

Ocean Academy Charter School  
Curriculum Guide  
Kindergarten - Science



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| <b>Original Adoption:</b> | August 2025                      |
| <b>Created by:</b>        | Amy LaBarca and Dariaknna Yencer |

| OCEAN ACADEMY CHARTER SCHOOL<br>Science Curriculum                                  |                                     |
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| <b>Content Area:</b> Science                                                        |                                     |
| <b>Course Title:</b> Science                                                        |                                     |
| <b>Grade Level:</b> Kindergarten                                                    |                                     |
| Unit Title                                                                          | Pacing Guide in Days                |
| Unit Plan 1: Weather and Climate<br><b>Climate Change</b>                           | Trimester 1<br>30 days              |
| Unit Plan 2: Motion and Stability: Forces and Interactions<br><b>Climate Change</b> | Trimester 2<br>30 days              |
| Unit Plan 3: Basic Needs of Humans, Plants and Animals<br><b>Climate Change</b>     | Trimester 3<br>30 days              |
| Unit Plan 4: Engineering and Design<br><b>Climate Change</b>                        | Ongoing throughout the 3 trimesters |

| OCEAN ACADEMY CHARTER SCHOOL<br>Unit 1 Overview                                                                                                                                                                              |                          |
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| <b>Content Area:</b> Science                                                                                                                                                                                                 |                          |
| <b>Unit Title:</b> Unit 1 Weather and Climate                                                                                                                                                                                | <b>Duration:</b> 30 days |
| <b>Target Course/Grade Level:</b> Kindergarten                                                                                                                                                                               |                          |
| <b>Introduction/Unit Focus:</b><br><br>This integrated science unit introduces kindergarten students to foundational concepts about weather, seasonal changes, and the effects of the sun on the Earth. The unit begins with |                          |

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structured instruction during the initial weeks of school and continues throughout the year with ongoing observation and investigation. Students will engage in daily weather observations, hands-on experiences, and interactive learning that supports the development of scientific thinking skills.

During the first several weeks, students will explore patterns and variations in local weather, including how weather forecasts help us prepare for and respond to severe conditions. This portion of the unit is designed to take approximately ten instructional days. Following this, students will begin investigating how the sun affects the Earth's surface, including how it warms the land, air, and water. This portion will span about fifteen days. Both topics serve as foundational knowledge that students will return to as the seasons change throughout the year.

Daily observations of weather and seasonal changes will continue year-round. Students will record their findings in a weather watcher journal using drawings, symbols, and simple labels. Teachers will model how to document observations accurately, encouraging students to use drawing and labeling to show patterns and changes over time.

Vocabulary and key concepts will be introduced at the beginning of the unit and reinforced as new weather events and seasonal changes occur. Instruction will use visual supports such as pictures, word walls, literature, videos, music, and movement activities to help students grasp and retain new vocabulary. Vocabulary instruction will be differentiated to support learners at various language development levels, including English language learners.

Instructional strategies will include teacher modeling to introduce how to make predictions, record observations, solve simple problems, and draw conclusions based on evidence. Students will engage in both formal and informal experiments designed to be age-appropriate and interactive. Through hands-on investigations, they will explore cause and effect relationships and practice thinking like scientists.

Throughout the unit, teachers will use graphic organizers and diagrams to help students organize information and deepen their understanding. These tools will be used to guide discussions, support journaling, and reinforce vocabulary.

Science instruction will be connected to other areas of the curriculum through cross-curricular lessons and activities. Literacy, math, and social studies experiences will be integrated to help students build a broader content knowledge base and apply vocabulary in meaningful ways. Books, songs, storytelling, and writing opportunities will support and extend the scientific concepts introduced in the unit.

Play-based learning will also play an essential role in student exploration and concept development. Classrooms will include content-rich learning centers intentionally designed to encourage hands-on exploration and role play. These centers provide a safe, engaging space for all learners, particularly English language learners, to explore and experiment with new language in a low-pressure environment. The materials used in these centers will be carefully chosen to reflect students' backgrounds, interests, and cultural experiences, while also supporting the development of key skills across learning domains. Materials will be rotated

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regularly to align with thematic units and to build on students' emerging interests and growing understanding of the world around them.

This unit offers a rich foundation for science learning in kindergarten by combining observation, experimentation, vocabulary development, and play. It is designed to promote curiosity, build academic language, and support inquiry throughout the year.

### Disciplinary Concepts for the Unit

#### Standard 9.1 Personal Financial Literacy

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

#### Standard 9.2 Career Awareness, Exploration, Preparation and Training

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

#### Standard 9.4 Life Literacies and Key Skills

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

#### Standard 8.1 Computer Science

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

#### Standard 8.2 Design Thinking

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

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

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

The instruction shall:

- (1) highlight and promote diversity, including economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance;
- (2) examine the impact that unconscious bias and economic disparities have at both an individual level and on society as a whole; and
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#### **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>

#### **Science and Engineering Practices**

##### **Asking Questions and Defining Problems**

Asking questions and defining problems in grades K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations to find more information about the designed world. (K- ESS3-2)

##### **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.

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)

### **Analyzing and Interpreting Data**

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. (K-ESS2-1)

**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.

- Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)

### **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.

- Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)

*Connections to Nature of Science*

#### **Scientific Investigations Use a Variety of Methods**

- Scientists use different ways to study the world. (K-PS3-1)

#### **Science Knowledge is Based on Empirical Evidence**

- Scientists look for patterns and order when making observations about the world. (K-ESS2-1)

### **Crosscutting Concepts**

#### **Patterns**

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)

#### **Cause and Effect**

- Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2),(K-ESS3-2)

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*Connections to Engineering, Technology and Applications of Science*

#### **Interdependence of Science, Engineering, and Technology**

- People encounter questions about the natural world every day. (K-ESS3-2)

#### **Influence of Engineering, Technology, and Science on Society and the Natural World**

- People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)

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

**ELA**

W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas. (K-PS3-1), (K-PS3-2)

RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how). (K-ESS2-2)

W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). (K-ESS2-2)

**MATH**

K.M.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-PS3-1), (K-PS3-2)

MP.2 Reason abstractly and quantitatively. (K-ESS2-1)

MP.4 Model with mathematics. (K-ESS2-1)

K.CC.A Know number names and the count sequence. (K-ESS2-1)

K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)

K.DL.A.1 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

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

**Core Ideas**

**Performance Expectations (Identified with Standard Number and statement)**

External factors can influence the items that an individual wants or needs.

9.1.2.FP.2: Differentiate between financial wants and needs.

9.1.2.FP.3: Identify the factors that influence people to spend or save (e.g., commercials, family, culture, society).

There are ways to keep the things we value safely at home and other places.

9.1.2.RM.1: Describe how valuable items might be damaged or lost and ways to protect them.

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| New Jersey Student Learning Standards: <u>Computer Science and Design Thinking</u>                                                                                            |                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Core Ideas                                                                                                                                                                    | Performance Expectations (Identified with Standard Number and Statement)                                                                        |
| Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide. | 8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network. |
| Individuals collect, use, and display data about individuals and the world around them.                                                                                       | 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.                                                 |
| Data can be used to make predictions about the world.                                                                                                                         | 8.1.2.DA.3: Identify and describe patterns in data visualizations.<br>8.1.2.DA.4: Make predictions based on data using charts or graphs.        |

| New Jersey Student Learning Standards: <u>Climate Change Mandate</u>                                                                                                                                                          |                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Core Ideas                                                                                                                                                                                                                    | Performance Expectations (Identified with Standard Number and Statement)                                                                                                                                               |
| Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. | K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time.                                                                                                                       |
| Sunlight warms Earth's surface.                                                                                                                                                                                               | K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.<br><br>K-PS3-2: Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. |

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| <b>Knowledge and Skills</b> |
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**Unit Learning Targets (Objectives):**

*Students will be able to...*

- Observe and describe daily weather using age-appropriate vocabulary
- Draw simple illustrations and diagrams of weather observations, with teacher modeling as needed
- Discuss and describe weather patterns and how weather changes over time
- Use newly learned vocabulary to talk about weather types and conditions
- Explore and describe tools and objects related to weather (e.g., thermometers, pinwheels, prisms, spray bottles)
- Match clothing, tools, and objects to appropriate weather conditions
- Compare weather in different places or regions using simple language and visuals
- Create a basic emergency preparedness kit (e.g., for a hurricane)
- Practice what to do during a weather emergency through discussion, modeling, and role-play

**Unit Enduring Understandings:**

*Students will know...*

- People observe and measure the weather to describe it, record it, and know how to prepare for it.
- Weather is made up of sunlight, wind, rain or snow, and temperature at a certain time and place.
- Some kinds of severe weather happen more often in certain places than in others.
- The sun helps warm the Earth's surface, including the land, air, and water.

**Unit Essential Questions:**

- What is the purpose of weather forecasting?
- How is today's weather different from yesterday's?
- Why is the sun important?
- How do we stay safe in different kinds of weather?
- What patterns can we see in the weather with rain, sun, wind, and clouds?

**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.

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 (Argument from Evidence: Disappearing Gargoyles)
  - 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 - Weather Patterns Unit
  - Lesson 1: Daily Weather Patterns (Activity: 4 Day Weather Journal)
  - Lesson 2: Seasonal Weather Patterns (Activity: Circle of Seasons)
  - Lesson 3: Animals Changing their Environment ( Activity: Build a Bird Nest)

**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

- Mystery Science - Severe Weather Unit
  - Lesson 1: Severe Weather and Preparation (Activity: Act Out Storm Preparation)
  - Lesson 2: Wind & Storms (Activity: Breeze Buddy)
  - Lesson 3: Weather Conditions (Activity: Be A Weather Watcher)
- Pebble Go: Earth & Space Science Share What You Know
  - Weather
  - Seasons

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

**Resources:**

- Mystery Science

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- Reading Extensions:
  - Lesson 1: (Weather Patterns Unit) The Weather Detective
  - Lesson 1: (Severe Weather Unit) How Can You Get Ready For A Big Storm?
  - Lesson 1: (Sunlight and Warmth Unit) Hot Foot

➤  Grade K Science Resources

- Pebble Go: Earth & Space Science Activity
- Weather
  - Seasons

*Evaluate:* Assess student understanding of learning objective

**Resources:**

- Mystery Science:
- Lesson 1: Weather and Local Patterns Read Aloud Assessment
  - Lesson 2: Seasonal Patterns Assessment
  - Lesson 3: Animals Changing Their Environment Assessment
  - Unit Assessment
- Pebble Go Earth & Space Questions for Understanding
- Weather
  - Seasons

**Evidence of Student Learning**

**Formative Assessments:**

- Graphic Organizers & Guided Note Taking
- Observation and discussion
- Cooperative Group Learning
- Journal Entries

**Summative Assessments:**

- Mystery Science Unit Assessments
- Projects

**Benchmark Assessments:**

- Associated Unit tests, quizzes

**Alternative Assessments:**

- Projects

**Performance Tasks:**

- RST- Research Simulation Task
- Labs and engineering based 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.
-

### **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 website

#### **Supplemental Materials:**

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➤ **Calendar/weather board**

- BrainPop
- Epic Books
- Readworks
- Pebble Go Next
- Nearpod
- Edpuzzle
- Fundamental Readers

Intervention Materials:

- Mystery Science “Extend the Lesson” Materials
  - Vocabulary
  - Readings
  - Mini Lessons
  - Transcripts

**Possible Centers:**

Dramatic Play: Stock this center with items used for various types of weather. You may even label boxes or shelves for putting items away by category. For instance, all rainy day items would go on the shelf labeled “rainy.” You may want to include pictures of people using weather props to prompt play.

<https://www.scholastic.com/teachers/blog-posts/allie-magnuson/literacy-in-kindergarten-dramatic-play-centers-part-4/>

Science Center: For this unit your science center might include a water table (or tub) with watering cans (or other items for making “rain”), a fan with various light items (windsock, etc), instant snow (or real snow!), weather pictures and nonfiction books.

Water Center: This is an area where children can learn and explore the properties of water.

<https://www.playdoughtoplato.com/must-try-weather-activities-for-kids/>

Reading/Library Center: Provide fiction and non fiction texts at multiple levels which include weather and climate as key concepts.

<https://www.weareteachers.com/best-weather-books-for-kids/>

**Teacher Notes**

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| OCEAN ACADEMY CHARTER SCHOOL<br>Unit 2 Overview                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |
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| Content Area: Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |
| Unit Title: Unit 2 Motion and Stability: Forces and Interactions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Duration: 30 days |
| Target Course/Grade Level: Kindergarten                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |
| <p style="text-align: center;"><b>Introduction/Unit Focus:</b></p> <p>In this unit, kindergarten students will explore how different strengths and directions of pushes and pulls affect the motion of objects. Through hands-on investigations and problem-solving activities, students will apply their understanding to analyze simple design solutions and begin to think like engineers and scientists.</p> <p>Vocabulary and related science concepts will be introduced early in the unit and reinforced regularly through a variety of engaging methods. These include visuals such as pictures and labeled diagrams, word walls, read-alouds, songs, videos, and movement-based activities. Instruction will be differentiated to meet the needs of all learners, including English language learners, to ensure access to new vocabulary in meaningful and supportive ways.</p> <p>Students will participate in formal and informal experiments, teacher demonstrations, and interactive investigations to build foundational skills in making predictions, recording observations, solving problems, and drawing conclusions. They will use science notebooks or journals to record their thinking, findings, and reflections through both writing and drawing, with support as needed.</p> <p>To further support student understanding, teachers will introduce graphic organizers and diagrams that help organize ideas and support discussion. These tools will be used alongside experiments and classroom conversations to strengthen science language and thinking.</p> <p>Cross-curricular integration is encouraged throughout the unit. Literacy, math, and social studies connections will help deepen students' content knowledge while building language and vocabulary. Read-alouds, writing prompts, and math-related problem-solving tasks tied to force and motion concepts will provide meaningful and engaging learning experiences.</p> <p>Planned, content-rich play centers will support exploration and role play, offering opportunities for students to apply new concepts in a playful and purposeful context. These centers provide a supportive space for all children, particularly English language learners, to “play” with new vocabulary and ideas in a non-threatening and imaginative environment.</p> <p>Materials in each center should be thoughtfully selected to reflect children’s backgrounds and interests and to reinforce key concepts and skills from across learning domains. Materials should be rotated regularly to align with thematic units, respond to students’ curiosity, and build upon their growing understanding of the world around them. Whenever possible, materials should be culturally responsive and directly connected to the curriculum.</p> <p>This unit encourages inquiry, exploration, and the development of early science and engineering practices. Through active learning, guided discovery, and purposeful play,</p> |                   |

students will begin to understand the forces that shape how objects move in their everyday world.

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#### **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-PS2-1 Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.** [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.]
- **K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.** [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.]

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| <b>Science and Engineering Practices</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Disciplinary Core Ideas/Unit Enduring Understandings</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Crosscutting Concepts</b>                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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.</p> <ol style="list-style-type: none"> <li>1. With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1)</li> </ol> <p>Analyzing and Interpreting Data</p> <p>Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ol style="list-style-type: none"> <li>2. Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2)</li> </ol> <p>-----</p> <p style="text-align: center;"><i>Connections to the Nature of Science</i></p> <p>Scientific Investigations Use a Variety of Methods</p> <p>Scientists use different ways to study the world. (K-PS2-1)</p> | <p><b>PS2.A: Forces and Motion</b></p> <ul style="list-style-type: none"> <li>➤ Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2)</li> <li>➤ Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2)</li> </ul> <p><b>PS2.B: Types of Interactions</b></p> <ul style="list-style-type: none"> <li>➤ When objects touch or collide, they push on one another and can change motion. (K-PS2-1)</li> </ul> <p><b>PS3.C: Relationship Between Energy and Forces</b></p> <ul style="list-style-type: none"> <li>➤ A bigger push or pull makes things speed up or slow down more quickly. (secondary to K-PS2-1)</li> </ul> <p><b>ETS1.A: Defining Engineering Problems</b></p> <ul style="list-style-type: none"> <li>➤ A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable</li> </ul> | <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>➤ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2)</li> </ul> |

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|                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                             | solutions. (secondary to K-PS2-2)                                                                                                                                                                                                                                                                       |  |
| New Jersey Student Learning Standards: Interdisciplinary Connections<br><a href="https://www.nj.gov/education/cccs">https://www.nj.gov/education/cccs</a>                   |                                                                                                                                                                                                                                                                                                         |  |
| English Language Arts                                                                                                                                                       |                                                                                                                                                                                                                                                                                                         |  |
| W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas. (K-PS3-1), (K-PS3-2)                               |                                                                                                                                                                                                                                                                                                         |  |
| RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how). (K-ESS2-2)                |                                                                                                                                                                                                                                                                                                         |  |
| W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). (K-ESS2-2)                      |                                                                                                                                                                                                                                                                                                         |  |
| SL.PE.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.           |                                                                                                                                                                                                                                                                                                         |  |
| Mathematics                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                         |  |
| MP.2 Reason abstractly and quantitatively. (K-PS2-1)                                                                                                                        |                                                                                                                                                                                                                                                                                                         |  |
| K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)                           |                                                                                                                                                                                                                                                                                                         |  |
| K.M.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-PS2-1) |                                                                                                                                                                                                                                                                                                         |  |
| New Jersey Student Learning Standards: <a href="#">Career Readiness, Life Literacies, and Key Skills</a>                                                                    |                                                                                                                                                                                                                                                                                                         |  |
| Core Ideas                                                                                                                                                                  | Performance Expectations<br>(Identified with Standard Number and statement)                                                                                                                                                                                                                             |  |
| 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.                                                                                                                                                                                                   |  |
| New Jersey Student Learning Standards: <a href="#">Computer Science and Design Thinking</a>                                                                                 |                                                                                                                                                                                                                                                                                                         |  |
| Core Ideas                                                                                                                                                                  | Performance Expectations<br>(Identified with Standard Number and Statement)                                                                                                                                                                                                                             |  |
| 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.<br><br>8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.<br><br>8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process. |  |

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|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Limitations (constraints) must be considered when engineering designs.            | 8.2.2.ED.4: Identify constraints and their role in the engineering design process.                                                                |
| Innovation and the improvement of existing technology involves creative thinking. | 8.2.2.NT.1: Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together. |

**New Jersey Student Learning Standards: Climate Change Mandate**

| <b>Core Ideas</b>                                                                                                                                                                 | <b>Performance Expectations<br/>(Identified with Standard Number and Statement)</b>                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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-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. |
| 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.         |

**Knowledge and Skills**

**Unit Learning Targets (Objectives):**

*Students will be able to...*

- Use new vocabulary to describe how objects move and what causes them to move
- Differentiate between pushes and pulls using real-life examples such as playground swings, toys, and classroom tools
- Sort objects or pictures based on whether they are moved by a push or a pull
- Conduct simple experiments using matchbox cars and other classroom materials to explore how objects move
- Compare how surfaces like carpet and tile affect movement and create friction
- Build ramps or other setups to investigate how changing height or slope affects speed and motion

- Create and carry out their own simple investigations to test the effects of pushes and pulls

**Unit Enduring Understandings:**

*Students will know...*

- When objects touch or bump into each other, they push one another and can change how they move.
- A stronger push or pull makes an object move faster.
- Friction, or the rubbing between surfaces, can make objects slow down or stop sooner.
- Pushes and pulls can be strong or gentle and can go in different directions.
- Pushing or pulling an object can make it start moving, stop, speed up, slow down, or change direction.

**Unit Essential Questions:**

- What happens to movement when friction is involved?
- How does a push or a pull (force) affect the way something moves?

**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.

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:**

- BrainPopJr
  - Forces - Pushes and Pulls (Activity: Push / Pull Sort)

**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- Force Olympics: Pushes & Pulls Unit
  - Lesson 1: Pushes & Pulls (Activity: Be a Digging Machine)
  - Lesson 2: Pushes, Pulls & “Work Words” (Optional Activity: Forces at Work)
  - Lesson 3: Motion, Speed, & Strength (Activity: Don’t Crush That House)
  - Lesson 4: Speed and Direction of Force (Activity: Human Bumper Bowling)
  - Lesson 5: Direction of Motion & Engineering (Activity: Boulder Bounce)
  - Lesson 6: Forces & Engineering (Optional Activity: Be an Inventor)

**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 Share What You Know
  - Forces & Motion
  - Simple Machines

**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:
  - Reading Extensions:
    - Lesson 2: Big Machines at Work
    - Lesson 4: How to Win at Bumper Bowling
    - Lesson 6: The Monster Trap
- Pebble Go Activity
  - Forces & Motion
  - Simple Machines

**Evaluate:** Assess student understanding of learning objective

**Resources:**

- Mystery Science:
  - Lesson 1: Pushes & Pulls Assessment
  - Lesson 2: Read Along Pushes, Pulls & “Work Words” Assessment

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- Lesson 3: Motion, Speed & Strength Assessment
- Lesson 4: Read Along Speed & Direction of Force Assessment
- Lesson 5: Direction of Motion & Engineering Assessment
- Lesson 6: Read Along Forces & Engineering Assessment
  
- Pebble Go Questions for Understanding
  - Forces & Motion
  - Simple Machines

**Evidence of Student Learning**

**Formative Assessments:**

- Graphic Organizers & Guided Note Taking
- Observation and discussion
- Cooperative Group Learning
- Journal Entries

**Summative Assessments:**

- Mystery Science Unit Assessments
- Projects

**Benchmark Assessments:**

- Associated Unit tests, quizzes

**Alternative Assessments:**

- Projects

**Performance Tasks:**

- RST- Research Simulation Task
- Labs and engineering based 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.

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- 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:

- Mystery Science website

### Supplemental Materials:

- BrainPop
- Epic Books
  - *Go Green for Earth Day* by Lisa Bullard
- Readworks
- Pebble Go Next
- Nearpod
- Edpuzzle
- Fundamental Readers

### Intervention Materials:

- Mystery Science “Extend the Lesson” Materials
  - Vocabulary
  - Readings
  - Mini Lessons

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- Transcripts

**Possible Centers:**

**Dramatic Play:** Stock this center with items used for construction. You may even label boxes or shelves for putting items away by category. You may want to include pictures of people using construction tools to prompt play.

<https://www.kidsparkz.com/construction-workers.html>

**Block Center:** Supply matchbox cars, construction vehicles, and other types of transportation toys.

<https://www.kidsparkz.com/transportation.html>

**Science Center:** For this unit your science center might include craft and building toys that require pushing and pulling ( such as Legos or pop beads), small balls and objects to construct ramps, and nonfiction books.

**Reading/Library Center:** Provide fiction and non fiction texts at multiple levels which include force and motion as key concepts.

<https://www.whatihavelearnedteaching.com/12-force-motion-picture-books-engage-young-learners/>

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| <b>Teacher Notes</b> |
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| <b>OCEAN ACADEMY CHARTER SCHOOL</b><br><b>Unit 3 Overview</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Content Area: Science</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Duration: Trimester 3: 30 days</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Target Course/Grade Level: Kindergarten</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p style="text-align: center;"><b>Introduction/Unit Focus:</b></p> <p>This unit begins with foundational background information, vocabulary, and key concepts introduced during the first instructional days. These early lessons provide a base that will be revisited and expanded throughout the year as students observe changing seasonal characteristics and behaviors of plants and animals.</p> <p>Students will explore what humans, plants, and animals need to survive and investigate the relationships between these needs and their environments. Through comparison and contrast,</p> |

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students will learn how different living things depend on specific resources and conditions related to where they live.

Vocabulary development is an essential part of this unit and will be supported through a variety of methods including pictures, word walls, literature, videos, music, and kinesthetic activities. Instruction will be differentiated to accommodate learners at varying language proficiency levels, ensuring all students can access and use new vocabulary meaningfully.

Teachers will utilize graphic organizers, diagrams, and guided note-taking to help students organize their thinking and deepen understanding. Demonstrations and teacher modeling will introduce key scientific skills such as making predictions, observing closely, solving problems, and drawing conclusions.

Students will engage in both formal and informal experiments and interactive investigations that foster their ability to think scientifically. These hands-on experiences provide opportunities to explore the needs of living things and how they relate to their habitats.

Cross-curricular connections are integrated throughout the unit to strengthen content knowledge and vocabulary. Literacy, math, and social studies activities linked to the science content will provide rich, meaningful contexts for learning.

The classroom environment will include thoughtfully planned play centers designed for exploration and role play. These centers offer a safe and supportive space for all students, especially English language learners, to experiment with language and concepts through pretend play. Materials within the centers will be purposefully selected to reflect children's backgrounds, interests, and developmental levels, while supporting skills across learning domains.

To maintain student engagement and support thematic learning, materials will be regularly rotated. This ensures that centers stay relevant to ongoing studies and respond to children's emerging interests and understandings. Additionally, materials will be chosen to be culturally responsive and aligned with curriculum goals.

This unit fosters curiosity and scientific thinking by helping students connect the needs of living things to their environments through observation, exploration, and language development.

### **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**

**K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.** [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]

**K-ESS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

**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.** [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

**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.** [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]

### **Crosscutting Concepts**

#### **Patterns**

Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)

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**Cause and Effect**

Events have causes that generate observable patterns. (K-ESS3-3)

**Systems and System Models**

Systems in the natural and designed world have parts that work together.  
(K-ESS2-2), (K-ESS3-1)

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

**English Language Arts**

W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas. (K-PS3-1), (K-PS3-2)

RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how). (K-ESS2-2)

W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). (K-ESS2-2)

SL.PE.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

**Mathematics**

K.M.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-LS-1)

MP.2 Reason abstractly and quantitatively. (K-ESS2-1)

MP.4 Model with mathematics. (K-ESS2-1)

K.CC.A Know number names and the count sequence. (K-ESS2-1)

K.M.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)

K.DL.A.1 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

**New Jersey Student Learning Standards: [Career Readiness, Life Literacies, and Key Skills](#)**  
**Performance Expectations (Identified with Standard Number and statement)**

9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

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9.1.2.CR.2: List ways to give back, including making donations, volunteering, and starting a business.

9.1.2.FP.2: Differentiate between financial wants and needs.

**New Jersey Student Learning Standards: Computer Science and Design Thinking**

**Performance Expectations (Identified with Standard Number and Statement)**

8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology.

8.2.2.ETW.2: Identify the natural resources needed to create a product.

8.2.2.ETW.4: Explain how the disposal of or reusing a product affects the local and global environment.

**New Jersey Student Learning Standards: Climate Change Mandate**

**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

Plants and animals can change their environment.

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.

**Knowledge and Skills**

**Unit Learning Targets (Objectives):**

*Students will be able to...*

- Identify the basic needs of all living things, including sunlight, water, air, food, and shelter for humans and animals
- Compare and contrast different types of animal homes
- Build models and draw diagrams to represent animal homes

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- Observe and describe patterns in humans, plants, and animals over time, including life cycles and seasonal changes
- Discuss how humans and animals change their environment
- Sort and classify materials for recycling
- Recognize natural resources that humans use, such as wood from trees

**Unit Enduring Understandings:**

*Students will know...*

- Living things need water, air, and resources from the land, and they live in places that provide these needs.
- Humans use natural resources in many ways for daily living.
- Plants and animals can change their environment.
- People's actions can affect the land, water, air, and living things, but humans can make choices to reduce these impacts.

**Unit Essential Questions:**

- What do plants and animals need to survive?
- How are the needs of plants and animals alike or different?
- Where do animals live and why do they live there?
- What impact do animals and humans have on the environment?
- How can humans reduce their impact on the land, water, and air?

**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.

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:**

- BrainPopJr
  - Animals

- Plants
- Habitats

**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 Secrets (Plant & Animal Needs)**
  - Lesson 1: Animal Needs: Food (Activity: Eat Like an Animal)
  - Lesson 2: Read Along Animal Needs: Shelter (Optional Activity: Nature Nuggets)
  - Lesson 3: Animal Needs: Safety (Activity: Gopher in a Hole)
  - Lesson 4: Read Along Animals & Changing the Environment (Optional Activity: Nature Explorers)
  - Lesson 5: Plant Needs: Water & Light (Activity: Sprout a Seed)
  - Lesson 6: Read Along Animal Needs & The Changing Environment (Optional Activity: Animal Visitors)

**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

- Pebble Go Share What You Know
  - Life Sciences

**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:
  - Reading Extensions:
    - Lesson 2: Who Lives There?
    - Lesson 4: Who Lives in That Hole?
    - Lesson 6: That Old Log
- Pebble Go Activity
  - Life Sciences

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Evaluate: Assess student understanding of learning objective.

**Resources:**

- Mystery Science:
  - Lesson 1: Animal Needs: Food Assessment
  - Lesson 2: Read Along Animals Need Shelter Assessment
  - Lesson 3: Animal Needs: Safety Assessment
  - Lesson 4: Read Along Animals & Changing the Environment Assessment
  - Lesson 5: Plant Needs: Water & Light Assessment
  - Lesson 6: Read Along Animal Needs and Changing Environment Assessment
- Pebble Go Questions for Understanding
  - Life Sciences

**Evidence of Student Learning**

**Formative Assessments:**

- Graphic Organizers & Guided Note Taking
- Observation and discussion
- Cooperative Group Learning
- Journal Entries

**Summative Assessments:**

- Mystery Science Unit Assessments
- Projects

**Benchmark Assessments:**

- Associated Unit tests, quizzes

**Alternative Assessments:**

- Projects

**Performance Tasks:**

- RST- Research Simulation Task
- Labs and engineering based projects

**Suggested Options for Differentiation and Modifications**

**Special Education**

- Follow all IEP modifications.
- Use visuals, manipulatives, and hands-on models.

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- 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.
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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.
  - 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.

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- 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 website
  - *Plant & Animal Needs experiments*

### Supplemental Materials:

- BrainPop
- Epic Books
- Readworks
- Pebble Go Next
- Nearpod
- Edpuzzle
- Fundamental Readers

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**Intervention Materials:**

- Mystery Science “Extend the Lesson” Materials
  - Vocabulary
  - Readings
  - Mini Lessons
  - Transcripts

**Possible Centers:**

**Dramatic Play:** Stock this center as a Veterinarian's office or a doctor's office with stuffed animals, dolls and a doctor's kit. You may even label boxes or shelves for putting items away by category.

<https://www.mrsalbanesesclass.com/2015/01/doctors-office-dramatic-play.html?m=1>

**Block Center:** Supply plastic animals and plants, a farm or zoo play set, etc.

**Science Center:** For this unit your science center might include natural materials such as feathers, nests, shells, sticks, seeds, dried plants, life cycle posters, and nonfiction books.

**Reading/Library Center:** Provide fiction and non fiction texts at multiple levels.

<https://www.scholastic.com/teachers/articles/teaching-content/books-teaching-about-animals/>

<https://www.weareteachers.com/picture-books-about-nature/>

| Teacher Notes |
|---------------|
|               |

| OCEAN ACADEMY CHARTER SCHOOL<br>Unit 4 Overview                                                                                                                                   |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Content Area: Science</b>                                                                                                                                                      |                          |
| <b>Unit Title: Engineering and Design</b>                                                                                                                                         | <b>Duration: Ongoing</b> |
| <b>Target Course/Grade Level: Kindergarten</b>                                                                                                                                    |                          |
| <b>Introduction/Unit Focus:</b>                                                                                                                                                   |                          |
| In this unit, students will engage in hands-on investigations where they explore natural phenomena, ask questions, and collaborate by sharing ideas with peers. Through teamwork, |                          |

they will design, build, and test simple structures and models to demonstrate scientific concepts or solve problems.

STEM learning and projects will be woven throughout the year, encouraging ongoing exploration and discovery. Students will have access to materials and activities that support construction and investigation, allowing them to apply engineering practices in meaningful ways during center time and other classroom experiences.

This approach promotes curiosity, creativity, and critical thinking while building foundational skills in science, technology, engineering, and math through playful and purposeful learning.

### **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**

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.

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.

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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.

| <p style="text-align: center;"><b>Science and Engineering Practices</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p style="text-align: center;"><b>Disciplinary Core Ideas/Unit Enduring Understandings</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p style="text-align: center;"><b>Crosscutting Concepts</b></p>                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Asking questions and defining problems</b> in K-2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> <li>➤ Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)</li> <li>➤ Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)</li> </ul> <p><b>Developing and Using Models</b><br/>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"> <li>➤ Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)</li> </ul> <p><b>Analyzing and Interpreting Data</b><br/>Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> | <p><b>ETS1.A: Defining and Delimiting Engineering Problems</b></p> <ul style="list-style-type: none"> <li>➤ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)</li> <li>➤ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)</li> <li>➤ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)</li> </ul> <p><b>ETS1.B: Developing Possible Solutions</b></p> <ul style="list-style-type: none"> <li>➤ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's</li> </ul> | <p><b>Structure and Function</b></p> <ul style="list-style-type: none"> <li>➤ The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)</li> </ul> |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>solutions to other people. (K-2-ETS1-2)</p> <p><b>ETS1.C: Optimizing the Design Solution</b></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> |  |
| <p><b>New Jersey Student Learning Standards: Interdisciplinary Connections</b><br/> <a href="https://www.nj.gov/education/cccs">https://www.nj.gov/education/cccs</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                           |  |
| <p><b>English Language Arts</b></p> <p>W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas. (K-PS3-1), (K-PS3-2)</p> <p>RI.CI.K.2. With prompting and support, identify the main topic and key details of an informational text (e.g., who, what, where, when, why, how). (K-ESS2-2)</p> <p>W.AW.K.1. Use a combination of drawing, dictating, and writing to compose opinion pieces on topics or texts (e.g., My favorite book is...). (K-ESS2-2)</p> <p>SL.PE.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.</p> |                                                                                                                                                                                                                                           |  |
| <p><b>Mathematics</b></p> <p>MP.5 Use appropriate tools strategically. (1-PS4-4)</p> <p>MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3)</p> <p>MP.4 Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3)</p> <p>MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)</p> <p>2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1), (K-2-ETS1-3)</p>                                                                                                                  |                                                                                                                                                                                                                                           |  |
| <p><b>New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                           |  |
| <b>Core Ideas</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><b>Performance Expectations</b><br/> <b>(Identified with Standard Number and statement)</b></p>                                                                                                                                        |  |

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|                                                                                                             |                                                                                                       |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 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. |
| <b>New Jersey Student Learning Standards: <u>Computer Science and Design Thinking</u></b>                   |                                                                                                       |
| <b>Core Ideas</b>                                                                                           | <b>Performance Expectations<br/>(Identified with Standard Number and Statement)</b>                   |
| Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.. | 8.1.2.AP.4: Break down a task into a sequence of steps                                                |
| Individuals develop and follow directions as part of daily life.                                            | 8.1.2.AP.1: Model daily processes by creating and following algorithms to complete tasks.             |

|                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                |
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| <b>New Jersey Student Learning Standards: <u>Climate Change Mandate</u></b>                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                |
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| <p>A situation that people want to change or create can be approached as a problem to be solved through engineering.</p> <p>Asking questions, making observations, and gathering information are helpful in thinking about problems.</p> <p>Before beginning to design a solution, it is important to clearly understand the problem.</p> | 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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**Knowledge and Skills**

**Unit Learning Targets (Objectives):**

*Students will be able to...*

- Define a simple problem that can be solved by creating a new or improved object or tool
- Create sketches, drawings, or physical models to represent their ideas and proposed solutions
- Test their designs and solutions to see if they work as intended
- Compare different designs and test results to determine which works best
- Ask questions based on observations to learn more about the natural and designed world and to solve problems

**Unit Enduring Understandings:**

*Students will know...*

- People can approach situations they want to change or create as problems to be solved through engineering.
- Asking questions, making observations, and gathering information help define simple problems that can be solved by designing new or improved objects or tools.
- It is important to fully understand a problem before beginning to design a solution.
- Designs can be communicated through sketches, drawings, or physical models to share ideas with others.
- Because there is usually more than one way to solve a problem, comparing and testing different designs helps find the best solution.

**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 show 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.

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

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**Resources:**

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  - Be A Scientist

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**Resources:**

- Mystery Science
  - Invention and Engineering (Activity: Bobby Dropper Ideas)

**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 Share What You Know
  - Science and Engineering Practices

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**Resources:**

- Pebble Go Activity
  - Science and Engineering Practices

**Evaluate:** Assess student understanding of learning objective.

**Resources:**

- BrainPopJr
  - Talk About It

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- Draw About It
- Write About It
- Quiz

**Evidence of Student Learning**

**Formative Assessments:**

- Graphic Organizers & Guided Note Taking
- Observation and discussion
- Cooperative Group Learning
- Journal Entries

**Summative Assessments:**

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  - Pre-teach and revisit key science vocabulary.
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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.
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  - Provide options and choice in how to show learning.
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### **Multilingual Learners**

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  - Pre-teach vocabulary using pictures, labels, and real objects.
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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.
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### 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 Invention and Engineering Activity: Bobby Dropper**

#### Supplemental Materials:

- BrainPop
- Epic Books
- Readworks
- Pebble Go Next
- Nearpod
- Edpuzzle
- Fundamental Readers

#### Intervention Materials:

- Mystery Science “Extend the Lesson” Materials
  - Vocabulary
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### Teacher Notes