



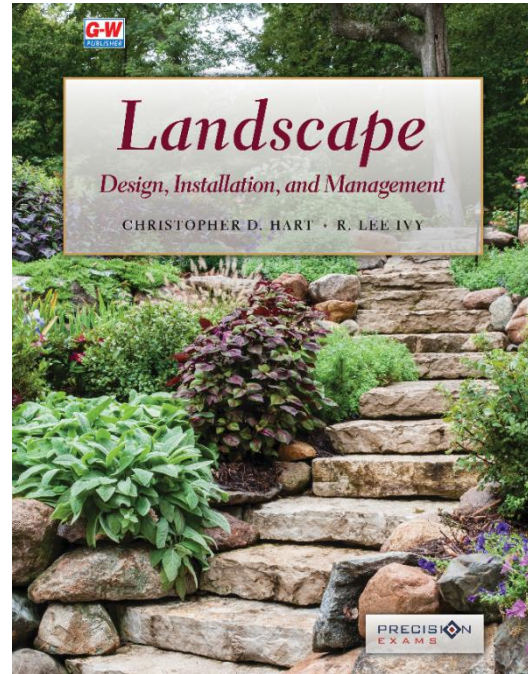
**Correlation of
Landscape Design, Installation, and Management, Hart and Ivy
(Goodheart-Willcox Publisher ©2020)**

to

AFNR Career Cluster Content Standards: Plant Science Systems Career Pathway

The following chart correlates the *Landscape Design, Installation, and Management* textbook to the National Council for Agricultural Education’s AFNR Career Cluster Content Standards for Plant Science Systems Career Pathway. The chart lists each of the performance Indicators in the pathway and the page numbers where applicable information can be found in the *Landscape Design, Installation, and Management* textbook.

The content standards for the Plant Science Systems (PS) career pathway outline the technical knowledge and skills required for success in Agriculture, Food, and Natural Resource (AFNR)-related Career and Technical Education (CTE) programs, as well as future career success. Students completing a program of study in this pathway will demonstrate competence in the application of principles and techniques for the development, application and management of plant systems in AFNR settings.



Standards and Indicators	G-W Content
PS.01. Develop and implement a crop management plan for a given production goal that accounts for environmental factors.	
PS.01.01. Determine the influence of environmental factors on plant growth.	Textbook: pg. 234 (STEM Connection), 236–239
PS.01.01.01.a. Identify and summarize the three measurements of light—color, intensity and duration—that affect plant growth.	Textbook: pg. 236–237, 243 (Thinking Critically #5; Suggested Activities #5)
PS.01.01.01.b. Analyze and describe plant responses to light color, intensity and duration.	Textbook: pg. 236–237, 243 (Thinking Critically #5; Suggested Activities #5)
PS.01.01.01.c. Analyze plant responses to varied light color, intensity and duration and recommend modifications to light for desired plant growth.	Textbook: pg. 236–237, 243 (Thinking Critically #5; Suggested Activities #5)

**Correlation of *Landscape Design, Installation, and Management* to AFNR Career Cluster
Content Standards: Plant Science Systems**

Standards and Indicators	G-W Content
PS.01.01.02.a. Identify and summarize the effects of air and temperature on plant metabolism and growth.	Textbook: pg. 236–237, 238, 243 (Thinking Critically #5; Suggested Activities #1, 2)
PS.01.01.02.b. Determine the optimal air and temperature conditions for plant growth.	Textbook: pg. 236–239, 243 (Thinking Critically #5; Suggested Activities #1, 2, 5)
PS.01.01.02.c. Design, implement and evaluate a plan to maintain optimal air and temperature conditions for plant growth.	Textbook: 205–206, pg. 243 (Suggested Activities #1, 2)
PS.01.01.03.a. Identify and summarize the effects of water quality on plant growth, (e.g., pH, dissolved solids, etc.).	Textbook: pg. 221 (Suggested Activities #1, 2), 236–239, 243 (Suggested Activities #1, 2, 5), 563 (Suggested Activities #9)
PS.01.01.03.b. Analyze and describe plant responses to water conditions.	Textbook: pg. 236–239, 347–349, 361 (Suggested Activities #8)
PS.01.01.03.c. Analyze plant responses to water conditions and recommend modifications to water for desired plant growth.	Textbook: pg. 347–349, 361 (Suggested Activities #8)
PS.01.02. Prepare and manage growing media for use in plant systems.	Textbook: pg. 199–201, 221 (Suggested Activities #1, 2)
PS.01.02.01.a. Identify the major components of growing media and describe how growing media support plant growth.	Textbook: pg. 199–201, 221 (Suggested Activities #1, 2)
PS.01.02.01.b. Describe the physical and chemical characteristics of growing media and explain the influence they have on plant growth.	Textbook: pg. 199–201, 221 (Suggested Activities #1, 2)
PS.01.02.01.c. Formulate and prepare growing media for specific plants or crops.	Textbook: pg. 199–201, 221 (Suggested Activities #1, 2)
PS.01.02.02.a. Identify the categories of soil water.	Textbook: pg. 129–133, 541–542
PS.01.02.02.b. Discuss how soil drainage and water-holding capacity can be improved.	Textbook: pg. 129–133, 541–542, 563 (Suggested Activities #9)
PS.01.02.02.c. Determine the hydraulic conductivity for soil and how the results influence irrigation practices.	Textbook: pg. 129–133, 563 (Suggested Activities #9), 595 (Suggested Activities #1, 2)
PS.01.03. Develop and implement a fertilization plan for specific plants or crops.	Textbook: pg. 563 (Suggested Activities #10), 568–573
PS.01.03.01.a. Identify the essential nutrients for plant growth and development and their major functions (e.g., nitrogen, phosphorous, potassium, etc.).	Textbook: pg. 236–239, 243 (Thinking Critically #5; Suggested Activities #2, 4)
PS.01.03.01.b. Analyze the effects of nutrient deficiencies and symptoms and recognize environmental causes of nutrient deficiencies.	Textbook: pg. 236–239, 243 (Thinking Critically #5; Suggested Activities #1, 2, 4)

**Correlation of *Landscape Design, Installation, and Management* to AFNR Career Cluster
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Standards and Indicators	G-W Content
PS.01.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report to correct elements negatively affecting plant growth in a field or greenhouse.	Textbook: pg. 234, 236–239, 243 (Thinking Critically #5; Suggested Activities #1, 2, 4)
PS.01.03.02.a. Discuss the influence of pH and cation exchange capacity on the availability of nutrients.	Textbook: pg. 221 (Suggested Activities #1), 236–239, 243 (Thinking Critically #5; Suggested Activities #1, 2, 4)
PS.01.03.02.b. Contrast pH and cation exchange capacity between mineral soil and soilless growing media.	Textbook: pg. 221 (Suggested Activities #1), 236–239, 243 (Thinking Critically #5; Suggested Activities #1, 2, 4)
PS.01.03.02.c. Adjust the pH of growing media for specific plants or crops.	Textbook: pg. 199–201, 221 (Suggested Activities #1), 243 (Thinking Critically #5; Suggested Activities #1, 2, 4)
PS.01.03.03.a. Collect soil and plant tissue samples using generally accepted procedures and explain how incorrect sample collection will affect the results of a laboratory analysis.	Textbook: pg. 221 (Suggested Activities #1), 243 (Suggested Activities #5), 320 (Hands-On Landscaping)
PS.01.03.03.b. Interpret laboratory analyses of soil and tissue samples.	Textbook: pg. 221 (Suggested Activities #1), 243 (Suggested Activities #5), 563 (Suggested Activities #9), 595 (Suggested Activities #1, 2)
PS.01.03.03.c. Prescribe fertilizer applications based on the results of a laboratory analysis of soil and plant tissue samples.	Textbook: pg. 563 (Suggested Activities #10)
PS.01.03.04.a. Identify fertilizer sources of essential plant nutrients; explain fertilizer formulations, including organic and inorganic; and describe different methods of fertilizer application.	Textbook: pg. 563 (Suggested Activities #10), 568–573
PS.01.03.04.b. Calculate the amount of fertilizer to be applied based on nutrient recommendation and fertilizer analysis.	Textbook: pg. 563 (Suggested Activities #10), 568–573
PS.01.03.04.c. Calibrate application equipment to meet plant nutrient needs.	Textbook: pg. 243 (Suggested Activities #1, 2), 557
PS.01.03.05.a. Research and summarize production methods focused on soil management (e.g., crop rotation, companion planting, cover crops, etc.).	Textbook: pg. 320 (Hands-On Landscaping), 623
PS.01.03.05.b. Assess and describe the short and long-term effects production methods have on soil.	Textbook: pg. 320 (Hands-On Landscaping)
PS.01.03.05.c. Devise a plan for soil management for a selected production method.	Textbook: pg. 131–133, 147 (Thinking Critically #3)
PS.01.03.06.a. Summarize the impact of environmental factors on nutrient availability (e.g., moisture, temperature, pH, etc.).	Textbook: pg. 128–143, 147 (Suggested Activities #3, 4, 6)

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Standards and Indicators	G-W Content
PS.01.03.06.b. Assess and describe the impact environmental factors have on a crop.	Textbook: pg. 198
PS.01.03.06.c. Devise a plan to meet plant nutrient needs based on environmental factors present.	Textbook: pg. 236–239, 243 (Suggested Activities #5)
PS.02. Apply principles of classification, plant anatomy, and plant physiology to plant production and management.	
PS.02.01. Classify plants according to taxonomic systems.	Textbook: pg. 226–231, 243 (Thinking Critically #1–4; Suggested Activities #2)
PS.02.01.01.a. Identify and summarize systems used to classify plants based on specific characteristics.	Textbook: pg. 226–231, 243 (Thinking Critically #1–4; Suggested Activities #2)
PS.02.01.01.b. Compare and contrast the hierarchical classification of agricultural and ornamental plants.	Textbook: pg. 226–231, 246–263, 269–285 (Nursery/Landscape Plant Identification)
PS.02.01.01.c. Classify agricultural and ornamental plants according to the hierarchical classification system.	Textbook: pg. 226–231, 243 (Thinking Critically #1–4; Suggested Activities #2), 246–263, 269–285 (Nursery/Landscape Plant Identification)
PS.02.01.02.a. Describe the morphological characteristics used to identify agricultural and herbaceous plants (e.g., life cycles, growth habit, plant use and as monocotyledons or dicotyledons, woody, herbaceous, etc.).	Textbook: pg. 226–227, 231–239, 243 (Thinking Critically #1–4; Suggested Activities #2)
PS.02.01.02.b. Identify and describe important plants to agricultural and ornamental plant systems by common names.	Textbook: pg. 231–239, 243 (Thinking Critically #1–4; Suggested Activities #2), 269–285 (Nursery/Landscape Plant Identification)
PS.02.01.02.c. Identify and describe important plants to agricultural and ornamental plant systems by scientific names.	Textbook: pg. 231–239, 243 (Thinking Critically #1–4; Suggested Activities #2), 269–285 (Nursery/Landscape Plant Identification)
PS.02.02. Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.	Textbook: pg. 231–239, 243 (Suggested Activities #1, 2)
PS.02.02.01.a. Identify structures in a typical plant cell and summarize the function of plant cell organelles.	Textbook: pg. 231–239, 243 (Thinking Critically #1)
PS.02.02.01.b. Compare and contrast mitosis and meiosis.	Textbook: pg. 238
PS.02.02.01.c. Apply the knowledge of cell differentiation and the functions of the major types of cells to plant systems.	Textbook: pg. 235, 238
PS.02.02.02.a. Identify and summarize the components, the types and the functions of plant roots.	Textbook: pg. 231, 243 (Thinking Critically #1; Suggested Activities #2)

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Standards and Indicators	G-W Content
PS.02.02.02.b. Analyze root tissues and explain the pathway of water and nutrients into and through root tissues.	Textbook: pg. 231, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.02.02.c. Correlate the active and passive transport of minerals into and through the root system to plant nutrition.	Textbook: pg. 231, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.02.03.a. Identify and summarize the components and the functions of plant stems.	Textbook: pg. 232–234, 243 (Thinking Critically #1)
PS.02.02.03.b. Analyze and describe the difference in arrangement of vascular tissue between monocot and dicot plant stems.	Textbook: pg. 232–234, 243 (Thinking Critically #1)
PS.02.02.03.c. Evaluate the function of the xylem, phloem and cambium tissues and the impact on plant systems.	Textbook: pg. 232–234, 243 (Thinking Critically #1)
PS.02.02.04.a. Research and summarize leaf morphology and the functions of leaves.	Textbook: pg. 235, 243 (Suggested Activities #2)
PS.02.02.04.b. Analyze how leaves capture light energy and summarize the exchange of gases.	Textbook: pg. 235–237, 243 (Thinking Critically #1, 5; Suggested Activities #2)
PS.02.02.04.c. Devise a plan for plant management practices that takes into account leaf structure and functions.	Textbook: pg. 235–237, 243 (Thinking Critically #5; Suggested Activities #5)
PS.02.02.05.a. Identify and summarize the components of a flower, the functions of a flower and the functions of flower components.	Textbook: pg. 231–235, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.02.05.b. Apply knowledge of flower structure to differentiate between the types of flowers and flower inflorescence (e.g., complete, incomplete, perfect, imperfect).	Textbook: pg. 224, 231–235, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.02.05.c. Evaluate flower structures and analyze the impact of plant structure on plant breeding, production and use.	Textbook: pg. 231–235, 243 (Thinking Critically #1; Suggested Activities #2), 268 (Suggested Activities #8)
PS.02.02.06.a. Identify and summarize the functions and components of seeds and fruit.	Textbook: pg. 236–237, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.02.06.b. Analyze and categorize the major types of seeds and fruit.	Textbook: pg. 236–237, 268 (Suggested Activities #8)
PS.02.02.06.c. Evaluate the impact of different seed and fruit structures to plant culture and use.	Textbook: pg. 236–237, 268 (Suggested Activities #8), 294
PS.02.03. Apply knowledge of plant physiology and energy conversion to plant systems.	Textbook: pg. 231–239, 243 (Thinking Critically #1; Suggested Activities #2)

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Standards and Indicators	G-W Content
PS.02.03.01.a. Summarize the importance of photosynthesis to plant life on earth and the process of photosynthesis, including the types (c3, c4, Cam), its stages (e.g., light-dependent and light independent reactions), and its products and byproducts.	Textbook: pg. 236–237, 243 (Thinking Critically #1, 5; Suggested Activities #1, 2)
PS.02.03.01.b. Apply knowledge of photosynthesis to analyze how various environmental factors will affect the rate of photosynthesis.	Textbook: pg. 236–237, 243 (Thinking Critically #1, 5; Suggested Activities #1, 2)
PS.02.03.01.c. Evaluate the impact of photosynthesis and the factors that affect it on plant management, culture and production problems.	Textbook: pg. 236–237, 243 (Thinking Critically #1, 5; Suggested Activities #1, 2)
PS.02.03.02.a. Summarize the stages of cellular respiration including their products and byproducts.	Textbook: pg. 236–237
PS.02.03.02.b. Analyze the factors that affect cellular respiration processes and rate in a crop production setting.	Textbook: pg. 236–237
PS.02.03.02.c. Evaluate the impact of plant respiration on plant growth, crop management and post-harvest handling decisions.	Textbook: pg. 236–237
PS.02.03.03.a. Summarize primary growth and the role of the apical meristem.	Textbook: pg. 231–234, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.03.03.b. Analyze plant growth and assess the process of secondary plant growth.	Textbook: pg. 232, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.03.03.c. Relate the principles of primary and secondary growth to plant systems.	Textbook: pg. 231–234, 243 (Thinking Critically #1; Suggested Activities #2)
PS.02.03.04.a. Identify and categorize the five groups of naturally occurring plant hormones and synthetic plant growth regulators.	Textbook: pg. 238–239, 568–573
PS.02.03.04.b. Analyze and identify the plant responses to plant growth regulators and different forms of tropism.	Textbook: pg. 236–239, 243 (Thinking Critically #5), 568–573
PS.02.03.04.c. Select and defend the use of specific plant growth regulators to produce desired responses from plants.	Textbook: pg. 563 (Suggested Activities #10)
PS.02.03.05.a. Compare and contrast the effects of transpiration, translocation and assimilation on plants.	Textbook: pg. 236–239, 243 (Suggested Activities #1)
PS.02.03.05.b. Identify and analyze the factors affecting transpiration, translocation and assimilation rate and products.	Textbook: pg. 236–239, 243 (Thinking Critically #1)

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Standards and Indicators	G-W Content
PS.02.03.05.c. Devise plans for plant management that applies knowledge of transpiration, translocation and assimilation on plant growth.	Textbook: pg. 236–239, 243 (Suggested Activities #1)
PS.03. Propagate, culture and harvest plants and plant products based on current industry standards.	
PS.03.01. Demonstrate plant propagation techniques in plant system activities.	Textbook: pg. 202–205, 221 (Suggested Activities #8)
PS.03.01.01.a. Identify examples of and summarize pollination, cross-pollination and self-pollination of flowering plants.	Textbook: pg. 202–205, 221 (Thinking Critically #3)
PS.03.01.01.b. Examine and apply the process of plant pollination and/or fertilization.	Textbook: pg. 202–205, 563 (Suggested Activities #10), 568–573
PS.03.01.01.c. Select and defend the use of pollination methods and practices used to maximize crop pollination.	Textbook: pg. 202–205, 221 (Thinking Critically #1–5; Suggested Activities #7)
PS.03.01.02.a. Demonstrate sowing techniques for providing favorable conditions to meet the factors of seed germination.	
PS.03.01.02.b. Handle seed to overcome seed dormancy mechanisms and to maintain seed viability and vigor.	Textbook: pg. 202 (Hands-On Landscaping), 221 (Suggested Activities #8)
PS.03.01.02.c. Conduct tests associated with seed germination rates, viability and vigor.	Textbook: pg. 202 (Hands-On Landscaping), 221 (Suggested Activities #8)
PS.03.01.03.a. Summarize optimal conditions for asexual propagation and demonstrate techniques used to propagate plants by cuttings, division, separation, layering, budding and grafting.	Textbook: pg. 203–205, 221 (Thinking Critically #3)
PS.03.01.03.b. Manage the plant environment to support asexual reproduction.	Textbook: pg. 203–205, 221 (Suggested Activities #7, 8)
PS.03.01.03.c. Evaluate asexual propagation practices based on productivity and efficiency.	Textbook: pg. 203–205, 221 (Thinking Critically #3)
PS.03.01.04.a. Define micropropagation, discuss advantages associated with the practice and summarize the main stages of the process.	Textbook: pg. 221 (Thinking Critically #1, 2)
PS.03.01.04.b. Demonstrate aseptic micropropagation techniques.	Textbook: pg. 204–205, 221 (Thinking Critically #1–3)
PS.03.01.04.c. Propagate plants by micropropagation.	Textbook: pg. 204–205, 221 (Thinking Critically #1, 2; Suggested Activities #1, 2, 8)
PS.03.01.05.a. Summarize the principles of recombinant DNA technology and the basic steps in the process.	
PS.03.01.05.b. Compare and contrast the potential risks and advantages associated with genetically modified plants.	Textbook: pg. 221 (Thinking Critically #1, 2; Suggested Activities #2, 7)

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Standards and Indicators	G-W Content
PS.03.01.05.c. Evaluate the impact of using genetically modified crops on other production practices.	Textbook: pg. 221 (Thinking Critically #1, 2; Suggested Activities #2, 7)
PS.03.02. Develop and implement a management plan for plant production.	Textbook: pg. 215–216, 221 (Thinking Critically #4; Suggested Activities #1, 2), 243 (Suggested Activities #1)
PS.03.02.01.a. Research and summarize the importance of starting with pest- and disease-free propagation material.	Textbook: pg. 221 (Thinking Critically #4; Suggested Activities #3)
PS.03.02.01.b. Inspect propagation material for evidence of pests or disease.	Textbook: pg. 221 (Suggested Activities #3), 631 (Suggested Activities #3, 8)
PS.03.02.01.c. Produce pest- and disease-free propagation material.	Textbook: pg. 221 (Suggested Activities #3), 631 (Suggested Activities #2–5)
PS.03.02.02.a. List and summarize the reasons for preparing growing media before planting.	Textbook: pg. 221 (Suggested Activities #1, 2)
PS.03.02.02.b. Prepare soil and growing media for planting with the addition of amendments.	Textbook: pg. 221 (Suggested Activities #1, 2)
PS.03.02.02.c. Analyze how mechanical planting equipment performs soil preparation and seed placement.	Textbook: pg. 541–552, 562–563 (Suggested Activities #2, 9)
PS.03.02.03.a. Determine seeding rate need for specified plant population or desired quantity of finished plants.	Textbook: pg. 221 (Suggested Activities #8)
PS.03.02.03.b. Apply pre-plant treatments required of seeds and plants and evaluate the results.	Textbook: pg. 221 (Suggested Activities #8)
PS.03.02.03.c. Adjust and calibrate mechanized seeding and/or planting equipment for desired seed application rate.	Textbook: pg. 221 (Suggested Activities #8)
PS.03.02.04.a. Observe and record environmental conditions during the germination, growth and development of a crop.	Textbook: pg. 202 (Hands-On Landscaping)
PS.03.02.04.b. Monitor the progress of plantings and determine the need to adjust environmental conditions.	Textbook: pg. 221 (Suggested Activities #8)
PS.03.02.04.c. Prepare and implement a plant production schedule based on predicted environmental conditions and desired market target (e.g., having plants ready to market on a specific day such as Mother’s Day, organic production, low maintenance landscape plants, etc.).	Textbook: pg. 243 (Suggested Activities #1)

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Standards and Indicators	G-W Content
PS.03.02.05.a. Summarize the stages of plant growth and the reasons for controlling plant growth.	Textbook: pg. 147 (Suggested Activities #4), 198–214, 221 (Thinking Critically #3), 243 (Suggested Activities #1, 5)
PS.03.02.05.b. Demonstrate proper techniques to control and manage plant growth through mechanical, cultural or chemical means.	Textbook: pg. 198–214, 221 (Thinking Critically #3; Suggested Activities #1, 2, 7, 8), 243 (Suggested Activities #1, 5)
PS.03.02.05.c. Prepare plant production schedules utilizing plant growth knowledge to get plants to their optimal growth stage at a given time.	Textbook: pg. 243 (Suggested Activities #1, 5)
PS.03.02.06.a. Identify and categorize structures and technologies used for controlled atmosphere production of plants.	Textbook: pg. 205–213, 230 (Looking Forward)
PS.03.02.06.b. Compare and contrast the types of technologies used for controlled atmosphere production.	Textbook: pg. 205–213, 230 (Looking Forward)
PS.03.02.06.c. Research, select and defend technology for use in controlled atmosphere production.	
PS.03.02.07.a. Summarize the use of hydroponic and aquaponic systems for plant production.	Textbook: pg. 258, 347–350, 361 (Suggested Activities #8)
PS.03.02.07.b. Compare and contrast the types of systems used in hydroponic and aquaponic plant production.	Textbook: pg. 347–350, 361 (Suggested Activities #8)
PS.03.02.07.c. Research, select and defend the use of a hydroponic or aquaponic plant system.	Textbook: pg. 361 (Suggested Activities #3, 5, 8)
PS.03.03. Develop and implement a plan for integrated pest management for plant production.	Textbook: pg. 631 (Suggested Activities #2–8)
PS.03.03.01.a. Identify and categorize plant pests, diseases and disorders.	Textbook: pg. 631 (Suggested Activities #3, 8)
PS.03.03.01.b. Identify and analyze major local weeds, insect pests and infectious and noninfectious plant diseases.	Textbook: pg. 631 (Suggested Activities #3, 8)
PS.03.03.01.c. Devise solutions for plant pests, diseases and disorders.	Textbook: pg. 631 (Suggested Activities #2–4, 8)
PS.03.03.02.a. Diagram the life cycle of major plant pests and diseases.	Textbook: pg. 630 (Thinking Critically #3)
PS.03.03.02.b. Predict pest and disease problems based on environmental conditions and life cycles.	Textbook: pg. 630 (Thinking Critically #1, 3)
PS.03.03.02.c. Design and implement a crop scouting program.	Textbook: pg. 631 (Suggested Activities #2, 6–8)

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Standards and Indicators	G-W Content
PS.03.03.03.a. Identify and summarize pest control strategies associated with integrated pest management and the importance of determining economic threshold.	Textbook: pg. 598–604, 630 (Thinking Critically #1, 2), 631 (Suggested Activities #2)
PS.03.03.03.b. Demonstrate pesticide formulations including organic and synthetic active ingredients and selection of pesticide to control specific pest.	Textbook: pg. 631 (Suggested Activities #3, 4, 8)
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.	Textbook: pg. 631 (Suggested Activities #2–8)
PS.03.03.04.a. Distinguish between risks and benefits associated with the materials and methods used in plant pest management.	Textbook: pg. 630 (Thinking Critically #5)
PS.03.03.04.b. Examine and apply procedures for the safe handling, use and storage of pesticides including personal protective equipment and reentry interval.	Textbook: pg. 623 (Stem Connection), 631 (Suggested Activities #4)
PS.03.03.04.c. Evaluate environmental and consumer concerns regarding pest management strategies.	Textbook: pg. 611 (Stem Connection), 630 (Thinking Critically #1, 5), 631 (Suggested Activities #2, 8)
PS.03.04. Apply principles and practices of sustainable agriculture to plant production.	Textbook: pg. 172–173, 215–216, 167 (Thinking Critically #1,2), 307 (Thinking Critically #1), 331 (Thinking Critically #1)
PS.03.04.01.a. Compare and contrast the alignment of different production systems (conventional and organic) with USDA sustainable practices criteria.	Textbook: pg. 215–216
PS.03.04.01.b. Analyze the alignment of modern technologies used in production systems (e.g., precision agriculture, GE crops, etc.) with USDA sustainable practices criteria.	Textbook: pg. 215–216
PS.03.04.01.c. Research, prepare and defend plans for a plant systems enterprise that aligns with USDA sustainable practices criteria.	Textbook: pg. 215–216, 221 (Suggested Activities #3)
PS.03.04.02.a. Summarize national/international and local/regional food production systems.	Textbook: pg. 268 (Thinking Critically #3)
PS.03.04.02.b. Compare and contrast the impact on greenhouse gas, carbon footprint of the national/international production system with local/regional production system markets.	
PS.03.04.02.c. Select and defend the use of nationally/internationally grown or locally/regionally grown for a production operation system.	

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Standards and Indicators	G-W Content
PS.03.04.03.a. Identify and summarize impacts of environmental conditions on plants.	Textbook: pg. 221 (Thinking Critically #5; Suggested Activities #1)
PS.03.04.03.b. Compare and contrast differing research conclusions related to environmental factors and their effect on plants.	Textbook: pg. 147 (Suggested Activities #3–6), 202 (Hands-On Landscaping)
PS.03.04.03.c. Evaluate evidence supporting claims on how environmental conditions effect plants.	Textbook: pg. 147 (Suggested Activities #3–6)
PS.03.05. Harvest, handle and store crops according to current industry standards.	Textbook: pg. 207–212
PS.03.05.01.a. Identify and summarize harvesting methods and equipment.	Textbook: pg. 84–113, 114–125, 210–212
PS.03.05.01.b. Assess the stage of growth to determine crop maturity or marketability and demonstrate proper harvesting techniques.	Textbook: pg. 207–212
PS.03.05.01.c. Analyze the processes used by mechanical harvesting equipment.	
PS.03.05.02.a. Research and summarize reasons for calculating crop loss and or damage.	
PS.03.05.02.b. Evaluate crop yield and loss data and make recommendations to reduce crop loss.	
PS.03.05.02.c. Implement and evaluate the effectiveness of plans to reduce crop loss.	
PS.03.05.03.a. Research and summarize how safety is ensured at each stage of the following processes: harvesting, processing and storing.	Textbook: pg. 54–83
PS.03.05.03.b. Research and analyze practices used to maintain a safe product through harvest, processing, storage and shipment (e.g., Food Safety Modernization Act, Good Agricultural Practices, etc.).	Textbook: pg. 27 (Thinking Critically #2; Suggested Activities #1)
PS.03.05.03.c. Research laws and apply regulations to ensure the production of plants and plant products that are safe for distribution and use.	Textbook: pg. 216
PS.03.05.04.a. Identify and categorize plant preparation methods for storing and shipping plants and plant products.	Textbook: pg. 208–213, 221 (Suggested Activities #5, 6), 541
PS.03.05.04.b. Analyze the proper conditions required to maintain the quality of plants and plant products held in storage and during shipping.	Textbook: pg. 208–213, 221 (Suggested Activities #5, 6)
PS.03.05.04.c. Monitor and evaluate environmental conditions in storage facilities for plants and plant products.	Textbook: pg. 208–213, 221 (Suggested Activities #5, 6)

**Correlation of *Landscape Design, Installation, and Management* to AFNR Career Cluster
Content Standards: Plant Science Systems**

Standards and Indicators	G-W Content
<p>PS.03.05.05.a. Summarize the reasons for preparing plants and plant products for distribution.</p>	
<p>PS.03.05.05.b. Demonstrate techniques for grading, handling and packaging plants and plant products for distribution.</p>	Textbook: pg. 208–213
<p>PS.03.05.05.c. Evaluate techniques for grading, handling and packaging plants and plant products.</p>	Textbook: pg. 208–213
<p>PS.04. Apply principles of design in plant systems to enhance an environment (e.g. floral, forest landscape, and farm).</p>	
<p>PS.04.01. Evaluating, identifying and preparing plants to enhance an environment.</p>	Textbook: pg. 136–143, 147 (Suggested Activities #3–5), 167 (Thinking Critically #1–5; Suggested Activities #1, 3–4, 6–7)
<p>PS.04.01.01.a. Identify and categorize plants by their purpose (e.g., floral plants, landscape plants, house plants, etc.).</p>	Textbook: pg. 226–236, 243 (Thinking Critically #1, 4), 246–263, 268 (Suggested Activities #8), 562 (Thinking Critically #2; Suggested Activities #1)
<p>PS.04.01.01.b. Demonstrate proper use of plants in their environment (e.g., focal and filler plants in floriculture, heat tolerant and shade plants in a landscape design, etc.).</p>	Textbook: pg. 226–236, 243 (Thinking Critically #1, 4), 246–263, 268 (Suggested Activities #8), 562 (Thinking Critically #2; Suggested Activities #1)
<p>PS.04.01.01.c. Install plants according to a design plan that uses the proper plants based on the situation and environment.</p>	Textbook: pg. 536–552, 562 (Thinking Critically #2, 4; Suggested Activities #2)
<p>PS.04.01.02.a. Summarize the applications of design in agriculture and ornamental plant systems.</p>	Textbook: pg. 246–263, 268 (Thinking Critically #2; Suggested Activities #1–5, 8)
<p>PS.04.01.02.b. Create a design utilizing plants in their proper environments.</p>	Textbook: pg. 268 (Thinking Critically #2; Suggested Activities #1–5, 8), 562 (Thinking Critically #2, 4; Suggested Activities #1–2)
<p>PS.04.01.02.c. Evaluate a design and provide feedback and suggestions for improvement (e.g., a floral arrangement, a landscape or a landscape plan, etc.).</p>	Textbook: pg. 562 (Thinking Critically #2–5)
<p>PS.04.02. Evaluating, identifying and preparing plants to enhance an environment.</p>	Textbook: pg. 226–236, 243 (Thinking Critically #1, 4), 246–263, 268 (Suggested Activities #8), 562 (Thinking Critically #2; Suggested Activities #1)
<p>PS.04.02.01.a. Research and summarize the principles and elements of design for use in plant systems.</p>	Textbook: pg. 150–163, 167 (Thinking Critically #1–5; Suggested Activities #1–2, 4–6)
<p>PS.04.02.01.b. Apply principles and elements of design that form the basis of artistic impression.</p>	Textbook: pg. 167 (Suggested Activities #1, 2, 4–6), 455 (Suggested Activities #1, 9)
<p>PS.04.02.01.c. Analyze designs to identify use of design principles and elements.</p>	Textbook: pg. 167 (Thinking Critically #1–5; Suggested Activities #1, 6), 455 (Suggested Activities #1, 9)

**Correlation of *Landscape Design, Installation, and Management* to AFNR Career Cluster
Content Standards: Plant Science Systems**

Standards and Indicators	G-W Content
PS.04.02.02.a. Identify and categorize tools used for design (e.g., computer landscape software, drawing tools, florist tools, etc.).	Textbook: pg. 430–436, 455 (Suggested Activities #1, 3)
PS.04.02.02.b. Demonstrate the use of tools used for creating designs.	Textbook: pg. 455 (Suggested Activities #1–7, 9)
PS.04.02.02.c. Choose and properly use appropriate tools to create a desired design.	Textbook: pg. 455 (Suggested Activities #1–7, 9)
PS.04.02.03.a. Explain the concept of landscape ecology and summarize factors that shape the ecology of a landscape (e.g., composition, structure, function, etc.).	Textbook: pg. 128–134, 136–143, 147 (Suggested Activities #3–7)
PS.04.02.03.b. Research and provide examples of ecological factors incorporated into landscape designs.	Textbook: pg. 455 (Suggested Activities #1, 3–9)
PS.04.02.03.c. Utilize green technologies and sustainable practices that prevent or limit negative environmental impacts.	Textbook: pg. 5, 27 (Thinking Critically #2, Suggested Activities #1), 221 (Thinking Critically #1)