Beach Haven School District

Science Curriculum

Grade 5

Original Adoption: September 12, 2016
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Recommended Pacing Guide	
Unit 1: Engineering Design	**40 days- ongoing**
Unit 2: Matter and its Interactions	**20 days- ongoing**
Unit 3: From Molecules to Organisms: Structures and Processes	**30 days- ongoing**
Unit 4: Ecosystems: Interactions, Energy, and Dynamics	**40 days- ongoing**
Unit 5: Motion and Stability: Forces and Interactions	**20 days- ongoing**
Unit 6: Earth and Human Activities	**30 days- ongoing**

Unit 1: Engineering Design	**Duration: 40 days- ongoing**

Standards/Learning Targets

New Jersey Student Learning Standards:

- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Correlation Chart

EDI

Performance Expectation

- **3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**

Science and Engineering Practices	Disciplinary Core Ideas
• Asking Questions and Defining Problems ○ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.	• Possible solutions to a problem are limited by available materials and resources (constraints). • The success of a designed solution is determined by considering the desired features of a solution (criteria). • Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.
Crosscutting Concepts	**Learning Objectives**
• Influence of Science, Engineering, and Technology on Society and the Natural World ○ People's needs and wants change over time, as do their demands for new and improved technologies.	• Students describe the purpose of the investigation, which includes finding possible failure points or difficulties to identify aspects of a model or prototype that can be improved. • Identifying the evidence to be address the purpose of the investigation, students describe the evidence to be collected • Students create a plan for the investigation that describes different tests for each aspect of the criteria and constraints. • Students carry out the investigation, collecting and recording data according to the developed plan.

Performance Expectation	
• **3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.**	
Science and Engineering Practices	**Disciplinary Core Ideas**
• Constructing Explanations and Designing Solutions ○ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	• Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. • At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.
Crosscutting Concepts	**Learning Objectives**

• Influence of Science, Engineering, and Technology on Society and the Natural World ○ Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	• Students use grade-appropriate information from research about a given problem, including the causes and effects of the problem and relevant scientific information. • Students generate at least two possible solutions to the problem based on scientific information and understanding of the problem. • Students specify how each design solution solves the problem. • Students share ideas and findings with others about design solutions to generate a variety of possible solutions. • Students describe the necessary steps for designing a solution to a problem, including conducting research and communicating with others throughout the design process to improve the design [note: emphasis is on what is necessary for designing solutions, not on a stepwise process]. • Students test each solution under a range of likely conditions and gather data to determine how well the solutions meet the criteria and constraints of the problem.

Performance Expectation	
• **3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**	
Science and Engineering Practices	**Disciplinary Core Ideas**
• Planning and Carrying Out Investigations ○ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	ETS1.B: Developing Possible Solutions • Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. ETS1.C: Optimizing the Design Solution • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.
Crosscutting Concepts	**Learning Objectives**
	• Students describe the purpose of the

	investigation, which includes finding possible failure points or difficulties to identify aspects of a model or prototype that can be improved. ● Identifying the evidence to be address the purpose of the investigation, students describe the evidence to be collected ● Students create a plan for the investigation that describes different tests for each aspect of the criteria and constraints. ● Students carry out the investigation, collecting and recording data according to the developed plan.

Primary Interdisciplinary Connections:

- **ELA/Literacy**
- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

21st Century Themes/Career Readiness:

- CRP4. Communicate clearly and effectively and with reason.
- CRP5. Consider the environmental, social and economic impacts of decisions.
- CRP6. Demonstrate creativity and innovation.
- CRP11. Use technology to enhance productivity.

Suggested Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Provide access to online dictionary

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

504:

- Follow specific 504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

Gifted and Talented:

- Open ended questions to activate higher level thinking
- Higher level texts
- Student developed extension activities
- Plan self directed inquiry
- Student created rubrics
- Curriculum compacting
- Opportunities to push assessment/activity boundaries

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input

Culturally Diverse:

- Involve families in student learning including phenomenon studies
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Provided students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps

- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students

Evidence of Student Learning

Formative Tasks:
- Weekly assessment of STEAM activity and task performance.
- Teacher Observation
- Lab Journals
- Conferencing
- Questioning
- Turn and Talk

Alternative Assessments:
- Engineering Projects

Summative Assessments:
- Recurrent assessment of the Engineering Design Process.

Benchmark Assessments:
- Scientific Notebook Check with Scoring Rubric

Knowledge & Skills

Enduring Understandings:
- Following established STEAM Lab rules and procedures that students and faculty remain safe and increase the likelihood that challenges are met successfully.
- Engineers take on specific responsibilities in order to contribute to the success of the overall challenge.
- The Engineering Design Process involves asking, questions, imagining possible solutions, planning a course of action, creating and testing a process or prototype, and analyzing results in order to make design improvements.

Essential Questions:
- How do we use the STEAM Lab flexible seating and equipment safely?
- How do we work together to meet our goals?
- What are the steps of the engineering process?

Core Instructional & Supplemental Materials

Suggested Activities/Resources:
- Discussion of Safety Rules and Lab Procedures: Using materials appropriately and following established routines ensures student safely in the lab.
- Use of the “Talk/Draw” Method of planning- Students draw and plan together on a large sheet of paper for the exchange of ideas, saving time and paper.

Varied Levels of Text:
- Hidden Figures (Young Readers Edition) by Margot Lee Shetterly

- *How Big Is Big? How Far Is Far?*
- *Which Way is Up?*
- *Dog Days of Summer*
- *Handbook of Stars and Constellations*
- *Star Scientist*
- *Made of Matter*
- *Break it Down*
- *Solving Dissolving*

• www.code.org Activities for beginner and advanced coding • Using STEM to Investigate Issues in Managing Waste • Steam Kids 50+ science/technology engineering / art / math / hands-on project • The Big Book of Makerspace Projects • STEAM Ahead! DIY for Kids • Make: Paper Inventions • STEM Labs for Middle Grades 5-8 • *HMH Dimensions* • www.teachengineering.org • https://pbskids.org/designsquad • Brainpop • http://www.livebinders.com/play/play_or_edit?id=126258 • https://www.edutopia.org/article/STEAM-resources • https://ozobot.com/stem-education • https://hourofcode.com/us/learn	• *Science You Can't See* • *Food Scientist's Handbook* • *Matter Makes It All Up* • *Energy Makes it All Go* • *Why do Scientists Argue?* • *Walk in the Woods* • *Restoration Case Studies*

Unit 2: Matter and its Interactions	**Duration: 15 days- ongoing**

Standards/Learning Targets

New Jersey Student Learning Standards:

- **5-PS1-1-** Develop a model to describe that matter is made of particles too small to be seen.
- **5-PS1-2-** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- **5-PS1-3-** Make observations and measurements to identify materials based on their properties.
- **5-PS1-4-** Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Performance Expectation

5-PS1-1- Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [*Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.*]

Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- • Use models to describe phenomena.	**5-PS1A.1-** • Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving

	freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects.
Crosscutting Concepts	**Learning Objectives**
Scale, Proportion, and Quantity- ● Natural objects exist from the very small to the immensely large.	● Students develop a model to describe a phenomenon that includes the idea that matter is made of particles too small to be seen. In the model, students identify the relevant components for the phenomenon. ● In the model, students identify and describe relevant relationships between components. ● Students use the model to describe how matter composed of tiny particles too small to be seen can account for observable phenomena (e.g., air inflating a basketball, ice melting into water).

Performance Expectation	
5-PS1-2- Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Using Mathematics and Computational Thinking- ● Measure and graph quantities such as weight to address scientific and engineering questions and problems.	**PS1.A: Structure and Properties of Matter-** ● The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. **PS1.B: Chemical Reactions-** ● No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)
Crosscutting Concepts	**Learning Objectives**
Scale, Proportion, and Quantity- ● Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. **Connections to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems-** ● Science assumes consistent patterns in natural systems.	● Students measure and graph the given quantities using standard units. ● Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed. ● Students describe* the changes in properties they observe during and/or after heating, cooling, or mixing substances.

	• Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed. • Students use measurements and descriptions of weight, as well as the assumption of consistent patterns in natural systems, to describe evidence to address scientific questions about the conservation of the amount of matter, including the idea that the total weight of matter is conserved after heating, cooling, or mixing substances.

Performance Expectation	
5-PS1-3- Make observations and measurements to identify materials based on their properties. [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [*Assessment Boundary: Assessment does not include density or distinguishing mass and weight*.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- • Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	**PS1.A: Structure and Properties of Matter-** • Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic scale mechanism of evaporation and condensation.)
Crosscutting Concepts	**Learning Objectives**
Scale, Proportion, and Quantity- • Natural objects exist from the very small to the immensely large.	• From the given investigation plan, students identify the phenomenon under investigation, which includes the observable and measurable properties of materials. • Students identify the purpose of the investigation, which includes collecting data to serve as the basis for evidence for an explanation about the idea that materials can be identified based on their observable and measurable properties. • From the given investigation plan, students describe the evidence from data (e.g., qualitative observations and

	measurements) that will be collected. ● Students describe how the observations and measurements will provide the data necessary to address the purpose of the investigation. ● From the given plan investigation plan, students describe how the data will be collected. ● Students collect and record data, according to the given investigation plan.

Performance Expectation	
5-PS1-4- Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	
Science and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	**PS1.B: Chemical Reactions-** ● When two or more different substances are mixed, a new substance with different properties may be formed.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Cause and effect relationships are routinely identified and used to explain change.	● From the given investigation plan, students describe the phenomenon under investigation, which includes the mixing of two or more substances. ● Students identify the purpose of the investigation, which includes providing evidence for whether new substances are formed by mixing two or more substances, based on the properties of the resulting substance. ● From the given investigation plan, students describe the evidence from data that will be collected. ● From the given investigation plan, students describe how the data will be collected.

Primary Interdisciplinary Connections:

- **ELA/Literacy**
- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.

- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Suggested Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Provide access to online dictionary

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Strategic grouping
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504:

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- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
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Culturally Diverse:

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- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Provided students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students

Evidence of Student Learning	
Formative Tasks: ● Interactive Science Notebooks ● Student Models ● Students' Scientific Arguments ● Student self assessment	**Alternative Assessments:** ● Kinesthetic models/observational ● Collaborative digital models ● Oral explanations/arguments ● Collaborative investigations-participation ● Teacher observation/anecdotal records
Summative Assessments ● Student Scientific Arguments/Chapter writing ● Critical Juncture Assessments- Amplify ● End of Unit Arguments	**Benchmark Assessments:** ● End Unit Written Scientific Argument ● Fall/Winter/Spring Written Scientific Argument
Knowledge & Skills	
Enduring Understandings: ● Matter is a term that applies to all of the stuff around us and it is made of particles that are too small to see.	**Essential Questions:** ● What is matter and what is it made of? ● What happens to the mass of matter as goes through its different forms (solid, liquid, gas)? ● What are the identifiable properties of a substance?

• When substances are heated, cooled, or mixed the total weight before and after is always the same. • Substances can be identified based on observable and measurable properties. • Sometimes when two substances are mixed, each of the substances keeps its original properties and sometimes a new substance is formed. • Give an examples of matter • Describe how gases are made from matter particles that are too small to be seen. (Ex: an inflated balloon) • Measure and graph the weights of matter before and after being heated, cooled, or mixed. • Identify materials based on various observable properties. • Determine whether the mixing of two substances always results in the formation of new substances or not and provide examples. • Identify the differences between soluble and insoluble solutions.	• When two substances are mixed together, is something completely new and different always made?
Core Instructional & Supplemental Materials	
Suggested Activities/Resources: • Science Digital resources • -http://betterlesson.com/lesson/644582/the-particles-of-matter • -https://njctl.org/courses/science/5th-grade-science/matter-and-its-interactions/ • -https://www.youtube.com/watch?v=R1RMV5qhwyE • Bill Nye “Phases of Matter” Video • *HMH Dimensions*	**Varied Levels of Text:** • Newsela • Teacher provided content related articles • Short shared text • *Made of Matter* • *Break it Down* • *Solving Dissolving* • *Science You Can’t See* • *Food Scientist’s Handbook*

Unit 3: From Molecules to Organisms: Structures and Processes	**Duration: 35 days- ongoing**
Standards/Learning Targets	
New Jersey Student Learning Standards: • **5-LS1-1-** Support an argument that plants get the materials they need for growth chiefly from air and water • **5-LS2-1-** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. • **5-PS1-1-** Develop a model to describe that matter is made of particles too small to be seen. • **5-PS1-4-** Conduct an investigation to determine whether the mixing of two or more substances results in new substances. • **5-PS3-1-** Use models to describe that energy in animals’ food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	

- **5-ESS3-1-** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Performance Expectation	
5-LS1-1- Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Engaging in Argument from Evidence- ● Support an argument with evidence, data, or a model.	**LS1.C: Organization for Matter and Energy-** ● Flow in Organisms Plants acquire their material for growth chiefly from air and water.
Crosscutting Concepts	**Learning Objectives**
Energy and Matter- ● Matter is transported into, out of, and within systems.	● Students identify a given claim to be supported about a given phenomenon. The claim includes the idea that plants acquire the materials they need for growth chiefly from air and water. ● Students describe the given evidence, data, and/or models that support the claim. ● Students determine whether the evidence supports the claim. ● Students use reasoning to connect the evidence to support the claim with argumentation. Students describe a chain of reasoning.

Performance Expectation	
5-LS2-1- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.[Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- ● Develop a model to describe phenomena. **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena-** ● Science explanations describe the mechanisms for natural events.	**LS2.A: Interdependent Relationships in Ecosystems-** ● The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or

	plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. **LS2.B: Cycles of Matter and Energy-** ● Transfer in Ecosystems Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● A system can be described in terms of its components and their interactions.	● Students develop a model to describe a phenomenon that includes the movement of matter within an ecosystem. In the model, students identify the relevant components. ● Students describe the relationships among components that are relevant for describing the phenomenon.

Performance Expectation	
5-PS1-4- Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	
Science and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	**PS1.B: Chemical Reactions-** ● When two or more different substances are mixed, a new substance with different properties may be formed.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Cause and effect relationships are routinely identified and used to explain change.	● From the given investigation plan, students describe the phenomenon under investigation, which includes the mixing of two or more substances. ● Students identify the purpose of the investigation, which includes providing

	evidence for whether new substances are formed by mixing two or more substances, based on the properties of the resulting substance. ● From the given investigation plan, students describe the evidence from data that will be collected. ● From the given investigation plan, students describe how the data will be collected.

Performance Expectation	
5-PS3-1- Use or develop a model to describe how energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flowcharts.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- ● Use models to describe phenomena.	**PS3.D: Energy in Chemical Processes and Everyday Life-** ● The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms-** ● Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1) Plants acquire their material for growth chiefly from air and water.
Crosscutting Concepts	**Learning Objectives**
Energy and Matter- ● Matter is transported into, out of, and within systems.	● Students use models to describe a phenomenon that includes the idea that energy in animals' food was once energy from the sun. Students identify and describe the components of the model that are relevant for describing the phenomenon. ● Students identify and describe the relevant relationships between components. ● Students use the models to describe causal accounts of the relationships between energy from the sun and animals' needs for energy.

Performance Expectation

5-ESS3-1- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Science and Engineering Practices	Disciplinary Core Ideas
Obtaining, Evaluating, and Communicating Information- ● Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	**ESS3.C: Human Impacts on Earth Systems-** ● Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● A system can be described in terms of its components and their interactions. **Science Addresses Questions About the Natural and Material World-** ● Science findings are limited to questions that can be answered with empirical evidence	● Students obtain information from books and other reliable media about: ○ How a given human activity (e.g., in agriculture, industry, everyday life) affects the Earth's resources and environments. ○ How a given community uses scientific ideas to protect a given natural resource and the environment in which the resource is found. ● Students combine information from two or more sources to provide and describe evidence about: ○ The positive and negative effects on the environment as a result of human activities. ○ How individual communities can use scientific ideas and a scientific understanding of interactions between components of environmental systems to protect a natural resource and the environment in which the resource is found.

Primary Interdisciplinary Connections:

ELA/Literacy

- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product

- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Suggested Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Provide access to online dictionary

Special Education/Students with Disabilities:

- Follow specific IEP accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

504:

- Follow specific 504 accommodations and modifications
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- Pre-teach concepts
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Gifted and Talented:

- Open ended questions to activate higher level thinking
- Higher level texts
- Student developed extension activities
- Plan self directed inquiry
- Student created rubrics
- Curriculum compacting
- Opportunities to push assessment/activity boundaries

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use

- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input

Culturally Diverse:

- Involve families in student learning including phenomenon studies
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Provided students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students

Evidence of Student Learning	
Formative Tasks: ● Interactive Science Notebooks ● Student Models ● Students' Scientific Arguments ● Student self assessment	**Alternative Assessments:** ● Kinesthetic models/observational ● Collaborative digital models ● Oral explanations/arguments ● Collaborative investigations-participation ● Teacher observation/anecdotal records
Summative Assessments ● Student Scientific Arguments/Chapter writing ● Critical Juncture Assessments- Amplify ● End of Unit Arguments	**Benchmark Assessments:** ● End Unit Written Scientific Argument ● Fall/Winter/Spring Written Scientific Argument
Knowledge & Skills	
Enduring Understandings: ● Everything is made of matter. Matter is made of molecules. ● Animals grow by changing food molecules into body molecules that can build their bodies. ● Animals use some food molecules to release energy for movement and growth.	**Essential Questions:** ● How do animals grow? ● Where do food molecules in an ecosystem come from? ● Where do food molecules for plants come from? ● Where does energy in an ecosystem come from?

• Food molecules in an ecosystem can always be traced back to plants. • Plants use water molecules, carbon dioxide molecules from the air, and energy from the sun to make food. • Animals and plants grow by changing food molecules into body molecules that can build their bodies. • Animals and plants use some food molecules to release energy for movement and growth. • Energy in an ecosystem can always be traced back to the sun. • Scientists convince others that their claims are correct by using data and ideas as evidence. • Decomposers release nutrients from dead plants and animals into the soil. • Animals, plants, and decomposers grow by changing food molecules into body molecules that can build their bodies. • Animals, plants, and decomposers use some food molecules to release energy for movement and growth. • Plants need nutrients to help make food molecules for energy and body matter.	• Why is the matter that makes up soil different in different places? • How do nutrients in the soil help plants grow? • How do scientists convince others that their claims are correct?
Core Instructional & Supplemental Materials	
Suggested Activities/Resources: • Gizmos • https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species.aspx • https://njctl.org/courses/science/5th-grade-science/ecosystem-dynamics/ • https://njctl.org/courses/science/5th-grade-science/energy-in-organisms/	**Varied Levels of Text:** • Newsela • Teacher provided content related articles • Short shared text • *Matter Makes It All Up* • *Energy Makes it All Go* • *Why do Scientists Argue?* • *Walk in the Woods* • *Restoration Case Studies*

Unit 4: Ecosystems: Interactions, Energy, and Dynamics	**Duration: 40 days- ongoing**
Standards/Learning Targets	
New Jersey Student Learning Standards: • **5-LS1-1-** Support an argument that plants get the materials they need for growth chiefly from air and water	
Performance Expectation	

5-LS1-1- Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]

Science and Engineering Practices	Disciplinary Core Ideas
Engaging in Argument from Evidence- ● Support an argument with evidence, data, or a model.	**LS1.C: Organization for Matter and Energy-** ● Flow in Organisms Plants acquire their material for growth chiefly from air and water.
Crosscutting Concepts	**Learning Objectives**
Energy and Matter- ● Matter is transported into, out of, and within systems.	● Students identify a given claim to be supported about a given phenomenon. The claim includes the idea that plants acquire the materials they need for growth chiefly from air and water. ● Students describe the given evidence, data, and/or models that support the claim. ● Students determine whether the evidence supports the claim. ● Students use reasoning to connect the evidence to support the claim with argumentation. Students describe a chain of reasoning.

Performance Expectation

5-LS2-1- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.[Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

Science and Engineering Practices	Disciplinary Core Ideas
Developing and Using Models- ● Develop a model to describe phenomena. **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena-** ● Science explanations describe the mechanisms for natural events.	**LS2.A: Interdependent Relationships in Ecosystems-** ● The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species

	of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. **LS2.B: Cycles of Matter and Energy-** ● Transfer in Ecosystems Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● A system can be described in terms of its components and their interactions.	● Students develop a model to describe a phenomenon that includes the movement of matter within an ecosystem. In the model, students identify the relevant components. ● Students describe the relationships among components that are relevant for describing the phenomenon.

Performance Expectation	
5-PS1-4- Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	
Science and Engineering Practices	**Disciplinary Core Ideas**
Planning and Carrying Out Investigations- ● Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	**PS1.B: Chemical Reactions-** ● When two or more different substances are mixed, a new substance with different properties may be formed.
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Cause and effect relationships are routinely identified and used to explain change.	● From the given investigation plan, students describe the phenomenon under investigation, which includes the mixing of two or more substances. ● Students identify the purpose of the investigation, which includes providing evidence for whether new substances are formed by mixing two or more substances, based on the properties of the resulting substance. ● From the given investigation plan, students describe the evidence from data that will be collected.

	• From the given investigation plan, students describe how the data will be collected.

Performance Expectation	
5-PS3-1- Use or develop a model to describe how energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flowcharts.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Developing and Using Models- • Use models to describe phenomena.	**PS3.D: Energy in Chemical Processes and Everyday Life-** • The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms-** • Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1) Plants acquire their material for growth chiefly from air and water.
Crosscutting Concepts	**Learning Objectives**
Energy and Matter- • Matter is transported into, out of, and within systems.	• Students use models to describe a phenomenon that includes the idea that energy in animals' food was once energy from the sun. Students identify and describe the components of the model that are relevant for describing the phenomenon. • Students identify and describe the relevant relationships between components. • Students use the models to describe causal accounts of the relationships between energy from the sun and animals' needs for energy.

Performance Expectation	
5-ESS3-1- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	
Science and Engineering Practices	**Disciplinary Core Ideas**
Obtaining, Evaluating, and Communicating Information-	**ESS3.C: Human Impacts on Earth Systems-** • Human activities in agriculture, industry, and

• Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.
Crosscutting Concepts	**Learning Objectives**

Systems and System Models-
• A system can be described in terms of its components and their interactions.
Science Addresses Questions About the Natural and Material World-
• Science findings are limited to questions that can be answered with empirical evidence
	• Students obtain information from books and other reliable media about:
	  ○ How a given human activity (e.g., in agriculture, industry, everyday life) affects the Earth's resources and environments.
	  ○ How a given community uses scientific ideas to protect a given natural resource and the environment in which the resource is found.
	• Students combine information from two or more sources to provide and describe evidence about:
	  ○ The positive and negative effects on the environment as a result of human activities.
	  ○ How individual communities can use scientific ideas and a scientific understanding of interactions between components of environmental systems to protect a natural resource and the environment in which the resource is found.

Primary Interdisciplinary Connections:

- **ELA/Literacy**
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Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
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Core Instructional & Supplemental Materials	
Suggested Activities/Resources: • Gizmos • https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species.aspx • https://njctl.org/courses/science/5th-grade-science/ecosystem-dynamics/ • https://njctl.org/courses/science/5th-grade-science/energy-in-organisms/	**Varied Levels of Text:** • *Zonia's Rainforest* by Juana Martinez-Neal • Newsela • Teacher provided content related articles • Short shared text • *Matter Makes It All Up* • *Energy Makes it All Go* • *Why do Scientists Argue?* • *Walk in the Woods* • *Restoration Case Studies*

Unit 5: Motion and Stability: Forces and Interactions	**Duration: 20 days- ongoing**
Standards/Learning Targets	
New Jersey Student Learning Standards: • **5-PS2-1-** Support an argument that the gravitational force exerted by Earth on objects is directed down. • **5-ESS1-1-** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. • **5-ESS1-2-** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	
Performance Expectation	

- **5-PS2-1-** Support an argument that the gravitational force exerted by Earth on objects is directed down. [Clarification Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth.] [Assessment Boundary: Assessment does not include mathematical representation of gravitational force.]

Science and Engineering Practices	Disciplinary Core Ideas
Engaging in Argument from Evidence- ● Support an argument with evidence, data, or a model.	**PS2.B: Types of Interactions-** ● The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center. (5-PS2-1)
Crosscutting Concepts	**Learning Objectives**
Cause and Effect- ● Cause and effect relationships are routinely identified and used to explain change.	● Students identify a given claim to be supported about a phenomenon. The claim includes the idea that the gravitational force exerted by Earth on objects is directed down toward the center of Earth. ● Identifying scientific evidence a Students identify and describe the given evidence, data, and/or models that support the claim, including: ○ Multiple lines of evidence that indicate that the Earth’s shape is spherical (e.g., observation of ships sailing beyond the horizon, the shape of the Earth’s shadow on the moon during an eclipse, the changing height of the North Star above the horizon as people travel north and south). ○ That objects dropped appear to fall straight down. ○ That people live all around the spherical Earth, and they all observe that objects appear to fall straight ● Students evaluate the evidence to determine whether it is sufficient and relevant to supporting the claim. ● Students describe whether any additional evidence is needed to support the claim. ● Students use reasoning to connect the relevant and appropriate evidence to support the claim with argumentation. ● Students describe a chain of reasoning that includes: ○ If Earth is spherical, and all observers see objects near them falling directly “down” to the Earth’s surface, then all observers would agree that objects fall toward the Earth’s center. ○ Since an object that is initially stationary when held moves downward when it is released, there must be a force (gravity) acting on the object that pulls the object

	toward the center of Earth.

Performance Expectation	
● **5-ESS1-1-** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. [Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Engaging in Argument from Evidence- ● Support an argument with evidence, data, or a model.	**ESS1.A: The Universe and its Stars-** ● The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.
Crosscutting Concepts	**Learning Objectives**
Scale, Proportion, and Quantity- ● Natural objects exist from the very small to the immensely large.	● Students identify a given claim to be supported about a given phenomenon. The claim includes the idea that the apparent brightness of the sun and stars is due to their relative distances from Earth. ● Students describe the evidence, data, and/or models that support the claim. ● Students evaluate the evidence to determine whether it is relevant to supporting the claim, and sufficient to describe the relationship between apparent size and apparent brightness of the sun and other stars and their relative distances from Earth. ● Students determine whether additional evidence is needed to support the claim. ● Students use reasoning to connect the relevant and appropriate evidence to the claim with argumentation. ● Students describe a chain of reasoning.

Performance Expectation	
5-ESS1-2- Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.]	
Science and Engineering Practices	**Disciplinary Core Ideas**
Analyzing and Interpreting Data- ● Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to	**ESS1.B: Earth and the Solar System-** ● The orbits of Earth around the sun and of the moon around Earth, together with the rotation

reveal patterns that indicate relationships.	of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.
Crosscutting Concepts	**Learning Objectives**
Patterns- ● Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.	● Using graphical displays (e.g., bar graphs, pictographs), students organize data pertaining to daily and seasonal changes caused by the Earth's rotation and orbit around the sun. ● Students use the organized data to find and describe relationships within the datasets. ● Students use the organized data to find and describe relationships among the datasets.

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Summative Assessments ● Student Scientific Arguments/Chapter writing ● End of Unit Arguments	**Benchmark Assessments:** ● End Unit Written Scientific Argument ● Fall/Winter/Spring Written Scientific Argument
Knowledge & Skills	
Enduring Understandings: ● Create an argument that the relative brightness of the Sun compared to other stars is a function of the distance to those stars. ● Explain how day turns into night. ● Explain why the sun casts different sized shadows. ● Explain that the location of constellations in the night sky appear in different locations due to the rotation and revolution of Earth. ● Explain that the length of shadows decreases during the day until they reach a certain point, then the shadows gradually start to get larger. ● Gravity is the pull from Earth that keeps objects from floating into space. ● Gravitational force pulls from each object's center of gravity (center of its mass)	**Essential Questions:** ● How does the relative distance affect the brightness of a star? ● What causes night and day? ● Why are some constellations only visible during certain times of the year? ● Why do shadows appear larger at certain times of the day, and shorter at other times? ● What factors make certain stars appear brighter than others? ● How does the tilt of the Earth's axis affect the angle at which the Sun's rays hit the Earth? ● What role does gravity play as it pertains to objects on Earth?
Core Instructional & Supplemental Materials	
Suggested Activities/Resources- ● Gizmos	**Varied Levels of Text-** ● Newsela ● Teacher provided content related articles ● Short shared text ● *How Big Is Big? How Far Is Far?* ● *Which Way is Up?* ● *Dog Days of Summer* ● *Handbook of Stars and Constellations* ● *Star Scientist*

Unit 6: Earth's Systems	Duration: 40 days- ongoing

Standards/Learning Targets

New Jersey Student Learning Standards:

- **5-ESS2-1-** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS2-2-** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- **5-ESS3-1-** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Performance Expectation

5-ESS2-1- Analyze and interpret data to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact, concluding that the presented water shortage is an interaction of the hydrosphere and biosphere. This prompts discourse of identify engineering problems and developing solutions. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.]

Science and Engineering Practices	Disciplinary Core Ideas
Developing and Using Models- ● Develop a model using an example to describe a scientific principle.	**ESS2.A: Earth Materials and Systems** ● Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)
Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● A system can be described in terms of its components and their interactions.	● SWBAT synthesize information to determine the distribution of fresh and salt water on the planet. ● SWBAT analyze and interpret data to explain the interconnectedness of two systems interactions ● SWBAT define problems and develop solutions.

Performance Expectation

5-ESS2-2- Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
[*Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, groundwater, and polar ice caps, and does not include the atmosphere.*]

Science and Engineering Practices	Disciplinary Core Ideas
Using Mathematics and Computational Thinking- ● Describe and graph quantities such as area and volume to address scientific questions.	**ESS2.C: The Roles of Water in Earth's Surface Processes-** ● Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
Crosscutting Concepts	**Learning Objectives**
Scale, Proportion, and Quantity- ● Standard units are used to measure and describe physical quantities such as weight and volume.	● SWBAT identify where freshwater is located on Earth. ● SWBAT construct a graph to represent and analyze the distribution of water on Earth. ● SWBAT identify the percentage of freshwater on earth that is available for human use. ● SWBAT explain why it is important to preserve the water we currently have available for human use.

Performance Expectation

5-ESS3-1- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Science and Engineering Practices	Disciplinary Core Ideas
Obtaining, Evaluating, and Communicating Information- ● Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	**ESS3.C: Human Impacts on Earth Systems-** ● Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

Crosscutting Concepts	Learning Objectives
Systems and System Models- ● A system can be described in terms of its components and their interactions. **Science Addresses Questions About the Natural and Material World-** ● Science findings are limited to questions that can be answered with empirical evidence	● Students obtain information from books and other reliable media about: ○ How a given human activity (e.g., in agriculture, industry, everyday life) affects the Earth's resources and environments. ○ How a given community uses scientific ideas to protect a given natural resource and the environment in which the resource is found. ● Students combine information from two or more sources to provide and describe evidence about: ○ The positive and negative effects on the environment as a result of human activities. ○ How individual communities can use scientific ideas and a scientific understanding of interactions between components of environmental systems to protect a natural resource and the environment in which the resource is found.

Suggested Accommodations

English Language Learners:
- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Provide access to online dictionary

Special Education/Students with Disabilities:
- Follow specific IEP accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

504:
- Follow specific 504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

Gifted and Talented:
- Open ended questions to activate higher level thinking
- Higher level texts
- Student developed extension activities
- Plan self directed inquiry
- Student created rubrics

- Curriculum compacting
- Opportunities to push assessment/activity boundaries

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input

Culturally Diverse:

- Involve families in student learning including phenomenon studies
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Provided students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students

Evidence of Student Learning	
Formative Tasks: ● Interactive Science Notebooks ● Student Models ● Students' Scientific Arguments/Engineering solutions ● Student self assessment	**Alternative Assessments:** ● Kinesthetic models/observational ● Collaborative digital models ● Oral explanations/arguments ● Collaborative investigations-participation ● Teacher observation/anecdotal records
Summative Assessments ● Student Scientific Arguments/Chapter writing ● Critical Juncture Assessments ● Engineering Solutions ● End of Unit Arguments	**Benchmark Assessments:** ● End Unit Written Scientific Argument ● Fall/Winter/Spring Written Scientific Argument

Knowledge & Skills	
Enduring Understandings: ● Earth is a nonliving object that is made up of four major systems (geosphere, atmosphere, hydrosphere, and biosphere). ● Geosphere (solid/molten rock, soil, sediments. Hydrosphere (water and ice). Biosphere (living things, including humans). Atmosphere (air). ● Earth's systems interact in multiple ways to affect Earth's surface materials and processes. ● Nearly all of Earth's available water is in the ocean - freshwater in glaciers or underground; tiny fraction in streams, lakes, wetlands, and atmosphere.	**Essential Questions:** ● What are the four major systems that make up our Earth and how do they interact? ● What are the components of our atmosphere, geosphere, biosphere, and hydrosphere? ● Where is the water on Earth located? Where and how much of this water is usable by humans? ● How is water distributed on Earth? (percentage) ● What effect does ocean water have on the nearby land? ● How does the interaction of winds/clouds and mountains determine weather patterns? ● What impact do humans play on the Earth's systems? ● **How can the engineering process be used to solve real world problems?**
Core Instructional & Supplemental Materials	
Suggested Activities/Resources: ● Gizmos ● www.Betterlesson.com ● www.teachengineering.org ● sciencing.com	**Varied Levels of Text:** ● Newsela ● Teacher provided content related articles ● Short shared text ● *How Big Is Big? How Far Is Far?* ● *Which Way is Up?* ● *Dog Days of Summer* ● *Handbook of Stars and Constellations* ● *Star Scientist* ● *Made of Matter* ● *Break it Down* ● *Solving Dissolving* ● *Science You Can't See* ● *Food Scientist's Handbook* ● *Matter Makes It All Up* ● *Energy Makes it All Go* ● *Why do Scientists Argue?* ● *Walk in the Woods* ● *Restoration Case Studies*

Unit 6: Earth and Human Activities	Duration: 30 days- ongoing
Standards/Learning Targets	
New Jersey Student Learning Standards: ● **5-ESS3-1-** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	
Primary Interdisciplinary Connections:	

- **ELA/Literacy**
- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

Technology Standards:

- 8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.
- 8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
- 8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product
- 8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
- 8.2.2.E.1 List and demonstrate the steps to an everyday task

Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP4. Communicate clearly and effectively and with reason.
- CRP12. Work productively in teams while using cultural global competence.

21st Century Life and Career Standards:

- 9.1.4.A.1- Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.

Standards/Learning Targets

New Jersey Student Learning Standards:

- **5-ESS2-1-** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS2-2-** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- **5-ESS3-1-** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Performance Expectation

5-ESS2-1- Analyze and interpret data to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact, concluding that the presented water shortage is an interaction of the hydrosphere and biosphere. This prompts discourse of identify engineering problems and developing solutions. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.]

Science and Engineering Practices	Disciplinary Core Ideas
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Crosscutting Concepts	**Learning Objectives**
Systems and System Models- ● A system can be described in terms of its components and their interactions.	● SWBAT synthesize information to determine the distribution of fresh and salt water on the planet. ● SWBAT analyze and interpret data to explain the interconnectedness of two systems interactions ● SWBAT define problems and develop solutions.

Performance Expectation	
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Science and Engineering Practices	**Disciplinary Core Ideas**
Using Mathematics and Computational Thinking- ● Describe and graph quantities such as area and volume to address scientific questions.	**ESS2.C: The Roles of Water in Earth's Surface Processes-** ● Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
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Essential Questions:
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- What impact do humans play on the Earth's systems?
- How can the engineering process be used to solve real world problems?

Core Instructional & Supplemental Materials

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- www.teachengineering.org
- sciencing.com

Varied Levels of Text:
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- *Star Scientist*
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	● *Solving Dissolving* ● *Science You Can't See* ● *Food Scientist's Handbook* ● *Matter Makes It All Up* ● *Energy Makes it All Go* ● *Why do Scientists Argue?* ● *Walk in the Woods* ● *Restoration Case Studies*