



Horticulture

Course: Horticulture/Landscape Design		Total Framework Hours up to: 180
CIP Code: 011101	☒ Exploratory Beginning ☐ Preparatory Advanced	Date Last Modified: 2017
Career Cluster: Agriculture, Food and Natural Resources		Cluster Pathway: Plant Systems

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Identify and summarize the components of a flower, the functions of a flower and the functions of flower components. PS.02.02.05.a
- Identify structures in a typical plant cell and summarize the function of plant cell organelles. PS.02.02.01.a
- Evaluate the impact of different seed and fruit structures to plant culture and use. PS.02.02.06.c
- 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. PS.02.03.01.a

Leadership Alignment: Students will think creatively to build a model of the flower components. Students will interact effectively with others to build analogies for plant cell organelles. Students will be self-directed learners when putting together their plant parts booklets. Students will produce results when developing their photosynthesis diagrams.

Standards and Competencies

Unit: Plant Growth and Physiology.

Competencies

Total Learning Hours for Standard: 30

- Identify and describe the morphology and functions of all parts of the plant (include roots, stems, leaves, flower and fruit).
- Describe cellular functions through knowledge of the plant processes including; photosynthesis, respiration, transpiration and vascular systems.
- Compare and contrast the hierarchical classification of plants.
- Classify plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or di-cotyledons.
- Identify the different types of flowers.
- Explain the components and functions of fruit and seeds.
- Discuss leaf morphology and leaf functions.
- Explain photosynthesis and cellular respiration.
- Explain the relationship between leaf structure and function and plant management practices.
- Define primary growth and the role of the apical meristem.
- Relate the role of primary and secondary growth to plant systems.
- Discuss plant hormones and synthetic growth regulators, identify plant response and select regulators for desired responses.

Aligned Washington State Standards

Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized referenced materials, as appropriate.

Reading	Read and comprehend complex literary and informational texts independently and proficiently.
Science	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
Writing	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> Determine the optimal air and temperature conditions for plant growth. PS.01.01.02.b Analyze plant responses to water conditions and recommend modifications to water for desired plant growth. PS.01.01.03.c Describe the physical and chemical characteristics of growing media and explain the influence they have on plant growth. PS.01.02.01.b Discuss how soil drainage and water-holding capacity can be improved. PS.01.02.02.b Identify the essential nutrients for plant growth and development and their major functions (e.g., nitrogen, phosphorous, potassium, etc.). Adjust the pH of growing media for specific plants or crops. PS.01.03.01.a Identify fertilizer sources of essential plant nutrients; explain fertilizer formulations, including organic and inorganic; and describe different methods of fertilizer application. PS.01.03.04.a 	
Leadership Alignment: Students will make judgements and decisions based on the soil in the garden beds. Students will collaborate with others to determine the best plan of action for each of the 39 raised beds. Students will access and evaluate information available for both organic and non-organic solutions.	
Standards and Competencies	
Unit: Soil; growing media and nutrients.	
Competencies	Total Learning Hours for Standard:20
<ul style="list-style-type: none"> Determine the influence on environmental factors on plant growth. Prepare growing media to meet plant requirements. Understand the types of soil. Utilize a soil textural triangle. Determine the optimal air, temperature, water and soil requirements for plant growth. Describe the physical characteristics of growing media and explain the influence they have on plant growth. Identify the essential nutrients for plant growth and their major functions. Discuss the influence of pH. Determine the nutrient content of soils. 	
Aligned Washington State Standards	
Reading	Read and comprehend complex literary and informational texts independently and proficiently.
Science	Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
Speaking and Listening	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
Writing	Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> Identify and summarize systems used to classify plants based on specific characteristics. PS.02.01.01.a Identify and describe important plants to agricultural and ornamental plant systems by common names. PS.02.01.02.b 	
Leadership Alignment: Students will manage projects related to plant ID. Students will solve problems of identification based on plant characteristics. Students can participate in the FFA floral CDE. Students will be able to produce results on plant ID quizzes.	
Standards and Competencies	
Unit: Plant Identification	
Competencies	Total Learning Hours for Standard:15
<ul style="list-style-type: none"> Correctly write the binomial names of plants. Understand the use of terminology and languages in nomenclature Identify plants based on their structure. Explain the hierarchy of plant classification systems. Utilize the Intelli-prep program to identify plants of the state plant list. Identify plants grown and propagated in the greenhouse program. 	
Aligned Washington State Standards	
Educational Technology	Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others.
Science	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
Speaking and Listening	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR. CS.03.04.03.b Evaluate and select appropriate tool and equipment to complete AFNR tasks. CS.06.04.02.c 	
Leadership Alignment: Students will interact effectively with others to maintain a safe environment while using classroom tools. Students will communicate clearly if they have issues with any tool. Students will solve problems that arise when using power tools. Students will be responsible to others when they are using power equipment.	
Standards and Competencies	
Unit: Tools identification, safe use and maintenance.	
Competencies	Total Learning Hours for Standard:5
<ul style="list-style-type: none"> Utilize horticulture/landscape tools correctly. Maintain horticulture/landscape tools. Identify tools and equipment used in horticulture/landscape. Use appropriate safety procedures when working with horticulture/landscape tools. 	

<ul style="list-style-type: none"> • Store horticulture/landscape tools correctly. 	
Aligned Washington State Standards	
Health and Fitness	Acquires the knowledge and skills to safely participate in a variety of developmentally appropriate physical activities Acquires skills to live safely and reduce health risks
Speaking and Listening	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> • Apply knowledge of photosynthesis to analyze how various environmental factors will affect the rate of photosynthesis. PS.02.03.01.b • Analyze plant growth and assess the process of secondary plant growth. PS.02.03.03.b • Analyze and identify the plant responses to plant growth regulators and different forms of tropism. PS.02.03.04.b • Demonstrate sowing techniques for providing favorable conditions to meet the factors of seed germination. PS.03.01.02.a • Diagram the life cycle of major plant pests and diseases. PS.03.03.02.a • Summarize optimal conditions for asexual propagation and demonstrate techniques used to propagate plants by cuttings, division, separation, layering, budding and grafting. PS.03.01.03.a • Evaluate asexual propagation practices based on productivity and efficiency. PS.03.01.03.c 	
Leadership Alignment: Students will interact effectively with others to propagate plants asexually. Students will produce results from the plant propagation lab. Students will interact effectively with others to utilize tools and equipment.	
Standards and Competencies	
Unit: Plant growth and greenhouse management; including propagation	
Competencies	Total Learning Hours for Standard:50
<ul style="list-style-type: none"> • Demonstrate how to seed correctly for different plant species. • Demonstrate successful transplanting of a variety of plants. • Utilize growth hormones for regulating plant growth, if needed. • Identify pests. • Explain integrated pest management strategies for a variety of greenhouse pests. • Demonstrate knowledge of the science and application of asexual propagation including; cuttings, separation and division. • Demonstrate knowledge of the science and application of appropriate asexual propagation techniques including; layering, budding, grafting and micro propagation. • Demonstrate correct transplanting techniques. • Demonstrate correct use of fertilization in a variety of greenhouse plants. • Demonstrate methods for pruning a variety of indoor and outdoor plants and trees. 	
Aligned Washington State Standards	
Educational Technology	Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others.
Language	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized referenced materials, as appropriate.
Reading	Read and comprehend complex literary and informational texts independently and proficiently.

Science	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
Writing	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> Apply the sales process to AFNR businesses and communicate ways of accomplishing the businesses' goals and objectives. ABS.05.02.01.b Identify and explain marketing principles used in AFNR businesses (e.g., 4 P's-product, place, price, promotion; attention, interest, desire, action, etc.). ABS.05.03.01.a Apply plant needs onto individual plant signs for customer use. 	
Leadership Alignment: Students will work creatively with others to develop a marketing plan for the plant sale. Students will create media products to display in the community. Students will communicate clearly with each other when discussing their goals and objectives.	
<i>Standards and Competencies</i>	
Unit: Utilize sales and marketing techniques.	
Competencies	Total Learning Hours for Standard:10
<ul style="list-style-type: none"> Develop skills in product/service display as a means of showing a product to its best advantage. Demonstrate common advertising techniques specific to the horticulture/landscape industry. Demonstrate customer relations skills. Create plant signs with growing requirements. 	
<i>Aligned Washington State Standards</i>	
Arts	Uses visual arts to communicate for a specific purpose. Uses visual arts to express feelings and present ideas.
Educational Technology	Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources.
Language	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
Math	Make inferences and justify conclusions from sample surveys, experiments and observational studies
Reading	Read and comprehend complex literary and informational texts independently and proficiently.
Social Studies	Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices. Understands the economic issues and problems that all societies face
Speaking and Listening	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
Writing	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> Devise, implement, and evaluate strategies for personal involvement in civic service at work and in the community. CRP.01.03.01.c Identify opportunities to apply technical concepts to solve problems in the community. CRP.02.02.01.a 	

<ul style="list-style-type: none"> Classify the types of information (e.g., data, research, procedures, regulations, etc.) and resources (e.g., human, financial, technology, time, etc.) that may be used to make workplace and community decisions. CRP.05.01.03.a Analyze how different research methods are used to generate data in a variety of situations. CRP.07.01.01.b Analyze and demonstrate adherence to protective equipment requirements when using various AFNR tools and equipment. CS.03.04.02.b

Leadership Alignment: Students will work independently to come up with their SAE program. Students will manage projects to fulfill classroom requirements. Students will communicate clearly any help or concerns they have.

Standards and Competencies

Unit: Demonstrate an understanding of Supervised Agricultural Experience Programs and leadership skills.

Competencies

Total Learning Hours for Standard:5

- Describe the various types of Supervised Agricultural Experience Programs including Experience Programs including Entrepreneurship, Placement, Improvement, and Exploratory Programs.
- Describe the purpose of Supervised Agricultural Experience Programs within the Agricultural Education program.
- Utilize and analyze appropriate record keeping techniques with their Supervised Agricultural Experience Program.
- Identify opportunities available through the Supervised Agricultural Experience Program.
- Recognize life skills that are incorporated in their Supervised Agricultural Experience Program.
- Incorporate appropriate research into Supervised Agricultural Experience Program.
- Demonstrate effective communication skills.
- Participate in team work activities.

Aligned Washington State Standards

Educational Technology	Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources.
Language	Acquire and use accurately a range of general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
Math	Reason quantitatively and use units to solve problems. Reason quantitatively and use units to solve problems Apply geometric concepts in modeling situations.
Speaking and Listening	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
Writing	Write arguments to support claims in an analysis of substantive of topics or texts, using valid reasoning and relevant and sufficient evidence. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

COMPONENTS AND ASSESSMENTS

Performance Assessments:

- Match potential career opportunities in career clusters with personal interests, talents, goals and preferences. CRP.10.01.02.c
- Organize personal information to prepare and continuously update a set of tools to aid in the pursuit of a career path. CRP.10.04.01.b
- Evaluate information based on career research presentations.

Leadership Alignment: Students will access and evaluate information related to careers in the landscape industry. Students will use and manage information when updating job documents. Students will communicate clearly their information to the classroom in a presentation.

Standards and Competencies

Unit: Understand the variety of horticulture/landscape career options available	
Competencies	Total Learning Hours for Standard:5
<ul style="list-style-type: none"> • Demonstrate quality employability skills essential for positions in the horticulture/landscape field. • Understand appropriate employee retention skills. • Understand and demonstrate the importance of customer service in horticulture/landscape. • Demonstrate an understanding of legal requirements and obligations in horticulture/landscape occupations. • Demonstrate an understanding of workplace ethics. • Identify career opportunities in the horticulture/landscape industry. • Identify entrepreneurial opportunities in the horticulture/landscape industry. • Understand, apply and transfer skills learned in horticulture/landscape applications to other fields. 	
<i>Aligned Washington State Standards</i>	
Educational Technology	Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology.
Language	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
Reading	Read and comprehend complex literary and informational texts independently and proficiently.
Speaking and Listening	Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.
Writing	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: <ul style="list-style-type: none"> • Apply principles and elements of design that form the basis of artistic impression. PS.04.02.01.b • Choose and properly use appropriate tools to create a desired design. PS.04.02.02.b • Create a design utilizing plants in their proper environments. PS.04.01.02.b 	
Leadership Alignment: Students will analyze media information before beginning their projects. Students will manage their projects and produce results during the drawing unit. Students will use systems thinking when putting in appropriate landscaping and hardscaping in their drawings.	
<i>Standards and Competencies</i>	
Unit: Landscape Design and Implementation	
Competencies	Total Learning Hours for Standard:40
<ul style="list-style-type: none"> • Utilize tools for drawing including; architectural triangle, T-square, drawing templates, vellum paper. • Design a plot plan. • Design an analysis plan. • Design a trial design with appropriate scale of house and land area. • Complete a final landscape drawing to scale with plant id key and color. 	
<i>Aligned Washington State Standards</i>	
Arts	Understands and applies visual art concepts and vocabulary Develops visual art skills and techniques Applies a creative process to visual arts (identifies, explores, gathers, interprets, uses, implements, reflects, refines, and presents) Uses visual arts to communicate for a specific purpose.

Check those that students will demonstrate in this course:

LEARNING & INNOVATION

Creativity and Innovation

- ☒ Think Creatively
- ☒ Work Creatively with Others
- ☒ Implement Innovations

Critical Thinking and Problem Solving

- ☒ Reason Effectively
- ☒ Use Systems Thinking
- ☒ Make Judgments and Decisions
- ☒ Solve Problems

Communication and Collaboration

- ☒ Communicate Clearly
- ☒ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS

Information Literacy

- ☒ Access and /evaluate Information
- ☒ Use and Manage Information

Media Literacy

- ☒ Analyze Media
- ☒ Create Media Products

Information, Communications and Technology (ICT Literacy)

- ☒ Apply Technology Effectively

LIFE & CAREER SKILLS

Flexibility and Adaptability

- ☒ Adapt to Change
- ☒ Be Flexible

Initiative and Self-Direction

- ☒ Manage Goals and Time
- ☒ Work Independently
- ☒ Be Self-Directed Learners

Social and Cross-Cultural

- ☒ Interact Effectively with Others
- ☒ Work Effectively in Diverse Teams

Productivity and Accountability

- ☒ Manage Projects
- ☒ Produce Results

Leadership and Responsibility

- ☒ Guide and Lead Others
- ☒ Be Responsible to Others