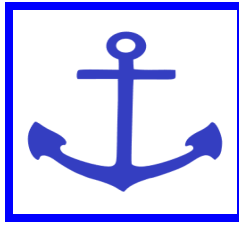


Ocean Academy Charter School
Curriculum Guide
Grade 6 - Science



Original Adoption:	August 2025
Created by:	Amy LaBarca and Dariaknna Yencer

OCEAN ACADEMY CHARTER SCHOOL 6th Grade Science Curriculum	
Content Area: Principles of Life Science	
Course Title: 6th Grade Science	Grade Level: 6th Grade
Unit Title	Pacing Guide in Days
Unit 1: Structure, Function, and Information Processing of Living Things Climate Change	65 days
Unit 2: Earth's Changing Surface Climate Change	65 Days
Unit 3: Earth's Cycles Climate Change	15 Days
Unit 4: Space Systems Climate Change	20 days
Unit 5: Structure and Properties of Matter Climate Change	15 days

OCEAN ACADEMY CHARTER SCHOOL Unit 1 Overview	
Content Area: 6th Grade Science	
Unit Title - Unit 1: Structure, Function, and Information Processing of Living Things	Duration: 65 Days
Target Course/Grade Levels: 6	
Introduction/Unit Focus: In this unit, sixth grade students will explore the idea that all living things are made of cells, which are the basic building blocks of life. They will learn about cell theory, which explains that all organisms are made of one or more cells, cells carry out the basic functions of life, and all cells come from other cells. Students will use microscopes, models, and hands-on investigations to observe cells and learn how their parts help them do important jobs. As students study living things, they will also learn how scientists classify organisms into groups based on shared traits. This will help students understand how the structure of an organism relates to its function, and how specific structures allow organisms to survive, grow, and reproduce. Students will use their knowledge of cells to compare different organisms and explain how their body parts work together as systems. Throughout the unit, students will use science and engineering practices such as planning and carrying out investigations, developing and using models, gathering and evaluating information, and communicating their findings. They will also practice using evidence to support their explanations and ideas about the natural world. To make deeper connections, students will explore important science ideas known as crosscutting concepts. These include structure and function, systems and system models, scale and proportion, and cause and effect. Students will also learn how science connects with engineering and technology, and that science is a human activity based on curiosity and discovery. By the end of this unit, students will understand that cells are the foundation of all living things. They will be able to explain how organisms are organized, how they are classified, and how their parts work together to help them live and grow.	
Disciplinary Concepts for the Unit	

Standard 9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

Standard 9.2 Career Awareness, Exploration, Preparation and Training

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

Standard 9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Standard 8.1 Computer Science

Computer Science outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

Standard 8.2 Design Thinking

Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The framework design includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts

Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

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Diversity and Inclusion: C.18A:35-4.36a Curriculum to include instruction on diversity and

inclusion.

The instruction shall:

- (1) highlight and promote diversity, including economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance;
- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
- (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Asian Americans and Pacific Islanders (AAPI)

Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLS) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416).

21st Century Themes and Skills

“Twenty-first century themes and skills” means themes such as global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; learning and innovation skills, including creativity and innovation, critical thinking and problem solving, and communication and collaboration; information, media, and technology skills; and life and career skills, including flexibility. Career readiness, life literacies, and key skills education provides students with the necessary skills to make informed career and financial decisions, engage as responsible community members in a digital society, and to successfully meet the challenges and opportunities in an interconnected global economy.”

Focus Standards Unit 1 (Major Standards)

<https://www.nj.gov/education/cccs/2020/NJSLS-Science.pdf>

MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction occurred

MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

MS-LS1-4 Use arguments: based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS-LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

MS-LS1-8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ➤ Develop and use a model to describe phenomena. (MS-LS1-1,2,3) (MS-PS1-2) ➤ Develop a model to describe unobservable mechanisms. (MS-LS1-2,7) Planning and Carrying Out Investigations Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use <u>multiple variables</u> and provide evidence to support explanations or solutions. ➤ Conduct an investigation to produce data to serve as the basis for evidence	LS1.A: Structure and Function ➤ All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1,2,3) ➤ Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2, MS-LS1-6, MS-LS1-7) (MS-PS1-2) ➤ In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues	Cause and Effect ➤ Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-6,7,8) (MS-PS1-2) Scale, Proportion, and Quantity ● Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-6,7,8) Systems and System Models ➤ Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3,4,6) (MS-PS1-2) Structure and Function ➤ Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their

that meets the goals of an investigation. (MS-LS1-3,4,5,6) Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ➤ Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3,4,6) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods. Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-1,2,3,4,5,6,7,8)	and organs that are specialized for particular body functions. (MS-LS1-2,3) LS1.D: Information Processing Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1-8)	function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-1,2,3) Energy and Matter ➤ Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-2,3,6,8) ----- - - - - <i>Connections to Engineering, Technology and Applications of Science</i> Interdependence of Science, Engineering, and Technology ➤ Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS1-4) ----- - - - - <i>Connections to Nature of Science</i> Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity,
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		skepticism, and openness to new ideas. (MS-LS1-4)
Supporting and Additional Standards Unit 1 New Jersey Student Learning Standards-Mathematics New Jersey Student Learning Standards-ELA https://www.state.nj.us/education/cccs/2016/ela/CompanionG0608.pdf		
<u>ELA/Literacy -</u> RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text. RI.CI.6.2. Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments. L.VL.6.3. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies. A. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. B. Determine the meaning of words and phrases as they are used, including figurative, connotative, and technical meanings. C. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible). D. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech. E. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary) RI.IT.6.3. Analyze how a particular text's (e.g., article, brochure, technical manual, procedural text) structure unfolds by using textual evidence to describe how a key individual, event, or idea is introduced, illustrated, and elaborated in a text. RI.PP.6.5. Identify author's purpose, perspective or potential bias in a text and explain the impact on the reader's interpretation. RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. RI.CT.6.8. Compare and contrast informational texts in different forms, by different authors, or from different genres (e.g., a memoir written by and a biography on the same person, historical novels and primary source documents, infographics and scientific journals) in terms		

of their approaches to similar themes and topics.

Mathematics -

6.EE

C. Represent and analyze quantitative relationships between dependent and independent variables

9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation to represent the relationship between distance and time.

Unit 1 New Jersey Student Learning Standards Connections: Career Readiness, Life Literacies, and Key Skills

Disciplinary Concepts - Career Awareness and Planning

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
Early planning can provide more options to pay for postsecondary training and employment.	9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.

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There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
Unit 1 New Jersey Student Learning Standards: Computer Science and Design Thinking	
Disciplinary Concepts Data and Analysis	
Core Ideas	
People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.	8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.
The purpose of cleaning data is to remove errors and make it easier for computers to process.	8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	8.1.8.DA.5: Test, analyze, and refine computational models. 8.1.8.DA.6: Analyze climate change computational models and propose refinements.

New Jersey Student Learning Standards: Climate Change Mandate

Core Ideas

Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.

MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.

MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Unit 1 Evidence of Student Learning

Performance Tasks/Use of Technology:

- Lab Safety Station Activity
- Gizmos - Homeostasis
- Living Things Collage
- Build Photosynthesis Equation
- Build a Cell
- Utilize Microscopes as life science tool

Other Assessments

Formative

- Observation
- Homework
- Class participation
- Graphic Organizers
- Projects
- Student Response Systems
- Do-Now/Exit Cards
- Laboratories/Lab Reports
- Notebook
- Writing Assignments
- Graphs, Models, and Tables

Summative

- Chapter/Unit Test
- Writing Assignments

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	➤ Presentations ➤ Laboratory Reports/Practical ➤ Unit Projects Benchmark ➤ SGO Exams ➤ Final Exams ➤ Performance Assessment Alternative ➤ CER (claim, evidence, reasoning) ➤ Student Surveys ➤ Scientist Circles ➤ Driving Question Board ➤ Consensus Model
Unit 1 Knowledge and Skills	
Unit 1 Learning Targets	
<i>Students will be able to:</i> ➤ Use a microscope correctly to view and study the microscopic parts of living things ➤ Identify the microscope as an important tool for observing the microscopic structures of organisms ➤ Identify the characteristics that distinguish living things from non-living things ➤ Classify organisms into one of the six kingdoms based on their traits, including whether they are unicellular or multicellular ➤ Compare unicellular and multicellular organisms and explain the differences between them ➤ Describe the role of specific cell parts (organelles) and how they work together to support the cell's overall function ➤ Create and explain a model that shows how the cell functions as a whole and how its parts contribute to its function ➤ Explain how the human body is made up of systems of interacting subsystems, including cells, tissues, organs, and organ systems ➤ Describe how sensory receptors detect different types of input (electromagnetic, mechanical, and chemical) and send signals to the brain that result in responses and memories	
Unit 1 Enduring Understandings	Unit 1 Essential Questions
<i>Students will know:</i> ➤ Cells are the basic units of life and organize into tissues, organs, and systems in multicellular organisms	➤ Why is the microscope an important tool for studying the tiny structures that make up living organisms?

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➤ Living things have specific characteristics that set them apart from non-living things ➤ Plant and animal cells have organelles with specialized functions that work together to keep the cell alive ➤ Organisms can be classified based on observable traits, including their cellular structure and the kingdom to which they belong ➤ The microscope is a vital scientific tool that allows us to explore and understand structures that are too small to be seen with the naked eye ➤ Living things respond to stimuli in their environment, which can lead to changes in behavior and memory	➤ What characteristics separate living things from non-living things? ➤ Why does a unicellular organism differ from a multicellular organism? ➤ How do the individual parts of a cell help the whole cell function properly? ➤ How does the structure of living things progress from single cells to complete body systems? ➤ What kinds of input do sense receptors detect, and how do these inputs help form behaviors and memories?
Unit 1 Instructional Plan	
Suggested Activities	Resources
➤ Graphic organizers and guided note taking ➤ Construct a model ➤ Draw diagrams ➤ Homework ➤ Journal Entries ➤ Web Quest ➤ Open-ended lab reflections ➤ Five paragraph essay ➤ Labs and Engineering based projects	➤ Online web quests ➤ Youtube links ➤ Nearpod ➤ BrainPop ➤ EdPuzzle ➤ Google Suite
Suggested Options for Differentiation and Modifications	
Special Education ➤ Follow all IEP modifications. ➤ Use visuals, diagrams, and graphic organizers to support abstract concepts. ➤ Pre-teach and review vocabulary and scientific terms. ➤ Provide guided notes, outlines, and study guides. ➤ Offer leveled texts or simplified resources when needed. ➤ Provide small-group or one-on-one instruction. ➤ Pair students with supportive lab partners or peer tutors. ➤ Read aloud directions and model lab procedures. ➤ Offer preferential seating near teacher, board, or lab materials. ➤ Allow extended time for labs, projects, and assessments.	

- Accept oral, dictated, or technology-supported responses.
 - Modify workload or adjust the number of test/assignment items.
 - Provide access to large-print, Braille, or digital texts with audio features.
 - Allow scribes or communication devices when required.
 - Incorporate interactive simulations, videos, and multimedia supports.
-

Students with 504 Plans

- Follow the 504 plan.
 - Provide extended time for labs, projects, and assessments.
 - Offer small-group or quiet testing settings.
 - Accept oral, dictated, or typed responses.
 - Provide large-print, Braille, or digital text with assistive technology.
 - Allow use of scribes or communication devices.
-

Students at Risk of School Failure

- Use visuals, models, and real-life examples to explain concepts.
 - Pre-teach vocabulary and connect science content to prior knowledge.
 - Break labs and projects into smaller, step-by-step tasks.
 - Provide frequent teacher check-ins and feedback.
 - Offer small-group instruction and structured practice.
 - Assign supportive partners during labs or projects.
 - Provide preferential seating.
 - Scaffold writing tasks (sentence starters, lab report templates).
-

Gifted and Talented

- Ask open-ended, higher-order science questions (evaluate, create, hypothesize).
 - Encourage independent investigations, experiments, or research.
 - Provide enrichment projects, STEM challenges, or cross-curricular connections.
 - Offer advanced science texts, journals, or online resources.
 - Use flexible grouping for inquiry-based labs, projects, and debates.
 - Allow choice in assessments (presentations, research papers, experiments).
 - Incorporate simulations, problem-solving competitions, or design challenges.
 - Provide opportunities to reflect and share findings with authentic audiences.
-

Multilingual Learners

- Collaborate with ESL/MLL teachers.
 - Provide small-group and partner learning opportunities.
 - Pre-teach and revisit science vocabulary using visuals, cognates, and realia.
 - Use bilingual glossaries, labeled diagrams, and picture dictionaries.
 - Scaffold writing with sentence frames, lab templates, and structured outlines.
 - Provide oral response options and extended time.
 - Use digital supports (translation tools, captioned videos, audio readings).
 - Scaffold academic conversations with discussion stems and lab talk routines.
-

Diversity and Inclusion

- Integrate diverse cultural contributions to science.
- Provide alternative formats for projects (oral, digital, hands-on).
- Use visuals, diagrams, and clear academic language.
- Avoid slang and idioms; emphasize precise scientific vocabulary.
- Collaborate with cultural liaisons and support staff.
- Establish inclusive classroom routines and norms.
- Allow sufficient wait time before calling on students.
- Build strong family partnerships and communicate science learning goals.

Core Instructional and Supplemental Materials and Additional Resources

Instructional Materials

- Textbook
- Laboratory manuals and equipment
- OpenSci Ed manuals and instructional material

Supplemental Materials

- Teacher generated presentations
- Science websites (National Geographic, PBS Learning, NewsELA, Next Generation Science, Gizmos, PHET, HHMI, Amoeba Sisters)
- EdPuzzle videos
- NearPod lessons
- Multimedia resources
- Chromebooks
- Station work

Intervention Materials

- Individuals with disabilities Resources
- School databases
- Multimedia Resources
- Online Resources and videos

- LinkIt Data
- MLL translations
- Translation apps
- Graphic organizers, guided notes
- Student- teacher goal setting
- Think, Pair, Share
- Review games
- Tiered assignments

Social and Emotional Learning - New Jersey SEL

Competencies and Sub-Competencies Social and emotional learning (SEL) involves the process through which children and adults acquire and apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. The purpose of the SEL competencies is to provide schools with guidelines for integrating SEL across grades and subject areas.

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings and perspectives of others
- Demonstrate awareness of the differences among individuals, groups and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

Teachers Notes

OCEAN ACADEMY CHARTER SCHOOL
Unit 2 Overview

Content Area: 6th Grade Science

Target Course/Grade Levels: 6

Unit Title - Unit 2: Earth's Changing Surface

Duration: 65 Days

Introduction/Unit 2 Focus

In this unit, students will explore how the surface of the Earth is constantly changing due to tectonic activity. They will investigate how rock layers can be rearranged by tectonic forces, and how these changes can be observed or inferred from patterns in the rock record. Through the study of rock formations and geological evidence, students will begin to understand how Earth's surface has been shaped over both short and long timescales.

Students will examine how tectonic processes not only move and rearrange rock layers but also play a key role in forming new rocks and breaking down older ones. They will learn that some events such as volcanic eruptions, earthquakes, or landslides can change the Earth rapidly, within hours or years, while other changes like mountain formation or seafloor spreading happen slowly, over thousands to millions of years.

At the core of this unit is the understanding that plate tectonics is a unifying scientific theory that explains the movement of Earth's crust, both in the past and present. This theory helps make sense of Earth's dynamic surface and provides a framework for understanding its geological history.

Students will work with real geoscience data to explore patterns, analyze changes, and investigate the properties of Earth materials that influence these processes. Throughout the

unit, they will develop scientific explanations and consider how new evidence can lead to revisions in our understanding of Earth science.

Key crosscutting concepts in this unit include scale, proportion, and quantity; patterns; and stability and change. These ideas will help students make sense of how and why geological processes operate differently over varying timescales. By engaging in practices such as analyzing and interpreting data, constructing explanations, and designing solutions, students will deepen their understanding of Earth's structure and the forces that shape it.

Disciplinary Concepts for the Unit

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This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

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- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
- (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Asian Americans and Pacific Islanders (AAPI)

Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLS) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416).

21st Century Themes and Skills

"Twenty-first century themes and skills" means themes such as global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; learning and innovation skills, including creativity and innovation, critical thinking and problem solving, and communication and collaboration; information, media, and technology skills; and life and career skills, including flexibility. Career readiness, life literacies, and key skills education provides students with the necessary skills to make informed career and financial decisions, engage as responsible community members in a digital society, and to successfully meet the challenges and opportunities in an interconnected global economy."

Focus Standards Unit 2 (Major Standards)

<https://www.nj.gov/education/cccs/2020/NJSLS-Science.pdf>

MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales

MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused [rise in global temperatures] climate change over the past century.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ➤ Develop and use a model to describe phenomena. (MS-ESS2-2,3)) ➤ Develop a model to describe unobservable mechanisms. (MS-ESS2-2,3) Planning and Carrying Out Investigations Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use <u>multiple variables</u> and provide evidence to support explanations or solutions. ➤ Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an	ESS1.C: The History of Planet Earth ➤ The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4) ➤ Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (<i>HS.ESS1.C GBE</i>), (<i>secondary to MS-ESS2-3</i>) (MS-ESS1-4) ESS2.A: Earth's Materials and Systems ➤ The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2)(MS-ESS3-5)	Cause and Effect ➤ Cause and effect relationships may be used to predict phenomena in natural systems. (MS-ESS2-2,3)(MS-ESS3-5) Systems and System Models ➤ Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-ESS2-2,3) (MS-ESS3-5) Structure and Function ➤ Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-ESS2-2,3) Energy and Matter

investigation. (MS-ESS2-2,3) Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ➤ Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-ESS2-2,3) (MS-ESS3-5) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods. Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-ESS2-2,3) (MS-ESS3-5) Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and	ESS2.B: Plate Tectonics and Large-Scale System Interactions ➤ Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3)	➤ Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS2-2,3) (MS-ESS3-5) Patterns ➤ Patterns in rates of change and other numerical relationships can provide information about natural systems. (MS-ESS2-2-3)(MS-ESS3-5) Scale Proportion and Quantity ➤ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS1-4),(MS-ESS2-2,3) ----- <i>Connections to Engineering, Technology and Applications of Science</i> Interdependence of Science, Engineering, and Technology ➤ Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-ESS2-2,3) -----
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progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ➤ Analyze and interpret data to provide evidence for phenomena. (MS-ESS2-2,3) (MS-ESS3-5) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ➤ Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe nature operate today as they did in the past and will continue to do so in the future. (MS-ESS2-2,3) ----- -----		<i>Connections to Nature of Science</i> Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-ESS2-2,3)
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<i>Connections to Nature of Science</i> Scientific Knowledge is Open to Revision in Light of New Evidence Science findings are frequently revised and/or reinterpreted based on new evidence. (MS-ESS2-2,3) (MS-ESS3-5)		
Supporting and Additional Standards Unit 2 New Jersey Student Learning Standards-Mathematics New Jersey Student Learning Standards-ELA https://www.state.nj.us/education/cccs/2016/ela/CompanionG0608.pdf		
<u>ELA/Literacy -</u> RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text. RI.CI.6.2. Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments. L.VL.6.3. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies. A. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. B. Determine the meaning of words and phrases as they are used, including figurative, connotative, and technical meanings. C. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible). D. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech. E. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary) RI.IT.6.3. Analyze how a particular text's (e.g., article, brochure, technical manual, procedural text) structure unfolds by using textual evidence to describe how a key individual, event, or idea is introduced, illustrated, and elaborated in a text. RI.PP.6.5. Identify author's purpose, perspective or potential bias in a text and explain the		

impact on the reader's interpretation.

RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue

RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

RI.CT.6.8. Compare and contrast informational texts in different forms, by different authors, or from different genres (e.g., a memoir written by and a biography on the same person, historical novels and primary source documents, infographics and scientific journals) in terms of their approaches to similar themes and topics.

Mathematics -

6.EE.B.B. Reason about and solve one-variable equations and inequalities

6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
7. Solve real-world and mathematical problems by writing and solving equations of the form $x+p$ and $px=q$ for cases in which p , q and x are all nonnegative rational numbers.

Unit 2 New Jersey Student Learning Standards Connections: Career Readiness, Life Literacies, and Key Skills

Disciplinary Concepts

Career Awareness and Planning

<i>Core Ideas</i>	Performance Expectations (Identified with Standard Number and Statement)
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
Early planning can provide more options to pay for postsecondary training and employment.	9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences,

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	dual enrollment, job search, scholarships) impacts postsecondary options.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
Unit 2 New Jersey Student Learning Standards: Computer Science and Design Thinking	
Disciplinary Concepts Data and Analysis	
Core Ideas	
People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.	8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.

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The purpose of cleaning data is to remove errors and make it easier for computers to process.	8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	8.1.8.DA.5: Test, analyze, and refine computational models. 8.1.8.DA.6: Analyze climate change computational models and propose refinements.
New Jersey Student Learning Standards: Climate Change Mandate	
Core Ideas	
All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.	MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.	MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
Unit 2 Evidence of Student Learning	
Performance Tasks/Use of Technology: ➤ Lab Safety Station Activity ➤ Build Model of Earth's Interior ➤ Build Model of Earth's Plates ➤ Seafloor Spreading Simulation ➤ Volcano Models ➤ Simulate Earthquake Project ➤ NearPod Activities	Other Assessments Formative ➤ Observation ➤ Homework ➤ Class participation ➤ Graphic Organizers ➤ Projects ➤ Student Response Systems ➤ Do-Now/Exit Cards ➤ Laboratories/Lab Reports ➤ Notebook ➤ Writing Assignments ➤ Graphs, Models, and Tables Summative

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	➤ Chapter/Unit Test ➤ Writing Assignments ➤ Presentations ➤ Laboratory Reports/Practical ➤ Unit Projects Benchmark ➤ SGO Exams ➤ Final Exams ➤ Performance Assessment Alternative ➤ CER (claim, evidence, reasoning) ➤ Student Surveys ➤ Scientist Circles ➤ Driving Question Board ➤ Consensus Model
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Unit 2 Knowledge and Skills

Unit 2 Learning Targets

Students will be able to:

- Analyze the locations of oceanic structures like mid-ocean ridges and deep-sea trenches
- Describe how the formation and eruption of volcanoes are influenced by plate location
- Predict how plate interactions form Earth's physical features such as mountains, ridges, and trenches
- Determine how energy from plate motion causes earthquakes and how this energy moves through Earth's layers
- Design models that show different types of plate motions and the features they produce
- Analyze outcomes of normal, reverse, and strike-slip faults
- Model geological processes such as seafloor spreading, subduction, and uplift
- Conclude that the Plate Tectonics Theory has evolved over time as scientists uncovered new evidence
- Interpret how convection currents within the mantle are responsible for plate movement
- Trace the development of the Plate Tectonics Theory using evidence from fossils, glacial movement, and climate patterns
- Investigate, using plate boundary maps, how slow plate movement affects Earth's surface over time
- Identify and compare the components and layers of the geosphere

Unit 2 Enduring Understandings	Unit 2 Essential Questions
<i>Students will know:</i> ➤ The movement of tectonic plates causes natural disasters like earthquakes and volcanic eruptions ➤ Fault types—normal, reverse, and strike-slip—result in different structural changes to Earth’s crust ➤ Tectonic plate interactions create many of Earth’s surface features, including mountains and ocean basins ➤ Seismic waves travel through Earth’s layers, revealing information about Earth’s interior ➤ Earth’s interior is composed of layers with different features and materials ➤ The Plate Tectonics Theory has developed over time as scientific knowledge has been revised and improved through new discoveries ➤ Convection currents in the mantle are the primary drivers of plate movement ➤ Fossil evidence, glacial data, and climate records support the theory that Earth’s continents were once joined as Pangaea	➤ How does energy stored in Earth’s crust create earthquakes, and how does this energy travel through the Earth? ➤ What landforms and features are created by interactions at plate boundaries? ➤ What are the differences in outcomes between normal, reverse, and strike-slip faults? ➤ Why and how do Earth’s tectonic plates move? ➤ What evidence supports the idea of continental drift and the Plate Tectonics Theory? ➤ How do volcanoes form differently depending on their tectonic plate locations? ➤ How do scientific theories like plate tectonics change when new evidence becomes available? ➤ What are the components and layers of the geosphere? ➤ How does plate movement shape Earth’s surface over time?
Unit 2 Instructional Plan	
Suggested Activities	Resources
➤ Graphic organizers and guided note taking ➤ Construct a model ➤ Draw diagrams ➤ Homework ➤ Journal Entries ➤ Web Quest	➤ Online web quests ➤ Youtube links ➤ Nearpod ➤ BrainPop ➤ EdPuzzle ➤ Google Suite ➤ Topographical Maps

- Open-ended lab reflections
- Labs and Engineering based projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, diagrams, and graphic organizers to support abstract concepts.
- Pre-teach and review vocabulary and scientific terms.
- Provide guided notes, outlines, and study guides.
- Offer leveled texts or simplified resources when needed.
- Provide small-group or one-on-one instruction.
- Pair students with supportive lab partners or peer tutors.
- Read aloud directions and model lab procedures.
- Offer preferential seating near teacher, board, or lab materials.
- Allow extended time for labs, projects, and assessments.
- Accept oral, dictated, or technology-supported responses.
- Modify workload or adjust the number of test/assignment items.
- Provide access to large-print, Braille, or digital texts with audio features.
- Allow scribes or communication devices when required.
- Incorporate interactive simulations, videos, and multimedia supports.

Students with 504 Plans

- Follow the 504 plan.
- Provide extended time for labs, projects, and assessments.
- Offer small-group or quiet testing settings.
- Accept oral, dictated, or typed responses.
- Provide large-print, Braille, or digital text with assistive technology.
- Allow use of scribes or communication devices.

Students at Risk of School Failure

- Use visuals, models, and real-life examples to explain concepts.
- Pre-teach vocabulary and connect science content to prior knowledge.
- Break labs and projects into smaller, step-by-step tasks.
- Provide frequent teacher check-ins and feedback.
- Offer small-group instruction and structured practice.
- Assign supportive partners during labs or projects.
- Provide preferential seating.

- Scaffold writing tasks (sentence starters, lab report templates).

Gifted and Talented

- Ask open-ended, higher-order science questions (evaluate, create, hypothesize).
- Encourage independent investigations, experiments, or research.
- Provide enrichment projects, STEM challenges, or cross-curricular connections.
- Offer advanced science texts, journals, or online resources.
- Use flexible grouping for inquiry-based labs, projects, and debates.
- Allow choice in assessments (presentations, research papers, experiments).
- Incorporate simulations, problem-solving competitions, or design challenges.
- Provide opportunities to reflect and share findings with authentic audiences.

Multilingual Learners

- Collaborate with ESL/MLL teachers.
- Provide small-group and partner learning opportunities.
- Pre-teach and revisit science vocabulary using visuals, cognates, and realia.
- Use bilingual glossaries, labeled diagrams, and picture dictionaries.
- Scaffold writing with sentence frames, lab templates, and structured outlines.
- Provide oral response options and extended time.
- Use digital supports (translation tools, captioned videos, audio readings).
- Scaffold academic conversations with discussion stems and lab talk routines.

Diversity and Inclusion

- Integrate diverse cultural contributions to science.
- Provide alternative formats for projects (oral, digital, hands-on).
- Use visuals, diagrams, and clear academic language.
- Avoid slang and idioms; emphasize precise scientific vocabulary.
- Collaborate with cultural liaisons and support staff.
- Establish inclusive classroom routines and norms.
- Allow sufficient wait time before calling on students.
- Build strong family partnerships and communicate science learning goals.

Core Instructional and Supplemental Materials and Additional Resources

Instructional Materials

- Textbook
- Laboratory manuals and equipment

- OpenSci Ed manuals and instructional material

Supplemental Materials

- Teacher generated presentations
- Science websites (National Geographic, PBS Learning, NewsELA, Next Generation Science, Gizmos, PHET, HHMI, Amoeba Sisters)
- EdPuzzle videos
- NearPod lessons
- Multimedia resources
- Chromebooks
- Station work

Intervention Materials

- Individuals with disabilities Resources
- School databases
- Multimedia Resources
- Online Resources and videos
- LinkIt Data
- MLL translations
- Translation apps
- Graphic organizers, guided notes
- Student- teacher goal setting
- Think, Pair, Share
- Review games
- Tiered assignments

Social and Emotional Learning - New Jersey SEL

Competencies and Sub-Competencies Social and emotional learning (SEL) involves the process through which children and adults acquire and apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. The purpose of the SEL competencies is to provide schools with guidelines for integrating SEL across grades and subject areas.

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals

- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings and perspectives of others
- Demonstrate awareness of the differences among individuals, groups and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
 - Utilize positive communication and social skills to interact effectively with others
 - Identify ways to resist inappropriate social pressure
 - Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
 - Identify who, when, where, or how to seek help for oneself or others when needed
- NJDOE Website on Social and Emotional Learning

Teacher Notes:

OCEAN ACADEMY CHARTER SCHOOL Unit 3 Overview

Content Area: 6th Grade Science

Unit Title - Unit 3: Earth's Cycles

Duration: 15 days

Target Course/Grade Levels: 6

Introduction/Unit 3 Focus:

In this unit, students will explore the properties and processes that shape Earth's surface. They will begin by learning how to differentiate between rocks and minerals, understanding that minerals have specific properties and compositions, while rocks are made up of one or

more minerals. Students will investigate the characteristics of igneous, sedimentary, and metamorphic rocks, and how these types of rocks form through various Earth processes.

Through the development of models, students will deepen their understanding of the rock cycle and how nature recycles rocks over time. They will also examine the water cycle by designing models to show how water moves between Earth's surface and the atmosphere. This exploration will help students understand how water plays a key role in shaping landforms and changing the surface of the Earth.

As students study Earth's systems, they will also learn about natural resources. They will distinguish between renewable and non-renewable resources and explore how these resources are used. A key focus will be on evaluating how human activities have impacted non-renewable resources and contributed to environmental issues such as climate change.

Throughout the unit, students will engage in scientific practices such as modeling, evaluating data, and drawing conclusions from evidence. By the end of the unit, they will have a clear understanding of how rocks and minerals are classified, how Earth's surface is shaped by natural processes, and how human choices affect the planet's resources.

Disciplinary Concepts for the Unit

Standard 9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

Standard 9.2 Career Awareness, Exploration, Preparation and Training

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

Standard 9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Standard 8.1 Computer Science

Computer Science outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

Standard 8.2 Design Thinking

Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The framework design includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts

Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the Holocaust and genocide in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion: C.18A:35-4.36a Curriculum to include instruction on diversity and inclusion.

The instruction shall:

- (1) highlight and promote diversity, including economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance;
- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
- (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Asian Americans and Pacific Islanders (AAPI)

Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLs) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416).

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innovation skills, including creativity and innovation, critical thinking and problem solving, and communication and collaboration; information, media, and technology skills; and life and career skills, including flexibility. Career readiness, life literacies, and key skills education provides students with the necessary skills to make informed career and financial decisions, engage as responsible community members in a digital society, and to successfully meet the challenges and opportunities in an interconnected global economy.”

Focus Standards Unit 3 (Major Standards)

<https://www.nj.gov/education/cccs/2020/NJSLS-Science.pdf>

MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused [rise in global temperatures climate change over the past century.

MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ➤ Develop and use a model to describe phenomena. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4) ➤ Develop a model to describe unobservable mechanisms. (MS-ESS2-1,4 ; MS-ESS3-1)	ESS2.A: Earth's Materials and Systems All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4)	Cause and Effect ➤ Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS2-1,4; MS-ESS3-1; MS-ESS3-5; MS-PS1-4) Systems and System Models ➤ Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4))

Planning and Carrying Out Investigations Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use <u>multiple variables</u> and provide evidence to support explanations or solutions. ➤ Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4) Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ➤ Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-ESS2-1,4; MS-ESS3-1; MS-ESS3-5) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and	ESS2.C: The Roles of Water in Earth's Surface Processes Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4,6; MS-PS1-4) Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4,6; MS-ESS3-5; MS-PS1-4) ESS2.C: The Roles of Water in Earth's Surface Processes Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formation. (MS-ESS2-4,6) ESS3.A: Natural Resources Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS2-1,4; MS-ESS3-1)(MS-ESS3-5)(MS-PS1-4)	Structure and Function ➤ Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-ESS2-1,4; MS-ESS3-1) Patterns ➤ Patterns in rates of change and other numerical relationships can provide information about natural systems. (MS-ESS2-1,4; MS-ESS3-1) Scale Proportion and Quantity ➤ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS2-1,4; MS-ESS3-1) Energy and Matter ➤ Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4) Stability and Change ➤ Explanations of stability and change in natural or designed
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validity of ideas and methods. Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4) Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ➤ Analyze and interpret data to provide evidence for phenomena. (MS-ESS2-1,4; MS-ESS3-1) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific		systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS2-1,4; MS-ESS3-1; MS-ESS3-5; MS-PS1-4) ----- ----- <i>Connections to Engineering, Technology and Applications of Science</i> Interdependence of Science, Engineering, and Technology ➤ Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-ESS2-1,4; MS-ESS3-1; MS-PS1-4) ----- ----- <i>Connections to Nature of Science</i> Science is a Human Endeavor ➤ Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new
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ideas, principles, and theories. ➤ Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe nature operate today as they did in the past and will continue to do so in the future. (MS-ESS2-1,4; MS-ESS3-1) ----- ----- Connections to Nature of Science Scientific Knowledge is Open to Revision in Light of New Evidence Science findings are frequently revised and/or reinterpreted based on new evidence. ((MS-ESS2-1,4; MS-ESS3-1; MS-ESS3-5; MS-PS1-4)		ideas. (MS-ESS2-1,4; MS-ESS3-1)
Supporting and Additional Standards Unit 3 New Jersey Student Learning Standards-Mathematics New Jersey Student Learning Standards-ELA https://www.state.nj.us/education/cccs/2016/ela/CompanionG0608.pdf		
<u>ELA/Literacy -</u> RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text. RI.CI.6.2. Determine the central idea of an informational text and explain how it is supported		

by key details; provide a summary of the text distinct from personal opinions or judgments.

L.VL.6.3. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, including technical meanings, choosing flexibly from a range of strategies.

- F. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
- G. Determine the meaning of words and phrases as they are used, including figurative, connotative, and technical meanings.
- H. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).
- I. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
- J. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary)

RI.IT.6.3. Analyze how a particular text's (e.g., article, brochure, technical manual, procedural text) structure unfolds by using textual evidence to describe how a key individual, event, or idea is introduced, illustrated, and elaborated in a text.

RI.PP.6.5. Identify author's purpose, perspective or potential bias in a text and explain the impact on the reader's interpretation.

RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue

RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

RI.CT.6.8. Compare and contrast informational texts in different forms, by different authors, or from different genres (e.g., a memoir written by and a biography on the same person, historical novels and primary source documents, infographics and scientific journals) in terms of their approaches to similar themes and topics.

Mathematics -

6.EE.B.Reason about and solve one-variable equations and inequalities

- 6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- 4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y+y+y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.

Unit 3 New Jersey Student Learning Standards Connections: Career Readiness, Life Literacies, and Key Skills

Ocean Academy Charter School
Curriculum Guide
Grade 6 - Science

Disciplinary Concepts: Career Awareness and Planning	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
Early planning can provide more options to pay for postsecondary training and employment.	9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
Unit 3 New Jersey Student Learning Standards: Computer Science and Design Thinking	
Disciplinary Concepts: Data and Analysis	
Core Ideas	

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People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.	8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.
The purpose of cleaning data is to remove errors and make it easier for computers to process.	8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	8.1.8.DA.5: Test, analyze, and refine computational models. 8.1.8.DA.6: Analyze climate change computational models and propose refinements.
New Jersey Student Learning Standards: Climate Change Mandate	
Core Ideas	
All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.	MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization and precipitation, as well as downhill flows on land.	MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
Human activities have significantly altered the biosphere, sometimes damaging or destroying natural	MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human

Ocean Academy Charter School
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habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.	impact on the environment.
Unit 3 Evidence of Student Learning	
Performance Tasks/Use of Technology: ➤ Lab Safety Station Activity ➤ Create Models of the Earth's Cycles (ex: Water Cycle) ➤ Thermal Energy Labs	Other Assessments Formative ➤ Observation ➤ Homework ➤ Class participation ➤ Graphic Organizers ➤ Projects ➤ Student Response Systems ➤ Do-Now/Exit Cards ➤ Laboratories/Lab Reports ➤ Notebook ➤ Writing Assignments ➤ Webquests ➤ Graphs, Models, and Tables Summative ➤ Chapter/Unit Test ➤ Writing Assignments ➤ Presentations ➤ Laboratory Reports/Practical ➤ Unit Projects Benchmark ➤ SGO Exams ➤ Final Exams ➤ Performance Assessment Alternative ➤ CER (claim, evidence, reasoning) ➤ Student Surveys ➤ Scientist Circles ➤ Driving Question Board ➤ Consensus Model
Unit 3 Knowledge and Skills	
Unit 3 Learning Targets	

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Students will be able to:

- Explain the difference between renewable and non-renewable resources
- Evaluate how human activities have impacted non-renewable resources on Earth
- Distinguish between rocks and minerals based on their composition and observable properties
- Identify and describe the characteristics of igneous, sedimentary, and metamorphic rocks
- Create a model of the rock cycle that shows how rocks change form over time
- Explain the stages of the water cycle and how it shapes Earth's surface
- Design a model of the water cycle to demonstrate the movement of water between the surface and the atmosphere

Unit 3 Enduring Understandings

Students will know:

- Renewable and non-renewable resources are used in different ways and have varying impacts on the environment
- Human actions and consumption affect the availability and condition of Earth's natural resources
- Rocks and minerals are different in both composition and properties
- Igneous, sedimentary, and metamorphic rocks are formed by different natural processes
- The rock cycle shows how rocks are naturally changed and recycled over time
- Water moves through the environment in a continuous cycle that helps shape the land

Unit 3 Essential Questions

- How have humans affected the non-renewable resources on planet Earth?
- What is the difference between mineral and rock composition as well as their properties?
- How do igneous, sedimentary, and metamorphic rocks vary from each other?
- How does the rock cycle represent processes that change rock from one form to another?
- What processes make up the water cycle?
- How does water influence and shape the Earth's surface?

Unit 3 Instructional Plan

Suggested Activities

- Graphic organizers and guided note taking
- Construct a model
- Draw diagrams
- Homework
- Journal Entries

Resources

- Online web quests
- Youtube links
- Nearpod
- BrainPop
- EdPuzzle
- Google Suite

- Web Quest
- Open-ended lab reflections
- Labs and Engineering based projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, diagrams, and graphic organizers to support abstract concepts.
- Pre-teach and review vocabulary and scientific terms.
- Provide guided notes, outlines, and study guides.
- Offer leveled texts or simplified resources when needed.
- Provide small-group or one-on-one instruction.
- Pair students with supportive lab partners or peer tutors.
- Read aloud directions and model lab procedures.
- Offer preferential seating near teacher, board, or lab materials.
- Allow extended time for labs, projects, and assessments.
- Accept oral, dictated, or technology-supported responses.
- Modify workload or adjust the number of test/assignment items.
- Provide access to large-print, Braille, or digital texts with audio features.
- Allow scribes or communication devices when required.
- Incorporate interactive simulations, videos, and multimedia supports.

Students with 504 Plans

- Follow the 504 plan.
- Provide extended time for labs, projects, and assessments.
- Offer small-group or quiet testing settings.
- Accept oral, dictated, or typed responses.
- Provide large-print, Braille, or digital text with assistive technology.
- Allow use of scribes or communication devices.

Students at Risk of School Failure

- Use visuals, models, and real-life examples to explain concepts.
- Pre-teach vocabulary and connect science content to prior knowledge.
- Break labs and projects into smaller, step-by-step tasks.
- Provide frequent teacher check-ins and feedback.
- Offer small-group instruction and structured practice.
- Assign supportive partners during labs or projects.

- Provide preferential seating.
 - Scaffold writing tasks (sentence starters, lab report templates).
-

Gifted and Talented

- Ask open-ended, higher-order science questions (evaluate, create, hypothesize).
 - Encourage independent investigations, experiments, or research.
 - Provide enrichment projects, STEM challenges, or cross-curricular connections.
 - Offer advanced science texts, journals, or online resources.
 - Use flexible grouping for inquiry-based labs, projects, and debates.
 - Allow choice in assessments (presentations, research papers, experiments).
 - Incorporate simulations, problem-solving competitions, or design challenges.
 - Provide opportunities to reflect and share findings with authentic audiences.
-

Multilingual Learners

- Collaborate with ESL/MLL teachers.
 - Provide small-group and partner learning opportunities.
 - Pre-teach and revisit science vocabulary using visuals, cognates, and realia.
 - Use bilingual glossaries, labeled diagrams, and picture dictionaries.
 - Scaffold writing with sentence frames, lab templates, and structured outlines.
 - Provide oral response options and extended time.
 - Use digital supports (translation tools, captioned videos, audio readings).
 - Scaffold academic conversations with discussion stems and lab talk routines.
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Diversity and Inclusion

- Integrate diverse cultural contributions to science.
- Provide alternative formats for projects (oral, digital, hands-on).
- Use visuals, diagrams, and clear academic language.
- Avoid slang and idioms; emphasize precise scientific vocabulary.
- Collaborate with cultural liaisons and support staff.
- Establish inclusive classroom routines and norms.
- Allow sufficient wait time before calling on students.
- Build strong family partnerships and communicate science learning goals.

Core Instructional and Supplemental Materials and Additional Resources

Instructional Materials

- Textbook

- Laboratory manuals and equipment
- OpenSci Ed manuals and instructional material

Supplemental Materials

- Teacher generated presentations
- Science websites (National Geographic, PBS Learning, NewsELA, Next Generation Science, Gizmos, PHET, HHMI, Amoeba Sisters)
- EdPuzzle videos
- NearPod lessons
- Multimedia resources
- Chromebooks
- Station work

Intervention Materials

- Individuals with disabilities Resources
- School databases
- Multimedia Resources
- Online Resources and videos
- LinkIt Data
- MLL translations
- Translation apps
- Graphic organizers, guided notes
- Student- teacher goal setting
- Think, Pair, Share
- Review games
- Tiered assignments

Social and Emotional Learning - New Jersey SEL

Competencies and Sub-Competencies Social and emotional learning (SEL) involves the process through which children and adults acquire and apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. The purpose of the SEL competencies is to provide schools with guidelines for integrating SEL across grades and subject areas.

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts and behaviors

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings and perspectives of others
- Demonstrate awareness of the differences among individuals, groups and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

Teacher Notes

OCEAN ACADEMY CHARTER SCHOOL

Unit 4 Overview

Unit Title-Unit 4: Space Systems

Duration: 20 Days

Target Course/Grade Levels: 6

Introduction/Unit Focus:

In this unit, students will explore the structure and function of our solar system and how it affects life on Earth. They will examine how the Sun, as the central and most massive object, holds a variety of celestial bodies, including planets, moons, and asteroids in orbit through its gravitational pull. By understanding this system, students will be able to explain the regular patterns of motion observed in the sky, such as the orbits of planets and the occurrence of eclipses.

Students will learn that models of the solar system can help explain phenomena such as solar and lunar eclipses, and the apparent movement of planets against the background of stars. They will also investigate the Earth's axial tilt and how it remains pointed in a fixed direction over short periods. This tilt, combined with Earth's orbit around the Sun, results in varying sunlight intensities across different regions of the planet and leads to the cycle of seasons throughout the year.

This unit emphasizes key crosscutting concepts, including patterns, scale, proportion, and quantity, as well as systems and system models. Students will consider how science, engineering, and technology are interconnected and how scientific knowledge relies on the assumption of order and consistency in natural systems. Throughout the unit, students will engage in science and engineering practices such as developing and using models and analyzing and interpreting data. These practices will support students in building a deep understanding of core disciplinary ideas related to Earth's place in the universe.

Disciplinary Concepts for the Unit

Standard 9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

Standard 9.2 Career Awareness, Exploration, Preparation and Training

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

Standard 9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Standard 8.1 Computer Science

Computer Science outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

Standard 8.2 Design Thinking

Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The framework design includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts

Amistad Law: N.J.S.A. 18A:52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the Holocaust and genocide in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion: C.18A:35-4.36a Curriculum to include instruction on diversity and inclusion.

The instruction shall:

- (1) highlight and promote diversity, including economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance;
- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
- (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Asian Americans and Pacific Islanders (AAPI)

Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLs) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416).

21st Century Themes and Skills

“Twenty-first century themes and skills” means themes such as global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; learning and innovation skills, including creativity and innovation, critical thinking and problem solving, and communication and collaboration; information, media, and technology skills; and life and career skills, including flexibility. Career readiness, life literacies, and key skills education provides students with the necessary skills to make informed career and financial decisions, engage as responsible community members in a digital society, and to successfully meet the challenges and opportunities in an interconnected global economy.”

Focus Standards Unit 4 (Major Standards)

<https://www.nj.gov/education/cccs/2020/NJSLS-Science.pdf>

MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons

MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ➤ Develop and use a model to describe phenomena. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing	ESS1.A: The Universe and Its Stars ➤ Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) ➤ Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2) ESS1.B: Earth and the Solar System ➤ The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that	Cause and Effect ➤ Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Systems and System Models ➤ Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Structure and Function ➤ Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their

between correlation and causation, and basic statistical techniques of data and error analysis. ➤ Analyze and interpret data to determine similarities and differences in findings. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3)	are held in orbit around the sun by its gravitational pull on them. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) ➤ This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS-ESS1-2)	function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Patterns ➤ Patterns in rates of change and other numerical relationships can provide information about natural systems. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Scale Proportion and Quantity ➤ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Energy and Matter ➤ Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) Stability and Change ➤ Explanations of stability and change in natural or designed systems can be constructed by
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		examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) ----- ----- <i>Connections to Engineering, Technology and Applications of Science</i> Interdependence of Science, Engineering, and Technology ➤ Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3) ----- ----- <i>Connections to Nature of Science</i> Science is a Human Endeavor ➤ Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3)
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Supporting and Additional Standards Unit 4
[New Jersey Student Learning Standards-Mathematics](#)
[New Jersey Student Learning Standards-ELA](#)
<https://www.state.nj.us/education/cccs/2016/ela/CompanionG0608.pdf>

ELA/Literacy -

RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

RI.CT.6.8. Compare and contrast informational texts in different forms, by different authors, or from different genres (e.g., a memoir written by and a biography on the same person, historical novels and primary source documents, infographics and scientific journals) in terms of their approaches to similar themes and topics.

RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

Mathematics -

6.RP.A. Understand ratio concepts and use ratio reasoning to solve problems

1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”
2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ -cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.” (Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)

6.EE.B. Reason about and solve one-variable equations and inequalities

6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

Unit 4 New Jersey Student Learning Standards Connections: [Career Readiness, Life Literacies, and Key Skills](#)

Disciplinary Concepts: Career Awareness and Planning

Core Ideas

Performance Expectations
(Identified with Standard Number and Statement)

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An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
Early planning can provide more options to pay for postsecondary training and employment.	9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
Unit 4 New Jersey Student Learning Standards: Computer Science and Design Thinking	
Disciplinary Concepts: Data and Analysis	
Core Ideas	

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People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.	8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.
The purpose of cleaning data is to remove errors and make it easier for computers to process.	8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	8.1.8.DA.5: Test, analyze, and refine computational models. 8.1.8.DA.6: Analyze climate change computational models and propose refinements.

New Jersey Student Learning Standards: [Climate Change Mandate](#)

Core Ideas

The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.	MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
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Unit 4 Evidence of Student Learning

Performance Tasks/Use of Technology:	Other Assessments
➤ Lab Safety Station Activity ➤ Scale Model of Solar System ➤ Model of Lunar Phases ➤ Model Solar vs. Lunar Eclipses	Formative ➤ Observation ➤ Homework ➤ Class participation ➤ Graphic Organizers ➤ Projects

	➤ Student Response Systems ➤ Do-Now/Exit Cards ➤ Laboratories/Lab Reports ➤ Notebook ➤ Writing Assignments ➤ Graphs, Models, and Tables Summative ➤ Chapter/Unit Test ➤ Writing Assignments ➤ Presentations ➤ Laboratory Reports/Practical ➤ Unit Projects Benchmark ➤ SGO Exams ➤ Final Exams ➤ Performance Assessment Alternative ➤ CER (claim, evidence, reasoning) ➤ Student Surveys ➤ Scientist Circles ➤ Driving Question Board ➤ Consensus Model
Unit 4 Knowledge and Skills	
Unit 4 Learning Targets	
<i>Students will be able to:</i> ➤ Describe how the solar system formed from a cloud of gas and dust ➤ Identify the Earth as part of a solar system within the Milky Way galaxy, which is one of many galaxies in the universe ➤ Examine the components of the solar system, including the Sun, planets, moons, and asteroids and explain how gravity keeps them in orbit around the Sun ➤ Create, analyze, and interpret data to model the relative sizes and distances of objects in the solar system ➤ Explain how the tilt of the Earth and the angle of sunlight cause the seasons across the year ➤ Use a model of the Earth-Moon-Sun system to describe the repeating pattern of lunar phases ➤ Demonstrate how models of the solar system explain the occurrence of solar	

and lunar eclipses	
Unit 4 Enduring Understandings	Unit 4 Essential Questions
<i>Students will know:</i> ➤ The Earth is part of a solar system made up of many celestial bodies held in orbit by gravity ➤ The solar system is one of many systems that exist in the universe ➤ The phases of the Moon follow a repeating and predictable pattern caused by its position in relation to the Earth and Sun ➤ Eclipses occur when the Earth, Moon, and Sun align in specific ways ➤ The tilt of the Earth's axis causes varying intensities of sunlight, which results in seasonal changes on Earth	➤ What types of celestial bodies make up our universe and how is the solar system structured within it? ➤ How did the solar system form, and what keeps its objects in motion? ➤ What predictable patterns occur due to the movement of the Earth, Moon, and Sun? ➤ How do lunar phases occur and why do they follow a regular cycle? ➤ What causes solar and lunar eclipses? ➤ Why do seasons change as Earth orbits the Sun?
Unit 4 Instructional Plan	
Suggested Activities	Resources
➤ Graphic organizers and guided note taking ➤ Construct a model ➤ Draw diagrams ➤ Homework ➤ Journal Entries ➤ Web Quest ➤ Open-ended lab reflections ➤ Labs and Engineering based projects	➤ <u>Science World Journals</u> ➤ Online web quests ➤ Youtube links ➤ Nearpod ➤ BrainPop ➤ EdPuzzle ➤ Google Suite
Suggested Options for Differentiation and Modifications	
Special Education ➤ Follow all IEP modifications. ➤ Use visuals, diagrams, and graphic organizers to support abstract concepts.	

- Pre-teach and review vocabulary and scientific terms.
 - Provide guided notes, outlines, and study guides.
 - Offer leveled texts or simplified resources when needed.
 - Provide small-group or one-on-one instruction.
 - Pair students with supportive lab partners or peer tutors.
 - Read aloud directions and model lab procedures.
 - Offer preferential seating near teacher, board, or lab materials.
 - Allow extended time for labs, projects, and assessments.
 - Accept oral, dictated, or technology-supported responses.
 - Modify workload or adjust the number of test/assignment items.
 - Provide access to large-print, Braille, or digital texts with audio features.
 - Allow scribes or communication devices when required.
 - Incorporate interactive simulations, videos, and multimedia supports.
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Students with 504 Plans

- Follow the 504 plan.
 - Provide extended time for labs, projects, and assessments.
 - Offer small-group or quiet testing settings.
 - Accept oral, dictated, or typed responses.
 - Provide large-print, Braille, or digital text with assistive technology.
 - Allow use of scribes or communication devices.
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Students at Risk of School Failure

- Use visuals, models, and real-life examples to explain concepts.
 - Pre-teach vocabulary and connect science content to prior knowledge.
 - Break labs and projects into smaller, step-by-step tasks.
 - Provide frequent teacher check-ins and feedback.
 - Offer small-group instruction and structured practice.
 - Assign supportive partners during labs or projects.
 - Provide preferential seating.
 - Scaffold writing tasks (sentence starters, lab report templates).
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Gifted and Talented

- Ask open-ended, higher-order science questions (evaluate, create, hypothesize).
- Encourage independent investigations, experiments, or research.
- Provide enrichment projects, STEM challenges, or cross-curricular connections.
- Offer advanced science texts, journals, or online resources.
- Use flexible grouping for inquiry-based labs, projects, and debates.

- Allow choice in assessments (presentations, research papers, experiments).
- Incorporate simulations, problem-solving competitions, or design challenges.
- Provide opportunities to reflect and share findings with authentic audiences.

Multilingual Learners

- Collaborate with ESL/MLL teachers.
- Provide small-group and partner learning opportunities.
- Pre-teach and revisit science vocabulary using visuals, cognates, and realia.
- Use bilingual glossaries, labeled diagrams, and picture dictionaries.
- Scaffold writing with sentence frames, lab templates, and structured outlines.
- Provide oral response options and extended time.
- Use digital supports (translation tools, captioned videos, audio readings).
- Scaffold academic conversations with discussion stems and lab talk routines.

Diversity and Inclusion

- Integrate diverse cultural contributions to science.
- Provide alternative formats for projects (oral, digital, hands-on).
- Use visuals, diagrams, and clear academic language.
- Avoid slang and idioms; emphasize precise scientific vocabulary.
- Collaborate with cultural liaisons and support staff.
- Establish inclusive classroom routines and norms.
- Allow sufficient wait time before calling on students.
- Build strong family partnerships and communicate science learning goals.

Core Instructional and Supplemental Materials and Additional Resources

Instructional Materials

- Textbook
- Laboratory manuals and equipment
- OpenSci Ed manuals and instructional material

Supplemental Materials

- Teacher generated presentations
- Science websites (National Geographic, PBS Learning, NewsELA, Next Generation Science, Gizmos, PHET, HHMI, Amoeba Sisters)
- EdPuzzle videos
- NearPod lessons
- Multimedia resources
- Chromebooks
- Station work

Intervention Materials

- Individuals with disabilities Resources
- School databases
- Multimedia Resources
- Online Resources and videos
- LinkIt Data
- MLL translations
- Translation apps
- Graphic organizers, guided notes
- Student- teacher goal setting
- Think, Pair, Share
- Review games
- Tiered assignments

Social and Emotional Learning - New Jersey SEL

Competencies and Sub-Competencies Social and emotional learning (SEL) involves the process through which children and adults acquire and apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. The purpose of the SEL competencies is to provide schools with guidelines for integrating SEL across grades and subject areas.

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings and perspectives of others
- Demonstrate awareness of the differences among individuals, groups and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
 - Utilize positive communication and social skills to interact effectively with others
 - Identify ways to resist inappropriate social pressure
 - Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
 - Identify who, when, where, or how to seek help for oneself or others when needed
- NJDOE Website on Social and Emotional Learning

Teacher Notes

OCEAN ACADEMY CHARTER SCHOOL
Unit 5 Overview

Unit Title-Unit 5: Structure and Properties of Matter
Target Course/Grade Levels: 6

Duration: 15 Days

Introduction/Unit Focus:

In this unit, students will explore the behavior and structure of matter at the atomic and molecular scale. They will develop an understanding that all matter is made up of particles, atoms and molecules, and that pure substances consist of only one type of particle. Through this lens, students will examine how pure substances have specific, measurable properties that can be used to identify and classify them.

Students will also investigate how matter exists in different states, solid, liquid, and gas and how these states can change when thermal energy is added or removed. Using molecular-level models, students will explain how particles behave during phase changes and how those changes affect the observable properties of matter.

To support their learning, students will engage in scientific and engineering practices such as developing and using models, obtaining and evaluating information, and effectively

communicating their understanding. These practices help students construct evidence-based explanations about matter and its behavior.

Throughout the unit, students will be introduced to crosscutting concepts such as cause and effect, scale, proportion, and quantity, and structure and function. They will also examine the role of science, engineering, and technology in society and how advances in these fields influence the natural world. These themes provide a meaningful framework for understanding the core ideas in physical science and for seeing how science connects to real-world applications.

Disciplinary Concepts for the Unit

Standard 9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

Standard 9.2 Career Awareness, Exploration, Preparation and Training

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

Standard 9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Standard 8.1 Computer Science

Computer Science outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

Standard 8.2 Design Thinking

Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The framework design includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts

Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the

Holocaust and genocide in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion: C.18A:35-4.36a Curriculum to include instruction on diversity and inclusion.

The instruction shall:

- (1) highlight and promote diversity, including economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance;
- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
- (3) encourage safe, welcoming, and inclusive environments for all students regardless of race or ethnicity, sexual and gender identities, mental and physical disabilities, and religious beliefs.

Asian Americans and Pacific Islanders (AAPI)

Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLS) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416).

21st Century Themes and Skills

"Twenty-first century themes and skills" means themes such as global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; learning and innovation skills, including creativity and innovation, critical thinking and problem solving, and communication and collaboration; information, media, and technology skills; and life and career skills, including flexibility. Career readiness, life literacies, and key skills education provides students with the necessary skills to make informed career and financial decisions, engage as responsible community members in a digital society, and to successfully meet the challenges and opportunities in an interconnected global economy."

Focus Standards Unit 5 (Major Standards)

<https://www.nj.gov/education/cccs/2020/NJSLS-Science.pdf>

MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused [rise in global temperatures] climate change over the past century.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6-8 builds on K-5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. ➤ Develop a model to predict and/or describe phenomena. (MS-PS1-1), (MS-PS1-4) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 and progresses to evaluating the merit and validity of ideas and methods. Gather, read, and synthesize information from multiple appropriate sources and	PS1.A: Structure and Properties of Matter ➤ Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1) ➤ Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3) (MS-PS1-2) ➤ Gases and liquids are made of molecules or inert atoms that are moving about relative	Cause and Effect ➤ Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4; MS-ESS3-5) Systems and System Models Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-PS1-1) Structure and Function Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3,4) Patterns

assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or now supported by evidence. (MS-PS1-3; MS-ESS3-5))	to each other. (MS-PS1-2,4) ➤ In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (MS-PS1-4) ➤ Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1) ➤ The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-2,4; MS-ESS3-5) PS1.B: Chemical Reactions ➤ Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new	➤ Patterns in rates of change and other numerical relationships can provide information about natural systems. (MS-PS1-5; MS-ESS3-5) Scale Proportion and Quantity ➤ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-4) Energy and Matter ➤ Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-PS1-4,5; MS-ESS3-5) Stability and Change ➤ Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-PS1-2,5; MS-ESS3-5) ----- <i>Connections to Engineering, Technology and Applications of Science</i>
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	substances have different properties from those of the reactants. (MS-PS1-3) (MS-PS1-2) (MS-PS1-5.) PS3.A: Definitions of Energy ➤ The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (MS-PS1-4; MS-ESS3-5) The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system’s total thermal energy. The total thermal energy (sometimes called the total internal	Interdependence of Science, Engineering, and Technology ➤ Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-1,2,3,4,5) ----- Connections to Nature of Science Science is a Human Endeavor ➤ Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-PS1-1,2,3,4,5) Influence of Science, Engineering and Technology on Society and the Natural World The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.
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	energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. (MS-PS1-4)	(MS-PS1-1,2,3,4,5; MS-ESS3-5)
Supporting and Additional Standards Unit 5 New Jersey Student Learning Standards-Mathematics New Jersey Student Learning Standards-ELA https://www.state.nj.us/education/cccs/2016/ela/CompanionG0608.pdf		
<u>ELA/Literacy -</u> RI.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text. RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue. W.SE.6.6. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. <u>Mathematics -</u> 6.RP.A. Understand ratio concepts and use ratio reasoning to solve problems 3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. 6.NS.C. Apply and extend previous understandings of numbers to the system of rational		

numbers

5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

8.EE.A. Work with radicals and integer exponents

3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as and the population of the world as and determine that the world population is more than 20 times larger.

Unit 5 New Jersey Student Learning Standards Connections: [Career Readiness, Life Literacies, and Key Skills](#)

Disciplinary Concepts

Career Awareness and Planning

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
An individual's strengths, lifestyle goals, choices, and interests affect employment and income	9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
Early planning can provide more options to pay for postsecondary training and employment.	9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
There are a variety of resources available to help navigate the career planning process.	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.

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Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Communication skills and responsible behavior in addition to education, experience, certifications, and skills are all factors that affect employment and income.	9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
Unit 5 New Jersey Student Learning Standards: Computer Science and Design Thinking	
Disciplinary Concepts: Data and Analysis	
Core Ideas	
People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.	8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals. Data is organized and accessible based on the application used to store it.	8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.
The purpose of cleaning data is to remove errors and make it easier for computers to process.	8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
Computer models can be used to simulate events, examine theories and inferences, or make predictions.	8.1.8.DA.5: Test, analyze, and refine computational models. 8.1.8.DA.6: Analyze climate change computational models and propose refinements.
New Jersey Student Learning Standards: Climate Change Mandate	
Core Ideas	
There are systematic processes for	MS-ETS1-3: Analyze data from tests to determine

evaluating solutions with respect to how well they meet the criteria and constraints of a problem. Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design.	similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
Unit 5 Evidence of Student Learning	
Performance Tasks/Use of Technology: ➤ Lab Safety Station Activity ➤ Physical vs Chemical Properties/Changes Lab ➤ Change of State Lab ➤ Design insulating cup models ➤ Draw an atom	Other Assessments Formative ➤ Observation ➤ Homework ➤ Class participation ➤ Graphic Organizers ➤ Projects ➤ Student Response Systems ➤ Do-Now/Exit Cards ➤ Laboratories/Lab Reports ➤ Notebook ➤ Writing Assignments ➤ Graphs, Models, and Tables Summative ➤ Chapter/Unit Test ➤ Writing Assignments ➤ Presentations ➤ Laboratory Reports/Practical ➤ Unit Projects Benchmark ➤ SGO Exams ➤ Final Exams ➤ Performance Assessment

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Curriculum Guide
Grade 6 - Science

	Alternative ➤ CER (claim, evidence, reasoning) ➤ Student Surveys ➤ Scientist Circles ➤ Driving Question Board ➤ Consensus Model
Unit 5 Knowledge and Skills	
Unit 5 Learning Targets	
<i>Students will be able to:</i> ➤ Conduct investigations to observe and compare physical and chemical changes during chemical reactions ➤ Create models to show how particle motion, temperature, and states of matter change with the addition or removal of thermal energy ➤ Differentiate how molecules are arranged and behave in solids, liquids, and gases ➤ Develop models to represent atomic structures in both simple molecules and extended repeating structures like crystals ➤ Use the Periodic Table to compare the properties of different elements ➤ Identify and describe the roles of protons, neutrons, and electrons in an atom ➤ Define matter as anything that has mass and takes up space (volume) ➤ Explain that elements are made of only one type of atom and are the basic building blocks of matter	
Unit 5 Enduring Understandings	Unit 5 Essential Questions
<i>Students will know:</i> ➤ Atoms are the basic units of matter and are made up of protons, neutrons, and electrons ➤ Elements consist of only one type of atom and are organized by their properties on the Periodic Table ➤ Matter can exist in different states depending on how its particles are arranged and how much energy they have ➤ The arrangement of molecules affects the physical properties of solids, liquids, and gases ➤ Adding or removing thermal energy can change the temperature, motion of particles, and state of a substance	➤ What are the basic parts of an atom, and what role does each part play? ➤ What is an element, and how does it differ from a compound or mixture? ➤ How do particles arrange and behave differently in solids, liquids, and gases? ➤ How do mass and volume define matter? ➤ How does thermal energy affect the motion of particles and changes in state? ➤ How can matter change to form a new substance with different properties? ➤ What evidence can be used to identify a chemical or physical change?

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➤ Matter has both physical and chemical properties that can be observed and used to identify it ➤ Chemical reactions produce physical and chemical changes that can be observed and measured ➤ All matter has mass and takes up space (volume)	
Unit 5 Instructional Plan	
Suggested Activities	Resources
➤ Graphic organizers and guided note taking ➤ Construct a model ➤ Draw diagrams ➤ Homework ➤ Journal Entries ➤ Web Quest ➤ Open-ended lab reflections ➤ Labs and Engineering based projects	➤ OpenSci Ed ➤ Online web quests ➤ Youtube links ➤ Nearpod ➤ BrainPop ➤ EdPuzzle ➤ Google Suite
Suggested Options for Differentiation and Modifications	
Special Education ➤ Follow all IEP modifications. ➤ Use visuals, diagrams, and graphic organizers to support abstract concepts. ➤ Pre-teach and review vocabulary and scientific terms. ➤ Provide guided notes, outlines, and study guides. ➤ Offer leveled texts or simplified resources when needed. ➤ Provide small-group or one-on-one instruction. ➤ Pair students with supportive lab partners or peer tutors. ➤ Read aloud directions and model lab procedures. ➤ Offer preferential seating near teacher, board, or lab materials. ➤ Allow extended time for labs, projects, and assessments. ➤ Accept oral, dictated, or technology-supported responses. ➤ Modify workload or adjust the number of test/assignment items. ➤ Provide access to large-print, Braille, or digital texts with audio features. ➤ Allow scribes or communication devices when required. ➤ Incorporate interactive simulations, videos, and multimedia supports.	

Students with 504 Plans

- Follow the 504 plan.
 - Provide extended time for labs, projects, and assessments.
 - Offer small-group or quiet testing settings.
 - Accept oral, dictated, or typed responses.
 - Provide large-print, Braille, or digital text with assistive technology.
 - Allow use of scribes or communication devices.
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Students at Risk of School Failure

- Use visuals, models, and real-life examples to explain concepts.
 - Pre-teach vocabulary and connect science content to prior knowledge.
 - Break labs and projects into smaller, step-by-step tasks.
 - Provide frequent teacher check-ins and feedback.
 - Offer small-group instruction and structured practice.
 - Assign supportive partners during labs or projects.
 - Provide preferential seating.
 - Scaffold writing tasks (sentence starters, lab report templates).
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Gifted and Talented

- Ask open-ended, higher-order science questions (evaluate, create, hypothesize).
 - Encourage independent investigations, experiments, or research.
 - Provide enrichment projects, STEM challenges, or cross-curricular connections.
 - Offer advanced science texts, journals, or online resources.
 - Use flexible grouping for inquiry-based labs, projects, and debates.
 - Allow choice in assessments (presentations, research papers, experiments).
 - Incorporate simulations, problem-solving competitions, or design challenges.
 - Provide opportunities to reflect and share findings with authentic audiences.
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Multilingual Learners

- Collaborate with ESL/MLL teachers.
- Provide small-group and partner learning opportunities.
- Pre-teach and revisit science vocabulary using visuals, cognates, and realia.
- Use bilingual glossaries, labeled diagrams, and picture dictionaries.
- Scaffold writing with sentence frames, lab templates, and structured outlines.
- Provide oral response options and extended time.
- Use digital supports (translation tools, captioned videos, audio readings).

- Scaffold academic conversations with discussion stems and lab talk routines.
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Diversity and Inclusion

- Integrate diverse cultural contributions to science.
- Provide alternative formats for projects (oral, digital, hands-on).
- Use visuals, diagrams, and clear academic language.
- Avoid slang and idioms; emphasize precise scientific vocabulary.
- Collaborate with cultural liaisons and support staff.
- Establish inclusive classroom routines and norms.
- Allow sufficient wait time before calling on students.
- Build strong family partnerships and communicate science learning goals.

Core Instructional and Supplemental Materials and Additional Resources

Instructional Materials

- Textbook
- Laboratory manuals and equipment
- OpenSci Ed manuals and instructional material

Supplemental Materials

- Teacher generated presentations
- Science websites (National Geographic, PBS Learning, NewsELA, Next Generation Science, Gizmos, PHET, HHMI, Amoeba Sisters)
- EdPuzzle videos
- NearPod lessons
- Multimedia resources
- Chromebooks
- Station work

Intervention Materials

- Individuals with disabilities Resources
- School databases
- Multimedia Resources
- Online Resources and videos
- LinkIt Data
- MLL translations
- Translation apps
- Graphic organizers, guided notes
- Student- teacher goal setting
- Think, Pair, Share
- Review games
- Tiered assignments

Social and Emotional Learning - New Jersey SEL

Competencies and Sub-Competencies Social and emotional learning (SEL) involves the process through which children and adults acquire and apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. The purpose of the SEL competencies is to provide schools with guidelines for integrating SEL across grades and subject areas.

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

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