

Ocean Academy Charter School
Curriculum Guide
Grade 1 - Science



Original Adoption:	August 2025
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OCEAN ACADEMY CHARTER SCHOOL Science Curriculum	
Content Area: Science	
Course Title: Science	
Grade Level: Grade 1	
Unit Title	Pacing Guide in Days
Unit Plan 1: Space Systems: Patterns and Cycles Climate Change	30 Days
Unit Plan 2: Light, Waves, Sound Climate Change	30 Days
Unit Plan 3: Structure, Functions, and Information Processing Climate Change	30 Days
Unit Plan 4: Engineering and Designing Climate Change	Ongoing

OCEAN ACADEMY CHARTER SCHOOL Unit 1 Overview	
Content Area: Science	
Unit Title: Space Systems: Patterns and Cycle	
Target Course/Grade Level: Grade 1	
Introduction/Unit Focus	

In this unit, students will explore objects in the sky, such as the sun and moon, and observe how they appear to move in predictable patterns. These movements help us understand important natural events, including the changing of the four seasons.

Students will also investigate how the sun creates shadows that change throughout the day, learning to observe and describe these patterns. Through these observations, students will develop a deeper awareness of the relationship between the sky's movements and the world around them.

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

1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.

1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year

Science and Engineering Practices Planning and Carrying out Investigations	Discipline Core Ideas/Unit Enduring Understandings ESS1.A: The Universe and its Stars	Crosscutting Concepts Patterns Patterns in the natural world can be observed,
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<p>Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2)</p>	<p>Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1)</p>	<p>used to describe phenomena, and used as evidence. (1-ESS1-1), (1-ESS1-2)</p> <p>Connections to Nature of Science</p> <p>Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes natural events happen today as they happened in the past. (1-ESS1-1) Many events are repeated. (1-ESS1-1)</p>
<p>Analyzing and Interpreting Data</p> <p>Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)</p>	<p>ESS1.B: Earth and the Solar System</p> <p>Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)</p>	
<p>New Jersey Student Learning Standards: Interdisciplinary Connections https://www.nj.gov/education/cccs</p>		
<p>ELA /Literacy</p>		
<p>W.SE.1.6. With guidance and support from adults, gather and select information from multiple sources to answer a question or write about a topic. (1-ESS1-1),(1-ESS1-2)</p>		
<p>W.WR.1.5. With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic. . (1-ESS1-1),(1-ESS1-2)</p>		
<p>Math</p>		
<p>MP.2 Reason abstractly and quantitatively. (1-ESS1-2)</p>		
<p>MP.4 Model with mathematics. (1-ESS1-2)</p>		

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MP.5 Use appropriate tools strategically. (1-ESS1-2)	
1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)	
1.DL.A.1 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2)	
New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills	
Core Ideas	Performance Expectations (Identified with Standard Number and statement)
Career Awareness and Planning: Different types of jobs require different knowledge and skills	9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job
Digital Citizenship: Young people can have a positive impact on the natural world in the fight against climate change.	9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).
Creativity and Innovation Brainstorming can create new, innovative ideas	9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2). 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)
New Jersey Student Learning Standards: Computer Science and Design Thinking	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Computing Systems: Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.	8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
Data & Analysis Data can be used to make predictions about the world.	8.1.2.DA.3: Identify and describe patterns in data visualizations. 8.1.2.DA.4: Make predictions based on data using charts or

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	graphs
New Jersey Student Learning Standards: Climate Change Mandate	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Sunlight warms Earth’s surface	<p>K-PS3-1: Make observations to determine the effect of sunlight on Earth’s surface.</p> <p>K-PS3-2: Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.</p>
Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.	K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Knowledge and Skills
<p>Unit Learning Targets (Objectives): <i>Students will be able to...</i></p> <ul style="list-style-type: none"> ➤ Identify the sun, moon, and stars ➤ Make observations—both firsthand and through media—to collect data for comparisons ➤ Use observations to describe patterns in the natural world and answer scientific questions ➤ Observe and measure the sun’s position in the sky and describe how shadows change throughout the day ➤ Predict how the earth and moon move in the sky ➤ Locate where the sun and moon will appear in the sky and describe the similarities and differences between seasons
<p>Unit Enduring Understandings: <i>Students will know...</i></p> <ul style="list-style-type: none"> ➤ The sun, moon, and stars move in patterns that can be observed, described, and predicted. ➤ Seasonal changes affect patterns of sunrise and sunset, which can also be observed, described, and predicted.

Unit Essential Questions:

- What predictable patterns result from the motion of the sun, moon, and stars?
- How does the amount of daylight change throughout the year?

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.

[Grade 1 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:**

- Pebble Go
 - Click on Science: Earth and Space Science
 - Lessons: (all lessons also have Read More section for furthering instruction)
 - Exploring Space- Astronauts, First Moon Landing, Satellites, Space Craft, Telescopes
 - Our Solar System- Meteors and Asteroids, Moon, Moon Phases, Planets, Sun, What is the Solar System
 - Planets
 - Stars

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- Sun, Moon, & Stars Unit
 - **Lesson 1 (under Sun and Shadows): Sun, Shadows, & Daily Patterns (Activity: Moving Shadows)**

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- Read- Along Lesson 2 (under Sun and Shadows): Sun, Shadows, & Daily Patterns (Activity: Trace Your Shadow)
- Lesson 3 (under and Sun and Shadows): Sun & Daily Patterns (Activity: Sun Finder)
- Read-Along Lesson 4: Daylight & Seasonal Patterns (Activity: Summer Sunshine Reader)
- Lesson 2 (under Moon and Stars): Stars & Daily Patterns (Activity: Star Projector)
- Read-Along Lesson 3 (under Moon and Stars): Stars & Seasonal Patterns (Activity: Where is North?)

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:**

- **Pebble Go:** Each lesson has an activity option at the bottom- hands on lesson (experiment), questions for understanding, share what you know (exit ticket)

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: Sun and Shadows and Moon & Stars Unit
 - Reading Extensions:
 - Lesson 1: What Makes a Shadow? By Clyde Robert Bulla
 - Lesson 3: The Sun is My Favorite Star, by Frank Asch
 - Lesson 2: Why don't we see stars in the daytime?

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science: Moon, & Stars Unit and Sun and Shadows Unit
 - Sun and Shadows Unit:
 - Lesson 1: Sun, Shadows, & Daily Patterns Assessment
 - Read- Along Lesson 2: Sun, Shadows, & Daily Patterns Assessment
 - Lesson 3: Sun & Daily Patterns Assessment
 - Moon and Stars Unit:
 - Read-Along Lesson 4: Daylight & Seasonal Patterns Assessment
 - Lesson 2: Stars & Daily Patterns Assessment
 - Read-Along Lesson 3: Stars & Seasonal Patterns Assessment

- PebbleGo- Check for Understanding (activity)

Evidence of Learning

Formative Assessments:

- Graphic Organizers
- Guided Note Taking
- Guided Reading
- Cooperative Group Learning
- Class Participation
- Science notebook Entries
- Teacher Observation

Summative Assessments

- Projects
- Mystery Science Assessments
- PebbleGo Activities
- Brainpopjr. Quizzes

Benchmark Assessments:

- (Include performance tasks that demonstrate students meeting the standards.)
- RST- Research Simulation Task
- Associated Unit tests
- Labs and engineering based projects

Alternative Assessments

- Projects

Performance Tasks:

- Experiments
- Engineering and Design Projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, manipulatives, and hands-on models.
- Pre-teach and review key vocabulary.
- Provide picture word banks and visual glossaries.
- Use small-group or one-on-one instruction.
- Assign peer tutoring or a “buddy” for lab activities.
- Read aloud directions; model steps for experiments.
- Use chants, songs, or gestures to reinforce science terms.
- Provide preferential seating near teacher or materials.
- Allow extra time for labs, projects, or assessments.

- Accept oral or dictated responses in place of written work.
 - Shorten or modify assignments when needed.
 - Use large-print materials, Braille, or digital/audio text.
 - Provide scribes or augmentative communication devices if needed.
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Students with 504 Plans

- Follow the 504 plan.
 - Provide extra time for assignments, labs, or tests.
 - Offer small-group or quiet settings for work.
 - Allow oral or dictated responses.
 - Provide large-print, Braille, or digital text with audio support.
 - Use scribes or communication devices when required.
-

Students at Risk of School Failure

- Use visuals, real objects, and simple demonstrations.
 - Pre-teach and revisit key science vocabulary.
 - Provide step-by-step directions and check for understanding.
 - Offer small-group instruction and guided practice.
 - Use peer support during activities.
 - Provide preferential seating.
 - Break down experiments or projects into smaller, manageable steps.
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Gifted and Talented

- Ask open-ended, higher-level science questions (“Why do you think...?”, “What would happen if...?”).
 - Encourage discovery learning and independent investigations.
 - Offer interest-based extension projects.
 - Provide advanced science texts, videos, or enrichment tasks.
 - Use flexible grouping for inquiry activities.
 - Provide options and choice in how to show learning.
 - Include enrichment centers, experiments, or STEM challenges.
 - Encourage reflection and sharing of findings.
-

Multilingual Learners

- Collaborate with ESL/MLL teachers.

- Provide small-group or partner science activities.
 - Pre-teach vocabulary using pictures, labels, and real objects.
 - Use gestures, visuals, and graphic organizers to explain concepts.
 - Provide bilingual or picture glossaries when possible.
 - Offer sentence frames for lab discussions (e.g., “I observed ___”).
 - Allow oral responses and extended time.
 - Use audio or recorded directions to support comprehension.
-

Diversity and Inclusion

- Respect and integrate cultural traditions in science examples.
- Involve families in projects and activities.
- Provide alternative assignments when appropriate.
- Use visuals and clear, simple language.
- Collaborate with support staff and language professionals.
- Create a structured, inclusive classroom environment.
- Provide wait time before calling on students to ensure participation.
- Build positive connections with families and caregivers.

Supplemental Resources

Instructional Materials

Mystery Science Unit plan

www.mysteryscience.com

[Exploring Science Grade 1](#)

- Earth Science: pgs. 108-153R

Supplemental Materials

www.readinga-z.com

www.brainpop.com

PebbleGo

Mentor Texts:

- Look At The Sky (Level B)
- Shadow Change (Level B)
- Our Earth (Level D)
- The Force Of Gravity (Level D)

Intervention Materials

- www.readinga-z.com
- Vocabulary List
- Anchor Charts
- Think Pair Share
- Stations

➤ Choice Board

Teacher Notes

**OCEAN ACADEMY CHARTER SCHOOL
Unit 2 Overview**

Content Area: Science

Unit Title: Lights, Waves, Sound

Duration: 30 Days

Target Course/Grade Level: Grade 1

Introduction/Unit Focus:

In this unit, students will explore the relationship between sound and vibration, discovering that sound is produced when objects vibrate and that vibrations can create sound. They will learn how people use different devices to communicate using sound.

Students will also investigate light, learning that some objects produce their own light while others are seen because they reflect light. They will observe how light can travel through certain materials, while other objects block light and create shadows. Through these explorations, students will develop an understanding of how sound and light behave in the world around them.

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.

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<p>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.”</p>		
<p>Focus Standards (Major Standards) https://www.nj.gov/education/cccs</p>		
<p>Content Standards: New Jersey Student Learning Standards for Science</p>		
<p>1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate</p>		
<p>1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated.</p>		
<p>1-PS4-3 Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</p>		
<p>1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</p>		
<p>Science and Engineering Practices</p>	<p>Discipline Core Ideas/Unit Enduring Understandings</p>	<p>Crosscutting Concepts</p>
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <p>Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1), (1- PS4-3)</p>	<p>PS4.A: Wave Properties Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)</p>	<p>Cause and Effect Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1), (1-PS4-2), (1-PS4-3)</p>
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K-2 builds on prior experiences and</p>	<p>PS4.B: Electromagnetic Radiation Objects can be seen if light is available to illuminate</p>	<p>Connections to Engineering, Technology, and Applications of Science</p>

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<p>progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <p>Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-PS4-2)</p> <p>Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)</p>	<p>them or if they give off their own light. (1- PS4-2)</p> <p>Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (1-PS4-3)</p>	<p>Influence of Engineering, Technology, and Science, on Society and the Natural World</p> <p>People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)</p>
	<p>PS4.C: Information Technologies and Instrumentation</p> <p>People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)</p>	<p>Connections to Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <p>Science investigations begin with a question. (1-PS4-1) Scientists use different ways to study the world. (1-PS4-1)</p>

New Jersey Student Learning Standards: Interdisciplinary Connections
<https://www.nj.gov/education/cccs>

ELA/Literacy

W.IW.1.2. With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.

- A. Introduce a topic.
- B. Develop the topic with facts or other information and examples related to the topic.
- C. Provide a conclusion.

W.WR.1.5. With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic. (1-PS4-1), (1-PS4-2), (1-PS4-3), (1-PS4-4)

SL.II.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media. (1-PS4-1), (1-PS4-2), (1-PS4-3)

SL.PE.1.1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1), (1-PS4-2), (1-PS4-3)

- A. Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
- B. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.

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C. Ask questions to clear up any confusion about the topics and texts under discussion.	
Math	
MP.5 Use appropriate tools strategically. (1-PS4-4)	
1.M.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4)	
1.M.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-PS4-4)	
New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills	
Core Ideas	Performance Expectations (Identified with Standard Number and statement)
Creativity and Innovation Brainstorming can create new, innovative ideas	9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2). 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a)
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Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.	K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Knowledge and Skills

Unit Learning Targets (Objectives):

Students will be able to...

- Identify sources of sound and light
- Use flashlights to explore how light passes through different materials and create shadow puppets
- Create sounds with various pitches using objects or instruments
- Begin investigations by asking questions
- Make observations firsthand or through media to explain natural phenomena
- Plan and conduct collaborative investigations to collect evidence that answers questions
- Use tools and materials to design devices that solve specific problems

Unit Enduring Understandings:

Students will know...

- Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)
- Objects can be seen if light is available to illuminate them or if they give off their own light. (1- PS4-2)
- Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (1-PS4-3)
- People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)

Unit Essential Questions:

- How and why do materials create sound through vibration?
- How and why does sound cause materials to vibrate?
- How does light and where it is located affect our ability to see objects?
- What are different ways you can communicate over a distance using light and/or sound?

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.

[Grade 1 Science Resources](#)

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prepare students for the day's learning. This is also known as an advance organizer, hook, or set induction.

➤ **Resources:**

- Pebble Go- Physical Science
 - Light
 - Matter
 - Sound

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- Lights and Sounds: Light, Sound, Communication Unit
 - Lesson 1: Sounds & Vibrations (Activity: Be a Sound Effects Artist)
 - Read- Along Lesson 2: Sounds & Vibrations (Activity: Head Harp)
 - Lesson 3: Light, Materials, Transparent & Opaque (Activity: Paper Stained Glass)
 - Read-Along Lesson 4: Light & Illumination (Activity: Dark Box)
 - Lesson 5: Light, Communication, & Engineering (Activity: Secret Signals)
 - Read-Along Lesson 6: Light, Sounds, & Communication (Activity: Navigating by Sights and Sounds)

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:**

- Pebble Go: Physical Science- Each lesson has an activity option at the bottom-hands on lesson (experiment), questions for understanding, share what you know (exit ticket)

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: Lights & Sounds: Light, Sound, & Communication Unit
 - Reading Extensions:
 - Lesson 1: The Little Old Lady Who Was Not Afraid of Anything By Linda Williams

- Lesson 3: Playing with Light and Shadows, Sensing Light and Sound, Sending Messages with Light and Sound,
- Lesson 5: *It's a Firefly Night* by Dianne Ochiltree

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- Mystery Science: Lights & Sounds: Light, Sound, & Communication Unit
 - Lesson 1: Sounds & Vibrations Assessment
 - Read- Along Lesson 2: Sounds & Vibrations Assessment
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- PebbleGo Activities

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers
- Guided Note Taking
- Guided Reading
- Cooperative Group Learning
- Class Participation
- Science notebook Entries
- Teacher Observation

Summative Assessments:

- Projects
- Mystery Science Assessments
- PebbleGo Assessments
- Brainpopjr. Quizzes

Benchmark Assessments:

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

Alternative Assessments

- Projects

Performance Tasks:

- Experiments
- Engineering and Design Projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
 - Use visuals, manipulatives, and hands-on models.
 - Pre-teach and review key vocabulary.
 - Provide picture word banks and visual glossaries.
 - Use small-group or one-on-one instruction.
 - Assign peer tutoring or a “buddy” for lab activities.
 - Read aloud directions; model steps for experiments.
 - Use chants, songs, or gestures to reinforce science terms.
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 - Allow extra time for labs, projects, or assessments.
 - Accept oral or dictated responses in place of written work.
 - Shorten or modify assignments when needed.
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Students with 504 Plans

- Follow the 504 plan.
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 - Offer small-group or quiet settings for work.
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Students at Risk of School Failure

- Use visuals, real objects, and simple demonstrations.
 - Pre-teach and revisit key science vocabulary.
 - Provide step-by-step directions and check for understanding.
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 - Use peer support during activities.
 - Provide preferential seating.
 - Break down experiments or projects into smaller, manageable steps.
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Gifted and Talented

- Ask open-ended, higher-level science questions (“Why do you think...?”, “What would

happen if...?”).

- Encourage discovery learning and independent investigations.
- Offer interest-based extension projects.
- Provide advanced science texts, videos, or enrichment tasks.
- Use flexible grouping for inquiry activities.
- Provide options and choice in how to show learning.
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- Encourage reflection and sharing of findings.

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- Collaborate with ESL/MLL teachers.
- Provide small-group or partner science activities.
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- Provide bilingual or picture glossaries when possible.
- Offer sentence frames for lab discussions (e.g., “I observed ___”).
- Allow oral responses and extended time.
- Use audio or recorded directions to support comprehension.

Diversity and Inclusion

- Respect and integrate cultural traditions in science examples.
- Involve families in projects and activities.
- Provide alternative assignments when appropriate.
- Use visuals and clear, simple language.
- Collaborate with support staff and language professionals.
- Create a structured, inclusive classroom environment.
- Provide wait time before calling on students to ensure participation.
- Build positive connections with families and caregivers.

Supplemental Resources

Instructional Materials

Exploring Science Textbook Grade 1

- Physical Science: pgs 2-39

Mystery Science Unit plan

www.mysteryscience.com

Supplemental Materials

Read Alouds for Sound and Light:

- *All About Sound* by Lisa Trumbauer
- *All About Light* by Lisa Trumbauer
- *Shadows and Reflections* by Daniel Nunn
- *Groundhog's Day* by Gail Gibbons
- *The Listening Walk* by Paul Showers
- *Light is All Around Us* by Wendy Pfeffer
- *Nothing Sticks Like a Shadow* by Ann Tompert
- *Shadows* by Carolyn B. Otto

Suggested Activities:

- Sound hunt-put objects in boxes (money, bell, cotton balls, crayons etc) and students shake the box and predict what is in their
- Work with a partner to trace shadows outside
- BrainPop Jr.: Light, sound.
- Discuss Groundhogs Day and the results of the shadow
- Experiment The Shine Study -To demonstrate opaque: shine light into bottom of can, To demonstrate translucent: shine light through a translucent lid, To demonstrate transparent: shine light through transparent lid or plastic wrap
- Writing Activity *Spotlight on Learning*- write about what he/she learned about light
- Take a listening walk in and around the building.
- Make a kazoo or paper cup telephone.
- Make instruments out of recyclable items.
- Use flashlights to reflect light off of mirrors.
- Use flashlights to shine on various mediums to test for transparency.
- Use tuning forks to make sounds of various pitches.
- Use flashlights to make shadow puppets.

Intervention Materials:

- www.readinga-z.com
- Vocabulary List
- Anchor Charts
 - Create an anchor chart What Gives off Light? Or What Gives off Sound?
- Think Pair Share
- Stations
- Choice Board

Teacher Notes

Unit 3 Overview

Content Area: Science

Unit Title: Structure, Functions, and Information Processing (Plants and Animals)

Duration: 30 Days

Target Course/Grade Level: Grade 1

Introduction/Unit Focus:

In this unit, students will explore how plants and animals use their external parts to survive, grow, and meet their basic needs. They will learn that these structures, such as roots, stems, legs, tails, and ears have specific functions that help living things stay alive in their environments.

Students will also investigate how certain behaviors of parents and their offspring support the survival of the young. Through observation and comparison, students will begin to understand that while young plants and animals often resemble their parents, they are not exactly the same.

This unit builds foundational knowledge of the ways living things grow, adapt, and care for their young in order to thrive.

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

1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs

1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

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Curriculum Guide
Grade 1 - Science

1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.		
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K-2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <p>Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)</p>	<p>LS1.A: Structure and Function All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)</p>	<p>Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2)</p>
<p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information</p> <p>Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)</p>	<p>LS1.B: Growth and Development of Organisms Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)</p>	<p>Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)</p>
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K-2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions</p> <p>Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)</p>	<p>LS1.D: Information Processing Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)</p>	<p>Influence of Engineering, Technology, and Science on Society and the Natural World Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1)</p>

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Grade 1 - Science

	<p>LS3.A: Inheritance of Traits Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1- LS3-1)</p>	<p><i>Connections to Nature of Science</i> Scientific Knowledge is Based on Empirical Evidence Scientists look for patterns and order when making observations about the world. (1-LS1-2)</p>
	<p>LS3.B: Variation of Traits Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)</p>	<p>Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)</p>

New Jersey Student Learning Standards: Interdisciplinary Connections
<https://www.nj.gov/education/cccs>

ELA/Literacy

W.IW.1.2. With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.

- A. Introduce a topic.
- B. Develop the topic with facts or other information and examples related to the topic.
- C. Provide a conclusion.

W.WR.1.5. With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic. (1-PS4-1),(1-PS4-2),(1-PS4-3),(1-PS4-4)

SL.II.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media. (1-PS4-1),(1-PS4-2),(1- PS4-3)

SL.PE.1.1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1),(1-PS4-2),(1- PS4-3)

- A. Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
- B. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
- C. Ask questions to clear up any confusion about the topics and texts under discussion.

Mathematics

MP.2 Reason abstractly and quantitatively. (1-LS3-1)

MP.5 Use appropriate tools strategically. (1-LS3-1)

1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$; (1-LS1-2)

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and

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subtraction; relate the strategy to a written method and explain the reasoning uses. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1-LS1-2)	
1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. (1-LS1-2)	
1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. (1-LS1-2)	
1.M.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS3-1)	
New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills	
Core Ideas	Performance Expectations (Identified with Standard Number and statement)
Creativity and Innovation Brainstorming can create new, innovative ideas	9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2). 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
Critical Thinking and Problem-solving :Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2). 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive)
Digital Citizenship: Individuals should practice safe behaviors when using the Internet	9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
New Jersey Student Learning Standards: Computer Science and Design Thinking	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Computing Systems: Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.	8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
New Jersey Student Learning Standards: Climate Change Mandate	

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Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
<ul style="list-style-type: none"> ➤ Plants and animals can change their environment. ➤ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. 	K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.	K-ESS3-1: Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
<ul style="list-style-type: none"> ➤ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. ➤ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. 	K-ESS3-3: Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.

Knowledge and Skills
Unit Learning Targets (Objectives):

Students will be able to...

- Recognize how young plants and animals are similar to, and different from, their parents
- Identify how animals and plants have adapted to their environments to meet their needs for survival
- Make firsthand or media-based observations to build explanations for natural phenomena
- Use materials to design a device or solution to solve a specific problem
- Read grade-level texts and use media to gather scientific information and identify patterns in nature
- Understand that scientists look for patterns and order when observing the natural world

Unit Enduring Understandings:

Students will know...

- All living things have external parts that help them survive, grow, and meet their needs.
- Different animals use their body parts in unique ways to see, hear, move, get food and water, and stay safe.
- Plants have specific parts—such as roots, stems, leaves, flowers, and fruits—that help them grow and survive.
- Adult plants and animals can have young, and in many animals, both parents and offspring have behaviors that support survival.
- Animals use body parts to gather and respond to information from their environment in ways that help them grow and survive.
- Plants also respond to some external signals in their environment.
- Young plants and animals closely resemble their parents but are not exactly the same.
- Individuals of the same species can look similar but also have many differences.

Unit Essential Questions:

- How do plants and animals use their external parts to survive, grow, and meet their needs?
- What behaviors do parents and offspring show that help the offspring survive?
- In what ways are young plants and animals alike—but not exactly like—their parents?
- How do plants and animals meet their basic needs in order to survive and grow?
- How are parents and their young 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.

[Grade 1 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:**

- PebbleGo- Life Sciences
 - Plants
 - Animals
 - Living and Nonliving
 - Adaptations
 - Food Chains and Webs

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- Plant & Animal Unit

Animal Superpowers Unit

- Lesson 2: Animal Structures & Survival (Activity: Find the Best Beak)
- Read- Along Lesson 2: Animal Behavior & Offspring Survival (Activity: What's Going On?)
- Lesson 4: Camouflage & Animal Survival (Activity: Moth Hide and Seek)
- Read-Along Lesson 5: Inheritance & Variation of Traits (Activity: Matchup Game)

Plant Superpowers Unit

- Lesson 1: Plant Survival & Engineering (Activity: Wind-Proof Umbrella)
- Read-Along Lesson 3: Plant Movement & Survival (Activity: Plants on the Move)

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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: Plant & Animal Superpowers Unit**
 - Reading Extensions:
 - Lesson 1: *Quack Like A Duck, Animals on the Farm: Ducks, I Love You Just Enough*
 - Lesson 3: "Animals of the Arctic," "Meet Some Owls" and "A Fawn in the Forest"
 - Lesson 5: *The Most Magnificent Thing* by Ashley Spires

Evaluate: Assess student understanding of learning objective

➤ **Resources:**

- **Mystery Science: Plant & Animal Superpowers Unit**
 - Animals Superpowers Unit:
 - Lesson 1: Animal Structures & Survival Assessment
 - Read- Along Lesson 2: Animal Behavior & Offspring Survival Assessment
 - Lesson 4: Camouflage & Animal Survival Assessment
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- PebbleGo Activities

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 - Encourage reflection and sharing of findings.
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- Use visuals and clear, simple language.
- Collaborate with support staff and language professionals.
- Create a structured, inclusive classroom environment.
- Provide wait time before calling on students to ensure participation.
- Build positive connections with families and caregivers.

Supplemental Resources

Instructional Materials

- Mystery Science Unit Plan
- Exploring Science Textbook Grade 1
 - Life Science: plants pgs. 40-71
 - Life Science: animals pgs. 72-107

Supplemental Materials

- Mentor Text Available in Book Closets:
 - Animals in Hiding (Level H)
 - Animals and the Environment (Level I)
 - 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)
- Read Alouds
 - What if You had Animal Ears* by Sandra Markle
 - What if You had Animal Teeth* by Sandra Markle
 - What if You had Animal Feet* by Sandra Markle
 - What if You had Animal Hair* by Sandra Markle
 - What if You had an Animal Nose* by Sandra Markle
 - Goodnight, Grizzle Grump!* by Aaron Blecha
 - Hibernation Station* by Michelle Meadows
 - When it Starts to Snow* by Phillis Gershator
 - When it Starts to Snow* by Phillis Gershator
 - National Geographic Readers from Seed to Plant* by Kristin Baird Rattini
 - From Seed to Plant* by Gail Gibbons
 - The Tiny Seed* by Eric Carle
- Suggested Activities:
 - Design a shield to protect a stuffed animal using various mediums and materials
 - Engineer their very own animal dens using various mediums and materials (cotton, marshmallows, toothpicks, shoe boxes, construction paper, twigs, etc.) Collect materials prior to this activity.
 - Blubber Experiment- STEP 1: Fill a large bowl with ice and cold water. STEP 2: Turn a ziplock bag inside out, place the bag on your hand, and use a spatula to cover both sides of the bag in vegetable shortening. STEP 3: Place the shortening coated bag inside another bag and seal.
 - Brain Pop Jr. videos : Animal/plant adaptations for survival: hibernation (Animal Hibernation), (Animal Migration)
 - Plant Seeds, observe each stage of the growth and record in science notebook
 - Create an anchor chart Needs of Plants and Parts of Plants
 - BrainPop Jr Videos: Parts of a Plant, Plant Life Cycle
 - Students to dissect a flower and tape/glue its parts to activity sheet
 - Taste test- Discuss each part of plant and taste (sunflower seeds, carrots, lettuce, celery, broccoli)

<p>Intervention Materials</p> <ul style="list-style-type: none"> ➤ Reading A-Z lower leveled text ➤ Vocabulary List ➤ Anchor Charts ➤ Think Pair Share ➤ Stations ➤ Choice Board

Teacher Notes

OCEAN ACADEMY CHARTER SCHOOL	
Unit 4 Overview	
Content Area: Science	
Unit Title: Engineering and Design	Duration: Ongoing
Target Course/Grade Level: Grade 1	
Introduction/Unit Focus	
<p>Learn about an engineer and it’s job description. Make observations and ask questions to find more information about a problem. Design and build a solution using various tools to develop or improve an object. Test, analyze and reflect on solutions.</p>	
Disciplinary Concepts for the Unit	
<p>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.</p> <p>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.</p> <p>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.</p>	

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

K-2-ETS-1-1-Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2-Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3-Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in K-2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> ➤ Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) ➤ Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) <p>Developing and Using Models Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> ➤ Develop a simple model based on evidence to represent a proposed object or tool. 	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> ➤ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ➤ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ➤ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) 	<ul style="list-style-type: none"> ➤ The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

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<p>(K-2-ETS1-2)</p> <p>Analyzing and Interpreting Data Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <p>Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)</p>	<p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> ➤ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2) <p>ETS1.C: Optimizing the Design Solution</p> <p>Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)</p>	
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New Jersey Student Learning Standards: Interdisciplinary Connections
<https://www.nj.gov/education/cccs>

ELA/Literacy

W.IW.1.2. With prompts and support, write informative/explanatory texts to examine a topic and convey ideas and information.

- D. Introduce a topic.
- E. Develop the topic with facts or other information and examples related to the topic.
- F. Provide a conclusion.

W.WR.1.5. With prompting and support, generate questions through shared research about a topic and determine possible sources to obtain information on that topic. (1-PS4-1),(1-PS4-2),(1-PS4-3),(1-PS4-4)

SL.II.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media. (1-PS4-1),(1-PS4-2),(1- PS4-3)

SL.PE.1.1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1),(1-PS4-2),(1- PS4-3)

- D. Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
- E. Build on others’ talk in conversations by responding to the comments of others through multiple exchanges.

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F. Ask questions to clear up any confusion about the topics and texts under discussion.	
Career Awareness and Planning: Different types of jobs require different knowledge and skills	9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job
Critical Thinking and Problem-solving : Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGl.2). 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive)
New Jersey Student Learning Standards: Computer Science and Design Thinking	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
Computing Systems: Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.	8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions	8.2.2.ED.1: Communicate the function of a product or device. 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.
Limitations (constraints) must be considered when engineering designs	8.2.2.ED.4: Identify constraints and their role in the engineering design process
New Jersey Student Learning Standards: Climate Change Mandate	
Core Ideas	Performance Expectations (Identified with Standard Number and Statement)
A situation that people want to change or create can be approached as a problem to be solved through engineering. Asking questions, making observations, and gathering information are helpful in thinking	K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.

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about problems. Before beginning to design a solution, it is important to clearly understand the problem.	
Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.	K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Knowledge and Skills

Unit Learning Targets (Objectives):

Students will be able to...

- Ask questions based on observations to find more information about the natural and/or designed world(s).
- Define a simple problem that can be solved through the development of a new or improved object or tool.
- Develop a simple model based on evidence to represent a proposed object or tool.
- Analyze data from tests of an object or tool to determine if it works as intended.

Unit Enduring Understandings:

Students will know...

- Engineering helps solve problems when people want to change or create something new.
- Asking questions, making observations, and gathering information are important steps to understand problems better.
- It is essential to fully understand the problem before starting to design a solution.
- Sketches, drawings, and physical models are useful ways to communicate design ideas to others.

Unit Essential Questions:

- How do asking questions, gathering information, and making observations help us understand problems?
- How does sketching or creating a model help solve a problem?
- How does testing a model reveal its strengths and weaknesses in solving a problem?

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.

[Grade 1 Science Resources](#)

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

(See STEAM Lab activities)

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.

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.

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

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

Evidence of Student Learning

Formative Assessments:

- Graphic Organizers
- Guided Note Taking
- Guided Reading
- Cooperative Group Learning
- Class Participation
- Science notebook Entries

- Teacher Observation

Summative Assessments:

- Projects
- Mystery Science Assessments
- PebbleGo Assessments
- Brainpopjr. Quizzes

Benchmark Assessments:

- (Include performance tasks that demonstrate students meeting the standards.)
- RST- Research Simulation Task
- Associated Unit tests
- Labs and engineering based projects

Alternative Assessments:

- Projects

Performance Tasks:

- Experiments
- Engineering and Design Projects

Suggested Options for Differentiation and Modifications

Special Education

- Follow all IEP modifications.
- Use visuals, manipulatives, and hands-on models.
- Pre-teach and review key vocabulary.
- Provide picture word banks and visual glossaries.
- Use small-group or one-on-one instruction.
- Assign peer tutoring or a “buddy” for lab activities.
- Read aloud directions; model steps for experiments.
- Use chants, songs, or gestures to reinforce science terms.
- Provide preferential seating near teacher or materials.
- Allow extra time for labs, projects, or assessments.
- Accept oral or dictated responses in place of written work.
- Shorten or modify assignments when needed.
- Use large-print materials, Braille, or digital/audio text.
- Provide scribes or augmentative communication devices if needed.

Students with 504 Plans

- Follow the 504 plan.
- Provide extra time for assignments, labs, or tests.

- Offer small-group or quiet settings for work.
 - Allow oral or dictated responses.
 - Provide large-print, Braille, or digital text with audio support.
 - Use scribes or communication devices when required.
-

Students at Risk of School Failure

- Use visuals, real objects, and simple demonstrations.
 - Pre-teach and revisit key science vocabulary.
 - Provide step-by-step directions and check for understanding.
 - Offer small-group instruction and guided practice.
 - Use peer support during activities.
 - Provide preferential seating.
 - Break down experiments or projects into smaller, manageable steps.
-

Gifted and Talented

- Ask open-ended, higher-level science questions (“Why do you think...?”, “What would happen if...?”).
 - Encourage discovery learning and independent investigations.
 - Offer interest-based extension projects.
 - Provide advanced science texts, videos, or enrichment tasks.
 - Use flexible grouping for inquiry activities.
 - Provide options and choice in how to show learning.
 - Include enrichment centers, experiments, or STEM challenges.
 - Encourage reflection and sharing of findings.
-

Multilingual Learners

- Collaborate with ESL/MLL teachers.
 - Provide small-group or partner science activities.
 - Pre-teach vocabulary using pictures, labels, and real objects.
 - Use gestures, visuals, and graphic organizers to explain concepts.
 - Provide bilingual or picture glossaries when possible.
 - Offer sentence frames for lab discussions (e.g., “I observed ___”).
 - Allow oral responses and extended time.
 - Use audio or recorded directions to support comprehension.
-

Diversity and Inclusion

- Respect and integrate cultural traditions in science examples.
- Involve families in projects and activities.
- Provide alternative assignments when appropriate.
- Use visuals and clear, simple language.
- Collaborate with support staff and language professionals.
- Create a structured, inclusive classroom environment.
- Provide wait time before calling on students to ensure participation.
- Build positive connections with families and caregivers.

Supplemental Resources

Instructional Materials

See Grade 1, Science Units 1-3

Supplemental Materials

Mentor Text Available in Book Closets:

- Scientists Ask Questions (Level I)
- Making Things Move (Level H)
- Lever, Screw, and Inclined Plane: The Power of a Simple Machine Roller Coaster

Read Alouds:

- *Rosie Revere Engineer* by Andrea Beaty
- *How to be an Engineer* by Carol Voderman
- *Iggly Peck Architect* by Andrea Beaty and David Roberts
- *If I Build a House* by Chris Van Dusen
- *13 Bridges Children Should Know* by Brad Finger

Suggested Activities:

- Design and build an igloo for winter
- Design and build a basket for eggs
- Design and build a bridge for the Gingerbread Man to cross the river
- Design and build a new character to a story
- Design and build a car for the turkey to escape
- Design and build a boat for the Pilgrims

Intervention Materials

Think Pair Share

Break Down Directions

Stations

Partner Work

Teacher Notes

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