Unit 04: Vocations: Greenhouse

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **FY**
Status: **Published**

Standards Alignment

New Jersey Student Learning Standards

Practice 1. Asking questions (for science) and defining problems (for engineering)
Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Practice 3. Planning and carrying out investigations
Planning and carrying out investigations in 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Select appropriate tools to collect, record, analyze, and evaluate data.

Practice 5. Using mathematics and computational thinking
Mathematical and computational thinking in 9-12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.

Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3, acre-feet, etc.).

Connections to the Nature of Science: Most Closely Associated with Practices
Scientific Investigations Use a Variety of Methods

Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

Scientific Knowledge is Based on Empirical Evidence

Science knowledge is based on empirical evidence.

Capacities of the Literate Individual
Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

They respond to the varying demands of audience, task, purpose, and discipline.

They value evidence.

They use technology and digital media strategically and capably.

LA.K-12.NJSLSA.R3	Analyze how and why individuals, events, and ideas develop and interact over the course of a text.
LA.K-12.NJSLSA.R5	Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
LA.RST.11-12	Reading Science and Technical Subjects
LA.RST.9-10	Reading Science and Technical Subjects
LA.K-12.NJSLSA.W	Writing
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
LA.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.
LA.K-12.NJSLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
LA.K-12.NJSLSA.W6	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.9-10.2.D	Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
LA.WHST.11-12.6	Use technology, including the Internet, to produce, share, and update writing products in response to ongoing feedback, including new arguments or information.
LA.WHST.9-10.6	Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.

Interdisciplinary Connections: NJSLS for ELA, Social Studies, Science and/or Math Section

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	Key Ideas and Details
LA.K-12.NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.RI.9-10	Reading Informational Text
LA.RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.) and make relevant connections, to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
LA.K-12.NJSLSA.W	Writing
	Text Types and Purposes

LA.K-12.NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.W.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media LiteracyNew Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale

Unit Rationale

The purpose of this unit…

Gaining a deep sense of community by following through on a group multi-step process will assist in fostering ideas of responsibility and teamwork with peers and adults.

Meaning

Essential Questions

Essential Questions

1. How will I work together with my peers to complete projects?
2. Why is it important to be part of my community?
3. How will working in the greenhouse prepare me for a job after high school?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

1. function at a level of complete independence or with minimal assistance from others.
2. Know how plants grow and how to care for them successfully.
3. participate in community activities
4. collaborate with peers to complete activities.
5. acquire skills and reasoning for job readiness

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know…

- How to recognize tasks that need to be completed.
- Work cooperatively with peers and staff.
- How to make accurate observations.
- How to work on and complete long term projects and goals.
- How to follow directions.

Skills

Skills

Student will be skilled at …

Level 1 - Recall

- Identify social situations and react appropriately
- Recognize when a task needs to be completed
- Demonstrates written communication skills

Level 2 - Skill/Concept

- Classify plants
- Make observations in the greenhouse
- Collect and display items for sale/in the greenhouse
- Observe the behavior of self and others
- Following directions and performing a task

Level 3 - Strategic Thinking

- Compare the care of different plants
- Formulate a plan for watering plants
- Draw conclusions
- Cite evidence obtained during the growing period

Level 4 - Extended Thinking

- Create projects for sale during the Collingwood Green Festival
- Analyze sales from the Festival in order to plan for next year
- Design original projects
- Connect to community by being a participant

Stage 3: Learning Plan

Resource and Mentor Texts

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Web based materials

http://foodtank.com/news/2015/02/dc-high-school-students-launch-innovative-greenhouse-program
https://www.plt.org/newsletter-stem-curriculum-fosters-green-projects
http://techclinic.lafayette.edu/files/2014/12/BangorGreenhouse-Manual2.pdf

Formative Assessment Strategies

Formative Assessment Strategies

- teacher observation
- student checklists
- task analyses
- activities and participation
- homework
- parent communication and transfer into the home
- task generalization skills in school building

Learning Activities/Unit of Study

Learning Activities/Unit of Study

The Greenhouse at CHS is used primarily during the months of January-April. The following activities will be done throughout the year, one day per cycle.

- One major project per month. These projects will be:
    - determined as a class
    - researched
    - developed
    - created
    - sold at the school store and/or Green Festival
- Preparation for the Green Festival will include:
    - researching agriculture and the importance of farming
    - making identification tags for the plants
    - creating/painting clay pots
    - making macrame plant hangers
- Growing plants from seed
    - Seeds will be purchased by the CST
    - class will research how to grow from seed, and will have the knowledge to do so with equipment provided by the school.
    - be responsible for planting and care for seedlings
    - determine when plants are ready to be re-potted
- Collingswood Green Festival
    - Each April, the CHS Vocations students and staff participate in the Collingswood Green Festival. The program has a tent, and sets up tables to sell the products grown in the greenhouse. Other accessories that have been created by students are available for sale as well. This is a valuable learning experience that all students are asked to participate in.

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, GIfted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of

using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.