East Newark Public School

Science Curriculum
Grade 4

Revised 2022

Equity Statement:

East Newark Public School District does not discriminate on the basis of race, color, creed, religion, sex, ancestry, or national origin. The East Newark Board of Education ensures that all students enrolled in the schools of this district shall be afforded equal educational opportunities in strict accordance with the law. No student shall be denied access to or benefit from any educational program or activity on the basis of the student's race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability. The Board directs the Superintendent to allocate faculty, administrators, support staff members, curriculum materials, and instructional equipment supplies among classes of this district in a manner that ensures equivalency of educational opportunity throughout this district. The school district's curricula will eliminate discrimination, promote mutual acceptance and respect among students, and enable students to interact effectively with others, regardless of race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability.

Course Description:

The East Newark Public School fourth grade science program is designed to introduce and develop a foundation in science through five major units of study. Students will gain an understanding of many important areas of Life, Earth, and Physical Sciences, and will utilize and understand scientific processes. All courses are designed to prepare students for The New Jersey Student Learning Assessment, their school science courses, and for solving simple scientific problems and issues in their everyday lives.

The material is presented at a moderate pace and can be adjusted for various levels taught. Lessons are based on discussions and student- driven activities. Hands-on activities are meant to show connections to real-life science applications, and to promote critical thinking and problem solving skills. Students who are placed in this course based on ESL placement will also receive appropriate accommodations based upon their ESL level. Students receiving Special Education services will receive modifications and accommodations to information and assessments as indicated in their Individual Education Plan.

Course Modifications:
The course instructor will determine, with the assistance of administrators, teacher assistants/aides, educational specialists, and/or special education teachers, what modifications will be made for his/her students. Such examples of modifications can include, but not be limited to:

- Extended time as needed
- Modification of tests and quizzes
- Preferential seating
- Alternative/Formative assessment (projects)
- Effective teacher questioning (ranging from simple recall to higher order critical thinking questions)
- Supplemental materials
- Cooperative learning
- Teacher tutoring
- Peer tutoring
- Differentiated Instruction

Best Practices:

Best practices come from research-based, effective methodologies in presenting material in a manner to engage all students in the learning process. Thorough planning and collaborative discussions about instructional practices are part of the ongoing practice of teachers. Student activities and practices that reflect effective methodology include, but are not limited to, providing students with:

- Regular opportunities to investigate topics in depth
- The ability to exercise choice and responsibility by choosing their own topics
- Opportunities for active participation in the classroom and the community
- Exploration of open-ended questions that challenge their thinking
- Opportunities for reading, writing, observing, discussing, and debating ideas
- Activities that include independent inquiry and cooperative learning
- Assessment of student learning that promotes lifelong responsible citizenship rather than the sole memorization of facts
- Strategies and tools to read and comprehend informational text

Grade 4 Scope and Sequence:

Unit	Estimated Pacing
Introduction to Science	5 weeks
Energy	9 weeks
Waves: Waves and Information	3 weeks
Structure, Function, and Information Processing	8 weeks
Processes that Shape the Earth	7 weeks

Marking Period	Unit Title	Recommended Instructional Days
1	Introduction to Science	5 weeks

NJSLS - Science: *TItle*	NJSLS - Science: *Performance Expectations*	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
Waves and Their Applications in Technologies for Information Transfer	• **4-PS4-2:** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	**Essential Question/s:** 1. Why am I shorter in the metric system? 2. What is data? 3. Why do scientists and engineers measure the same thing so much? 4. How do you solve a problem? 5. How does the North Star allow you to find direction? 6. How many mindsets can you use when solving a problem? **Activity Description**: • Article analysis • Vocabulary activities • Video/photo analysis • Weekly Phenomenon Investigation: Why am I shorter in the metric system? • Students will create a reference page in their interactive notebooks and include images or drawings of the different measuring tools and descriptions of what they can measure. • Investigate length, mass, and volume; practice gathering/calculating different measurements. • Weekly Phenomenon Investigation: Why do scientists and engineers measure the same thing so much? • Writing prompt: Your class has earned a class party! The class gets to decide what the party is. The options for the party are popcorn, extra recess, pizza, and a read-a-thon. Each student gets one vote. Your teacher is trying to figure out which party had the highest number of votes. You come up with the idea of creating a graph. Write a letter to your teacher to share your idea. Make sure to
Engineering Design	• **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.	
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
PS4.B: Electromagnetic Radiation	An object can be seen when light reflected from its surface enters the eyes.	
ETS1.A: Defining and Delimiting Engineering Problems	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.
ETS1.B: Developing Possible Solutions	• 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. • 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.
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***
Developing and Using Models	Develop a model to describe phenomena.
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.
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.
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.

include what type of graph the class should use and why creating a graph would be the best decision.

- Discuss: How does observing your surroundings help you make better choices and decisions? How does looking at data help you make better choices? What data could you use to help you be a better friend?
- Students will analyze data and organize it into different types of graphs (bar, line, pie, etc.)
- Weekly Phenomenon Investigation: How do you solve a problem? Situation: Your classroom is full of school supplies. Your teacher doesn't know where to keep all of them. You need to design something to hold your school supplies. Create a how-to book with instructions on how to create your product.
- Discuss: How do you feel before you solve a problem? How do you feel after you solve a problem? Who or what can you talk to when you need help solving a problem?
- Weekly Phenomenon Investigation: How does the North Star allow you to find direction?
- "I Wonder" graphic organizer: Brainstorm ideas of what you are curious about. What are things you want to learn more about? What are some things that interest you?
- Writing prompt: Create your own constellation. Write a story about its origin.
- Assemble and use a planisphere.
- Weekly Phenomenon Investigation: How many mindsets can you use when solving a problem?
- Discuss: What is something that you have done that demonstrated persistence? What is something that you have done that demonstrated resilience? How does being resilient help you overcome obstacles?
- Cup challenge: Students will be divided into groups of 2-3. Each group will be given a stack of plastic cups and instructed to take turns building a tower as tall as possible. Students will then be given different building challenges, such as not being able to use their hands, but instead must use rubber bands, paper clips, or yarn to stack the cups.

Interdisciplinary Connections: Content: ;NJSLS#:

ELA/Literacy -

FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***
Cause and Effect	Cause and effect relationships are routinely identified.
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. ● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
● Self-Awareness ● Self-Management ● Responsible Decision Making ● Social Awareness ● Relationship Skills ● Motivation	● Emotional Awareness ● Internal Regulation ● Behavior Control ● Goal Pursuance ● Appreciating Social and Environment Diversity ● Adaptive Behavior ● Communication ● Social Engagement ● Constructive Thinking ● Consequence Evaluation ● Respect for Self and Others ● Enthusiasm ● Initiative ● Resilience

- SL.4.5 - Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
- RI.5.1 - Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.1 - 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.
- 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.
- W.5.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

Mathematics -

- MP.2 - Reason abstractly and quantitatively.
- MP.4 - Model with mathematics.
- MP.5 - Use appropriate tools strategically.
- 3-5.OA - Operations and Algebraic Thinking
- 4.G.A.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Technology -

- 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Participation in class discussions/debates ● Exit tickets ● Quizzes ● In-class assignments/activities	**Benchmarks:** ● Writing promps ● Mid-Unit Assessments **Summative Assessments:**

• Presentations • Group assignments • IXL results	• Unit test • Unit project • Lab activities

Differentiated Student Access to Content: Teaching and Learning *Resources/Materials*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Modified/leveled readings from Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Translated and modified readings from Science Studies Weekly - Grade Four • Translated teacher created reading guides and presentations	• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations

Supplemental Resources

- Chromebooks
- SmartBoard
- IXL
- Teacher Online Resources
- Newsela.com
- Science A-Z
- BrainPop
- Quizlet
- Kahoot
- Applicable educational videos

Differentiated Student Access to Content: Recommended *Strategies & Techniques*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. • Jigsaws • Think-Pair-Share • Boost engagement with material by providing opportunities for differentiation, group work, and	• Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Extended time for revisions or	• Utilize visual supports and graphic organizers • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Device used for translation purposes • Provide additional wait time for student responses to questions to allow	• Encourage students to explore concepts in depth and encourage independent studies or investigations. • Modeling or independent student-led research • Use of higher leveled text and/or writing assignments

alternative assignments/assessments where appropriate ● Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.	opportunity to identify and develop areas of personal interest	students the ability to undergo the process of translation between languages, composition of response and attempted response.	● Utilize differentiation in the areas of acceleration, enrichment, and grouping

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:**	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	● **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process. ● **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem. ● **9.4.5.CT.3:** Describe how digital tools and technology may be used to solve problems. ● **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
	Career Readiness, Life Literacies, & Key Skills Practices	
	● Act as a responsible and contributing community members and employee. ● Attend to financial well-being. ● Consider the environmental, social and economic impacts of decisions. ● Demonstrate creativity and innovation. ● Utilize critical thinking to make sense of problems and persevere in solving them. ● Model integrity, ethical leadership and effective management ● Plan education and career paths aligned to personal goals. ● Use technology to enhance productivity increase collaboration and communicate effectively. ● Work productively in teams while using cultural/global competence.	

Marking Period	Unit Title	Recommended Instructional Days
1-2	Energy	9 weeks

<table>
<tr><th>NJSLS - Science:
TItle</th><th>NJSLS - Science:
Performance Expectations</th><th>Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit</th></tr>
<tr><td>Energy</td><td>● 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.
● 4-PS3-2: Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
● 4-PS3-3: Ask questions and predict outcomes about the changes in energy that occur when objects collide.
● 4-PS3-4: Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</td><td rowspan="5"><u>Essential Question/s:</u>

1. What is energy?
2. How does the striking speed affect the sound that a gong makes?
3. Why is a baseball field larger than a softball field?
4. Why can’t we make energy?
5. Where does energy go?
6. Why do I get an electric shock?
7. Why do you need to wear a helmet?
8. What type of energy is created in a thunderstorm?
9. What is a Bluetooth Speaker?
10. How does a Bluetooth speaker work?
11. What is nonrenewable energy?
12. Which nonrenewable resource has the most advantages and fewest disadvantages?
13. What is renewable energy?
14. Can vegetable oil be used as fuel?

<u>Activity Description</u>:

● Article analysis
● Vocabulary activities
● Video/photo analysis
● Weekly Phenomenon Investigation: How does the striking speed affect the sound that a gong makes?
● Discuss: Do you like loud music? Why or why not? When do you like it? What is your favorite kind of music? What sounds help you feel calm? What sounds make you feel excited? How do you feel about the absence of sound?
● Activity: Students will pass ping pong balls and basketballs back and forth using different speeds and then discuss potential and kinetic energy. Ask students: Where did you see energy transfer when you tossed the basketball and ping pong ball back and forth?
● Writing prompt: Construct an explanation of how the speed of an object relates to its energy.
● Weekly Phenomenon Investigation: Why is a baseball field larger than a softball field?
● Simulation: Take students outside and give each student a baseball and softball. Have students spread out in a line and throw the balls</td></tr>
<tr><td>Earth and Human Activity</td><td>● 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.</td></tr>
<tr><td>Engineering Design</td><td>● 3-5-ETS1-1: Define a simple design problem reflecting on a need or want that includes specified criteria for success and constraints in 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.</td></tr>
<tr><td>FOUNDATION
Disciplinary:
Core Idea</td><td>FOUNDATION
Disciplinary:
Statement</td></tr>
<tr><td>PS3.A: Definitions of Energy</td><td>● The faster a given object is moving, the more energy it possesses.</td></tr>
</table>

	• Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	in the same direction with the same amount of force. As students throw the baseballs and softballs, ask them to pay attention to which one traveled faster. Have students draw and write their observations about energy in their interactive notebooks. • Weekly Phenomenon Investigation: Why can't we make energy? • Create a pendulum using chairs, meter sticks, fishing line, fishing weights, graph paper, and pens or markers. Instruct students to write down any observations they made and answer the following questions: Do you notice a pattern? If so, what is the pattern? Students will then repeat the process for 2-3 different heights. • Roller Coaster Lab: Design and build a roller coaster with at least one hill and one loop, then test it with a marble. Try to make the marble go from the beginning of the roller coaster to the end as fast as possible. Create a data chart to keep track of the time it takes for the marble to go from the beginning to the end. Make changes to your initial design to try to get the marble to go faster. • Writing prompt: You have been hired to advise a new company on how to build a roller coaster. Write an informational paper explaining the law of conservation of energy and why the company can only include so many hills in their design. • Weekly Phenomenon Investigation: Why do I get an electric shock? • Discuss: What can you do to protect yourself from getting shocked outside? What can you do to protect yourself from getting shocked at home or in school? How does electricity help you meet your needs? What could you do if there was not any electricity? • Static Electricity Lab • Writing prompt: Power lines provide buildings and homes with electricity. They are an invaluable source of electric power, but they can also be very dangerous. Write a paragraph explaining why you should never touch a power line. Include details about what you should do if you see a broken power line. • Weekly Phenomenon Investigation: Why do you need to wear a helmet? • Discuss: How does it feel when someone accidentally runs into you? What can you do if you collide with another person by accident? How can you protect yourself in the event of a collision, either in a car or on a bicycle? How can a concussion impact your well-being? • Research the history of protective gear in football. Pick five events and add them to a timeline. Make sure that you include a description and date for each event • Activity: Marble Collisions and conclusion questions.
PS3.B: Conservation of Energy and EnergyTransfer	• Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. • Light also transfers energy from place to place. • Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.	
PS3.C: Relationship Between Energy and Forces	When objects collide, the contact forces transfer energy so as to change the objects' motions.	
PS3.D: Energy in Chemical Processes and Everyday Life	The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use.	
ESS3.A: Natural Resources	Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.	
ETS1.A: Defining Engineering Problems	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.	

ETS1.B: Developing Possible Solutions	• 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. • Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.	• Writing prompt: What advice would you give to a friend who wants to play football? Explain why they should wear protective gear based on the science of collision. • Weekly Phenomenon Investigation: What type of energy is created in a thunderstorm? • Discuss: How does energy affect you in your daily life? If there was a lack of energy, how would it affect you? • Energy Sort Cards Activity • Research project: Types of Energy; in small groups choose a type of energy, conduct research, and prepare a presentation for the class. • Weekly Phenomenon Investigation: How does a Bluetooth speaker work? • Activity: Use the engineering design process to build a Rube Goldberg machine - create a device that transports energy over a distance while converting it into different forms. Constraints include: The beginning and end of the Rube Goldberg machine should produce a vibration that mimics sound (like a microphone and speaker); You must have at least four steps, including the beginning and the end. • Writing prompt: Think of a simple task like turning a light on. Create your own Rube Goldberg cartoon showing how the task could be done using a series of energy transfer steps. • Weekly Phenomenon Investigation: Which nonrenewable resource has the most advantages and fewest disadvantages? • Nonrenewable Energy graphic organizer • Discuss: What types of nonrenewable energy sources do you use? What is something you wonder about nonrenewable energy? What consequences may arise from not paying attention to our use of nonrenewable energy sources? Why do you think that it is important to reflect on the advantages and disadvantages of nonrenewable resources? • Writing prompt: Which nonrenewable resource has the most advantages and fewest disadvantages? Make a claim and support it with evidence and reasoning. Think about the advantages and disadvantages to this fuel type. • Weekly Phenomenon Investigation: Can vegetable oil be used as fuel? • Discuss: What are some ways that you can protect the environment in your area? What renewable energy sources do you use? What is one way that your family could use a renewable source of energy? How does using renewable energy affect a person's well-being? How does it impact the community's well-being?
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.	
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Constructing Explanations and Designing Solutions	• Use evidence (e.g., measurements, observations, patterns) to construct an explanation. • Apply scientific ideas to solve design problems. • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	
Planning and Carrying Out Investigations	• Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. • 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.	
Asking Questions and Defining Problems	• Ask questions that can be investigated and predict reasonable outcomes based	

	on patterns such as cause and effect relationships. ● 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.
Obtaining, Evaluating, and Communicating Information	Obtain and combine information from books and other reliable media to explain phenomena.
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. ● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***
Energy and Matter	Energy can be transferred in various ways and between objects.
Cause and Effect	Cause and effect relationships are routinely identified and used to explain change.
Influence of Engineering, Technology, and Science on Society and the Natural World	● Engineers improve existing technologies or develop new ones. ● Over time, people's needs and wants change, as do their demands for new and improved technologies.
Interdependence of Science, Engineering, and Technology	Knowledge of relevant scientific concepts and research findings is important in engineering.
Science is a Human Endeavor	● Most scientists and engineers work in teams. ● Science affects everyday life.
Social and Emotional Learning:	**Social and Emotional Learning:**

- Renewable energy graphic organizer
- Challenge: Wind power is clean but causes many bird deaths each year. Wind turbines are necessary to provide enough clean electricity for human society. Design a way wind turbines could be made more bird-friendly.
- Writing prompt: Make a claim about which renewable energy source would be best for the area you live in. Provide evidence and reasoning to support your claim.
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Interdisciplinary Connections: Content: ;NJSLS#:

ELA/Literacy -

- RI.4.1 - Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3 - Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- RI.4.9 - Integrate information from two 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.
- W.5.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.
- W.4.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.4.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- W.4.8 - Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
- W.4.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

Mathematics -

Competencies	*Sub-Competencies*	
• Self-Awareness • Self-Management • Responsible Decision Making • Social Awareness • Relationship Skills • Motivation	• Emotional Awareness • Internal Regulation • Behavior Control • Goal Pursuance • Appreciating Social and Environment Diversity • Adaptive Behavior • Communication • Social Engagement • Constructive Thinking • Consequence Evaluation • Respect for Self and Others • Enthusiasm • Initiative • Resilience	• MP.2 - Reason abstractly and quantitatively. • MP.4 - Model with mathematics. • MP.5 - Use appropriate tools strategically. • 4.OA.A.1 - Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. • 4.OA.A.3 - Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Technology - • 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
<u>Formative Assessments:</u> • Participation in class discussions/debates • Exit tickets • Quizzes • In-class assignments/activities • Presentations • Group assignments • IXL results	**<u>Benchmarks:</u>** • Writing promps • Mid-Unit Assessments **<u>Summative Assessments:</u>** • Unit test • Unit project • Lab activities

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Modified/leveled readings from Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Translated and modified readings from Science Studies Weekly - Grade Four	• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations

		• Translated teacher created reading guides and presentations	

Supplemental Resources

- Chromebooks
- SmartBoard
- IXL
- Teacher Online Resources
- Science A-Z
- BrainPop
- Newsela.com
- Quizlet
- Kahoot
- Applicable educational videos
- PhET Simulations
-

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. • Jigsaws • Think-Pair-Share • Boost engagement with material by providing opportunities for differentiation, group work, and alternative assignments/assessments where appropriate • Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.	• Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Extended time for revisions or opportunity to identify and develop areas of personal interest	• Utilize visual supports and graphic organizers • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Device used for translation purposes • Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.	• Encourage students to explore concepts in depth and encourage independent studies or investigations. • Modeling or independent student-led research • Use of higher leveled text and/or writing assignments • Utilize differentiation in the areas of acceleration, enrichment, and grouping

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:**	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.

	Performance Expectation/s:	• **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process. • **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem. • **9.4.5.CT.3:** Describe how digital tools and technology may be used to solve problems. • **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
	Career Readiness, Life Literacies, & Key Skills Practices	
	• Act as a responsible and contributing community members and employee. • Attend to financial well-being. • Consider the environmental, social and economic impacts of decisions. • Demonstrate creativity and innovation. • Utilize critical thinking to make sense of problems and persevere in solving them. • Model integrity, ethical leadership and effective management • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence.	

Marking Period	**Unit Title**	**Recommended Instructional Days**
2-3	Waves: Waves and Information	3 weeks

NJSLS - Science: ***TItle***	**NJSLS - Science:** ***Performance Expectations***	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit**
Waves and Their Applications in Technologies for Information Transfer	• **4-PS4-1:** Develop a model to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. • **4-PS4-3:** Generate and compare multiple solutions that use patterns to transfer information.	**Essential Question/s:** 1. What creates a wave? 2. Why do waves move birds up and down, not push them to the shore? 3. How do I hear? 4. How do ocean waves transfer energy across the ocean? 5. How is data transferred over long distances? 6. Who invented the telegraph?

FOUNDATION **Disciplinary:** ***Core Idea***	**FOUNDATION** **Disciplinary:** ***Statement***
PS4.A: Wave Properties	● Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. ● Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).
PS4.C: Information Technologies and Instrumentation	Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa.
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.
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***
Developing and Using Models	Develop a model using an analogy, example, or abstract representation to describe a scientific principle.
Scientific Knowledge is Based on Empirical Evidence	Science findings are based on recognizing patterns.
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 solution.
FOUNDATION **Crosscutting Concepts:**	**FOUNDATION** **Crosscutting Concepts:**

Activity Description:

- Article analysis
- Vocabulary activities
- Video/photo analysis
- Weekly Phenomenon Investigation: Why do waves move birds up and down, not push them to the shore?
- Parts of a Wave Graphic Organizer
- Dominoes Lab
- Writing prompt: Write a two-paragraph informational piece on the process of how humans use their ears.
- Weekly Phenomenon
- How do ocean waves transfer energy across the ocean?
- Weekly Phenomenon Investigation: How do ocean waves transfer energy across the ocean?
- Discuss: Can you think of anything related to your social groups that can be compared to waves (fights with friends, emotions, activities, etc.)? What can you do to defuse or de-escalate a negative situation with friends? How do the things that you say and do impact the people around you like waves crash on the shoreline?
- Wave labeling/matching activity.
- Writing prompt: Write a postcard to a friend explaining the difference between an ocean wave and a tsunami.
- Weekly Phenomenon Investigation: How is data transferred over long distances?
- Discuss: What data is considered personal information that you would not want to transmit? What emotions might a person be feeling if they need to send out an SOS message? What are some digital SOS signals you might see on social media? What can you do if you see someone sending digital SOS messages on social media?
- Waves and Data Graphic Organizeer
- Writing challenge: Write a message to a friend in Morse code.

Interdisciplinary Connections: Content: ;NJSLS#:

ELA/Literacy -

- SL.4.5- Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.

Core Idea	*Statement*
Patterns	Similarities and differences in patterns can be used to sort, classify, and analyze simple rates of change for natural phenomena.
Interdependence of Science, Engineering, and Technology	Knowledge of relevant scientific concepts and research findings is important in engineering.
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
● Self-Awareness ● Self-Management ● Responsible Decision Making ● Social Awareness ● Relationship Skills ● Motivation	● Emotional Awareness ● Internal Regulation ● Behavior Control ● Goal Pursuance ● Appreciating Social and Environment Diversity ● Adaptive Behavior ● Communication ● Social Engagement ● Constructive Thinking ● Consequence Evaluation ● Respect for Self and Others ● Enthusiasm ● Initiative ● Resilience

Mathematics -

- MP.4 - Model with mathematics.
- 4.G.A.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Technology -

- 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Participation in class discussions/debates ● Exit tickets ● Quizzes ● In-class assignments/activities ● Presentations ● Group assignments ● IXL results	**Benchmarks:** ● Writing promps ● Mid-Unit Assessments **Summative Assessments:** ● Unit test ● Unit project ● Lab activities
Differentiated Student Access to Content: **Teaching and Learning *Resources/Materials***	

Core Resources	Alternate Core Resources *IEP/504/At-Risk/ESL*	ELL Core Resources	Gifted & Talented Core Resources
• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Modified/leveled readings from Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Translated and modified readings from Science Studies Weekly - Grade Four • Translated teacher created reading guides and presentations	• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations

Supplemental Resources

- Chromebooks
- SmartBoard
- IXL
- Teacher Online Resources
- Science A-Z
- BrainPop
- Newsela.com
- Quizlet
- Kahoot
- Applicable educational videos

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	Alternate Core Resources *IEP/504/At-Risk/ESL*	ELL Core Resources	Gifted & Talented Core
• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. • Jigsaws • Think-Pair-Share • Boost engagement with material by providing opportunities for differentiation, group work, and alternative assignments/assessments where appropriate • Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.	• Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Extended time for revisions or opportunity to identify and develop areas of personal interest	• Utilize visual supports and graphic organizers • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Device used for translation purposes • Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.	• Encourage students to explore concepts in depth and encourage independent studies or investigations. • Modeling or independent student-led research • Use of higher leveled text and/or writing assignments • Utilize differentiation in the areas of acceleration, enrichment, and grouping

	Disciplinary Concept:

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	***Core Ideas:***	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	• **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process. • **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem. • **9.4.5.CT.3:** Describe how digital tools and technology may be used to solve problems. • **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
	Career Readiness, Life Literacies, & Key Skills Practices	
	• Act as a responsible and contributing community members and employee. • Attend to financial well-being. • Consider the environmental, social and economic impacts of decisions. • Demonstrate creativity and innovation. • Utilize critical thinking to make sense of problems and persevere in solving them. • Model integrity, ethical leadership and effective management • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence.	

Marking Period	**Unit Title**	**Recommended Instructional Days**
3-4	Structure, Function, and Information Processing	8 weeks

NJSLS - Science: ***TItle***	**NJSLS - Science:** ***Performance Expectations***	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit**
Waves and Their Applications in Technologies for Information Transfer	• **4-PS4-2:** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	**<u>Essential Question/s:</u>** 1. How do humans see? 2. Why does the moon change shape? 3. What is a leaf? 4. Why are leaves green and shiny?
From Molecules to Organisms: Structures and Processes	• **4-LS1-1:** Construct an argument that plants and animals have internal and	

	external structures that function to support survival, growth, behavior, and reproduction. ● **4-LS1-2:** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	5. What is the function of a leaf? 6. Why are some leaves bigger than others? 7. How does leaf size affect photosynthesis? 8. Why do some animals live in certain ecosystems but not in others? 9. Do cold deserts exist? 10. Are hermit crabs really crabs? 11. Why do hermit crabs live in borrowed shells? 12. What does a hermit crab eat? 13. Do all animals use the same senses? 14. Is taste your strongest sense? 15. What is touch? 16. How do the five senses impact our daily lives? 17. Are you a supertaster? 18. Your nose helps you do what? 19. Why do worms crawl on the sidewalk when it rains?
Engineering Design	● **3-5-ETS1-1:** Define a simple design problem reflecting on a need or want that includes specified criteria for success and constraints in 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.	**Activity Description**: ● Article analysis ● Vocabulary activities ● Video/photo analysis ● Weekly Phenomenon Investigation: How do humans see? ● Discuss: What is your favorite color? How does it feel when you are included? How does it feel when you are not included? What can you do to help others feel included in your activities? If one of your senses is impaired, how can you be resilient and overcome the challenge? How can you communicate what you feel because of it? ● Graphic Organizer: Anatomy of the Human Brain ● Graphic Organizer: Drawing Waves ● Differentiate between transparent, translucent, and opaque and give examples of each. ● Color Blindness Activity ● Writing prompt: Write a letter to the principal about things that your school could do to help colorblind students. ● Weekly Phenomenon Investigation: Why does the moon change shape? ● Discuss: What are some ways you have changed in the past year? What are some changes you want to make for yourself in the next three months? ● Investigate three claims about the Sun-Moon-Earth system. Make a model for each of the claims, then use the model to collect data.
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
PS4.B: Electromagnetic Radiation	An object can be seen when light reflected from its surface enters the eyes.	
LS1.A: Structure and Function	Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	
LS1.D: Information Processing	Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.	
ETS1.A: Defining and Delimiting Engineering Problems	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.	What claim do you think is the correct one? Why? Why are the others wrong? Use drawings and words to answer why the claim is correct or incorrect. ● Writing prompt: Different cultures have stories that explain why the moon changes shape each night. Write your own story about the reason that the moon changes shape. ● Weekly Phenomenon Investigation: Why are leaves green and shiny? ● Discuss: Your body looks strong and healthy when you take care of it. What are some things you can do to take care of your physical well-being? What are some ways that you have changed in the last year? What talent or skill do you want to develop over the next year? Leaves have different shapes and sizes. All people are different and have different skills and talents. What are some ways you can appreciate the differences in your peers? How can appreciating the differences in others help you collaborate with them? ● Go outside and gather leaves. Analyze them and classify them based on their characteristics. Pick two different leaves and compare and contrast them in a Venn diagram. ● Photosynthesis Investigation ● Writing prompt: Write a letter to the younger students who like to pick all of the leaves off of the trees at recess. Explain why the trees' leaves are important to them. ● Weekly Phenomenon Investigation: Why do some animals live in certain ecosystems but not in others? ● Discuss: What would you say your niche is in the classroom? What is your favorite type of animal? Why? What are some skills you have that help you contribute to your classroom and family? What do you appreciate about the differences between your classmates? ● T-Chart: Living and Non-living things. ● Engineering Design Process: The invasion of the brown tree snake in Guam - students will work in groups to come up with a solution for this problem. ● Biodiversity simulation. ● Assign each student one letter of the alphabet. Have students pick an animal that is endangered or extinct due to deforestation whose name starts with that letter. Then, ask them to research that animal using online resources, library books, etc.Have students create a poster about their animal. ● Writing prompt: The city wants to turn a neighborhood soccer field into a parking lot. Write an opinion letter to the mayor explaining
ETS1.B: Developing Possible Solutions	● 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. ● 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.	
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Developing and Using Models	● Develop a model to describe phenomena. ● Use a model to test interactions concerning the functioning of a natural system.	
Engaging in Argument from Evidence	Construct an argument with evidence, data, and/or a model.	
Systems and System Models	A system can be described in terms of its components and their interactions.	
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.	

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.	how that area is an ecosystem and why it must be saved to protect biodiversity. ● Weekly Phenomenon Investigation: Why do hermit crabs live in borrowed shells? ● Discuss: When should you wear a helmet? Why is wearing a helmet important? A hermit crab uses its shell to protect itself. What are some things you can do to protect yourself? ● Project: Make a "shell" for a "hermit crab" to protect it from falling off a "rock." * Modified egg-drop challenge. ● Create a poster or brochure educating others about the dangers of plastic pollution and how it affects hermit crabs. ● Weekly Phenomenon Investigation: Do all animals use the same senses? ● Discuss: What senses do you have? How do your senses shape your perspective? How do you think a person would be impacted by the loss of one of their senses? What can you do to support someone who does not have one or more of their senses? ● Animal Research Report. Within the report, determine this animal's strongest sense and write about how it helps this animal hunt or survive. ● Set up an obstacle course in the classroom or gym and have some student volunteers try to cross the course while blindfolded. These volunteers will have to rely on their senses, other than sight, to succeed. ● Weekly Phenomenon Investigation: How do the five senses impact our daily lives? ● Discuss: In what ways do your senses help you process information? In what ways can your senses protect you from danger? What sense are you most grateful for? ● Mystery Box Activity - have students feel the items and make observations about them using a graphic organizer. ● Venn Diagram: Compare and contrast the sense of taste in insects and in humans. ● Weekly Phenomenon Investigation: Why do worms crawl on the sidewalk when it rains? ● Discuss: Have you ever moved to a new place? What was it like to move? Were there any challenges? What are some of your favorite animals? What is a structure of an animal you like that has a really cool function? ● Hunting Camouflaged Prey Simuation ● Bird Beak Adaptation Lab
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.	
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. ● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
Cause and Effect	Cause and effect relationships are routinely identified.	
Systems and System Models	A system can be described in terms of its components and their interactions.	
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	
● Self-Awareness ● Self-Management ● Responsible Decision Making ● Social Awareness ● Relationship Skills ● Motivation	● Emotional Awareness ● Internal Regulation ● Behavior Control ● Goal Pursuance ● Appreciating Social and Environment Diversity ● Adaptive Behavior ● Communication ● Social Engagement ● Constructive Thinking ● Consequence Evaluation ● Respect for Self and Others ● Enthusiasm ● Initiative ● Resilience	

		● Differentation Activity: Behavioral adaptations and structural adaptations ● Write an informational paper about a migrating animal. Explain how the animal's migration helps it grow, survive, and reproduce. **Interdisciplinary Connections: Content: ;NJSLS#:** ELA/Literacy - ● RI.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. ● RI.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. ● RI.4.7: Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. ● W.4.1 - Write opinion pieces on topics or texts, supporting a point of view with reasons and information. ● W.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly. ● W.4.3: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences. ● W.4.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic. ● W.4.8: Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. ● SL.4.4: Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. ● SL.4.5: Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. Mathematics - ● MP.2 - Reason abstractly and quantitatively. ● MP.4 - Model with mathematics. ● MP.5 - Use appropriate tools strategically.

		• 3-5.OA - Operations and Algebraic Thinking • 4.G.A.1 - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. • 4.G.A.3 - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. Technology - • 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: • Participation in class discussions/debates • Exit tickets • Quizzes • In-class assignments/activities • Presentations • Group assignments • IXL results	**Benchmarks:** • Writing promps • Mid-Unit Assessments **Summative Assessments:** • Unit test • Unit project • Lab activities

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
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Supplemental Resources

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Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core**
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NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:**	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	• **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process. • **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem. • **9.4.5.CT.3:** Describe how digital tools and technology may be used to solve problems. • **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
	Career Readiness, Life Literacies, & Key Skills Practices	

	• Act as a responsible and contributing community members and employee. • Attend to financial well-being. • Consider the environmental, social and economic impacts of decisions. • Demonstrate creativity and innovation. • Utilize critical thinking to make sense of problems and persevere in solving them. • Model integrity, ethical leadership and effective management • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence.

Marking Period	**Unit Title**	**Recommended Instructional Days**
4	Earth's Systems: Processes that Shape the Earth	8 weeks

NJSLS - Science: ***TItle***	**NJSLS - Science:** ***Performance Expectations***	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit**
Earth's Place in the Universe	• **4-ESS1-1:** Identify evidence from patterns in rock formation and fossils in rock layers to support an explanation for changes in a landscape over time.	**<u>Essential Question/s:</u>** 1. What is a Fossil? 2. Does Earth ever change? 3. Where do mountains come from? 4. What causes stable things like landscapes to change? 5. Have people who make maps been to every point of the world? 6. How do maps show patterns of data? 7. What happened at Kilauea? 8. Can lava be stopped? 9. Why are some houses built on stilts? **<u>Activity Description</u>:** • Article analysis • Vocabulary activities • Video/photo analysis
Earth's Systems	• **4-ESS2-1:** Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, wind, ice, or vegetation. • **4-ESS2-2:** Analyze and interpret data from maps to describe patterns of Earth's features.	
Earth and Human Activity	• **4-ESS3-2:** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	
Engineering Design	• **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.	● Weekly Phenomenon Investigation: Does Earth ever change? ● Discuss: The Earth changes over time. What are some ways that you can see changes in your life being beneficial to you? What are some ways that you can look at change in a positive way? Thinking about the way you treat others, what will others know about you based on what they see you do? ● Create a Geological Timeline ● Assign each student a geological time period - students will create a brochure using a provided template ● Rock Layer Investigation ● Writing prompt: Create a narrative about the life of a fossil on top of Mount Everest. ● Weekly Phenomenon Investigation: Where do mountains come from? ● Discuss: What are some things that you can do to help yourself acclimate to something new? Sedimentary rocks are made up of many small pieces. What are some of the small things about you that make up who you are? Metamorphic rocks are created by intense heat and pressure. What great challenge have you gone through that has made you who you are today? ● Rock Cycle Game ● Create a graphic organizer to differentiate between Igneous, Sedimentary, and Metamorphic rocks ● Write a narrative about a rock's journey through the rock cycle. ● Weekly Phenomenon Investigation: What causes stable things like landscapes to change? ● Discuss: If your words could build up or erode other people, what words would you choose to build up another person? How can the presence or lack of water in an area define the community? In what ways can communities engage in the engineering design process to solve problems regarding lack of clean water? What could you do in your community to encourage people to conserve water? ● Weathering and Erosion Simulations ● Divide the class into groups of four students. Give each group a large container filled with water, a rock, a blown-up balloon, an orange, and a marshmallow. Have students predict in their interactive notebooks whether each object (rock, balloon, orange, and marshmallow) will sink or float in the water. Instruct students to test one object at a time and record their findings in their interactive notebooks. Studemts will then respond to follow-up questions.
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
ESS1.C: The History of Planet Earth	Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.	
ESS2.A: Earth Materials and Systems	Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.	
ESS2.B: Plate Tectonics and Large-Scale System Interactions	The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth.	
ESS2.E: Biogeology	Living things affect the physical characteristics of their regions.	
ESS3.B: Natural Hazards	A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts.	
ETS1.B: Developing Possible Solutions	● 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. ● Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. ● Testing a solution involves investigating how well it performs under a range of likely conditions.	● Writing assignment: Choose and research one National Park in the United States. Students will complete a graphic organizer to record their information. ● Write a narrative about a superhero who could stop weathering and erosion. ● Weekly Phenomenon Investigation: Have people who make maps been to every part of the world? ● Discuss: How do maps help people solve problems? How does knowing about geography improve your academic and mental well-being? What are some modern examples of maps and how do they impact your daily life? How has technology impacted maps and the way people use maps? ● Writing prompt: Have you ever gotten lost? What happened? Would a map have helped you? Use these questions to tell your story. ● Weekly Phenomenon Investigation: How do maps show patterns of data? ● Discuss: Have you ever felt like your emotions were going to erupt like a volcano? What did you do? How did you keep yourself from "erupting"? If you did "erupt," how did others respond? What can you do to help release tension and pressure so that your emotions do not erupt like a volcano? What coping strategies for stress and emotional regulation can you utilize? What changes to an area do volcanoes create? How do these changes impact people in the area and their basic needs for food and water? ● Mount Vesuvius research and graphic organizer ● Students will use a data table to plot the Hawaiian volcanoes on a graph. ● Balloon Hot Spot Lab ● Graphic organizer: Comparing Volcanoes ● Writing assignment: You are the explorer who discovered the Hawaiian Islands. Write a letter to another scientist, explaining what you have learned about the formation of Hawaii. ● Weekly Phenomenon Investigation: Can lava be stopped? ● Discuss: What can you do to prepare for weather changes and natural disasters? How does preparing for natural disasters impact your well-being? How does learning about the way that volcanoes work help your well-being? Lava moves very slowly, but people still need to evacuate if they are near the erupting volcano. Are there any social situations you face that you wish you could evacuate? ● Think-Pair-Share: Stopping Lava ● Mini engineering design challenge: Students can work individually or in assigned groups. Students will act like civil engineers and
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.	
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
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. ● Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	
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. ● Identify the evidence that supports particular points in an explanation.	
Analyzing and Interpreting Data	Analyze and interpret data to make sense of phenomena using logical reasoning.	
FOUNDATION **Crosscutting Concepts:**	**FOUNDATION** **Crosscutting Concepts:**	

Core Idea	*Statement*
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.
Patterns	Patterns can be used as evidence to support an explanation.
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	Science assumes consistent patterns in natural systems.
Cause and Effect	Cause and effect relationships are routinely identified, tested, and used to explain change.
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
• Self-Awareness • Self-Management • Responsible Decision Making • Social Awareness • Relationship Skills • Motivation	• Emotional Awareness • Internal Regulation • Behavior Control • Goal Pursuance • Appreciating Social and Environment Diversity • Adaptive Behavior • Communication • Social Engagement • Constructive Thinking • Consequence Evaluation • Respect for Self and Others • Enthusiasm • Initiative • Resilience

make models of buildings using toothpicks and marshamallows. The structure must be at least two stories high, or two toothpick levels high. It cannot be a flat, one-level structure. They will test their buildings' structures to see how well they stand up under the stress of earthquakes.

- Mini engineering design challenge: Students will create flood barrier for an origami house. Goal: The house must be completely dry 10 seconds after adding water. Designs, explanations, and results will be recorded using a graphic organizer.
- Mini engineering design challenge: Build a tower that will support a tennis ball and resist the force of wind from a hurricane (fan). Your tower needs to be as high as possible.
- Writing prompt: Write a letter to a friend about what would happen if this disaster struck your community.
- Weekly Phenomenon Investigation: Why are some houses built on stilts?
- Discuss: What can you do to prepare for natural disasters in your area? What research can you do to prepare yourself for an emergency? How do collaboration and innovation help suffering communities? What can you do to help your community prepare for natural disasters in your area?
- Divide students into groups of four. Give each group a tray of sand and instruct them to create a castle or object out of the sand. Have each group shake the tray side to side and observe what happens to their creation. Ask students to write their observations in their interactive notebooks.
- Writing: Come up with a solution to a natural hazard that could affect your community. Write a letter to the major to convince them why they should use your solution.

Interdisciplinary Connections: Content: ;NJSLS#:

ELA/Literacy -

- RI.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- RI.4.7 - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines,

		animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. ● W.4.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic. ● W.4.8 - Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. ● W.4.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research. Mathematics - ● MP.2 - Reason abstractly and quantitatively. ● MP.4 - Model with mathematics. ● MP.5 - Use appropriate tools strategically. ● 3-5.OA - Operations and Algebraic Thinking ● 4.MD.A.1 - Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. ● 4.MD.A.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. Technology - ● 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
<u>Formative Assessments:</u> ● Participation in class discussions/debates ● Exit tickets ● Quizzes	**<u>Benchmarks:</u>** ● Writing promps ● Mid-Unit Assessments

• In-class assignments/activities • Presentations • Group assignments • IXL results	**<u>Summative Assessments:</u>** • Unit test • Unit project • Lab activities

Differentiated Student Access to Content: Teaching and Learning *Resources/Materials*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Modified/leveled readings from Science Studies Weekly - Grade Four • Teacher created reading guides and presentations	• Translated and modified readings from Science Studies Weekly - Grade Four • Translated teacher created reading guides and presentations	• Science Studies Weekly - Grade Four • Teacher created reading guides and presentations

Supplemental Resources

- Chromebooks
- SmartBoard
- IXL
- Teacher Online Resources
- Science A-Z
- BrainPop
- Newsela.com
- Quizlet
- Kahoot
- Applicable educational videos

Differentiated Student Access to Content: Recommended *Strategies & Techniques*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. • Jigsaws • Think-Pair-Share • Boost engagement with material by providing opportunities for differentiation, group work, and	• Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions	• Utilize visual supports and graphic organizers • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Device used for translation purposes	• Encourage students to explore concepts in depth and encourage independent studies or investigations. • Modeling or independent student-led research • Use of higher leveled text and/or writing assignments

alternative assignments/assessments where appropriate ● Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.	● Extended time for revisions or opportunity to identify and develop areas of personal interest	● Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.	● Utilize differentiation in the areas of acceleration, enrichment, and grouping

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:**	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	● **9.4.5.CT.1:** Identify and gather relevant data that will aid in the problem-solving process. ● **9.4.5.CT.2:** Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem. ● **9.4.5.CT.3:** Describe how digital tools and technology may be used to solve problems. ● **9.4.5.CT.4:** Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
	Career Readiness, Life Literacies, & Key Skills Practices	
	● Act as a responsible and contributing community members and employee. ● Attend to financial well-being. ● Consider the environmental, social and economic impacts of decisions. ● Demonstrate creativity and innovation. ● Utilize critical thinking to make sense of problems and persevere in solving them. ● Model integrity, ethical leadership and effective management ● Plan education and career paths aligned to personal goals. ● Use technology to enhance productivity increase collaboration and communicate effectively. ● Work productively in teams while using cultural/global competence.	

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*		Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*	x	Standards in Action: *Climate Change*