

**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