

**East Newark Public School**

**Science Curriculum**

**Grade 4**



# Science Grade 4

EAST NEWARK PUBLIC SCHOOL

## Course Description

Based on the Next Generation Science Standards, the East Newark Public School fourth grade science program is designed to introduce and develop a foundation in science through six major units of study. These units are: Energy, Waves and Their Applications in Technology, From Molecules to Organisms: Structures and Processes, Rocks and Fossils, Changes to Earth's Surface, and Natural Resources and Hazards. In the fourth grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate an understanding of the core ideas.

## Course Resources

1. Science Fusion Teacher Edition
2. Science Fusion Student Edition
3. Inquiry Flipchart
4. [www.thinkcentral.com](http://www.thinkcentral.com)
5. Digital Lessons
6. Virtual Lab
7. SMARTboard

## Pacing Guide

Unit	Unit Title	Topics Covered	Standards	Resources
1	Energy	<ul style="list-style-type: none"><li>• Forms of Energy</li><li>• Where Does Energy Come From?</li><li>• Heat</li><li>• How Is Heat Produced?</li><li>• Conductors, and Insulators</li><li>• Electricity?</li><li>• How Do Electric Charges Interact?</li><li>• Electric Circuits</li><li>• Uses of Electricity</li><li>• Motion</li><li>• Speed</li></ul>	4-PS3-1 4-PS3-2 4-PS3-3 4-PS3-4	Science Fusion  Think Central
2	Waves and Their Applications in Technology	<ul style="list-style-type: none"><li>• Describing Waves</li><li>• Sound</li><li>• Sight</li><li>• Color</li><li>• Mirrors</li><li>• Refraction</li><li>• Digitized Information</li></ul>	4-PS4-1 4-PS4-2 4-PS4-3	New Jersey Center for Teaching and Learning  Think Central
3	From Molecules to Organisms: Structures and Processes	<ul style="list-style-type: none"><li>• Plant Structures</li><li>• Plant Reproduction</li><li>• The Life Cycle of a Plant</li><li>• Animal Reproduction</li><li>• Adaptations of Living Things</li></ul>	4-LS1-1 4-LS1-2	Science Fusion  Think Central

		<ul style="list-style-type: none"> <li>• Birds Beaks: Why Are They Different?</li> </ul>		
4	Rocks and Fossils	<ul style="list-style-type: none"> <li>• The Structure of Earth</li> <li>• Rock Layers</li> <li>• Fossils and Relative Time</li> <li>• Rock Formations and Earth Forces</li> <li>• Tectonic PLates</li> <li>• Earth's Visible Features</li> <li>• Patterns of Earth's Features</li> </ul>	4-ESS1-1	<p>New Jersey Center for Teaching and Learning</p> <p>Think Central</p>
5	Changes to Earth's Surface	<ul style="list-style-type: none"> <li>• Earth's Systems</li> <li>• Mechanical Weathering</li> <li>• Chemical Weathering</li> <li>• Erosion</li> <li>• Biogeology</li> <li>• Water Cycle</li> </ul>	4-ESS2-1 4-ESS2-2	<p>Science Fusion</p> <p>New Jersey Center for Teaching and Learning</p> <p>Think Central</p>
6	Natural Resources and Hazards	<ul style="list-style-type: none"> <li>• Natural Resources</li> <li>• Human Energy Use</li> <li>• Renewable Energy</li> <li>• Non-Renewable ENergy</li> <li>• Environmental Impacts</li> <li>• Natural Hazards</li> <li>• Earthquakes</li> <li>• Volcanoes</li> <li>• Tsunamis</li> <li>• Minimizing Damage</li> </ul>	4-ESS3-1 4-ESS3-2	<p>Science Fusion</p> <p>New Jersey Center for Teaching and Learning</p> <p>Think Central</p>

## Unit 1: Energy

<b>Timeframe</b>	<b>September-October</b>
<b>Overview</b>	Students explore how mechanisms change energy by transferring direction, speed, type of movement, and force. Students discover a variety of ways that potential energy can be stored and released as kinetic energy. Citing evidence, students explain the relationship between the speed of an object and the energy of that object. They also predict the transfer of energy as a result of a collision between two objects.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● Science Fusion <ul style="list-style-type: none"> <li>○ Unit 9, Lessons 1-6</li> <li>○ Unit 10, Lessons 1-2, 4-5</li> <li>○ Unit 11, Lessons 1-2</li> </ul> </li> <li>● Inquiry Flipcharts</li> <li>● Online Database: <a href="http://www.thinkcentral.com">www.thinkcentral.com</a> <ul style="list-style-type: none"> <li>○ Digital Lessons</li> <li>○ Virtual Labs</li> </ul> </li> <li>● Hands-On Activities</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What are some forms of energy?</li> <li>2. Where does energy come from?</li> <li>3. What is heat?</li> <li>4. How is heat produced?</li> <li>5. What are conductors and insulators?</li> <li>6. Which materials are conductors?</li> <li>7. What is electricity?</li> <li>8. How do electric charges interact?</li> <li>9. What is an electric circuit?</li> <li>10. How do we use electricity?</li> <li>11. What is motion?</li> <li>12. What is speed?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Identify energy uses and their sources.</li> <li>2. Describe the uses of chemical and mechanical energy and how chemical energy can be changed to other forms of energy.</li> <li>3. Differentiate between potential and kinetic energy.</li> <li>4. Understand that sound is a form of energy produced through vibrations.</li> <li>5. Identify how potential energy is transferred into kinetic energy.</li> <li>6. Investigate how energy has the ability to cause motion.</li> <li>7. Define temperature and heat, describe ways to transfer heat, and identify sources of heat.</li> <li>8. Observe that an object's temperature increases when it is exposed to a heat source.</li> <li>9. Identify materials that conduct heat well and determine which materials can be used to prevent the transfer of energy as heat.</li> <li>10. Explain what causes static electricity, describe how charged particles interact with one another, and relate electricity to magnetism.</li> <li>11. Compare the interaction between a charged object and an uncharged object, and the interaction between two objects with the same charge.</li> <li>12. Demonstrate the ability of a charged object to attract or repel another object, even if the two objects are not touching.</li> <li>13. Analyze circuits, explain how they work, identify elements in a circuit that transforms electrical energy into heat, light, sound, and motion.</li> <li>14. Identify conductors and insulators of electricity.</li> </ol>

	<ol style="list-style-type: none"> <li>15. Describe how electricity is generated and explain why energy conservation is important, and identify some ways to conserve electricity.</li> <li>16. Observe and record changes of position.</li> <li>17. Explain how to measure motion and compare the motion of various objects.</li> <li>18. Describe how velocity and acceleration are related.</li> <li>19. Determine the speed of a moving object by measuring the distance it travels and the time required, and determine how to increase or decrease the speed of the object.</li> </ol>
<p><b>Technology Infusion</b></p>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<p><b>Standards</b></p>	<ul style="list-style-type: none"> <li>● <b>4-PS3-1:</b> Use evidence to construct an explanation relating the speed of an object to the energy of that object.</li> <li>● <b>4-PS3-2:</b> Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</li> <li>● <b>4-PS3-3:</b> Ask questions and predict outcomes about the changes in energy that occur when objects collide.</li> <li>● <b>4-PS3-4:</b> Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</li> </ul>
<p><b>Integrated Accommodations and Modifications</b></p>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>○ Invite students to explore different points of view on a topic of study and compare.</li> <li>○ Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>○ Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>○ Independent student led research.</li> </ul> </li> </ul>
<p><b>Assessments</b></p>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<p><b>Integration of 21st Century Learning Skills</b></p>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> </ul>

	<ul style="list-style-type: none"> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>
<p><b>Career Education</b></p>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness, Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<p><b>Interdisciplinary Connections</b></p>	<ul style="list-style-type: none"> <li>● The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting, provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.</li> <li>● For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.</li> </ul>

**Unit 2:  
Waves and Their Applications in Technology**

<b>Timeframe</b>	<b>November-December</b>
<b>Overview</b>	Students will understand that waves are regular patterns of motion caused by a disturbance. Students will be able to compare and contrast longitudinal waves and transverse waves. Students will investigate what has to happen in order for sight to occur, and analyze how we are able to see colors. Students will understand that light has to bend to pass from one material to another. Furthermore, students will analyze how the process of information transfer has changed over time, and understand how computers are able to communicate.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● New Jersey Center for Teaching and Learning (<a href="https://njctl.org/courses/science/4th-grade-science/waves-light-information/">https://njctl.org/courses/science/4th-grade-science/waves-light-information/</a>) <ul style="list-style-type: none"> <li>○ Waves, Light, and Information PDF</li> <li>○ Waves, Light, and Information Hands on Activities</li> </ul> </li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What are waves and what are they caused by?</li> <li>2. What words do scientists use to describe waves?</li> <li>3. What are longitudinal waves and what causes them?</li> <li>4. What are transverse waves and what causes them?</li> <li>5. How are longitudinal and transverse waves different?</li> <li>6. How does light allow us to see?</li> <li>7. Why do we see colors?</li> <li>8. How do plane mirrors reflect light and objects?</li> <li>9. How is light refracted?</li> <li>10. How do modern ways of communication utilize patterns to transfer information?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Create a wave and explain how to manipulate various characteristics of the wave (like amplitude or wavelength)</li> <li>2. Create a simple device to transfer sound waves and explain why it can do so.</li> <li>3. Relate amplitude and wavelength to volume and pitch.</li> <li>4. Model changes in amplitude and wavelength on a one-string guitar.</li> <li>5. Explain how mirrors reflect objects and light.</li> <li>6. Use patterns to create a code to transfer information.</li> <li>7. Decode a set of digitized information.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>4-PS4-1:</b> Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.</li> <li>● <b>4-PS4-2:</b> Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.</li> <li>● <b>4-PS4-3:</b> Generate and compare multiple solutions that use patterns to transfer information.</li> </ul>
<b>Integrated Accommodations and Modifications</b>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>o Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>o Invite students to explore different points of view on a topic of study and compare.</li> <li>o Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>o Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>o Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>o Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>o Independent student led research.</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<b>Integration of 21st Century Learning Skills</b>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>
<b>Career Education</b>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness,</p>



	<p>Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<b>Interdisciplinary Connections</b>	<ul style="list-style-type: none"><li>• The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting, provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.</li><li>• For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.</li></ul>

**Unit 3:**  
**From Molecules to Organisms: Structures and Processes**

<b>Timeframe</b>	<b>January-February</b>
<b>Overview</b>	Students explore the various inputs and outputs of the human body. Students discover how signals passing from cell to cell allow us to receive stimuli from the outside world, get this information to the brain for processing, and then send out a signal to generate a response. Students investigate how we take in information through the senses and where the information is processed in the brain. Additionally, students explore how the brain and body react to stimuli.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● Science Fusion <ul style="list-style-type: none"> <li>○ Unit 3, Lessons 1-5</li> </ul> </li> <li>● Inquiry Flipcharts</li> <li>● Online Database: <a href="http://www.thinkcentral.com">www.thinkcentral.com</a> <ul style="list-style-type: none"> <li>○ Digital Lessons</li> <li>○ Virtual Labs</li> </ul> </li> <li>● Hands-On Activities</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What are some plant structures?</li> <li>2. How do plants reproduce?</li> <li>3. How can we observe a plant's life cycle?</li> <li>4. How do animals reproduce?</li> <li>5. How are living things adapted to their environment?</li> <li>6. Why do bird beaks differ?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Describe the structures of typical plants.</li> <li>2. Describe the process of photosynthesis.</li> <li>3. Recognize that all seed-plant life cycles include germination, maturity, reproduction, and death.</li> <li>4. Identify the stages in the life cycle of a flowering plant, and a nonflowering , seed-bearing plant.</li> <li>5. Describe the role of pollination in the sexual reproduction of plants and describe ways that plants are pollinated; Describe reproduction in seedless plants.</li> <li>6. Observe a developing plant embryo.</li> <li>7. Understand that some animals are born live, whereas other animals hatch from eggs.</li> <li>8. Understand that some animals go through metamorphosis as part of their life cycle.</li> <li>9. Define and explain the terms environment and adaptation.</li> <li>10. Define and explain physical and behavioral adaptations and recognize physical and behavioral adaptations in plants and animals.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>4-LS1-1:</b> Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</li> <li>● <b>4-LS1-2:</b> 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.</li> </ul>

<p><b>Integrated Accommodations and Modifications</b></p>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>○ Invite students to explore different points of view on a topic of study and compare.</li> <li>○ Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>○ Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>○ Independent student led research.</li> </ul> </li> </ul>
<p><b>Assessments</b></p>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<p><b>Integration of 21st Century Learning Skills</b></p>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>

<b>Career Education</b>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness, Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<b>Interdisciplinary Connections</b>	<ul style="list-style-type: none"><li>• The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting, provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.</li><li>• For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.</li></ul>

**Unit 4:  
Rocks and Fossils**

<b>Timeframe</b>	<b>March</b>
<b>Overview</b>	Students will understand that Earth's crust provides us with clues about Earth's history. Students will investigate how sedimentary rocks form and understand that the fossils within these layers can help scientists determine the age of rocks. Students will develop an understanding of how tectonic plates move and interact and create a model to demonstrate this. Students will also be able to explain why many features on Earth's surface exist at the boundaries of tectonic plates.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● New Jersey Center for Teaching and Learning (<a href="https://njctl.org/courses/science/4th-grade-science/the-history-of-planet-earth/">https://njctl.org/courses/science/4th-grade-science/the-history-of-planet-earth/</a>) <ul style="list-style-type: none"> <li>○ The History of Planet Earth PDF</li> <li>○ The History of Planet Earth Hands on Activities</li> </ul> </li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What can rock formations teach about the history of Earth?</li> <li>2. How can fossils help determine the age of rocks and rock layers?</li> <li>3. What are tectonic plates?</li> <li>4. What causes many of Earth's surface features and where do these features tend to exist?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Create a model of sedimentary rock formation.</li> <li>2. Create a model of fossils in sedimentary rock layers.</li> <li>3. Identify rock layers in a sedimentary rock model and use this information to determine the step-by-step process of rock formation.</li> <li>4. Determine what the youngest and oldest layer of a rock is based on the Law of Superposition.</li> <li>5. Collaborate to build a model of one type of plate boundary.</li> <li>6. Map earthquakes and plate boundary locations and determine the connections between their locations.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>4-ESS1-1:</b> Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.</li> </ul>
<b>Integrated Accommodations and Modifications</b>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>○ Invite students to explore different points of view on a topic of study and compare.</li> <li>○ Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>o Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>o Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>o Independent student led research.</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<b>Integration of 21st Century Learning Skills</b>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>
<b>Career Education</b>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness, Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<b>Interdisciplinary Connections</b>	<ul style="list-style-type: none"> <li>● The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting,</li> </ul>

provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.

- For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.

**Unit 5:  
Changes to Earth's Surface**

<b>Timeframe</b>	<b>April-May</b>
<b>Overview</b>	Earth has four systems (atmosphere, biosphere, geosphere, hydrosphere) that work together. Students will investigate how the systems work together and how features of Earth's surface can change over time. Students will be able to explain weathering and erosion, and differentiate between mechanical and chemical weathering. Students will conclude that all living things affect the environment and the amount of water in an area determines what organisms are able to live there.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● New Jersey Center for Teaching and Learning (<a href="https://njctl.org/courses/science/4th-grade-science/earths-systems/">https://njctl.org/courses/science/4th-grade-science/earths-systems/</a>) <ul style="list-style-type: none"> <li>○ Earth's Systems PDF</li> <li>○ Earth's Systems Hands on Activities</li> </ul> </li> <li>● Science Fusion <ul style="list-style-type: none"> <li>○ Unit 6, Lesson 1</li> </ul> </li> <li>● Inquiry Flipcharts</li> <li>● Online Database: <a href="http://www.thinkcentral.com">www.thinkcentral.com</a> <ul style="list-style-type: none"> <li>○ Digital Lessons</li> <li>○ Virtual Labs</li> </ul> </li> <li>● Hands-On Activities</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What is mechanical and chemical weathering and how does it affect the environment?</li> <li>2. What is erosion and how does it affect the environment?</li> <li>3. How do living things affect their environments?</li> <li>4. How does rainfall affect the environment?</li> <li>5. What is the water cycle?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Create a model of ice weathering a rock and relate it to weathering in nature.</li> <li>2. Create a model of water weathering a rock and relate it to weathering in nature.</li> <li>3. Create a model of erosion and relate it to erosion in nature.</li> <li>4. Create a model of weathering and erosion and relate it to weathering and erosion in nature.</li> <li>5. Identify chemical versus mechanical weathering.</li> <li>6. Distinguish between weathering and erosion.</li> <li>7. Identify the effects of weathering and erosion in the environment.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>4-ESS2-1:</b> Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.</li> <li>● <b>4-ESS2-2:</b> Analyze and interpret data from maps to describe patterns of Earth's features.</li> </ul>
<b>Integrated Accommodations and Modifications</b>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>o Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>o Invite students to explore different points of view on a topic of study and compare.</li> <li>o Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>o Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>o Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>o Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>o Independent student led research.</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<b>Integration of 21st Century Learning Skills</b>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>
<b>Career Education</b>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness,</p>

	<p>Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<b>Interdisciplinary Connections</b>	<ul style="list-style-type: none"><li>• The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting, provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.</li><li>• For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.</li></ul>

**Unit 6:  
Natural Resources and Hazards**

<b>Timeframe</b>	<b>May-June</b>
<b>Overview</b>	Students will develop an understanding that the energy and fuels humans used were derived from natural sources. In order for energy to be produced it has to be converted, and devices must be designed, tested, and refined in order to do this. Students will be able to differentiate between renewable and non-renewable energy and give examples of each. Additionally, students will learn that natural processes sometimes cause natural hazards, which cannot be prevented, but their damage can be minimized. Students will analyze how scientists monitor and/or predict natural hazards, and then conduct research and design a building that will be able to resist damage from an earthquake.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● Science Fusion <ul style="list-style-type: none"> <li>○ Unit 4, Lesson 4</li> </ul> </li> <li>● Inquiry Flipcharts</li> <li>● Online Database: <a href="http://www.thinkcentral.com">www.thinkcentral.com</a> <ul style="list-style-type: none"> <li>○ Digital Lessons</li> <li>○ Virtual Labs</li> </ul> </li> <li>● Hands-On Activities</li> <li>● New Jersey Center for Teaching and Learning (<a href="https://njctl.org/courses/science/4th-grade-science/energy-natural-resources/">https://njctl.org/courses/science/4th-grade-science/energy-natural-resources/</a>) <ul style="list-style-type: none"> <li>○ Natural Resources PDF</li> <li>○ Natural Resources Hands on Activities</li> </ul> </li> <li>● New Jersey Center for Teaching and Learning (<a href="https://njctl.org/courses/science/4th-grade-science/natural-hazards/">https://njctl.org/courses/science/4th-grade-science/natural-hazards/</a>) <ul style="list-style-type: none"> <li>○ Natural Hazards PDF</li> <li>○ Natural Hazards Hands on Activities</li> </ul> </li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What Are Natural Resources?</li> <li>2. Where do humans derive energy from?</li> <li>3. What does it mean to produce energy?</li> <li>4. How can energy be converted from one form to another?</li> <li>5. What is renewable energy?</li> <li>6. What is non-renewable energy?</li> <li>7. How does human energy use impact the environment?</li> <li>8. What is a natural hazard?</li> <li>9. Can natural hazards be prevented?</li> <li>10. How do earthquakes, volcanoes and tsunamis form?</li> <li>11. How are earthquakes, volcanoes and tsunamis monitored?</li> <li>12. How does earthquake engineering create earthquake resistant buildings?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Design and build a simple device that converts energy from one form to another.</li> <li>2. Define a simple engineering problem related to constraints due to materials, cost, or time.</li> <li>3. Explain one energy type in depth, including where the energy is found, what it is used for, and how it impacts the environment.</li> <li>4. Analyze a combination of information they have collected about one type of energy.</li> <li>5. Describe natural hazards.</li> <li>6. Explain how earthquakes, volcanoes and tsunamis form.</li> <li>7. Describe the tools used to monitor earthquakes.</li> <li>8. Explain how a seismograph works.</li> <li>9. Describe how seismic, gas and ground deformation monitoring helps</li> </ol>

	<p>scientists to monitor/predict volcanoes.</p> <p>10. Describe how the DART system enables scientists to detect potential tsunamis.</p> <p>11. Design an earthquake resistant building.</p>
<p><b>Technology Infusion</b></p>	<ul style="list-style-type: none"> <li>● 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems</li> <li>● 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures</li> <li>● 8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue</li> </ul>
<p><b>Standards</b></p>	<ul style="list-style-type: none"> <li>● <b>4-ESS3-1:</b> Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.</li> <li>● <b>4-ESS3-2:</b> Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.</li> </ul>
<p><b>Integrated Accommodations and Modifications</b></p>	<ul style="list-style-type: none"> <li>● <b>Special Education Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>English Language Learners</b> <ul style="list-style-type: none"> <li>○ Invite students to explore different points of view on a topic of study and compare.</li> <li>○ Allow the use of laptops for translation purposes.</li> </ul> </li> <li>● <b>504 Students</b> <ul style="list-style-type: none"> <li>○ Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge.</li> <li>○ Extended time for revisions or opportunity to identify and develop areas of personal interest.</li> </ul> </li> <li>● <b>Gifted &amp; Talented Students</b> <ul style="list-style-type: none"> <li>○ Encourage students to explore concepts in depth and encourage independent studies or investigations.</li> <li>○ Independent student led research.</li> </ul> </li> </ul>
<p><b>Assessments</b></p>	<ul style="list-style-type: none"> <li>● Research simulation tasks and peer review</li> <li>● Formal assessments through the use of tests and quizzes</li> <li>● Multimedia presentations</li> <li>● Writing prompts</li> <li>● Vocabulary quizzes</li> <li>● Formative assessments in the form of quizzes, class participation, discussion, topic blogging, and/or journaling</li> </ul>
<p><b>Integration of 21st Century Learning Skills</b></p>	<ul style="list-style-type: none"> <li>● 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.</li> <li>● 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.</li> <li>● 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.</li> <li>● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.</li> <li>● CRP1. Act as a responsible and contributing citizen and employee.</li> </ul>

	<ul style="list-style-type: none"> <li>● CRP2. Apply appropriate academic and technical skills.</li> <li>● CRP4. Communicate clearly and effectively and with reason.</li> <li>● CRP5. Consider the environmental, social and economic impacts of decisions.</li> <li>● CRP6. Demonstrate creativity and innovation.</li> <li>● CRP7: Employ valid and reliable research strategies.</li> <li>● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● CRP9. Model integrity, ethical leadership and effective management.</li> <li>● CRP10. Plan education and career paths aligned to personal goals.</li> <li>● CRP11: Use technology to enhance productivity.</li> </ul>
<p><b>Career Education</b></p>	<p>The 12 Career Ready Practices: These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness. This unit addresses standard 9.2 (Career Awareness, Exploration, and Preparation) as it outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p>
<p><b>Interdisciplinary Connections</b></p>	<ul style="list-style-type: none"> <li>● The science curriculum includes unifying themes such as systems, changes, and models. These themes combine with connected skills such as using measurement and representations. These themes and skills, along with the shared processes of observing and predicting, provide teachers with a myriad of opportunities for making meaningful cross-curricular connections.</li> <li>● For example, investigations of local issues can engage students in thinking about science and social science concepts and help develop their understanding of probability and data analysis, which are part of the mathematics standards. Learning, understanding, and using scientific vocabulary allows students to connect their ideas to content specific words and phrases. Students must understand appropriate levels of scientific terminology to be able to achieve the lesson objectives. In addition, teachers may use journals, writing prompts, lab reports, and outlines to provide students with opportunities to write in the science classroom.</li> </ul>