

Instructional Units 4th Grade

Unit: Electricity

Pacing:

Assessment Transfer Tasks:

Student's science notebook

Students who demonstrate understanding can:

1. **4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.**

Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.

2. **4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.**

Assessment Boundary: Assessment does not include quantitative measurements of energy.

3. **4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.**

Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact.

Assessment Boundary: Assessment does not include quantitative measurements of energy.

4. **4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.***

Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.

Assessment Boundary: Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light or sound.

5. **4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.**

Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.

Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.

6. 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.

7. 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.*

Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.</p> <ul style="list-style-type: none">Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3) <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K– 2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <ul style="list-style-type: none">Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)	<p>PS3.A: Definitions of Energy</p> <ul style="list-style-type: none">The faster a given object is moving, the more energy it possesses. (4- PS3-1)Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-2),(4-PS3-3) <p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none">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. (4-PS3-2),(4-PS3-3)Light also transfers energy from place to place. (4-PS3-2)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.	<p>Energy and Matter</p> <ul style="list-style-type: none">Energy can be transferred in various ways and between objects. (4-PS3-1),(4-PS3-2),(4-PS3-3),(4-PS3-4) <p>Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering and Technology on Society and the Natural World</p> <ul style="list-style-type: none">Engineers improve existing technologies or develop new ones. (4-PS3-4)Knowledge of relevant scientific concepts and research findings is important in engineering. (4-PS4-3) <p>Connections to Nature of Science</p>

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

- Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1)
- Apply scientific ideas to solve design problems. (4-PS3-4)
- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-PS4-3)

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1)
- Develop a model to describe phenomena. (4-PS4-2)

Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns. (4-PS4-1)

The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (4-PS3-2),(4-PS3-4)

PS3.C: Relationship Between Energy and Forces

- When objects collide, the contact forces transfer energy so as to change the objects' motions. (4-PS3-3)

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. (4-PS3-4)

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. (secondary to 4-PS3-4)

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

Science is a Human Endeavor

- Most scientists and engineers work in teams. (4-PS3-4)
- Science affects everyday life. (4-PS3-4)

Patterns

- Similarities and differences in patterns can be used to sort and classify natural phenomena. (4-PS4-1)
- Similarities and differences in patterns can be used to sort and classify designed products. (4-PS4-3)

Cause and Effect

- Cause and effect relationships are routinely identified. (4-PS4-2)

	<p>the water meets a beach. (Note: This grade band endpoint was moved from K–2.) (4-PS4- 1)</p> <ul style="list-style-type: none"> Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1) <p>PS4.B: Electromagnetic Radiation</p> <ul style="list-style-type: none"> An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2) <p>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> 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. (4-PS4-3) <p>ETS1.C: Optimizing The Design Solution</p> <ul style="list-style-type: none"> Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (secondary to 4-PS4-3) 	
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Connections to other DCIs in fourth grade: 4.PS3.A (4-PS4-1); 4.PS3.B (4-PS4-1); 4.ETS1.A (4-PS4-3)

Articulation of DCIs across grade-levels: K.PS2.B (4-PS3-3); K.ETS1.A (4-PS3-4); 2.ETS1.B (4-PS3-4); 3.PS2.A (4-PS3-3); 5.PS3.D (4-PS3-4); 5.LS1.C (4-PS3-4); MS.PS2.A (4-PS3- 3); MS.PS2.B (4-PS3-2); MS.PS3.A (4-PS3-1),(4-PS3-2),(4-PS3-3),(4-PS3-4); MS.PS3.B (4-PS3-2),(4-PS3-3),(4-PS3-4); MS.PS3.C (4-PS3-3); MS.PS4.B (4-PS3-2); MS.ETS1.B (4- PS3-4); MS.ETS1.C (4-PS3-4) K.ETS1.A (4-PS4-3); 1.PS4.B (4-PS4-2); 1.PS4.C (4-PS4-3); 2.ETS1.B (4-PS4-3); 2.ETS1.C (4-PS4-3); 3.PS2.A (4-PS4-3); MS.PS4.A (4-PS4-1); MS.PS4.B (4-PS4-2); MS.PS4.C (4-PS4-3); MS.LS1.D (4-PS4-2); MS.ETS1.B (4-PS4-3)

Interdisciplinary Connections

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. (4-PS3-1) (4-PS4-3)
 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. (4- PS3-1)

RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-PS3-1) (4-PS4-3)
W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (4-PS3-1)
W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-PS3-2),(4-PS3-3),(4-PS3-4)
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. (4-PS3-1),(4-PS3-2),(4-PS3-3),(4-PS3-4)
W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-PS3-1)
SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-PS4-1),(4-PS4-2)

Mathematics

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. (4-PS3-4)
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-PS4-1),(4-PS4- 2)
MP.4 Model with mathematics. (4-PS4-1),(4-PS4-2)

21st Century Themes and Skills

Career Ready Practices:

- CRP1.** Act as a responsible and contributing citizen and employee.
- CRP2.** Apply appropriate academic and technical skills.
- CRP4.** Communicate clearly and effectively and with reason.
- CRP5.** Consider the environmental, social and economic impacts of decisions.
- CRP6.** Demonstrate creativity and innovation.
- CRP7.** Employ valid and reliable research strategies.
- CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9.** Model integrity, ethical leadership and effective management.
- CRP11.** Use technology to enhance productivity.
- CRP12.** Work productively in teams while using cultural global competence.

Personal Finance Literacy and Career Awareness, Exploration and Preparation

Integration of NJSLS 21st Century Skills, Life and Career Standards

9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness

https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing

Technology Standards

8.1 Educational Technology

None identified at this time

8.2 Technology Education

None identified at this time

NSLS Technology:

https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing

Materials:

textbook

All resources

Lab materials

Formative, Alternate, Summative and Benchmark Assessments

Not limited to:

Think Pair Share

Pre and Post assessments

Observations

Discussions

Tests and Quizzes

Exit and Entrance Tickets

Self Evaluations

Science notebooks

1 Minute papers

End of Unit tests

End of Unit Projects

End of Unit Presentations

Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk

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Note** Modifications and accommodations listed in curriculum guides are suggested for all types of learners. Specific student accommodations and modifications listed in an IEP will take priority for each individual student instruction.

4th Grade

Unit: Engineering of Sound

Pacing: 24-30 days

STEAM/Field Trips/Extension Activities:

STEM: Sound Machine
School Concert attendance
Instrumental program

Assessment Transfer Tasks:

Student's science notebook

Students who demonstrate understanding can:

- 1. 4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.**
Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.
Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.
- 2. 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.**
Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.
- 3. 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.***
Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.
- 4. 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.**
Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.

5. **4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.**

Assessment Boundary: Assessment does not include quantitative measurements of energy.

6. **4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.**

Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact.

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7. **4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.***

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investigations that control variables and provide evidence to support explanations or design solutions.

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Connections to Nature of Science

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- 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. (4-PS4-3)

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- Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (secondary to 4-PS4-3)

Connections to other DCIs in fourth grade: 4.PS3.A (4-PS4-1); 4.PS3.B (4-PS4-1); 4.ETS1.A (4-PS4-3)

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MP.4 Model with mathematics. (4-PS4-1),(4-PS4-2)

21st Century Themes and Skills

Career Ready Practices:

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

- CRP6.** Demonstrate creativity and innovation.
- CRP7.** Employ valid and reliable research strategies.
- CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9.** Model integrity, ethical leadership and effective management.
- CRP11.** Use technology to enhance productivity.
- CRP12.** Work productively in teams while using cultural global competence.

Personal Finance Literacy

None identified for this unit of instruction

Career Awareness, Exploration and Preparation

9.2.4.A.4

Integration of NJSLS 21st Century Skills, Life and Career Standards

9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness

https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing

Technology Standards

8.1 Educational Technology

8.1.5.A.3, 8.1.5.A.3

8.2 Technology Education

8.2.5.C.1, 8.2.5.C.3, 8.2.5.C.4, 8.2.5.C.7, 8.2.5.D.3, 8.2.5.D.4, 8.2.5.D.5, 8.2.5.D.6

NSLS Technology:

https://docs.google.com/document/d/1GHL_TdtZh2bmZbevCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing

Materials:

textbook

All resources

Lab materials

Formative, Alternate, Summative and Benchmark Assessments

Not limited to:

Think Pair Share

Pre and Post assessments

Observations

Discussions

Tests and Quizzes

Exit and Entrance Tickets

Self Evaluations
Science notebooks
1 Minute papers
End of Unit tests
End of Unit Projects
End of Unit Presentations

Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk

https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing

Note** Modifications and accommodations listed in curriculum guides are suggested for all types of learners. Specific student accommodations and modifications listed in an IEP will take priority for each individual student instruction.

4th Grade

Unit: Environment and Life

Pacing: 24 – 30 days

STEAM/Field Trips/Extension Activities:

Agricultural Center Time Machine trip at Sussex County Fair Grounds
Speakers - career education related to Living and Non Living Things
Epals/Skype with regional differences related to weather/climate
Water Shed Ambassador

Assessment Transfer Tasks:

Student's science notebook, Lesson Check Ups

Students who demonstrate understanding can:

1. **4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.**

Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.

Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.

2. **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.**

Clarification Statement: Emphasis is on systems of information transfer.

Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.

3. **3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.**

Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.

Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.

4. **3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.**

Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)

Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Construct an argument with evidence, data, and/or a model. (4-LS1-1)

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)

Disciplinary Core Ideas

LS1.A: Structure and Function

- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

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. (4-LS1-2)

LS3.A: Inheritance of Traits

- Many characteristics of organisms are inherited from their parents. (3-LS3-1)
- Other characteristics result from individuals’ interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

LS3.B: Variation of Traits

- Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

Crosscutting Concepts

Systems and System Models

- A system can be described in terms of its components and their interactions. (4-LS1-1),(4-LS1-2)

Patterns

- Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)

Cause and Effect

- Cause and effect relationships are routinely identified, tested, and used to explain change. Events that occur together with regularity might or might not be a cause and effect relationship.

<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <ul style="list-style-type: none"> Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2) 	<ul style="list-style-type: none"> The environment also affects the traits that an organism develops. (3-LS3-2) 	
<p>Connections to other DCIs in fourth grade: N/A</p>		
<p>Articulation of DCIs across grade-levels: 1.LS1.A (4-LS1-1); 1.LS1.D (4-LS1-2); 3.LS3.B (4-LS1-1); MS.LS1.A (4-LS1-1),(4-LS1-2); MS.LS1.D (4-LS1-2) 1.LS3.A (3-LS3-1); 1.LS3.B (3-LS3-1); MS.LS1.B (3-LS3-2); MS.LS3.A (3-LS3-1); MS.LS3.B (3-LS3-1)</p>		
<p><u>Interdisciplinary Connections</u></p> <p>ELA/Literacy – RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1),(3-LS3-2) RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1),(3-LS3-2) RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1),(3-LS3-2) W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1),(3-LS3-2) W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (4-LS1-1) SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS3-1),(3-LS3-2) SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-LS1-2)</p> <p>Mathematics – MP.2 Reason abstractly and quantitatively. (3-LS3-1),(3-LS3-2) MP.4 Model with mathematics. (3-LS3-1),(3-LS3-2) 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. (4-LS1-1) 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1),(3-LS3-2)</p>		

21st Century Themes and Skills

Career Ready Practices:

- CRP1.** Act as a responsible and contributing citizen and employee.
- CRP2.** Apply appropriate academic and technical skills.
- CRP4.** Communicate clearly and effectively and with reason.
- CRP5.** Consider the environmental, social and economic impacts of decisions.
- CRP6.** Demonstrate creativity and innovation.
- CRP7.** Employ valid and reliable research strategies.
- CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9.** Model integrity, ethical leadership and effective management.
- CRP11.** Use technology to enhance productivity.
- CRP12.** Work productively in teams while using cultural global competence.

Personal Finance Literacy

None identified at this time

Career Awareness, Exploration and Preparation

None identified at this time'

Integration of NJSLs 21st Century Skills, Life and Career Standards

9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness

https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing

Technology Standards

8.1 Educational Technology

8.1.5.B.1 (1st person interview with agriculturalist)

8.2 Technology Education

8.2.5.A.1 8.2.2.A.1 8.2.2.A.2

NSLS Technology:

https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing

Materials:

textbook

All resources

Lab materials

Formative, Alternate, Summative and Benchmark Assessments

Not limited to:

Think Pair Share

Pre and Post assessments

Observations

Discussions

Tests and Quizzes

Exit and Entrance Tickets

Self Evaluations

Science notebooks

1 Minute papers

End of Unit tests

End of Unit Projects

End of Unit Presentations

Accommodations & modifications for special education, ELL, G&T, 504 plans and At Risk

https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing

Note** Modifications and accommodations listed in curriculum guides are suggested for all types of learners. Specific student accommodations and modifications listed in an IEP will take priority for each individual student instruction.

4th Grade

Unit: Rocks and Minerals

Pacing: 45 days

Assessment Transfer Tasks:

Student's science notebook

Note* same standards as unit Weather and Climate

Students who demonstrate understanding can:

1. 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Clarification Statement: Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.

Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.

2. 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.]

Assessment Boundary: Assessment is limited to a single form of weathering or erosion.

3. 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.

4. 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; nonrenewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.

5. **4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.***

Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.

Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3– 5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <ul style="list-style-type: none"> Identify the evidence that supports particular points in an explanation. (4-ESS1-1) Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-ESS3-2) <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <ul style="list-style-type: none"> Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1) <p>Analyzing and Interpreting Data</p>	<p>ESS1.C: The History of Planet Earth</p> <ul style="list-style-type: none"> 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. (4-ESS1-1) <p>ESS2.A: Earth Materials and Systems</p> <ul style="list-style-type: none"> 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. (4-ESS2-1) <p>ESS2.B: Plate Tectonics and Large-Scale System Interactions</p> <ul style="list-style-type: none"> 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. (4-ESS2-2) 	<p>Patterns</p> <ul style="list-style-type: none"> Patterns can be used as evidence to support an explanation. (4-ESS1-1) Patterns can be used as evidence to support an explanation. (4-ESS2-2) <p>Connections to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems</p> <ul style="list-style-type: none"> Science assumes consistent patterns in natural systems. (4-ESS1-1) <p>Cause and Effect</p> <ul style="list-style-type: none"> Cause and effect relationships are routinely identified, tested, and used to explain change. (4-ESS2-1) Cause and effect relationships are routinely identified and used to explain change. (4-ESS3-1)

<p>Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> Analyze and interpret data to make sense of phenomena using logical reasoning. (4-ESS2-2) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluate the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> Obtain and combine information from books and other reliable media to explain phenomena. (4-ESS3-1) 	<p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> Living things affect the physical characteristics of their regions. (4-ESS2-1) <p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> 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. (4-ESS3-1) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> 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. (4-ESS3-2) (Note: This Disciplinary Core Idea can also be found in 3.WC.) <p>ETS1.B: Designing Solutions to Engineering Problems</p> <ul style="list-style-type: none"> Testing a solution involves investigating how well it performs under a range of likely conditions. (secondary to 4-ESS3-2) 	<ul style="list-style-type: none"> Cause and effect relationships are routinely identified, tested, and used to explain change. (4-ESS3-2) <p>Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> Knowledge of relevant scientific concepts and research findings is important in engineering. (4-ESS3-1) <p>Influence of Science, Engineering and Technology on Society and the Natural World</p> <ul style="list-style-type: none"> Over time, people’s needs and wants change, as do their demands for new and improved technologies. (4-ESS3-1) Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands. (4-ESS3-2)
<p>Connections to other DCIs in fourth grade: 4.ETS1.C (4-ESS3-2)</p>		
<p>Articulation of DCIs across grade-levels: 2.ESS1.C (4-ESS1-1); 3.LS4.A (4-ESS1-1); MS.LS4.A (4-ESS1-1); MS.ESS1.C (4-ESS1-1) MS.ESS2.A (4-ESS1-1); MS.ESS2.B (4-ESS1-1) : 2.ESS1.C (4-ESS2-1); 2.ESS2.A (4-ESS2-1); 2.ESS2.B (4-ESS2-2); 2.ESS2.C (4-ESS2-2); 5.ESS2.A (4-ESS2-1); 5.ESS2.C (4-ESS2-2); MS.ESS1.C (4-ESS2-2); MS.ESS2.A (4-ESS2-2); MS.ESS2.B (4-ESS2-2) 2) Articulation of DCIs across grade-levels: K.ETS1.A (4-ESS3-2); 2.ETS1.B (4-ESS3-2); 2.ETS1.C (4-ESS3-2); 5.ESS3.C (4-ESS3-1); MS.PS3.D (4-ESS3-1); MS.ESS2.A (4-ESS3-1),(4-ESS3-2); MS.ESS3.A (4-ESS3-1); MS.ESS3.B (4-ESS3-2); MS.ESS3.C (4-ESS3-1); MS.ESS3.D (4-ESS3-1); MS.ETS1.B (4-ESS3-2)</p>		
<p><u>Interdisciplinary Connections</u> 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. (4-ESS3-2)</p>		

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. (4-ESS2-2) (4-ESS3-1)

RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-ESS3-2)

W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS1-1) (4-ESS2-1)

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. (4-ESS1-1) (4-ESS2-1) (4-ESS3-1)

W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-ESS1-1) (4-ESS3-1)

Mathematics –

MP.2 Reason abstractly and quantitatively. (4-ESS1-1) (4-ESS2-1) (4-ESS3-1),(4-ESS3-2)

MP.4 Model with mathematics. (4-ESS1-1) (4-ESS2-1) (4-ESS3-1),(4-ESS3-2)

MP.5 Use appropriate tools strategically. (4-ESS2-1)

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-ESS1-1) (4-ESS2-1)

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. (4-ESS2-1),(4-ESS2-2)

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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-ESS3-1),(4-ESS3-2)

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Personal Finance Literacy and Career Awareness, Exploration and Preparation

Integration of NJSLS 21st Century Skills, Life and Career Standards

9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness

https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing

Technology Standards

8.1 Educational Technology

None identified at this time

8.2 Technology Education

None identified at this time

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