

Ocean Academy Charter School
Curriculum Guide
Grade 3 - Science



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OCEAN ACADEMY CHARTER SCHOOL Science Curriculum	
Content Area: Science	
Course Title: Science	
Grade Level: Grade 3	
Unit Title	Pacing Guide in Days
Unit Plan 1: Forces and Interactions	20 Days
Unit Plan 2: Inheritance and Variation of Traits Climate Change	30 Days
Unit Plan 3: Interdependent Relationships in Ecosystems: Environmental Impacts on Organisms Climate Change	20 Days
Unit Plan 4: Earth Systems Climate Change	20 Days

OCEAN ACADEMY CHARTER SCHOOL Unit 1 Overview	
Content Area: Science	
Unit Title: Forces and Interactions	Duration: 20 Days
Target Course/Grade Level: Grade 3	
Introduction/Unit Focus:	

In this unit, students will investigate how forces affect the motion of objects. They will explore both balanced and unbalanced forces, developing an understanding that unbalanced forces cause changes in an object's motion. Through experiments and hands-on learning, students will observe patterns of motion and begin to use those patterns to predict how objects might move in the future.

Students will also examine different types of forces, including those that require contact, such as pushes and pulls, and those that act at a distance, such as magnetism and gravity. They will explore cause-and-effect relationships in magnetic and electric interactions between objects that are not in contact.

By the end of the unit, students will apply their understanding of forces and magnetic interactions to define a simple design problem that can be solved using magnets. This unit helps students build foundational knowledge of physical science concepts through active exploration, observation, and problem-solving.

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.

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 (Major Standards) <https://www.nj.gov/education/cccs>

Content Standards: New Jersey Student Learning Standards for Science

3-PS2-1: Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

3-PS2-2: Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion.

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3-PS2-3: Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other		
3-PS2-4 : Define a simple design problem that can be solved by applying scientific ideas about magnets.		
Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems Asking questions and defining problems in grades 3-5 builds on grades K-2 experiences and progresses to specifying qualitative relationships. Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are	PS2.A: Forces and Motion - Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1) - The patterns of an object's motion in various situations can be observed and measured; when the past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) PS2.B: Types of Interactions	Patterns - Patterns of change can be used to make predictions. (3-PS2-2) Cause and Effect - Cause and effect relationships are routinely identified. (3-PS2-1) - Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3) Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering, and Technology Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4)

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controlled and the number of trials considered. (3-PS2-1) Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2) Connections to Nature of Science Science Knowledge is Based on Empirical Evidence Science findings are based on recognizing patterns. (3-PS2-2) Scientific Investigations Use a Variety of Methods Science investigations use a variety of methods, tools, and techniques. (3-PS2-1)	- Objects in contact exert forces on each other. (3-PS2-1) - Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3), (3-PS2-4)	
New Jersey Student Learning Standards: Interdisciplinary Connections https://www.nj.gov/education/cccs		
English Language Arts RI.CR.3.1. Ask and answer questions and make relevant connections to demonstrate understanding of an informational text, referring explicitly to textual evidence as the basis for the answers. (3-PS2-1), (3-PS2-3) RI.IT.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-PS2- 3) RI.AA.3.7. Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text. (3-PS2-3) W.WR.3.5. Generate questions about a topic and independently locate related information from at least two reference sources (print and non-print) to obtain information on that topic. (3-PS2-1), (3-PS2-2)		

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W.SE.3.6. Use discussion, books, or media resources to gather ideas, outline them, and prioritize the information to include while planning to write about a topic. (3-PS2-1), (3-PS2-2)

SL.PE.3.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly. (3-PS2-3)

Mathematics

MP.2 Reason abstractly and quantitatively. (3-PS2-1)

MP.5 Use appropriate tools strategically. (3-PS2-1)

3.M.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-PS2-1)

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

Core Ideas	Performance Expectations (Identified with Standard Number and statement)
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).

New Jersey Student Learning Standards: [Computer Science and Design Thinking](#)

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Many factors influence the accuracy of inferences and predictions.	8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.	8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Knowledge and Skills

Unit Learning Targets (Objectives):

Students will be able to...

- Test how barriers and distance affect the strength of magnetic forces
- Compare the fall time of different objects dropped from the same height
- Conduct investigations to measure how far and how long objects travel when forces are applied
- Observe the motion of objects and create diagrams or models to describe how they move
- Explore how friction affects how far an object moves after being pushed or released
- Investigate how gravity acts on objects of different masses and materials

Unit Enduring Understandings:

Students will know...

- Magnetic and electric forces can act between objects that are not touching
- A force has both strength and direction and acts on a specific object
Objects in contact apply forces to each other
- Unequal forces acting on an object can change its speed or direction
- The strength of magnetic forces depends on distance, the materials involved, and the orientation of the magnets
- Patterns of motion can be observed and measured to help predict future movement
- When the total (net) force on an object is zero, the object stays at rest or moves at a constant speed

Unit Essential Questions:

- How can magnets be used to solve problems or complete tasks?
- How do equal and unequal forces affect the motion of an object?
- What is the impact of forces in the natural world?

Instructional Plan

Students will engage in a science framework that enables them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments. This is a model to support students through mastery of the Next Generation Science Standards.

[Science Resources](#)

5 E Instructional Model provides opportunities for students to engage, explore, explain, elaborate and evaluate science content.

The Science block will consist of the following components:

Engage: Raise a question and use compelling storytelling and visuals to introduce students to a scientific phenomenon and get them excited to investigate. Activate prior knowledge and prepare students for the day's learning. This is also known as an advance organizer, hook, or set induction.

➤ **Resources:**

- Mystery Science- Anchor Phenomenon (Ice Board)
 - See, Think, Wonder Chart
 - Activity and Discussion

Explore: Students experience key concepts through a collaborative hands-on, inquiry activity. They test predictions, share ideas and record observations. Teachers act as a facilitator, supporting students in establishing relationships and communicating their experience and ideas. This could be done through read alouds, videos, experiments, STEM/STEAM challenges and projects.

➤ **Resources:**

- Mystery Science- Invisible Forces Unit
 - Lesson 1: Balanced and Unbalanced Forces (Activity: Hopper Popper)
 - Lesson 2: Balanced Forces and Engineerings (Activity: Paper Bridge Engineering)
 - Lesson 3: Patterns of Motion, Gravity, & Friction (Activity: Trapeze Tester)
 - Lesson 4: Magnets and Forces (Activity: Magnetic Discovery)
 - Lesson 5: Magnetism and Engineering (Activity: Invent a Magnetic Lock)

Explain: Students have frequent opportunities to connect their prior knowledge to new concepts. They share their thinking and build explanations. Post-activity questions encourage students to engage in sense-making, linking their findings to the Mystery question. Video exploration can build upon the student discussion and provide scientific explanation

➤ **Resources:**

- Mystery Science:
 - Performance Task: Forces Engineering (Can you design an ice board?) Unit Review and Activity

Elaborate: Opportunity for students to apply their learning to a similar or new situation. Project ideas and readings can help extend the learning

Resources:

- Mystery Science:
 - Performance Task: Forces Engineering (Can you design an ice board?) Unit Review and Activity
 - Reading Extensions:
 - Lesson 1: Fishing for Forces

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- Lesson 2: Why that Bridge Collapsed
- Lesson 3: (Awaiting reading extension to be added-new lesson)
- Lesson 4: Hunting for Rocks from Outer Space and the Biggest Rock in the World
- Lesson 5: Magnetism by Mari Schuh and Discovering Science: Playing with Magnets by Gary Gibson

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science:

- Lesson 1: Balanced and Unbalanced Forces Assessment
- Lesson 2: Balanced Forces and Engineerings Assessment
- Lesson 3 Patterns of Motion, Gravity, & Friction
- Lesson 4: Magnets and Forces Assessment
- Lesson 5: Magnetism and Engineering Assessment
- Invisible Forces Unit Assessment

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers & Guided Note Taking
- Directed Reading
- Cooperative Group Learning
- Homework
- Journal Entries

Summative Assessments

- Mystery Science Unit Assessments
- Projects

Benchmark Assessments:

- RST- Research Simulation Task
- Associated Unit tests, quizzes
- Labs and engineering based projects

Alternative Assessments

- Projects

Performance Task

- projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
 - Use visuals, graphic organizers, and hands-on models.
 - Pre-teach and review vocabulary and scientific concepts.
 - Provide outlines, word banks, and study guides.
 - Use leveled texts and simplified resources when needed.
 - Provide small-group or one-on-one instruction.
 - Assign peer tutors or lab partners for support.
 - Read aloud directions and model scientific procedures.
 - Offer preferential seating near teacher or materials.
 - Give extra time for labs, projects, and tests.
 - Accept oral or dictated responses instead of written work.
 - Modify or reduce the number of questions on assignments.
 - Provide access to large-print, Braille, or digital text with audio tools.
 - Use scribes or augmentative communication devices when required.
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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 environments.
 - Accept oral or dictated responses.
 - Provide large-print, Braille, or digital text with audio features.
 - Allow use of a scribe or communication device.
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Students at Risk of School Failure

- Use visuals, real objects, and demonstrations for science concepts.
 - Pre-teach vocabulary and connect it to real-life examples.
 - Provide step-by-step directions and frequent check-ins.
 - Offer small-group instruction with guided practice.
 - Break down experiments and projects into smaller tasks.
 - Assign peer support for collaborative activities.
 - Provide preferential seating and structured routines.
 - Give frequent feedback and encouragement.
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Gifted and Talented

- Ask open-ended questions to promote higher-order thinking.

- Encourage independent investigations and research projects.
 - Provide enrichment tasks, such as STEM challenges or experiments beyond grade-level.
 - Offer advanced reading materials and videos on science topics.
 - Group flexibly for inquiry projects and debates.
 - Allow choice in projects, reports, or presentations.
 - Provide opportunities for cross-curricular connections (e.g., math in data analysis, ELA in lab reports).
 - Encourage reflection and presentation of findings to peers.
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Multilingual Learners

- Collaborate with ESL/MLL teachers.
 - Provide small-group instruction and partner learning.
 - Pre-teach and revisit vocabulary with visuals and realia (objects, pictures).
 - Use bilingual glossaries or picture dictionaries.
 - Provide sentence frames and discussion stems for lab work.
 - Scaffold writing with graphic organizers and labeled diagrams.
 - Allow extended time and oral responses.
 - Use recorded directions, audio supports, or captioned videos.
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Diversity and Inclusion

- Respect and include cultural traditions and perspectives in science examples.
- Provide alternative formats for assignments (oral, visual, or hands-on projects).
- Use visuals, diagrams, and clear, direct language.
- Avoid slang and idioms; use precise science vocabulary.
- Collaborate with support staff and cultural liaisons.
- Create an inclusive, respectful classroom environment.
- Provide sufficient wait time before calling on students.
- Build positive relationships with families and invite them into science learning.

Supplemental Resources

Instructional Materials

Mystery Science Unit plan
www.mysteryscience.com

Supplemental Materials

www.readinga-z.com
www.brainpop.com
PebbleGo:

- Pebble Go topics: friction, kinds of forces, what is motion, magnetism

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www.flocabulary.com

Mentor Text:

- Making Things Move (Level H)
- Amazing Forces and Movement (Level I)
- How Do Things Move?
- Pushing and Pulling (Level J)
- Roll, Slope, and Slide: A Book about Ramps (Level K)
- Castle Under Siege! (Level L)
- Roller Coaster! Motion and Acceleration (Level M)
- Getting to Know Wheels and Axles (Level N)
- Experiments with Motion (Level N)
- Springs (Level O)
- Crash Course in Forces and Motion with Max Axiom (Level P)

Intervention Materials

- www.readinga-z.com lower levels
- Vocabulary List
- Anchor Charts
- Think Pair Share
- Stations
- Choice Board

Teacher Notes

**OCEAN ACADEMY CHARTER SCHOOL
Unit 2 Overview**

Content Area: Science

Unit Title: Inheritance and Variation of Traits

Duration: 30 Days

Target Course/Grade Level: Grade 3

Introduction/Unit Focus:

In this unit, students will explore how organisms survive, adapt, and succeed across different ecosystems and time periods. Through investigations and hands-on experiments, students will learn how organisms vary in their traits and what happens when the environment changes.

They will examine how inherited characteristics influence how living things look and function, and how these traits can affect their chances of survival.

Students will study the similarities and differences in life cycles of various plants and animals, gaining an understanding that organisms have different inherited information that shapes their development and behavior. They will also explore what types of organisms lived long ago and what those organisms can tell us about ancient environments.

As students build their understanding, they will learn that environmental changes can lead to a variety of outcomes for organisms: some may survive and reproduce, some may migrate to new environments, others may adapt to the changes, and some may not survive at all. This unit helps students connect traits, survival, and change over time in a meaningful way that deepens their understanding of life science.

Disciplinary Concepts for the Unit

Standard 9.1 Personal Financial Literacy

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Focus Standards (Major Standards) <https://www.nj.gov/education/cccs>

Content Standards: New Jersey Student Learning Standards for Science

3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms

3-LS3-2: Use evidence to support the explanation that traits can be influenced by the environment.

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3-LS1-1 : Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death.		
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in 3-5 builds on K-2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. Clarification: When possible and feasible, digital tools should be used. Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3-5 builds on K-2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)	LS3.A: Inheritance of Traits Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2) LS3.B: Variation of Traits Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) The environment also affects the traits that an organism develops. (3-LS3-2)	Patterns Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1) Cause and Effect Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)
Asking Questions and Defining Problems Asking questions and defining problems in grades 3-5 builds on grades K-2 experiences and progresses to specifying qualitative relationships. Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) Define a simple problem that	LS1.B: Growth and Development of Organisms Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)	Patterns Patterns of change can be used to make predictions. (3-LS1-1) Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence Science findings are based on recognizing patterns. (3-LS1-1)

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can be solved through the development of a new or improved object or tool. (3-PS2-4) Developing and Using Models Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Develop models to describe phenomena. (3-LS1-1)		
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New Jersey Student Learning Standards: Interdisciplinary Connections
<https://www.nj.gov/education/cccs>

English Language Arts

RI.CR.3.1. Ask and answer questions and make relevant connections to demonstrate understanding of an informational text, referring explicitly to textual evidence as the basis for the answers. (3-PS2-1),(3-PS2-3)

RI.CI.3.2. Recount in oral and written form the key details from a multi-paragraph informational text and explain how they support the main idea. (3-LS3-1),(3-LS3-2),(3-LS4-2)

RI.IT.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-PS2-3)

RI.TS.3.4. Utilize and reference features of a text when writing or speaking about a text, using text features (e.g., graphics, images, captions, headings) and search tools (e.g., key words, sidebars, hyperlinks) to locate and integrate information relevant to a given topic efficiently. (3-LS1-1)

W.IW.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1),(3-LS3-2),(3-LS4-2)

Mathematics

MP.2 Reason abstractly and quantitatively. (3-PS2-1)

MP.4 Model with mathematics. (3-LS2-1), (3-LS4-1), (3-LS4-3), (3-LS4-4)

MP.5 Use appropriate tools strategically. (3-LS4-1)

3.DL.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. (3-LS4-2)

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3.DL.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1),(3-LS3-2)

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

Core Ideas	Performance Expectations (Identified with Standard Number and statement)
Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

New Jersey Student Learning Standards: Computer Science and Design Thinking

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Many factors influence the accuracy of inferences and predictions.	8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.	8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.
<i>The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals.</i>	8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology

New Jersey Student Learning Standards: Climate Change

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
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Populations live in a variety of habitats and change in those habitats affects the organisms living there. When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.	3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
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Knowledge and Skills

Unit Learning Targets (Objectives):

Students will be able to...

- Identify and describe adaptations that support survival in different ecosystems
- Provide evidence that offspring may inherit traits from parents, but not always in identical ways
- Explain how certain traits help organisms survive and thrive in their specific environments
- Compare the life cycles of different organisms and identify both similarities and differences
- Describe how environmental conditions can impact the stages of an organism's life cycle

Unit Enduring Understandings:

Students will know...

- Organisms look and function differently because they inherit different traits
- Some characteristics are passed from parents, while others are shaped by the environment, including diet, experience, and learning
- Reproduction is necessary for the survival of all living organisms, and each plant and animal has a unique life cycle
- The traits that organisms develop can be the result of both heredity and environmental interactions
- Traits can be influenced by both inherited genetic information and environmental factors

Unit Essential Questions:

- Do all offspring inherit the exact same traits from their parents?
- How do differences in traits give some organisms an advantage for survival?

- In what ways can the environment influence an organism's traits?
- How are life cycles of living organisms similar and different?

Instructional Plan

Students will engage in a science framework that enables them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments. This is a model to support students through mastery of the Next Generation Science Standards.

[Science Resources](#)

5 E Instructional Model provides opportunities for students to engage, explore, explain, elaborate and evaluate science content.

The Science block will consist of the following components:

Engage: Raise a question and use compelling storytelling and visuals to introduce students to a scientific phenomenon and get them excited to investigate. Activate prior knowledge and prepare students for the day's learning. This is also known as an advance organizer, hook, or set induction.

- **Resources:**

- Mystery Science- Anchor Phenomenon (Fossil Evidence and Habitat Change)
 - See, Think, Wonder Chart

Activity and Discussion

Explore: Students experience key concepts through a collaborative hands-on, inquiry activity. They test predictions, share ideas and record observations. Teachers act as a facilitator, supporting students in establishing relationships and communicating their experience and ideas. This could be done through read alouds, videos, experiments, STEM/STEAM challenges and projects.

- Mystery Science- Animals Through Time
 - Lesson 1: Habitats, Fossils, and Environments over Time (Activity: Fossil Dig)
 - Lesson 2: Fossil Evidence and Dinosaurs
 - Lesson 3 Fossil Evidence, Trace Fossils and Animal Behavior (Activity: Outrunning Ceelo)
 - Lesson 4: Trait Variation, Inheritance, and Artificial Selection (Activity: Odd One Out)
 - Lesson 5: Trait Variation, Inheritance, and Artificial Selection (Activity: Designer Dog)

- Lesson 6:: Trait Variation, Natural Selection, Survival (Activity: Lizard Island)
- Lesson 7: Animal Groups and Survival (Activity: Field Journal)
- Lesson 8: Traits and Environmental Variation (Activity: How long can people survive in outer space?)

Explain: Students have frequent opportunities to connect their prior knowledge to new concepts. They share their thinking and build explanations. Post-activity questions encourage students to engage in sense-making, linking their findings to the Mystery question. Video exploration can build upon the student discussion and provide scientific explanation

➤ **Resources:**

- Mystery Science:
 - Performance Task: Fossil Evidence and Habitat Change

Elaborate: Opportunity for students to apply their learning to a similar or new situation. Project ideas and readings can help extend the learning

➤ **Resources:**

- Mystery Science:
 - Performance Task: Fossil Evidence and Habitat Change Unit Review and Activity
 - Reading Extensions:
 - Lesson 1: A Whale of a Find
 - Lesson 2: A Plant Eating Dinosaur had lots of Spare Teeth and Biggest Dino Ever?
 - Lesson 3: First Impressions and Some Arctic Dinosaurs Lived in Herds
 - Lesson 4:
 - Lesson 5: Scientist of Lizard Island
 - Lesson 6: Ants to Rescue Extension Activity
 - Lesson 7: Bugged and Fighting Back Against Mosquitoes
 - Lesson 8: What do Astronauts Eat in Space?

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science:
 - Performance Task: Fossil Evidence and Habitat Change (Activity:)
 - Reading/ Extensions:
- Mystery Science:
 - Lesson 1: Habitats, Fossils, and Environments over Time Assessment
 - Lesson 2: Fossil Evidence and Classification Assessment

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- Lesson 3 Fossil Evidence, Trace Fossils and Animal Behavior Assessment
- Lesson 4: Trait Variation, Inheritance, and Artificial Selection Assessment
- Lesson 5: Trait Variation, Inheritance, and Artificial Selection Assessment
- Lesson 6: Trait Variation, Natural Selection, Survival Assessment
- Lesson 7: Animal Groups and Survival Assessment
- Lesson 8: Traits and Environmental Variation Assessment
- Unit Summative Assessment

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers & Guided Note Taking
- Directed Reading
- Cooperative Group Learning
- Homework
- Journal Entries

Summative Assessments

- Mystery Science Unit Assessments
- Projects

Benchmark Assessments:

- RST- Research Simulation Task
- Associated Unit tests, quizzes
- Labs and engineering based projects

Alternative Assessments

- Projects

Performance Task

- projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, graphic organizers, and hands-on models.
- Pre-teach and review vocabulary and scientific concepts.
- Provide outlines, word banks, and study guides.
- Use leveled texts and simplified resources when needed.
- Provide small-group or one-on-one instruction.
- Assign peer tutors or lab partners for support.

- Read aloud directions and model scientific procedures.
 - Offer preferential seating near teacher or materials.
 - Give extra time for labs, projects, and tests.
 - Accept oral or dictated responses instead of written work.
 - Modify or reduce the number of questions on assignments.
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- Follow the 504 plan.
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Students at Risk of School Failure

- Use visuals, real objects, and demonstrations for science concepts.
 - Pre-teach vocabulary and connect it to real-life examples.
 - Provide step-by-step directions and frequent check-ins.
 - Offer small-group instruction with guided practice.
 - Break down experiments and projects into smaller tasks.
 - Assign peer support for collaborative activities.
 - Provide preferential seating and structured routines.
 - Give frequent feedback and encouragement.
-

Gifted and Talented

- Ask open-ended questions to promote higher-order thinking.
 - Encourage independent investigations and research projects.
 - Provide enrichment tasks, such as STEM challenges or experiments beyond grade-level.
 - Offer advanced reading materials and videos on science topics.
 - Group flexibly for inquiry projects and debates.
 - Allow choice in projects, reports, or presentations.
 - Provide opportunities for cross-curricular connections (e.g., math in data analysis, ELA in lab reports).
 - Encourage reflection and presentation of findings to peers.
-

Multilingual Learners

- Collaborate with ESL/MLL teachers.
- Provide small-group instruction and partner learning.
- Pre-teach and revisit vocabulary with visuals and realia (objects, pictures).
- Use bilingual glossaries or picture dictionaries.
- Provide sentence frames and discussion stems for lab work.
- Scaffold writing with graphic organizers and labeled diagrams.
- Allow extended time and oral responses.
- Use recorded directions, audio supports, or captioned videos.

Diversity and Inclusion

- Respect and include cultural traditions and perspectives in science examples.
- Provide alternative formats for assignments (oral, visual, or hands-on projects).
- Use visuals, diagrams, and clear, direct language.
- Avoid slang and idioms; use precise science vocabulary.
- Collaborate with support staff and cultural liaisons.
- Create an inclusive, respectful classroom environment.
- Provide sufficient wait time before calling on students.
- Build positive relationships with families and invite them into science learning.

Supplemental Resources

Instructional Materials

Mystery Science Unit Plan
www.mysteryscience.com

Supplemental Materials

www.readinga-z.com

PebbleGo:

- Pebble Go Next topics: inherited traits, what is evolution, what are fossils

www.readworks.com

Mentor Texts available in book rooms

- Exploding Ants: Amazing Facts About How Animals Adapt
- Extreme Animals: The Toughest Creatures on Earth
- Plants in Different Habitats
- Rainforest Grew All Around
- What Do You Do with a Tail Like This?
- Animals in Hiding (Level H)
- What Do You Do When Something Wants to Eat You? (Level K)
- What Color is Camouflage? (Level L)
- Animals and the Environment (Level I)

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- Hurray for Plants (Level J)
- Hungry Plants (Level N)
- Animal Def: How Animals Protect Themselves
- I Wonder Why Trees Have Leaves (Level O)
- How Do Animals Adapt? (Level P)
- Giant Plant Eating Dinosaurs (Level M)

Intervention Materials

- www.readinga-z.com lower levels
- Vocabulary List
- Anchor Charts
- Think Pair Share
- Stations
- Choice Board

Teacher Notes

**OCEAN ACADEMY CHARTER SCHOOL
Unit 3 Overview**

Content Area: Science

Unit Title: Ecosystems: Interactions, Energy, and Dynamics

Duration: 20 Days

Target Course/Grade Level: Grade 3

Introduction/Unit Focus:

In this unit, students explore the diverse ecosystems and environments that exist on Earth, gaining an understanding of how plants and animals adapt to survive in different settings. They will investigate the interdependence of living things within habitats and how changes in the environment can impact the organisms that live there. Through collaborative group work, students will learn the importance of cooperation among animals and how being part of a group can help with obtaining food, defending against predators, and coping with environmental changes.

Students will also examine fossils to uncover clues about organisms that lived long ago and the nature of their environments, helping them connect past and present ecosystems. They will study how some plants and animals thrive in particular habitats while others cannot survive, emphasizing the delicate balance of ecosystems and the consequences of environmental changes. This unit encourages students to think critically about how

environmental factors influence survival and what solutions might help protect plants and animals facing changing conditions.

Overall, the unit aims to deepen students' understanding of the relationships between organisms and their environments, the importance of adaptation and survival strategies, and the role humans can play in preserving the natural world for future generations.

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.

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 (Major Standards) <https://www.nj.gov/education/cccs>

Content Standards: New Jersey Student Learning Standards for Science

3-LS2-1 : Construct an argument that some animals form groups that help members survive.

3-LS4-1: Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago

3-LS4-2 : Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all

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3-LS4-4 : Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.		
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). Construct an argument with evidence, data, and/or a model. (3- LS2-1) Analyzing and Interpreting Data Analyzing data in 3-5 builds on K-2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3-5 builds on K-2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2) Engaging in Argument from Evidence Engaging in	LS2.D: Social Interactions and Group Behavior Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (3-LS2-1) LS2.C: Ecosystem Dynamics, Functioning, and Resilience When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4) LS4.A: Evidence of Common Ancestry and Diversity Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1) Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1) LS4.B: Natural Selection Sometimes the differences in	Cause and Effect Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1) Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2), (3- LS4-3) Scale, Proportion, and Quantity Observable phenomena exist from very short to very long time periods. (3-LS4-1) Systems and System Models A system can be described in terms of its components and their interactions. (3-LS4-4) Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering, and Technology Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4- 4) Connections to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes consistent patterns in natural systems. (3- LS4-1)

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argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). Construct an argument with evidence. (3-LS4-3) Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)	characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2) LS4.C: Adaptation For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4- 3) LS4.D: Biodiversity and Humans Populations live in a variety of habitats and change in those habitats affects the organisms living there. (3-LS4-4)	
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New Jersey Student Learning Standards: Interdisciplinary Connections
<https://www.nj.gov/education/cccs>

RI.CR.3.1. Ask and answer questions and make relevant connections to demonstrate understanding of an informational text, referring explicitly to textual evidence as the basis for the answers.

W.IW.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

MP.2 Reason abstractly and quantitatively

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

Core Ideas	Performance Expectations (Identified with Standard Number and statement)
Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process
Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.	9.4.5.IML.2: Create a visual representation to organize information about a problem or issue

New Jersey Student Learning Standards: [Computer Science and Design Thinking](#)

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
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The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals.	8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology
Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants.	8.2.2.ETW.2: Identify the natural resources needed to create a product.
Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment.	8.2.2.ETW.3: Describe or model the system used for recycling technology.

New Jersey Student Learning Standards: Climate Change

Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Populations live in a variety of habitats and change in those habitats affects the organisms living there. When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.	3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Knowledge and Skills

Unit Learning Targets (Objectives):

Students will be able to...

- Identify the factors necessary for an animal to survive in a particular environment.
- Describe how different parts of a habitat depend on each other to form a functioning ecosystem.
- Examine fossils and describe where they might have been found.
- Show how changes in the environment affect the lifestyle of an organism.
- Work collaboratively in groups to complete a task and explain the benefits of cooperation.
- Compare how organisms adapt to survive in various ecosystems and settings.

Unit Enduring Understandings:

Students will know...

- Populations live in a variety of habitats, and changes in those habitats affect the organisms living there.
- Some plants and animals that once lived on Earth no longer exist today.
- Fossils provide important evidence about organisms that lived long ago and their environments.
- When environments change—such as physical features, temperature, or resource availability—some organisms survive and reproduce, others relocate, and some perish.
- Being part of a group helps animals find food, protect themselves, and adjust to environmental changes; group sizes and functions can vary widely.
- For any given environment, some organisms thrive, some survive less well, and some cannot survive at all.

Unit Essential Questions:

- Why do some animals live and work in groups to improve survival?
- How do fossils give us clues about past organisms and environments?
- How does a habitat influence the survival of the plants and animals living there?
- What causes plants and animals to change when their environment changes?
- What impacts do environmental changes have on living things?
- What solutions can help address problems caused by changes in the environment?

Instructional Plan

Students will engage in a science framework that enables them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments. This is a model to support students through mastery of the Next Generation Science Standards. [Science Resources](#)

5 E Instructional Model provides opportunities for students to engage, explore, explain, elaborate and evaluate science content.

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➤ **Resources:**

- Mystery Science- Anchor Phenomenon (Life Cycles)
 - See, Think, Wonder Chart
 - Activity and Discussion

Explore: Students experience key concepts through a collaborative hands-on, inquiry activity. They test predictions, share ideas and record observations. Teachers act as a facilitator, supporting students in establishing relationships and communicating their experience and ideas. This could be done through read alouds, videos, experiments, STEM/STEAM challenges and projects.

- Mystery Science- Animals Through Time
 - Lesson 1: Animal Life Cycles (Activity: Birthday Buddies)
 - Lesson 2: Environmental Change and Engineering
 - Lesson 3: Pollination and Plant Reproduction
 - Lesson 4: Fruit, Seeds, and Plant Reproduction
 - Lesson 5: Plant Life Cycles

Explain: Students have frequent opportunities to connect their prior knowledge to new concepts. They share their thinking and build explanations. Post-activity questions encourage students to engage in sense-making, linking their findings to the Mystery question. Video exploration can build upon the student discussion and provide scientific explanation

➤ **Resources:**

- Mystery Science:
 - Performance Task: Life Cycles (Activity:)
- Mystery Science:
 - Performance Task: Life Cycles (Activity:)
 - Reading/ Extensions:
 - Lesson 1: Flowers Go Bats
 - Lesson 2: Mystery Science Fruit Salad Activity and Extension
 - Lesson 3: Weird Sunflowers, Wonderful New Traits and Giant Pumpkins Grow Fast
 - Lesson 4: Growing Melons, Kinds of Melons, Fun with Melons (3 readings) and Magic Tomatoes
 - Lesson 5:

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science- Animals Through Time
 - Lesson 1: Animal Life Cycles Assessment
 - Lesson 2: Environmental Change and Engineering Assessment
 - Lesson 3: Pollination and Plant Reproduction Assessment
 - Lesson 4: Fruit, Seeds, and Plant Reproduction Assessment
 - Lesson 5: Plant Life Cycles Assessment

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers & Guided Note Taking
- Directed Reading
- Cooperative Group Learning
- Homework
- Journal Entries

Summative Assessments

- Mystery Science Unit Assessments
- Projects

Benchmark Assessments:

- RST- Research Simulation Task
- Associated Unit tests, quizzes
- Labs and engineering based projects

Alternative Assessments

- Projects

Performance Task

- projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, graphic organizers, and hands-on models.
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Multilingual Learners

- Collaborate with ESL/MLL teachers.
- Provide small-group instruction and partner learning.
- Pre-teach and revisit vocabulary with visuals and realia (objects, pictures).
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- Provide sentence frames and discussion stems for lab work.
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- Allow extended time and oral responses.
- Use recorded directions, audio supports, or captioned videos.

Diversity and Inclusion

- Respect and include cultural traditions and perspectives in science examples.
- Provide alternative formats for assignments (oral, visual, or hands-on projects).
- Use visuals, diagrams, and clear, direct language.
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- Collaborate with support staff and cultural liaisons.
- Create an inclusive, respectful classroom environment.
- Provide sufficient wait time before calling on students.
- Build positive relationships with families and invite them into science learning.

Supplemental Resources

Instructional Materials

- Mystery Science unit plan
www.mysteryscience.com

Supplement Materials

www.brainpopjr.com

www.flocabulary.com

[PebbleGo:](#)

- Pebble Go topics: pollination, flowering plants

www.readinga-z.com

Mentors Texts:

- Growing Up Green (Level G)
- Water World (Level G)
- Our Organic Garden (Level H)
- What Does Green Mean (Level I)
- Cleaning Up The Earth (Level J)
- Recycling Earth's Resources (Level J)
- My Green Lunch (Level J)
- Trees: Earth's Lungs
- Helping Habitats (Level K)
- Clean and Green Energy (Level K)
- Filing the Earth with Trash (Level K)
- Endangered (Level L)
- Box Turtle at Long Pond
- Cactus Hotel
- Everglades
- Forest Bright, Forest Night

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- The Forest in the Clouds

Intervention Materials

- Vocabulary list
- Anchor charts
- Lower text in reading a-z
- Think pair share
- Learning stations
- Tic tac toe boards/choice boards

Teacher Notes

**OCEAN ACADEMY CHARTER SCHOOL
Unit 4 Overview**

Content Area: Science

Unit Title: Earth's Systems

Duration: 20 Days

Target Course/Grade Level: Grade 3

Introduction/Unit Focus:

This unit engages third-grade students in exploring typical weather patterns across different regions and seasons of the world. Students will analyze and organize data to describe seasonal weather conditions and develop an understanding of how weather-related hazards impact communities. Through hands-on investigations and critical thinking, students will evaluate design solutions that aim to reduce the effects of these hazards. This unit supports building foundational knowledge of weather and emphasizes the importance of applying science and engineering practices to solve real-world problems.

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.

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 (Major Standards) <https://www.nj.gov/education/cccs>

Content Standards: New Jersey Student Learning Standards for Science

3-ESS2-1: Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season

3-ESS2-2: Obtain and combine information to describe climates in different regions of the world.

Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in 3-5 builds on K-2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3-5 builds on K-2 experiences and progresses to evaluating	ESS2.D: Weather and Climate Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)	Patterns of change can be used to make predictions. (3-ESS2-1), (3-ESS2-2)

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the merit and accuracy of ideas and methods. Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)		
New Jersey Student Learning Standards: Interdisciplinary Connections https://www.nj.gov/education/cccs		
RI.CT.3.8. Compare and contrast the elements of informational texts regarding the most important points and key details presented in two texts on the same topic.		
W.WR.3.5. Generate questions about a topic and independently locate related information from at least two reference sources (print and non-print) to obtain information on that topic.		
3.M.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.		
New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills		
Core Ideas	Performance Expectations (Identified with Standard Number and statement)	
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process	
Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity	
New Jersey Student Learning Standards: Computer Science and Design Thinking		
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)	
Data can be organized, displayed, and presented to highlight relationships.	8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.	
Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data	8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.	

New Jersey Student Learning Standards: Climate Change

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Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.	3-ESS2-2: Obtain and combine information to describe climates in different regions of the world.
A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.	3-ESS3-1: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Knowledge and Skills
Unit Learning Targets (Objectives): <i>Students will be able to...</i> ➤ Research weather and climate in different regions around the world and explain reasons for their weather patterns. ➤ Identify and describe various weather-related hazards. ➤ Record weather patterns and use data to predict future weather in a specific area. ➤ Explore and suggest ways humans can reduce the impact of weather-related natural hazards.
Unit Enduring Understandings: <i>Students will know...</i> ➤ Scientists analyze weather patterns over time and across locations to predict future weather events. ➤ Climate refers to the typical weather conditions of a region over many years and how much those conditions vary. ➤ Natural processes can cause hazards that humans cannot eliminate but can work to minimize their effects.
Unit Essential Questions: ➤ How do seasonal changes influence weather conditions? ➤ How can data from tables and graphs be used to describe typical weather patterns? ➤ In what ways does a region's location on Earth affect its climate? ➤ How do engineers develop solutions to lessen the effects of weather-related hazards?
Instructional Plan
Students will engage in a science framework that enables them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and

discuss those arguments. This is a model to support students through mastery of the Next Generation Science Standards. [Science Resources](#)

5 E Instructional Model provides opportunities for students to engage, explore, explain, elaborate and evaluate science content.

The Science block will consist of the following components:

Engage: Raise a question and use compelling storytelling and visuals to introduce students to a scientific phenomenon and get them excited to investigate. Activate prior knowledge and prepare students for the day's learning. This is also known as an advance organizer, hook, or set induction.

➤ **Resources:**

- Mystery Science- Anchor Phenomenon (Weather System Modeling: Activity Summer Ice Storm)
 - See, Think, Wonder Chart
 - Activity and Discussion

Explore: Students experience key concepts through a collaborative hands-on, inquiry activity. They test predictions, share ideas and record observations. Teachers act as a facilitator, supporting students in establishing relationships and communicating their experience and ideas. This could be done through read alouds, videos, experiments, STEM/STEAM challenges and projects.

➤ **Resources**

- Mystery Science- Stormy Skies
 - [Lesson 1: Water Cycle and Phases of Matter \(Activity: Gas Trap\)](#)
 - [Lesson 2: Local Weather Patterns and Weather Prediction \(Activity: Storms Spotters Guide\)](#)
 - [Lesson 3: Seasonal Weather Patterns](#)
 - [Lesson 4: Climate and Global Weather Patterns \(Activity: Climate Decoder\)](#)
 - [Lesson 5: Natural Hazards and Engineering \(Activity: Design a Wind Proof House\)](#)

Explain: Students have frequent opportunities to connect their prior knowledge to new concepts. They share their thinking and build explanations. Post-activity questions encourage students to engage in sense-making, linking their findings to the Mystery question. Video exploration can build upon the student discussion and provide scientific explanation

➤ **Resources:**

- Mystery Science:

- Performance Task: Weather and Climate (Activity: Can we predict when it's going to hail?)

Elaborate: Opportunity for students to apply their learning to a similar or new situation. Project ideas and readings can help extend the learning

- Performance Task: Unit Review and Activity. Weather and Climate (Activity: Can we predict when it's going to hail?)
- Reading/ Extensions:
 - Lesson 1: What's the Big Idea about Water, Why's of Weather: Clouds
 - Lesson 2: Why's of Weather: Rain, Summer Vacation
 - Lesson 3: Animals Get Ready
 - Lesson 4: How a House is Built, Wind

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science- Stormy Skies
 - Lesson 1: Water Cycle and Phases of Matter (Activity: Gas Trap)
 - Lesson 2: Local Weather Patterns and Weather Prediction (Activity: Storms Spotters Guide)
 - Lesson 3: Seasonal Weather Patterns
 - Lesson 4: Climate and Global Weather Patterns (Activity: Climate Decoder)
 - Lesson 5: Natural Hazards and Engineering (Activity: Design a Wind Proof House)

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers & Guided Note Taking
- Directed Reading
- Cooperative Group Learning
- Homework
- Journal Entries

Summative Assessments

- Mystery Science Unit Assessments
- Projects

Benchmark Assessments:

- RST- Research Simulation Task

- Associated Unit tests, quizzes
- Labs and engineering based projects

Alternative Assessments

- Projects

Performance Task

- projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
 - Use visuals, graphic organizers, and hands-on models.
 - Pre-teach and review vocabulary and scientific concepts.
 - Provide outlines, word banks, and study guides.
 - Use leveled texts and simplified resources when needed.
 - Provide small-group or one-on-one instruction.
 - Assign peer tutors or lab partners for support.
 - Read aloud directions and model scientific procedures.
 - Offer preferential seating near teacher or materials.
 - Give extra time for labs, projects, and tests.
 - Accept oral or dictated responses instead of written work.
 - Modify or reduce the number of questions on assignments.
 - Provide access to large-print, Braille, or digital text with audio tools.
 - Use scribes or augmentative communication devices when required.
-

Students with 504 Plans

- Follow the 504 plan.
 - Provide extended time for labs, projects, and assessments.
 - Offer small-group or quiet testing environments.
 - Accept oral or dictated responses.
 - Provide large-print, Braille, or digital text with audio features.
 - Allow use of a scribe or communication device.
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Students at Risk of School Failure

- Use visuals, real objects, and demonstrations for science concepts.
- Pre-teach vocabulary and connect it to real-life examples.
- Provide step-by-step directions and frequent check-ins.

- Offer small-group instruction with guided practice.
 - Break down experiments and projects into smaller tasks.
 - Assign peer support for collaborative activities.
 - Provide preferential seating and structured routines.
 - Give frequent feedback and encouragement.
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Gifted and Talented

- Ask open-ended questions to promote higher-order thinking.
 - Encourage independent investigations and research projects.
 - Provide enrichment tasks, such as STEM challenges or experiments beyond grade-level.
 - Offer advanced reading materials and videos on science topics.
 - Group flexibly for inquiry projects and debates.
 - Allow choice in projects, reports, or presentations.
 - Provide opportunities for cross-curricular connections (e.g., math in data analysis, ELA in lab reports).
 - Encourage reflection and presentation of findings to peers.
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Multilingual Learners

- Collaborate with ESL/MLL teachers.
 - Provide small-group instruction and partner learning.
 - Pre-teach and revisit vocabulary with visuals and realia (objects, pictures).
 - Use bilingual glossaries or picture dictionaries.
 - Provide sentence frames and discussion stems for lab work.
 - Scaffold writing with graphic organizers and labeled diagrams.
 - Allow extended time and oral responses.
 - Use recorded directions, audio supports, or captioned videos.
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Diversity and Inclusion

- Respect and include cultural traditions and perspectives in science examples.
- Provide alternative formats for assignments (oral, visual, or hands-on projects).
- Use visuals, diagrams, and clear, direct language.
- Avoid slang and idioms; use precise science vocabulary.
- Collaborate with support staff and cultural liaisons.
- Create an inclusive, respectful classroom environment.
- Provide sufficient wait time before calling on students.
- Build positive relationships with families and invite them into science learning.

Supplemental Resources

Instructional Material -

Mystery Science Unit Plans

www.mysteryscience.com

Supplement Materials

www.brainpopjr.com

www.flocabiulary.com

PebbleGo:

- Pebble Go Next topics: tornadoes, hurricanes, floods, blizzards, clouds, climate types, droughts, weather patterns, wild fires

www.readinga-z.com

Mentor Texts

- Super Storms (Level K)
- Twisters (Level L)
- Lightning: Its Electrifying (Level M)
- Flash, Crash, Rumble, and Roll (Level N)
- Tornado (Level O)
- Electric Storm (Level P)
- Flood and Monsoon Alert (Level R)
- Global Warming Alert (Level R)
- Wicked and Wonderful Water
- Tornado: Nature in Action (Level T)
- Violent Volcanoes (Level S-W)
- White Out: Blizzards (Level S-W)
- Avalanches (Level S-W)

Intervention Materials

- Vocabulary list
- Anchor charts
- Lower text in reading a-z
- Think pair share
- Learning stations
- Tic tac toe boards/choice boards

Teacher Notes