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