

Appendix A: AFNR Career Cluster Content Standards-**Floriculture**

	Performance Measurement Levels	Event Activities Addressing Measurements	Related Academic Standards
ABS.01.01. Performance Indicator: Apply principles of capitalism in the business environment.			Social Studies: 7b and 7g
	ABS.01.01.01.a. Recognize principles of capitalism as related to AFNR businesses.	selling, floral arrangement, corsage, dish garden	
ABS.01.02. Performance Indicator: Apply principles of entrepreneurship in businesses.			Social Studies: 7d
	ABS.01.02.01.b. Classify the characteristics of successful entrepreneurs in AFNR businesses.	selling	
ABS.02.03. Performance Indicator: Apply appropriate management skills to organize a business.			Language Arts: 12; Social Studies: 7f
	ABS.02.03.01.c. Implement management approaches to assure efficiency and profitability.	team activity	
ABS.06.04. Performance Indicator: Develop specific tactics to market AFNR products and services.			Social Studies: 7b, 7g and 7h
	ABS.06.04.01.b. Develop advertising campaigns that promote products and services.	media selling, product display	
ABS.06.05. Performance Indicator: Merchandise products and services to achieve specific marketing goals.			Language Arts: 4; Social Studies: 7b and 7d
	ABS.06.05.01.c. Monitor marketing approaches to determine effectiveness in goal achievement and make needed changes in such approaches.	product display, sales	
ABS.07.01. Performance Indicator: Prepare a step-by-step production plan that identifies needed resources.			Language Arts: 4, 5 and 8
	ABS.07.01.01.c. Adapt production processes based on changing product characteristics.	problem solving	
BS.02.04. Performance Indicator: Safely manage biological materials, chemicals and wastes used in the laboratory.			Science: B2, B3, F4 and F5; Language Arts: 7
	BS.02.04.01.a. Prepare simple chemical solutions using standard operating procedures.	plant disorders/diseases, hazardous situations	

ESS.03.02. Performance Indicator: Apply soil science principles to environmental service systems.		Science: B2 and D2; Social Studies: 3k
	ESS.03.02.02.b. Relate the activities of microorganisms in soil to environmental service systems.	plant disorders/diseases, hazardous situations, general knowledge exam
	ESS.03.02.03.b. Identify the physical qualities of the soil that determine its use for environmental service systems.	potting, asexual propagation, plant disorders/diseases, general knowledge exam
ESS.03.05. Performance Indicator: Apply chemistry principles to environmental service systems.		Science: B2, B3 and F4
	ESS.03.05.01.c. Apply standard operating procedures for use of chemicals in environmental service systems.	plant disorders/diseases, hazardous situations
ESS.04.02. Performance Indicator: Manage safe disposal of all categories of solid waste.		Science: F1, F4 and F5
	ESS.04.02.01.b. Evaluate environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.	hazardous situations, plant disorders/diseases
ESS.04.05. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.		Science: F4 and F5
	ESS.04.05.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	hazardous situations
ESS.06.02. Performance Indicator: Maintain tools, equipment and machinery in safe working order for tasks in environmental service systems.		
	ESS.06.02.01.b. Operate equipment and machinery in accordance with manufacturers' instructions and OSHA standards, specifically addressing personal protective equipment and proper machine guarding.	hazardous situation, team activity, corsage, dish garden, floral arrangements, plant disorders/diseases
NRS.01.01. Performance Indicator: Apply knowledge of natural resource components to the management of natural resource systems.		Math: 5a; Science: C4 and F3; Social Studies: 3h and 3k
	NRS.01.01.01.a. Identify natural resources.	plant ID, general knowledge exam
NRS.01.02. Performance Indicator: Classify natural resources.		Science: F3
	NRS.01.02.01.b. Identify trees and other woody plants.	plant ID
	NRS.01.02.02.b. Identify herbaceous plants.	plant ID

NRS.03.01. Performance Indicator: Produce, harvest, process and use natural resource products.		Science: F3
	NRS.03.01.01.a. Describe forest harvesting methods.	problem solving, general knowledge exam (harvesting of flowers)
PS.01.01. Performance Indicator: Classify agricultural plants according to taxonomy systems.		Science: C3
	PS.01.01.01.c. Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.	plant ID, general knowledge exam, problem solving
	PS.01.01.02.c. Identify agriculturally important plants by scientific names.	plant ID
PS.01.02. Performance Indicator: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.		Science: B6, C3 and C5
	PS.01.02.01.c. Apply the knowledge of cell differentiation and the functions of the major types of cells to plant systems.	general knowledge exam, potting plants, asexual propagation
	PS.01.02.02.c. Relate the active and passive transport of minerals into and through the root system to plant nutrition.	general knowledge exam, problem solving, plant disorders/diseases
	PS.01.02.03.c. Apply concepts associated with translocation to the management of plants.	general knowledge exam
	PS.01.02.04.c. Explain the relationships between leaf structure and functions and plant management practices.	general knowledge exam, problem solving, asexual propagation
	PS.01.02.05.c. Apply the knowledge of flower structures to plant breeding, production and use.	asexual propagation, general knowledge exam, potting plant
	PS.01.02.06.c. Apply the knowledge of seed and fruit structures to plant culture and use.	general knowledge exam, problem solving

PS.01.03. Performance Indicator: Apply knowledge of plant physiology and energy conversion to plant systems.		Science: B6 and C5
	PS.01.03.01.c. Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management.	general knowledge exam, problem solving
	PS.01.03.02.c. Explain the four stages of aerobic respiration and relate cellular respiration to plant growth, crop management and post-harvest handling.	general knowledge exam, asexual propagation
	PS.01.03.03.c. Relate the principles of primary and secondary growth to plant systems.	potting plants, pinching, general knowledge exam
	PS.01.03.04.c. Select plant growth regulators to produce desired responses from plants.	general knowledge exam, problem solving, plant disorders/diseases
PS.02.01. Performance Indicator: Determine the influence of environmental factors on plant growth.		Science: C6
	PS.02.01.01.c. Evaluate plant responses to varied light color, intensity and duration.	general knowledge exam, problem solving
	PS.02.01.02.c. Design, implement and evaluate a plan to maintain optimal conditions for plant growth.	general knowledge exam, problem solving, potting plants
PS.02.02. Performance Indicator: Prepare growing media for use in plant systems.		Science: B2
	PS.02.02.01.b. Describe the physical characteristics of growing media and explain the influence they have on plant growth.	asexual propagation, potting plants, general knowledge exam, plant disorders/diseases
	PS.02.02.02.b. Discuss how soil drainage and water-holding capacity can be improved.	general knowledge exam, plant disorders/diseases
PS.02.03. Performance Indicator: Develop and implement a fertilization plan for specific plants or crops.		Math: 4B; Science: A2
	PS.02.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report.	plant disorders/diseases
	PS.02.03.02.a. Discuss the influence of pH and cation exchange capacity on the availability of nutrients.	plant disorders/diseases, general knowledge exam
	PS.02.03.04.a. Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations and describe different methods of fertilizer application.	plant disorders/diseases, general knowledge exam

PS.03.01. Performance Indicator: Demonstrate plant propagation techniques.		Science: C2
	PS.03.01.01.a. Explain pollination, cross-pollination and self-pollination of flowering plants.	general knowledge exam
	PS.03.01.02.a. Demonstrate sowing techniques and provide favorable conditions for seed germination.	general knowledge exam
	PS.03.01.03.c. Evaluate asexual propagation practices based on productivity and efficiency.	asexual propagation, general knowledge exam
PS.03.02. Performance Indicator: Develop and implement a plant management plan for crop production.		Science: C5 and C6; Language Arts: 7
	PS.03.02.01.b. Inspect propagation material for evidence of pests or disease.	plant disorders/diseases
	PS.03.02.02.c. Prepare growing media for planting.	potting, asexual propagation, general knowledge exam
	PS.03.02.05.a. Explain the reasons for controlling plant growth.	general knowledge exam, pinching plants
PS.03.03. Performance Indicator: Develop and implement a plan for integrated pest management.		Science: C4 and C6; Language Arts: 7
	PS.03.03.01.b. Identify major local weeds, insect pests and infectious and noninfectious plant diseases.	plant disorders/diseases, general knowledge exam
	PS.03.03.02.c. Predict pest and disease problems based on environmental conditions and life cycles.	plant disorders/diseases, general knowledge exam
	PS.03.03.03.c. Employ pest management strategies to manage pest populations, assess the effectiveness of the plan and adjust the plan as needed.	plant disorders/diseases, general knowledge exam
	PS.03.03.04.b. Explain procedures for the safe handling, use and storage of pesticides.	hazardous materials, general knowledge exam
PS.04.01. Performance Indicator: Create designs using plants.		Language Arts: 12
	PS.04.01.01.c. Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.	corsage, team activity, dish garden, floral arrangement, growing procedure, general knowledge exam
	PS.04.01.02.c. Create and implement designs by following established principles of art.	floral arrangement, team activity, corsage, dish garden

CS.01.01. Performance Indicator: Action: Exhibit the skills and competencies needed to achieve a desired result.		Social Studies: 4d and 4h
CS.01.01.01.c. Work independently and in group settings to accomplish a task.	team activity, practicums, general knowledge exam	
CS.01.01.02.c. Assess outcomes to determine success for a task.	corsage, team activity, dish garden, floral arrangement, growing procedure, job interview, sales	
CS.01.01.03.c. Implement an effective project plan.	team activity, dish garden, floral arrangement, corsage	
CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.	all event activities	
CS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.	team activity	
CS.01.02. Performance Indicator: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.		Language Arts: 12; Social Studies: 4h
CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.	team activity, sales, job interview	
CS.01.02.04.c. Evaluate the effectiveness of team members.	team activity	
CS.01.06. Performance Indicator: Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.		Science: A4; Language Arts: 8; Social Studies: 4h
CS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.	problem solving	
CS.02.03. Performance Indicator: Professional Growth: Develop awareness and apply skills necessary for achieving career success.		Language Arts: 12; Social Studies: 4a
CS.02.03.03.c. Demonstrate employability skills for a specific career.	job interview	
CS.02.04. Performance Indicator: Mental Growth: Demonstrate the effective application of reasoning, thinking and coping skills.		Math: 6C; Science: A4; Language Arts: 4, 8
CS.02.04.01.c. Demonstrate critical and creative thinking skills while completing a task.	media selling, problem solving	
CS.02.04.02.c. Implement effective problem solving strategies.	problem solving	
CS.02.04.03.c. Demonstrate the skills needed to negotiate with others.	customer complaint, sales	

CS.03.01. Performance Indicator: Communication: Demonstrate oral, written and verbal skills.		Language Arts: 4, 5 and 12
CS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.	job interview	
CS.03.01.03.c. Make effective business presentations.	sales, media selling, customer complaint	
CS.05.01. Performance Indicator: Manage organizational structures and processes to better serve customers.		Social Studies: 7a
CS.05.01.01.c. Implement a plan to manage relationships with both internal and external customers.	team activity, sales	
CS.06.04. Performance Indicator: Examine health risks associated with a particular skill to better develop personnel safety guidelines.		Science: F1 and F5
CS.06.04.01.c. Implement a plan to mitigate the level of contamination or injury identified in the workplace.	hazardous situation, general knowledge exam	
CS.07.01. Performance Indicator: Apply safety/health practices to AFNR worksites.		Science: F1 and F5
CS.07.01.01.b. Use appropriate personal protective equipment for a given task.	hazardous situation, general knowledge exam	
CS.07.03. Performance Indicator: Follow appropriate procedures in case of an emergency.		
CS.07.03.01.b. Develop various emergency response plan requirements for a facility.	hazardous situation	
CS.07.04. Performance Indicator: Assess workplace safety.		Science: F5
CS.07.04.01.c. Apply general workplace safety precautions/procedures.	hazardous situation, general knowledge exam	
CS.07.04.02.c. Evaluate general workplace safety precautions/procedures for compliance with regulations.	hazardous situation, general knowledge exam	
CS.08.01. Performance Indicator: Evaluate and select the appropriate tool to perform a given task.		
CS.08.01.01.c. Use tools and equipment appropriately to complete a specific task.	floral arrangement, corsage, sales, dish garden	
CS.09.02. Performance Indicator: Apply skills with computer software to accomplish a variety of business activities.		Math: 6C; Science: A3
CS.09.02.01.b. Use basic software systems such as spreadsheet and word processing to complete a task.	job interview, media selling	

Appendix B: Related Academic Standards- **Floriculture**

National academic standards for mathematics, science, English language arts and social studies related to this event are reported below. The statements are based on information in reports of the respective associations/organizations in the academic areas. Some adjustment of numbering was done to facilitate the process of alignment with the standards that have been developed in the pathways of the Agriculture, Food and Natural Resources (AFNR) Career Cluster.

The approach was to determine the presence of alignment between the content standards, expectations or thematic strands of the four academic areas and the performance indicators of the AFNR Standards. Supporting statements have been included to clarify content of the respective content standards, expectations or thematic strands. The statements were initially developed independently by the respective organizations and, therefore, are not parallel in wording and presentation. Occasionally minor editing was done to adjust the background or stem of a statement but not the statement itself.

Mathematics

4. Standard and Expectations: Measurement

4B. Apply appropriate techniques, tools and formulas to determine measurements.

5. Standard and Expectations: Data Analysis and Probability

5A. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them.

6. Standard and Expectations: Problem Solving

6C. Apply and adapt a variety of appropriate strategies to solve problems.

Science

A. Content Standard: Science as an Inquiry

A2. Design and conduct scientific investigations.

A3. Use technology and mathematics to improve investigations and communications.

A4. Formulate and revise scientific explanations and models using logic and evidence.

B. Content Standard: Physical Science

B2. Structure and properties of matter.

B3. Chemical reactions.

B6. Interactions of energy and matter.

C. Content Standard: Life Science

C2. Molecular basis of heredity.

C3. Biological evolution.

C4. Interdependence of organisms.

C5. Matter, energy and organization in living systems.

C6. Behavior of organisms.

D. Content Standard: Earth and Space Science

D2. Geochemical cycles.

F. Content Standard: Science in Personal and Social Perspectives

F1. Personal and community health.

F3. Natural resources.

F4. Environmental quality.

F5. Natural and human-induced hazards.

English Language Arts

4. Students adjust their use of spoken, written and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
5. Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
7. Students conduct research on issues and interests by generating ideas and questions and by posing problems. They gather, evaluate and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
8. Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.
12. Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion and the exchange of information).

Social Studies

3. Thematic Strand: People, Places and Environments
 - 3h. examine, interpret and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas and ecosystem changes;
 - 3k. propose, compare and evaluate alternative policies for the use of land and other resources in communities, regions, nations and the world.
4. Thematic Strand: Individual Development and Identity
 - 4a. articulate personal connections to time, place and social/cultural systems;
 - 4d. apply concepts, methods and theories about the study of human growth and development, such as physical endowment, learning, motivation, behavior, perception and personality;
 - 4h. work independently and cooperatively within groups and institutions to accomplish goals;
7. Thematic Strand: Production, Distribution, and Consumption
 - 7a. explain how the scarcity of productive resources (human, capital, technological and natural) requires the development of economic systems to make decisions about how goods and services are to be produced and distributed;
 - 7b. analyze the role that supply and demand, prices, incentives and profits play in determining what is produced and distributed in a competitive market system;
 - 7h. apply economic concepts and reasoning when evaluating historical and contemporary social developments and issues;
 - 7d. describe relationships among the various economic institutions that comprise economic systems such as households, business firms, banks, government agencies, labor unions and corporations;
 - 7f. compare how values and beliefs influence economic decisions in different societies;
 - 7g. compare basic economic systems according to how rules and procedures deal with demand, supply, prices, the role of government, banks, labor and labor unions, savings and investments and capital;