the pros and cons of borrowing money
 - Identify sources of credit.
- AS3-2 Students will maintain and complete a set of financial records based on a Supervised Agricultural Experience Project (SAE) or a simulated class activity
- AS3-3 Students will explain keeping and using records in agricultural occupations
- Explain the purpose of record keeping
 - Complete a balance sheet
 - Demonstrate understanding of cash flow, income statements, and computerized record keeping

COMPETENCY

AS4 **Students will demonstrate understanding of applied sciences in agriculture.**

OBJECTIVES

- AS4-1 Students will describe how the scientific method is used in agricultural research
- AS4-2 Students will explain the steps of the scientific method

COMPETENCY

AS5 **Students will demonstrate understanding of the Future Farmers of America (FFA) organization.**

OBJECTIVES

- AS5-1 History and membership of FFA
- AS5-2 Parliamentary procedure
- AS5-3 Identify opportunities through FFA
- AS5-4 Demonstrate leadership, citizenship, and cooperation skills

Agriculture & Natural Resources Cluster

PLANT SCIENCE PATHWAY

Pathway Core Competencies & Objectives

COMPETENCY

ASPS1 Students will demonstrate an understanding of soil science.

OBJECTIVES

- ASPS1-1 Students will explain the importance of soil
- Explain the importance of soil as a medium for plant growth
 - Describe the agricultural and non-agricultural uses of soil
- ASPS1-2 Students will explain soil-forming factors
- Identify five factors involved in soil formation (parent material, topography, organisms, time, climate)
- ASPS1-3 Students will describe basic biological, physical, and chemical properties of soil
- Explain the components of soil (biological, chemical, mineral, and profile)
 - Describe soil texture, structure and profile
- ASPS1-4 Students will analyze soil fertility
- Describe the meaning and importance of soil fertility
 - Explain the role of organic matter, soil depth, surface slope, soil organisms, and nutrient balance in soil productivity

COMPETENCY

ASPS2 Students will demonstrate basic surveying and soil and water management skills.

OBJECTIVES

- ASPS2-1 Students will describe land measurement and legal descriptions
- Investigate surveying equipment
 - Interpret legal land descriptions

COMPETENCY

ASPS3

Students will demonstrate an understanding of agronomy.

OBJECTIVES

- ASPS3-1 Demonstrate an understanding of crop production and the resources necessary for producing domesticated plants
- Identify the environmental impacts of crop production
 - Describe the use of irrigation in crop production
- ASPS3-2 Students will describe the planting, growth, and development of economically important crops
- ASPS3-3 Students will identify the fertilization needs of crops
- ASPS3-4 Students will understand how to harvest and store forages and grain crops

COMPETENCY

ASPS4

Students will understand plant science careers.

OBJECTIVES

- ASPS4-1 Students will identify career opportunities and levels of education needed in the plant science area
- Identify and describe the major areas of plant and soil science occupations
 - Students will identify career and entrepreneurship opportunities and expectations in plant and soil science

COMPETENCY

ASPS5

Students will demonstrate an understanding of plant structure and function.

OBJECTIVES

- ASPS5-1 Students will demonstrate an understanding of plant cells and seeds
- Describe the cellular structure of plants
 - Explain the structure and kinds of seed
 - Describe the process of seed germination and conditions required
 - Explain the importance of seed quality
- ASPS5-2 Students will analyze the function of the stem, roots and leaves
- ASPS5-3 Students will understand plant adaptations used for protection
- Discuss plant responses to a shortage of water
 - Describe plant responses to temperature

- ASPS5-4 Students will explain the control of plant growth and development
- Understand the use and importance of plant growth regulators (PGR) and their functions
 - Explain plant tropisms
- ASPS5-5 Students will describe the uptake and use of water, minerals, and light
- Describe the functions of water in plant growth
 - Explain the absorption and transport systems of plants
 - Explain the role of light quality and quantity on plant growth
 - Describe the processes of photosynthesis
- ASPS5-6 Students will explain plant reproduction
- Identify the major parts of flowers and explain the functions of the parts
 - Describe the types of flowers
 - Explain the processes of pollination and fertilization
 - Describe the purposes and kinds of fruit
 - Explain the structure and kinds of seed
 - Explain sexual reproduction, pollination, and fertilization in plants
 - Explain asexual propagation in plants
 - Describe methods for asexually propagating plants

COMPETENCY

ASPS6 Students will investigate principles of biotechnology in plant science.

OBJECTIVES

- ASPS6-1 Students will discuss ethical issues in modern biotechnology
- ASPS6-2 Students will understand plant genetics and the role of technology in modern practices

COMPETENCY

ASPS7 Students will demonstrate understanding of weeds, diseases, and insects.

OBJECTIVES

- ASPS7-1 Students will identify plant pests, diseases and their causes
- Identify and describe types of pests
 - Explain the identification of weeds
 - Explain the classification of and identify economic importance of insects
- ASPS7-2 Students will identify and select an appropriate control for each major type of pest
- Describe types of pest control strategies
 - Explain the identification, diagnosis, and methods of controlling plant diseases
 - Describe methods of weed management and the selection of herbicides
 - Describe methods of insect management
- ASPS7-3 Students will describe the principles of pest management
- Explain Integrated Pest Management (IPM) and its benefits
 - Explain scouting of field crops for pests
 - Identify basic principles of crop monitoring
- ASPS7-4 Students will prepare plant and soil samples for analysis
- Describe why, how, and when to conduct soil samples
 - Interpret the results of soil analysis
 - Explain samples and sampling techniques used with monitoring field crops
- ASPS7-5 Students will understand the importance of pesticide safety
- Identify major classifications of pesticides and their use (herbicides, pesticides, fungicides, etc.)
 - Identify the safety practices that should be followed when applying pesticides
 - Properly interpret pesticide labels
 - Explain how to properly calibrate equipment used in applying pesticides
 - Identify the environmental concerns involved with pesticide use