NEW MILFORD PUBLIC SCHOOLS

New Milford, Connecticut



Plant Science I

April 2021

BOE Approved August 2021

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New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

Plant Science I

Grades 11 and 12

Plant Science I is an introductory course to the field of horticulture. In this semester course, students will be introduced to the nature of horticulture, careers in the field of horticulture, the classification of plants, the basic anatomy and physiology of plant structures, and uses and care of plants in the interior landscape. Students will have the opportunity for hands-on training and experience in the greenhouse. This experience includes the propagation and care of several types of plants, which are necessary skills for a variety of careers in horticulture. Students should gain an appreciation of the importance and use of plants in their own lives.

Pacing Guide

Unit #	Unit Name	Weeks
First Marking F	Period	
1	Exploring Careers in Horticulture 2	
2	Classification of Plants	3
3	Root Systems	2
4	Stems	
Second Marking Period		
5	Leaves	3
6	Flowers	3
7	Houseplants and Plantscaping	3

Unit 1: Exploring Careers in Horticulture

	Stage 1 – Desired Results	
ESTABLISHED GOALS	Tra	ansfer
• CCSS .ELA-Literacy.RST.11-12 .1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or	 Students will be able to independently use their learning to Develop an interest and sense of purpose in the field of horticulture. Establish the skills required to be successful in a horticulture career. Recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Planning and carrying out investigations Constructing explanations Obtaining, evaluating, and communicating information 	
inconsistencies in the account.	Meaning	
• SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts.	 UNDERSTANDINGS Students will understand that There are many careers and jobs within the horticulture field in which this course can help prepare the student to obtain. Operating and maintaining a greenhouse requires a specific set of skills and knowledge. 	 ESSENTIAL QUESTIONS Students will keep considering What job opportunities are there in the horticulture field? How is a greenhouse operated and maintained?
	Acq	uisition
	 Students will know There is a specific set of skills that each job or career in the horticulture field requires. These skills include a basic understanding of plant anatomy and care, marketing skills, and interpersonal skills. How to operate the watering beds in the greenhouse; how to set up the soil bins for planting; and how to properly clean and maintain the greenhouse. 	 Students will be skilled at Listing various jobs and careers that are available to those that study in the field of horticulture. Demonstrating the skills needed to operate and maintain greenhouse equipment. Working with team members to promote good plant maintenance Practicing teamwork and collaborative problem-solving

Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
		PERFORMANCE TASK(S):
А, М, Т	Teacher-created rubric that is a hybrid between a rubric and a checklist of expectations.	 Goal: To identify three careers in horticulture that would be of potential interest to the student. Role: High School Senior trying to decide between several potential careers in the horticultural field. Audience: Student peers and teacher Situation: Student is performing research during the college and career planning process to discuss with their guidance counselor Performance: Perform research on the job descriptions, skills necessary for the jobs, educational requirements, and average salaries of various careers in the horticultural field. Reflection on personal interest in each career is also required. Standards for Success: Horticulture Career Project Rubric
		OTHER EVIDENCE:
		Students will show they have achieved Stage 1 goals by
A, M, T A, M, T A, M, T		Formative: • Worksheets Summative: • Unit Self Evaluation • Research Project

Stage 3 – Learning Plan		
Pre-Assessment Pre-assessment will be in the form of a class discussion about students' knowledge of the careers they know of in the horticultural field.		
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
А, М А, М	 Teacher presents content: Careers in Horticulture Industry Students explore the skills needed for various careers in horticulture - Exploring Careers in 	 Pear Deck or Guided Notes Ask students to share their progress on the worksheet. Teacher check-in with students Read grading rubric / remind students of grading rubric
A, M, T A, M, T	 Horticulture Worksheet Students demonstrate an understanding of concepts from Unit 1 - Self Evaluation Horticulture Career Project - Students research the description, education requirements, and average salary of five careers in the horticulture field 	
	description, education requirements, and average salary of five careers in the horticulture field.	

Unit 2: Plant Evolution and Taxonomy

Stage 1 – Desired Results			
ESTABLISHED GOALS	Transfer		
 NGSS - HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations. CCSS.ELA-Literacy.RST.11- 12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. CCSS.ELA-Literacy.RST.11- 12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or 	 Evaluate the contributions that plants have made to humans over evolutionary time. Develop an interest and sense of purpose in the field of horticulture. Establish the skills required to be successful in a horticulture career. Recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Developing and using models Planning and carrying out investigations Obtaining, evaluating, and communicating information Meaning UNDERSTANDINGS 		
	 Plants play an important role in the lives of humans, not only providing food and oxygen, but they can be used to make landscapes aesthetically pleasing. Living organisms can be classified into identifiable groups in order for us to have a clear, organized way of identifying them. Plants have evolved over time with traits to make them more suitable to the various environments on land. 	 What is the role of plants in our lives? How are plants categorized into groups? What are the characteristics of plants that are used to classify them? How have plants evolved to be more suited to life on land over evolutionary time? 	
analyze the specific results	Acquisition		
 based on explanations in the text. SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. 	 Students will know The basic roles that plants play in our everyday lives. Plants are the foundational food source for all living things on Earth. Plants provide resources for food, clothes, shelter, medicine and much more. The purpose and importance of taxonomic classification. Plants have evolved into different taxa of plants. Each taxa is identified by structure and reproductive differences and similarities. 	 Students will be skilled at Explaining how all organisms are classified into separate taxa using Linnaean taxonomy. Identifying the four main groups of terrestrial plants and list their evolutionary order Describing the key adaptations that distinguish terrestrial plant groups from one another Classify the leaves of various trees by using a dichotomous key. Describing the many resources that plants 	

	 supply for all living organisms. Performing a simple classification of plants and to justify their reasoning by pointing to defining plant characteristics (e.g. producing seeds as opposed to spore). Comparing and contrasting plant species and identifying specific characteristics that distinguish one plant group from another. Practicing teamwork and collaborative problem-solving
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Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
		PERFORMANCE TASK(S):
А, М, Т	Answer key has been created for assignment. Students are allowed to check their work at the answer key station and go back to the lab bench and make revisions.	 Goal: To classify the leaves from trees of unknown origin by using a dichotomous key. Role: Arborist studying leaf type, shape, margin shape, and leaf arrangement in order to identify the species of tree that the leaf came from. Audience: Student peers and teacher. Situation: Students are given picture cards of 10-15 leaves of an unknown tree. Performance: Students use a dichotomous key and leaf information charts to identify the tree origin of 10-15 unknown leaves. Standards for Success: Students can successfully identify the tree that each leaf came from, as well as leaf type, shape, margin shape and leaf arrangement.

	OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
A, M A, M, T A, M, T	Formative: Interactive Notebook Warm-Ups Worksheets Lab Activities
A, M, T T A, M, T	Summative: • Unit Self Evaluation • Unit Test / Quizzes • Authentic Assessment

Stage 3 – Learning Plan		
	<i>Pre-Assessment</i> The pre-assessment for this unit includes a group discussion of how humans use plants in their everyday lives.	
	Students break into groups and do a Think-Pair-Share.	
Code A, M	 Summary of Key Learning Events and Instruction Students will explore the importance of plants in human lives 	 Progress Monitoring Group discussions
	- What are Plants? / What are the Characteristics of Plants? / Why are Plants Important? Worksheets	 Pear Deck or Guided Notes Read grading rubric / remind students of
A	Teacher will deliver content - Classification of Living Things /Taxonomy	grading rubricTeacher check-in during lab
Α, Μ, Τ	 Students use their knowledge of Linnaean taxonomy to create and name their own fantasy flower based on the traits and/or origin of the flower - The Fantasy Flower Activity 	 Group discussions during lab Teacher check-in during evaluation Teacher check-in during test
A	Teacher will deliver content - Classification of Plants	• Students can verify if their work is correct as
А, М	Students investigate the method of classifying plants - Virtual Lab: Plant Classification	they go.
Α, Μ, Τ	• Students study live plant specimens of the major land plant groups to identify the typical features of each plant group and how they have changed over time Lab: Evolutionary	

	Relationships of Plants
A, M, T	Students demonstrate an understanding of concepts from
	Unit 2 - Self Evaluation
Т	Students demonstrate an understanding of concepts from
	Unit 2 - Test
Α, Μ, Τ	Students are assigned pictures of 10-15 leaves. They use a
	charts and a dichotomous key to identify the species of the
	trees that the leaves are from - AAQ1: Mystery Tree
	Challenge

Unit 3: Root Systems

	Stage 1 – Desired Results	
ESTABLISHED GOALS	Transfer	
 NGSS - HS-1.2.2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. CCSS.ELA-Literacy.RST.11-1 2.1 Cite specific textual 	 Students will be able to independently use their learning Develop an interest and sense of purpose in the Establish the skills required to be successful in Recognize one's strengths and limitations with purpose. Developing and using models Planning and carrying out investigations Constructing explanations Obtaining, evaluating, and communicating information 	ng to… e field of horticulture. a horticulture career. a well-grounded sense of confidence and rmation
evidence to support analysis	Meaning	
 of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. CCSS.ELA-Literacy.RST.11-1 2.3 Follow precisely a complex multistep procedure when carrying out 	 UNDERSTANDINGS Students will understand that The structures in plants are differentiated to perform specific functions for the plant to survive, reproduce, and maintain health. Some plants have evolved with modified structures to ensure its survival in various environments. 	 ESSENTIAL QUESTIONS Students will keep considering Why are there different types of root systems? What is the purpose of roots in plants? How do the structures within the plant roots help the roots perform their functions? How can we identify if a root is a monocot or a dicot?
experiments, taking	Acquisitic	on
 technical tasks; analyze the specific results based on explanations in the text. SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. 	 Students will know The two main types of roots systems are fibrous and tap-root The roots anchor the plant in the ground, bring water with dissolved minerals into the plant from the ground, and store products of photosynthesis from the leaves (sugars, starches) The three zones of a root and the function of each zone. The different structures of monocot and dicot roots. 	 Students will be skilled at Describing the differences in structure and function of tap roots and fibrous roots. Identifying the structures in both types of root systems and their functions. Identifying the three zones of a root and function of each zone. Comparing and contrasting the structures within monocot and dicot roots. Practicing teamwork and collaborative problem-solving

Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
А, М, Т	Teacher will observe students throughout the lab/activity to ensure the proper use of scalpel and dissection techniques. Teacher will monitor the progress of the conclusion questions. Students will be evaluated by the questions on the lab handout.	 PERFORMANCE TASK(S): Goal: To identify the location of the tissues that store starches in plant roots. Role: Plant Scientist conducting an experiment in the lab. Audience: Other plant scientists Situation: Plant roots being dissected to determine where starch storing tissues are located.
		them with iodine.
		diagram the location of phloem tissue in the roots of the plants.
		OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
A,M A, M A, M, T A, M, T		Formative: • Interactive Notebook Warm-Ups • Reading / Review Worksheet • Worksheets • Lab Activities
т		Summative: • Unit Test / Quizzes

	Stage 3 – Learning Plan Pre-Assessment	
	The pre-assessment for this unit is a warm-up in which students demonstrate their knowledge of why roots are important for plants.	
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
А А, М	 Teacher will deliver content - Root Anatomy Students work through a series of station activities to learn about plant roots. Each station contains a different task - Root Stations Activities 	 Warm-Up Questions or Brief Discussions. Monitor student notes during note taking or pear deck responses. Exit tickoto
A, M, T	 Students will investigate the structure and function of roots - Roots Reading / Review Worksheet 	 Exit tickets Student project-based assignments. Teacher Check In during Activities or Labs
А, М, І	 Students view the root tip of an onion plant under a microscope to observe the cells of the root and the three zones of a root tip - Lab: Roots and Zones of a Root 	 Teacher Check-In during Activities of Labs Teacher Check-In during test taking Group Discussions with Lab Partners
А, М	 Students create a model of a cross section of a dicot root Activity: Cross Section of a Dicot Root 	
А, М, Т Т	 Students conduct an experiment in which they test various root vegetables with iodine to determine where each root stores starches - Lab: Starches in Roots Students demonstrate an understanding of concepts from Unit 3 - Test 	

Unit 4: Stems

Stage 1 – Desired Results			
ESTABLISHED GOALS	Tr	ansfer	
• NGSS - HS-1.2.2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	 Students will be able to independently use their learning to Develop an interest and sense of purpose in the field of horticulture. Establish the skills required to be successful in a horticulture career. Recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Developing and using models Planning and carrying out investigations Constructing explanations Obtaining, evaluating, and communicating information 		
• CCSS.ELA-Literacy.RST.11-1	Me	eaning	
 2.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. CCSS.ELA-Literacy.RST.11-1 2.3 Follow precisely a 	 UNDERSTANDINGS Students will understand that The structures in plants are differentiated to perform specific functions for the plant to survive, reproduce, and maintain health. Some plants have evolved with modified structures to ensure its survival in various environments. 	 ESSENTIAL QUESTIONS Students will keep considering What are the three main functions of stems in plants? How do monocot and dicot stems differ? How do primary growth and primary growth occur in stems? How do the structures within the plant stems help the stems perform their functions? Why are there modified stems? 	
complex multistep procedure	Acq	uisition	
 experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. 	 Students will know Plant stems produce leaves and flowers, hold leaves up to sunlight, and transport substances between the roots and leaves. Plant stems contain xylem and phloem tissue that transport water and nutrients within the plant. Primary growth elongates a stem and secondary growth increases the width. Modified stems help plants gain an additional means to store substances. 	 Students will be skilled at Identifying the structures of stems and how they relate to the three main functions of a plant stem. Describing how the specialized tissues of xylem and phloem help transport water and substances between the roots and leaves. Comparing and contrasting primary and secondary growth in plant stems. Explaining that roots use modified stems for additional storage of water and food. Practicing teamwork and collaborative problem-solving 	

Stage 2 – Evidence			
Code	Evaluative Criteria	Assessment Evidence	
А, М, Т	Teacher will observe students throughout the lab/activity to ensure the proper use of the microscope and slides. Teacher will monitor the progress of the conclusion questions. Students will be evaluated by their diagrams and the questions on the lab handout.	 Goal: To identify the structures of plant stems: internal and external. Role: Plant Scientist conducting an experiment in the lab. Audience: Other plant scientists Situation: Plant stem slides are observed under a microscope. The stems of woody and herbaceous plants are observed and diagramed. Performance: Students examine external and internal structures of various plant stems and create diagrams for each station Standards for Success: Students can successfully identify and diagram the external and internal structures of woody and herbaceous plants. 	
A,M A, M A, M, T A, M, T T		OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by Formative: Interactive Notebook Warm-Ups Reading / Review Worksheet Worksheets Lab Activities Summative: Unit Test / Quizzes	

	Stage 3 – Learning Plan	
	Pre-Assessment	
	The pre-assessment for this unit is a group discussion of the possible similarities between the stems and roots of plants.	
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
A A, M A, M, T A, M A, M, T T	 Teacher will deliver content - Stem Anatomy Students will explore the structure and function of plant stems - Stems Reading Worksheet Students will review the structure and function of plant stems - Stem Anatomy Worksheet Students examine external and internal structures of various plant stems and create diagrams for each station - Lab: Stem Anatomy Students will investigate the vascular tissues within a plant stem - Xylem and Phloem Worksheet Students use the Gizmo online platform to determine how various conditions affect tree growth and determine a tree's age by counting tree rings - Virtual Lab: Measuring Trees Students demonstrate an understanding of concepts from Unit 4 - Test 	 Warm-Up Questions or Brief Discussions. Monitor student notes during note taking or pear deck responses. Exit tickets Student project-based assignments. Teacher Check-In during Activities or Labs Teacher Check-In during test taking Group Discussions with Lab Partners

Unit 5: Leaves

Stage 1 – Desired Results			
ESTABLISHED GOALS	Transfer		
 NGSS - HS-1.2.2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms CCSS.ELA-Literacy.RST.11- 12.1 Cite apacific textual 	 Students will be able to independently use their learning to Develop an interest and sense of purpose in the field of horticulture. Establish the skills required to be successful in a horticulture career. Recognize one's strengths and limitations with a well-grounded sense of confidence and purpose. Developing and using models Planning and carrying out investigations Constructing explanations Obtaining, evaluating, and communicating information 		
12.1 Cite specific textual	Meaning		
 of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. CCSS.ELA-Literacy.RST.11- 12.3 Follow precisely a 	 UNDERSTANDINGS Students will understand that The structures in plants are differentiated to perform specific functions for the plant to survive, reproduce, and maintain health. Some plants have evolved with modified structures to ensure its survival in various environments. 	 ESSENTIAL QUESTIONS Students will keep considering How does the structure of a leaf enable it to carry out photosynthesis? How does gas exchange take place in a leaf? What is the purpose of leaves in plants? 	
complex multistep procedure	Acquis	sition	
 when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. 	 Students will know The external structures of leaves include the margin, midrib, and veins. The internal structures include a series of tissues optimized for photosynthesis. Leaves carry out photosynthesis to produce sugars for the rest of the plant. The leaf contains specialized tissues that transport water and sugars to and from the leaf. Over evolutionary time, there have been several modifications to the shape of leaves. 	 Students will be skilled at Labeling and diagramming the external and internal structures of a leaf. Describing how the various tissues in a leaf have been adapted to optimize photosynthesis. Explaining the role and location of xylem and phloem tissue in the leaves of plants. Modeling the exchange of gases in the leaf of a plant. Describing how some modified leaves are better adapted to their environment. Practicing teamwork and collaborative problem-solving 	

Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
Α, Μ, Τ	Teacher will observe students throughout the lab/activity to ensure the proper use of the microscope and slides. Students will be evaluated by their diagrams and the questions on the lab handout.	 PERFORMANCE TASK(S): Goal: To build a model of the structure of a leaf and compare the model with the cells of a leaf as seen through a microscope. Role: Plant Scientist conducting an experiment in the lab. Audience: Other plant scientists Situation: Plant leaf slides are observed under a microscope. Performance: Students examine prepared slides of the external structures of various plant leaves and create diagrams for each station. Standards for Success: Students can successfully identify and diagram the external and internal stem structures of the leaves of plants.
A,M A, M A, M, T A, M, T T		OTHER EVIDENCE: Formative: Interactive Notebook Warm-Ups Reading / Review Worksheet Worksheets Lab Activities Summative: Unit Test / Quizzes

	Stage 3 – Learning Plan	
	Pre-Assessm Students will break out into groups and brainstorm the purpose that the role of leaves is to produce oxygen - which is just a byp	nent of leaves. (This usually leads to the misconception roduct of photosynthesis).
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
A A, M A, M A, M A, M, T A, M, T T	 Teacher will deliver content - Leaf Structure: External Parts and Types Students will investigate the structure and function of leaves - External Leaf Anatomy Worksheet Teacher will deliver content - Leaf Structure: Internal Anatomy Students will explore the adaptations that leaves have made for photosynthesis - Adaptation of the Leaf to Photosynthesis Worksheet Students will review the structure and function of leaves - Leaves Reading and Review Worksheet Students view various cross sections of leaves to observe structural differences for gas exchange. They also use pictures of cross sections to identify the structure Students create a model of a leaf cross section - Leaf Cross Section Activity Students demonstrate an understanding of concepts from Unit 5 - Test 	 Warm-Up Questions or Brief Discussions. Monitor student notes during note taking or pear deck responses. Exit tickets Student project-based assignments. Teacher Check-In during Activities or Labs Teacher Check-In during test taking Group Discussions with Lab Partners

Unit 6: Flowers

	Stage 1 – Desired Results		
ESTABLISHED GOALS	Transfer		
 NGSS - HS-1.2.2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation 	 Students will be able to independently use t Develop an interest and sense of pur Establish the skills required to be suc Recognize one's strengths and limitation and purpose. Developing and using models Planning and carrying out investigation Constructing explanations Obtaining, evaluating, and communicipation 	their learning to rpose in the field of horticulture. ccessful in a horticulture career. ations with a well-grounded sense of confidence ons	
for how characteristic animal	S/S/Me	eaning	
 behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. CCSS.ELA-Literacy.RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to 	 UNDERSTANDINGS Students will understand that The structures in plants are differentiated to perform specific functions for the plant to survive, reproduce, and maintain health. Some plants have evolved with modified structures to ensure its survival in various environments. 	 ESSENTIAL QUESTIONS Students will keep considering How do plants reproduce sexually? What are the parts of a flower? How have flowers adapted to various types of seed dispersal? 	
any gaps or inconsistencies in the	Acquisition		
 distinctions the author makes and to any gaps or inconsistencies in the account. CCSS.ELA-Literacy.RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. SEL Competency: Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts. 	 Students will know The flower consists of male, female, or both reproductive organs that have various functions within reproduction. The flower is responsible for attracting pollinators and other animals through adaptations that attract a wide variety of pollinators and seed spreaders to the plant. Flowers have evolved modifications that help the plant spread its pollen in various environments. 	 Students will be skilled at Identifying the structures of plant flowers with focus on reproductive organs. Explaining how the structure and function of flowers in plants are related to each other. Describing how the structures of a flower are adapted for reproduction. Explaining how flowers have adapted to attract pollinatorsIdentifying and diagramming the various structures within a plant flower. Practicing teamwork and collaborative 	
		problem-solving	

Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
Α, Μ, Τ	Teacher will observe students throughout the lab/activity to ensure the students understand the assignment. Teacher will monitor the progress of the conclusion questions. Students will be evaluated by the questions on the worksheets.	 PERFORMANCE TASK(S): Goal: To investigate flower adaptations and traits that have allowed flowers to attract various pollinators. Role: Plant Scientist conducting an experiment in the lab. Audience: Other plant scientists Situation: Students work through several stations gathering information from pictures and profile cards of pollinators. Performance: Students examine pictures of flowers and pollinator profile cards to draw conclusions of the traits that each pollinator is attracted to. Students then identify the pollinator that would be attracted to unside unside
		Standards for Success: Students can successfully identify the flower adaptations/features that match various pollinators and
A,M A, M A, M, T A, M, T T		explain the evidence they used to draw their conclusions. OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by Formative: Interactive Notebook Warm-Ups Reading / Review Worksheet Worksheets Lab Activities Summative: Unit Test / Quizzes

	Stage 3 – Learning Plan	
	Pre-Assessm Students will be given a warm-up and asked to identify as many same warm-up will be used at the end of the unit to show progre	ent structures within a plant flower as possible. The ess in learning.
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
A A, M A, M A, M, T A, M, T A, M, T A, M, T	 Teacher will deliver notes - Flower Anatomy Students will investigate the structure and function of flowers - Flower Anatomy Reading and Questions Students will review the structure and function of flowers - Basic Flower Structure and Function Worksheet Students dissect a flower into its separate structures and identify each structure and its function - Lab: Flower Dissection Teacher delivers notes - Reproduction of Flowering Plants Students engage in an interactive science simulation - Gizmo: Pollination - Flower to Fruit Video Inquiry: The Private Lives of Plants Flowers Seeking Pollinators Project - Students examine pictures of flowers and pollinator profile cards to draw 	 Warm-Up Questions or Brief Discussions. Monitor student notes during note taking or pear deck responses. Exit tickets Student project-based assignments. Teacher Check-In during Activities or Labs Teacher Check-In during test taking Group Discussions with Lab Partners
т	 conclusions of the traits that each pollinator is attracted to. Students then identify the pollinator that would be attracted to various unknown flowers. Students demonstrate an understanding of concepts from Unit 6 - Test 	

Unit 7: Houseplants and Plantscaping

Stage 1 – Desired Results		
ESTABLISHED GOALS	Tra	ansfer
• CCSS .ELA-Literacy.RST.11-12 .1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	 Students will be able to independently use their Develop an interest and sense of purpose Establish the skills required to be success Recognize one's strengths and limitation purpose. Planning and carrying out investigations Analyzing and interpreting data Constructing explanations Obtaining, evaluating, and communication 	ir learning to se in the field of horticulture. ssful in a horticulture career. ns with a well-grounded sense of confidence and
• SEL Competency:	Meaning	
Self-awareness: The abilities to understand one's own emotions, thoughts, and values and how they influence behavior across contexts.	 UNDERSTANDINGS Students will understand that Plants that are intended to be grown and housed indoors have specific growth requirements. There are a variety of houseplants that are suitable for indoor use in homes and businesses. 	 ESSENTIAL QUESTIONS Students will keep considering What are the specific requirements of various plants for good growth and development? What plants are appropriate for different indoor environments.
	Acq	uisition
	 Students will know The ideal growth and propagation requirements for a variety of houseplants. These include: light requirement, water requirement, temperature, soil type, and suitable container type. There are various design elements that are used when determining the proper plants to use in a home or business. 	 Students will be skilled at Identifying the four major requirements for caring for indoor plants Propagating and maintaining a collection of indoor plants Transferring and repotting mature plants Identifying by name 15-20 houseplants Developing a catalog of assigned houseplants Selecting appropriate plants for various sites Practicing teamwork and collaborative problem-solving Asking questions

Stage 2 – Evidence		
Code	Evaluative Criteria	Assessment Evidence
A, M, T	Teacher will observe students throughout the project to ensure the students understand the assignment. Students will be evaluated by the final project presentation.	 PERFORMANCE TASK(S): Goal: To design a plantscape for a room in a home or business. Role: Employee / Owner of a Plantscaping business. Audience: Customer requiring plantscaping. Situation: Student has been hired to design a plantscape for a customer's business or home. Performance: Students are given a room in either this building or a
		 picture of a room. They use their knowledge of design elements and the growth requirements of various houseplants to design a plantscape for their assigned room. Standards for Success: Students can successfully create a plantscape that meets the design criteria, customers ability to care for plants, and the lighting/temperature of their assigned room.
		OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
A, M, T A, M, T		Formative: Worksheets Research Activities
A, M, T		Summative: Authentic Assessment

Stage 3 – Learning Plan		
	Pre-Assessment Students are shown some slides that use various design elements in plantscaping. They will brainstorm in groups trying to come up with terms that describe the element they think is being used.	
Code	Summary of Key Learning Events and Instruction	Progress Monitoring
A A A, M A, M, T	 Throughout the semester, students conduct research on 15-20 houseplants to determine basic information, growth requirements, and propagation methods for each plant - Houseplant Fact Sheets (Started at the beginning of the semester) Teacher will deliver content - Interior Landscaping (Plantscaping) Students will investigate the seven elements of interior design - Understanding the Elements of Interior Landscaping Worksheet Students are given a room in either this building or a picture of a room. They use their knowledge of design elements and the growth requirements of various houseplants to design a plantscape for their assigned room - Interior Landscaping (Plantscaping) Project 	 Warm-Up Questions or Brief Discussions. Monitor student notes during note taking or pear deck responses. Exit tickets Student project-based assignments. Teacher Check-In during Activities or Labs