Title of Unit	1	Grade Level	5
Curriculum Area	Earth Science	Time Frame	50 days
Organizational Framework	Earth's Systems and Resources		

Science:

- 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.
- 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.

Literacy:

- RI.5.1 Quote accurately from a text what the text says explicitly and when drawing on inferences from the text.
- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or solve a problem efficiently.
- RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which points.
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably,

Enduring Understandings Students will understand that	Essential Questions Students will keep considering	
 Students will understand the different systems of the Earth and how they interact and impact each other's balance and viability. Students will understand how humans impact Earth's systems and what can be done to protect and preserve resources. Students will understand that scientists examine cause and effect to see relationships between organisms, places, things, ideas and events 	 systems? What can we do to positively influence society and protect the environment? Why are scientists concerned about cause and effect? 	

Knowledge/Objectives Students will know	Skills (based on Standards) Students will be skilled at		
 The sun is a star that appears larger and brighter than other stars because it is closer. The orbits involving the sun, moon and earth cause observable patterns. Earth's major systems Human activities have major effects on these systems. 	 Plan and conduct investigations and experiments. Collect and analyze data obtained from hands on collaborative group work and from multiple print and reliable media sources. Determine if data collected is reliable and usable. Draw conclusions based upon data collection. 		
Tier II Academic Vocabulary	2st Century Themes/Skills		
compare contrast analyze demonstrate innovate initiate emphasize structure achieve construct potential magnitude	Clobal Awareness Global Awareness Financial, Economic, Business, & Entrepreneurial Literacy Civic Literacy Environmental Literacy Health Literacy Health Literacy Health Literacy Creativity & Innovation Communication & Collaboration Media Literacy Critical Thinking & Problem Solving Information, Communication, & Technology Te		

Students will show their learning by...

Summative Assessment: Each unit includes the opportunity for students to compose one extended project that uses research to address a significant topic, problem or issue. This task should entail integrating knowledge from several additional literary or informational texts in various media or formats on a particular topic or question drawn from one or more texts from the module. Students are expected to perform research that assesses the accuracy of sources and acknowledges the conclusions of others without plagiarizing. Students can present their findings in a <u>variety of modes in both informal and more formal argumentative or explanatory contexts, either in writing or orally.</u> (Research aligned with the standards could take one to two weeks of instruction.

Performance Tasks:

Now that students have analyzed, evaluated, compared and contrasted, and synthesized information about the geological formations in the National Parks, they will apply this research in a project aimed at demonstrating the beauty and significance of their parks as well as the importance of protecting these natural assets of our country.

* National Parks Postcard Project: Students will learn about different geological formations and ecosystems and what scientists and historians have done over time to protect the ecological diversity in our country. Students will learn about the National Parks of the United States and select a park to investigate. Students will apply this research in a project to be worked on in the classroom creating a letter and a poster describing their research findings on the geological formations (canyons, caves, glaciers, etc.) and the animals and plants that thrive in that habitat. Students will demonstrate an understanding of the history, geology, ecology, and biodiversity and need for continued protection of the National Parks.

Formative Assessment

Suggested Formative Assessments:

- Quizzes
- Tests
- Interactive notebooks
- Graphic organizers
- OER's

Suggested Student Self-Assessments:

- Interactive notebooks
- Science journal writing
- Exit tickets
- Thumbs up or thumbs down
- Students will create a Quizlet on the material they have learned in this unit for review.
- Letter to a future student: At the conclusion of the unit students will write a letter to a future student explaining what they've learned in the unit, what to do when a task is difficult or what the student learned about their own learning process that may help the incoming student.
- Muddy Point Board: Students will use a designated area of the classroom to pin questions, muddy points, or topics they'd like to revisit. Asking students to periodically pick a question or comment from the board to discuss build student ownership of learning.

Resources/Technology

http://www.scientificamerican.com/article/bring-science-home-earthquake-proof-engineering/?print=true

http://www.nextgenscience.org/pe/5-ess1-1-earths-place-universe

http://www.nextgenscience.org/pe/5-ess2-1-earths-systems

http://www.nextgenscience.org/pe/5-ess3-1-earth-and-human-activity

https://newsela.com/

Brain pop

Bill Nye

National Geographic

Scientific American

Kids Discover

http://kids.nationalgeographic.com

http://www.kidsdiscover.com/kids-discover-online/

http://www.nationalparks.org/explore-parks

http://www.scientificamerican.com/article/bring-science-home-earthquake-proof-engineering/?print=true

http://www.nextgenscience.org/pe/5-ess1-1-earths-place-universe

Google classroom

Quizlet

Title of Unit	2	Grade Level	5
Curriculum Area	Science	Time Frame	42 days
Organizational Framework	Matter, Energy and Motion		

Science

- 5-PS1-1 Develop a model to describe that matter is made up 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 upon their properties.
- 5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- 5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down.
- 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.

Literacy

- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.(5-PS1-1)
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Math

• MP.2 Reason abstractly and quantitatively.

Enduring Understandings Students will understand that	Essential Questions (no more than 3) Students will keep considering
• Students will understand that matter is made up of particles too small to be seen.	How can we identify materials by their properties?
Students will be able to make observations and measurements to identify materials based on their properties.	 How can we conduct investigations on the effects of mixing substances or applying liquids, heat, pressure or cooling?
• Students will understand how scientists gather, classify, sequence, and interpret information and visual data in order to recognize how organisms, places, and events shape our world.	• Do the properties change when we dissolve crystals in water?

Knowledge/Objectives Students will know	 How can we use various types of information to make inferences and generalizations? Why should we use a variety of information and sources to make inferences and generalizations and to draw conclusions? Skills (based on Standards) Students will be skilled at
 Matter of any type can be changed into particles too small to see, but even then the matter still exists and can be detected by other means. When two or more substances are mixed a new substance with different properties may be formed. Natural objects exist that are too small to be seen. Standard units are used to measure and describe physical quantities such as weight, time, temperature and volume. Cause and effect relationships are routinely identified, tested and used to explain change 	 Plan and conduct investigations to determine the physical properties of substances. Summarize information on data gathered from multiple sources including online sources and data collected from hands on investigations in performance based tasks. Draw conclusions based upon and supported by the analysis of data.

Tier II Academic Vocabulary	2st Century Themes/Skills	
delineate determine analyze understanding apply evaluate calculate extend solution clarify	Creativity & Innovation Communication & Collaboration Media Literacy Critical Thinking & Problem Solving Information, Communication, & Technology Life & Career Skills	

Students will show their learning by...

Summative Assessment: Each unit includes the opportunity for students to compose one extended project that uses research to address a significant topic, problem or issue. This task should entail integrating knowledge from several additional literary or informational texts in various media or formats on a particular topic or question drawn from one or more texts from the module. Students are expected to perform research that assesses the accuracy of sources and acknowledges the conclusions of others without plagiarizing. Students can present their findings in a variety of modes in both informal and more formal argumentative or explanatory contexts, either in writing or orally. (Research aligned with the standards could take one to two weeks of instruction.

Performance Tasks:

Crystallization Processes: Students will create crystals through dissolving salt, sugar, Epsom salts or alum in boiling water and evaporating for crystallization. Various techniques will be used to create and observe the process of dissolving a solid into a liquid and evaporating fluids to recrystallize to a solid. Students will apply unit knowledge through collaboration on desalination of salt water and water purification. In addition, students will connect previous knowledge from fifth grade history study of Native Americans and their utilization for salt at a time when resources were limited. This discussion will be connected to the global need for fresh water and what scientists are doing to create safe desalination systems.

Collaborative Group Projects and Performance Tasks:

Native American salt sticks, recrystallizing Epsom salt crystals, making crystal egg geodes with alum. Comparing and contrasting crystallization data: crystallization time, materials, size of crystals, color of crystals, and present findings to class.

Formative Assessment

Suggested Formative Assessments:

- Quizzes
- Tests
- Interactive notebooks
- Small group experiments/STEAM activities
- Graphic organizers
- OER's

- Rubrics
- Class discussion

Suggested Student Self-Assessments:

- Interactive notebooks
- Science journal writing
- Exit tickets
- Thumbs up or thumbs down
- Students will create a Quizlet on the material they have learned in this unit for review.
- Letter to a future student: At the conclusion of the unit students will write a letter to a future student explaining what they've learned in the unit, what to do when a task is difficult or what the student learned about their own learning process that may help the incoming student.
- Muddy Point Board: Students will use a designated area of the classroom to pin questions, muddy points, or topics they'd like to revisit. Asking students to periodically pick a question or comment from the board to discuss build student ownership of learning.

Resources/Technology

http://www.nclark.net

http://www.nextgenscience.org/dci-arrangement/5-ps1-matter-and-its-interactions

http://www.nextgenscience.org/dci-arrangement/5-ps2-motion-and-stability-forces-and-interactions

http://www.nextgenscience.org/dci-arrangement/5-ps3-energy

https://ssec.si.edu (Smithsonian Science)

https://newsela.com/

Brain Pop

Bill Nye

USGS.gov

http://kids.nationalgeographic.com

http://www.kidsdiscover.com/kids-discover-online/

https://quizlet.com

https://getkahoot.com

https://www.khanacademy.org/science/physics

Google classroom

Title of Unit	3	Grade Level	5
Curriculum Area	Life Science	Time Frame	42 days
Organizational Framework			
	Ecosystems: Interactions, Energy, Structures and Processes		
0, 1, 1, 0, 1			

Science:

- 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.

Literacy:

- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Enduring Understandings Students will understand that	Essential Questions (no more than 3) Students will keep considering
Scientists examine cause and effect to see relationships between organisms, places, things and ideas.	Why should we understand how organisms, places and ideas have changed over time?
 Scientists analyze how organisms, places and things change over time. 	Why should we recognize universal patterns that exist within our world?
Scientists analyze and interpret evidence to solve problems and make decisions.	How can the different perspectives of a group affect their use and impact on the environment?

Knowledge/Objectives Students will know	Skills (based on Standards) Students will be skilled at	
 When a specific population of a plant or animal is at risk of disappearing, or becoming extinct, it is known as an endangered species. Organisms are related in food webs in which some animals eat plants for food and others eat animals that eat plants. Plants acquire their material for growth chiefly from air and water 	 Integrate information from several texts on the same topic to write or speak on the subject knowledgeably. Create detailed food webs and food chains that describe the energy transfer among organisms in an ecosystem. Describe and explain the plight of endangered animals in our community and what can be done to save them. 	
Tier II Academic Vocabulary	2st Century Themes/Skills	
sequence irrigate solution similar repetitive origin transfer distinguish consequence delineate understanding	Check all that apply Global Awareness Financial, Economic, Business, & Entrepreneurial Literacy Civic Literacy Environmental Literacy Health Literacy	

21st Century Skills: check all that apply
 □ Creativity & Innovation □ Communication & Collaboration □ Media Literacy □ Critical Thinking & Problem Solving □ Information Literacy □ Information, Communication, & Technology □ Life & Career Skills

Students will show their learning by...

Summative Assessment: Each unit includes the opportunity for students to compose one extended project that uses research to address a significant topic, problem or issue. This task should entail integrating knowledge from several additional literary or informational texts in various media or formats on a particular topic or question drawn from one or more texts from the module. Students are expected to perform research that assesses the accuracy of sources and acknowledges the conclusions of others without plagiarizing. Students can present their findings in a variety of modes in both informal and more formal argumentative or explanatory contexts, either in writing or orally. (Research aligned with the standards could take one to two weeks of instruction.

Performance Tasks:

*Species on the Edge Art and Essay Contest: http://www.conservewildlifenj.org/education/edge/

Students will research an endangered animal in our local habitat, compose an essay and complete an art piece in a contest for New Jersey fifth grade students. The project will begin with a lecture from a local environmentalist and guest speaker on endangered animals. Students will select an endangered animal and read about its habitat and why it is endangered. Working with a timeline students will complete the project in school and submit the essays and art posters to the Conserve Wildlife Foundation. Students will be scored on a rubric and judged locally as well as on the state level. Students are expected to understand the habitat of their species as well as the threats to its survival.

Formative Assessment

Suggested Formative Assessments:

- Quizzes
- Tests
- Interactive notebooks
- Small group experiments/STEAM activities
- Graphic organizers
- OER's
- Rubrics
- Class discussion

Suggested Student Self-Assessments:

- Interactive notebooks
- Science journal writing
- Exit tickets
- Thumbs up or thumbs down
- Students will create a Quizlet on the material they have learned in this unit for review.
- Letter to a future student: At the conclusion of the unit students will write a letter to a future student explaining what they've learned in the unit, what to do when a task is difficult or what the student learned about their own learning process that may help the incoming student.
- Muddy Point Board: Students will use a designated area of the classroom to pin questions, muddy points, or topics they'd like to revisit. Asking students to periodically pick a question or comment from the board to discuss build student ownership of learning.

Resources/Technology

http://www.nclark.net

 $\underline{http://www.nextgenscience.org/pe/5-ls1-1-molecules-organisms-structures-and-processes}$

http://www.nextgenscience.org/pe/5-ls2-1-ecosystems-interactions-energy-and-dynamics

Title of Unit	4	Grade Level	5
Curriculum Area	Engineering Science	Time Frame	42 days
Organizational Framework			
	Design, Plan, Test and Improve		
04 1 1 10 1			

Science:

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

Literacy:

- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or solve a problem efficiently.
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources, summarize or paraphrase information in notes and finished work, and provide a list of sources.

Math:

- MP.2 Reason abstractly and quantitatively
- MP.5 use appropriate tools strategically.

Enduring Understandings Students will understand that	Essential Questions Students will keep considering
 Students will understand that engineering involves defining problems, creating possible solutions, testing those solutions and continuing the design process to improve overall design and performance. 	 How can you gather and use evidence and data to solve problems and make decisions? What types of problems are of concern for communities?
	How can studying evidence from the past help us prevent future problems and increase efficiency?

Knowledge/Objectives Students will know	Skills (based on Standards) Students will be skilled at
 Possible solutions to a problem are limited by available materials and resources. Multiple solutions to problems can be compared on the basis of how well each solution meets the criteria and considers the constraints. Research should be carried out before beginning to design a solution. Communicating with peers is an important part of the design process and shared ideas can lead to improved designs. Tests are designed to identify weak points which suggest which parts of the design need to be improved. Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. 	 Work effectively in groups to solve problems with simpler tasks. Listen critically to peers to collaborate on the design process. Collaborate in small groups to test and evaluate the improvements needed in the design. Summarize and present to the class the problem, solution and design with details on the testing and improvement as a result of testing.

Tier II Academic Vocabulary	2st Century Themes/Skills
Prediction Hypothesis Frequency Manipulate Construct Analyze Calculate Evaluate Thesis Variable	Check all that apply Global Awareness Financial, Economic, Business, & Entrepreneurial Literacy Civic Literacy Environmental Literacy Health Literacy
Chronological	21" Century Skills: check all that apply Creativity & Innovation Communication & Collaboration Media Literacy Critical Thinking & Problem Solving Information Literacy Information, Communication, & Technology Life & Career Skills

Students will show their learning by...

Formative Assessment

Suggested Formative Assessments:

- Quizzes
- Tests
- Interactive notebooks
- Small group experiments/STEAM activities
- Graphic organizers
- OER's
- Rubrics
- Class discussion
- STEM Interviews

Suggested Student Self-Assessments:

- Interactive notebooks
- Science journal writing
- Exit tickets
- Thumbs up or thumbs down
- Students will create a Quizlet on the material they have learned in this unit for review.
- Letter to a future student: At the conclusion of the unit students will write a letter to a future student explaining what they've learned in the unit, what to do when a task is difficult or what the student learned about their own learning process that may help the incoming student.
- Muddy Point Board: Students will use a designated area of the classroom to pin questions, muddy points, or topics they'd like to revisit. Asking students to periodically pick a question or comment from the board to discuss build student ownership of learning.

Resources/Technology

http://www.nextgenscience.org/pe/3-5-ets1-1-engineering-design

https://www.teachengineering.org

http://www.nextgenscience.org/dci-arrangement/3-5-ets1-engineering-design

http://pbskids.org/designsquad/

http://www.nsta.org/default.aspx

Google docs Google classroom Google slides

IMovie