

**East Newark Public School**  
**Science Curriculum**  
**Grade 7**



# 7th Grade Science Curriculum

EAST NEWARK PUBLIC SCHOOL

## Course Description

The East Newark Public School seventh grade science program is designed to introduce and develop a foundation in science through five major units of study. Students will gain an understanding of many important areas of the Life, Earth and Physical Sciences, and will utilize and understand scientific processes.

## Course Resources

1. Next Generation Science Standards:
  - Physical Science: <http://www.nextgenscience.org/file/3886/download?token=DgiPGjif>
  - Life Science: <http://www.nextgenscience.org/file/3751/download?token=I9tt2Yaw>
  - Earth & Space Science: <http://www.nextgenscience.org/file/3221/download?token=SbGEGsSFG>
2. Engineering Design <http://www.nextgenscience.org/file/3196/download?token=N-IGFy6h>
3. Integrated iScience Course 2, McGraw Hill, Copyright 2012, ConnectEd online textbook resources
4. New Jersey Center for Teaching & Learning (NJCTL) <https://njctl.org/courses/science/>

## Pacing Guide

Unit	Unit Title	Topics Covered	Standards	Resources
1	Life: Structure and Function	<ul style="list-style-type: none"><li>• Classifying and Exploring Life</li><li>• Cell Structure and Function</li><li>• From a Cell to an Organism</li><li>• Reproduction of Organisms</li></ul>	MS-LS1-1 MS-LS1-2	iScience (Leopard)
2	Life: Changes and Interactions	<ul style="list-style-type: none"><li>• Genetics</li><li>• The Environment and Change Over Time</li><li>• Plant Processes and Reproduction</li><li>• Interactions of Living Things</li></ul>	MS-LS3-1 MS-LS3-2	iScience (Leopard)
3	Energy and Matter	<ul style="list-style-type: none"><li>• Foundations of Chemistry</li><li>• The Periodic Table</li><li>• Using Energy and Heat</li></ul>	MS-PS1-2 MS-PS1-3 MS-PS1-4	iScience (Leopard)
4	Earth: A Dynamic Planet	<ul style="list-style-type: none"><li>• The Earth System</li><li>• Earth's Changing Surface</li><li>• Earth's Atmosphere</li><li>• Weather</li><li>• Climate</li></ul>	MS-ESS1-4 MS-ESS2-1 MS-ESS2-2 MS-ESS2-3	iScience (Leopard)
5	Exploring the Universe	<ul style="list-style-type: none"><li>• Motion, Forces, and Newton's Laws</li><li>• The Sun-Earth-Moon System</li></ul>	MS-ESS1-1 MS-ESS1-2 MS-ESS1-3 MS-ESS2-4	iScience (Leopard)

## Unit 1: Life: Structure and Function

<b>Timeframe</b>	September-November
<b>Overview</b>	Students demonstrate age appropriate abilities to plan and carry out investigations to develop evidence that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate an understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions in organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells. The crosscutting concepts of scale, proportion, and quantity and structure and function provide a framework for understanding the disciplinary core ideas.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● iScience Online &amp; Digital Texts</li> <li>● iScience Materials</li> <li>● Microscopes and prepared slides of plant and animal cells</li> <li>● Chapter 1 - Lesson 1-2</li> <li>● Chapter 2 - Lesson 2-4</li> <li>● Chapter 3 - Lesson 1-2</li> <li>● Chapter 4 - Lesson 1-2</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What are living things and how can they be classified?</li> <li>2. How do the structures and process of a cell enable it to survive?</li> <li>3. How can one cell become a multicellular organism?</li> <li>4. Why do living things reproduce?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Describe what characteristics are shared by all living things.</li> <li>2. Describe why organisms are classified and the significance of a species' scientific name.</li> <li>3. Conduct an investigation to provide evidence that living things are made of cells.</li> <li>4. Compare and contrast prokaryotic and eukaryotic cells.</li> <li>5. Develop and use a model to describe the function of a cell as a whole and the ways the parts of cells contribute to its function.</li> <li>6. Explain how materials enter and exit the cell.</li> <li>7. Describe how a cell obtains and uses energy.</li> <li>8. Explain the phases of the cell cycle.</li> <li>9. Differentiate between unicellular and multicellular organisms and describe how this leads to organization within multicellular organisms.</li> <li>10. What happens during meiosis and why is it important.</li> <li>11. Differentiate between sexual and asexual reproduction.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.</li> <li>● 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications.</li> <li>● 8.1.8.A.3 Use and/or develop a simulation that solves or supports a real world problem or theory.</li> <li>● 8.1.8.A.4 Graph and calculate data within a spreadsheet and summarize the results</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>MS-ESS1-1:</b> Develop and use a model of the Earth-Sun-Moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.</li> <li>● <b>MS-ESS1-2:</b> Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</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 Device used 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 Modeling or independent student led research</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Simulation tasks and peer review</li> <li>● Formal Assessments by way of tests and quizzes</li> <li>● Multimedia presentation</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>● 9.2.8.B.1 Research careers within the 16 Career Clusters and determine attributes of career success.</li> <li>● 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.</li> <li>● 9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.</li> <li>● 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.</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</li> </ul>

and predicting, 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 2: Life: Changes and Interactions

<b>Timeframe</b>	September-November
<b>Overview</b>	Students develop and use models to describe how gene mutations and sexual reproduction contribute to genetic variation. Students understand how genetic factors determine the growth of an individual organism. They also demonstrate understanding of the genetic implications of sexual and asexual reproduction. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding how gene structure determines differences in the functioning of organisms. Students are expected to demonstrate proficiency in developing and using models. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● iScience Online &amp; Digital Texts</li> <li>● iScience Materials</li> <li>● Microscopes and prepared slides of plant and animal cells</li> <li>● Chapter 5 - Lesson 1-3</li> <li>● Chapter 6 - Lesson 1-3</li> <li>● Chapter 8 - Lesson 1-3</li> <li>● Chapter 9 - Lesson 1-3</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. How are traits passed from parent to offspring?</li> <li>2. How do species adapt to changing environments?</li> <li>3. What processes enable plants to survive and reproduce?</li> <li>4. How do living things interact with and depend on the other parts of an ecosystem?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Describe the results of Mendel's experiments.</li> <li>2. Analyze how dominant and recessive factors interact.</li> <li>3. Model inheritance.</li> <li>4. Describe how fossils form, are dated, and can be used as evidence of biological evolution.</li> <li>5. Explain how Charles Darwin's theory of evolution by natural selection explains how species change over time.</li> <li>6. Analyze how adaptations are evidence for natural selection.</li> <li>7. Give examples of evidence from living species that supports the theory that species descended from other species over time.</li> <li>8. Describe cellular respiration and photosynthesis and analyze the relationship between the two processes.</li> <li>9. Describe how plants respond to environmental and chemical stimuli.</li> <li>10. Differentiate between different types of plant reproduction.</li> <li>11. Define ecosystem and biome and describe what happens when an environment changes.</li> <li>12. Describe how organisms interact and give examples of symbiotic relationships.</li> <li>13. Describe and model how energy and matter is transferred in an ecosystem.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.</li> <li>● 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications.</li> <li>● 8.1.8.A.3 Use and/or develop a simulation that solves or supports a real world problem or theory.</li> <li>● 8.1.8.A.4 Graph and calculate data within a spreadsheet and summarize the results</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>MS-LS3-1:</b> Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.</li> <li>● <b>MS-LS3-2:</b> Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring</li> </ul>

	with genetic variations.
<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>○ Device used 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>○ Modeling or independent student led research</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Simulation tasks and peer review</li> <li>● Formal Assessments by way of tests and quizzes</li> <li>● Multimedia presentation</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>● 9.2.8.B.1 Research careers within the 16 Career Clusters and determine attributes of career success.</li> <li>● 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.</li> <li>● 9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.</li> <li>● 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.</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>	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.
<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: Energy and Matter

<b>Timeframe</b>	February-April
<b>Overview</b>	Students build understandings of what occurs at the atomic and molecular scale. Students apply their understanding that pure substances have characteristic properties and are made from a single type of atom or molecule. They also provide molecular level accounts to explain the states of matter and what happens when changes between states occur. Students demonstrate grade appropriate proficiency in developing and using models, and obtaining, evaluating, and communicating information.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● iScience Online &amp; Digital Texts</li> <li>● iScience Materials</li> <li>● Microscopes and prepared slides of plant and animal cells</li> <li>● Chapter 10 - Lesson 1-4</li> <li>● Chapter 11 - Lesson 1</li> <li>● Chapter 12 - Lesson 1-3</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What is matter and how does it change?</li> <li>2. How is the periodic table used to classify and provide information about all known elements?</li> <li>3. What are energy transfers and energy transformations?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Differentiate between substances and mixtures.</li> <li>2. Analyze how atoms of different elements differ.</li> <li>3. Explain how matter is classified.</li> <li>4. Understand what a physical property is and describe how physical properties can be used to separate mixtures.</li> <li>5. Describe how a change in energy can affect the state of matter.</li> <li>6. Understand the concept of conservation of mass.</li> <li>7. Define chemical property, describe signs of a chemical change, and describe the factors that affect the rate of chemical reactions.</li> <li>8. Describe how elements are arranged on the periodic table.</li> <li>9. Differentiate between potential and kinetic energy.</li> <li>10. Compare and contrast mechanical and thermal energy.</li> <li>11. Understand that some energy is carried by waves.</li> <li>12. Describe what happens to the mass of an object after it undergoes a physical and/or chemical change.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.</li> <li>● 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications.</li> <li>● 8.1.8.A.3 Use and/or develop a simulation that solves or supports a real world problem or theory.</li> <li>● 8.1.8.A.4 Graph and calculate data within a spreadsheet and summarize the results</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>MS-PS1-2:</b> Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.</li> <li>● <b>MS-PS1-3:</b> Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</li> <li>● <b>MS-PS1-4:</b> Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</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 Device used 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 Modeling or independent student led research</li> </ul> </li> </ul>
<b>Assessments</b>	<ul style="list-style-type: none"> <li>● Simulation tasks and peer review</li> <li>● Formal Assessments by way of tests and quizzes</li> <li>● Multimedia presentation</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>● 9.2.8.B.1 Research careers within the 16 Career Clusters and determine attributes of career success.</li> <li>● 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.</li> <li>● 9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.</li> <li>● 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.</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>
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<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</li> </ul>

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## Unit 4: Earth: A Dynamic Planet

<b>Timeframe</b>	February-April
<b>Overview</b>	Students will examine geoscience data in order to understand processes and events in Earth's history. Important crosscutting concepts in this unit are scale, proportion, and quantity, stability and change, and patterns in relation to the different ways geologic processes operate over geologic time. An important aspect of the history of Earth is that geologic events and conditions have affected the evolution of life, but different life forms have also played important roles in altering Earth's systems. Students understand how Earth's geosystems operate by modeling the flow of energy and the cycling of matter within and among different systems.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● iScience Online &amp; Digital Texts</li> <li>● iScience Materials</li> <li>● Microscopes and prepared slides of plant and animal cells</li> <li>● Chapter 13 - Lesson 1-2</li> <li>● Chapter 14 - Lesson 1-3</li> <li>● Chapter 16 - Lesson 1-2</li> <li>● Chapter 17 - Lesson 1-2</li> <li>● Chapter 18 - Lesson 1-3</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. How do Earth systems recycle Earth materials?</li> <li>2. How do natural processes change Earth's surface over time?</li> <li>3. How does Earth's atmosphere affect life on Earth?</li> <li>4. How do scientists describe and predict weather?</li> <li>5. What is climate and how does it impact life on Earth?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Describe and model how Earth systems interact in the carbon and phosphorus cycles.</li> <li>2. Describe materials in the geosphere and explain why it has a layered structure.</li> <li>3. Explain the theory of plate tectonics and state evidence to support the theory.</li> <li>4. Understand that plate motion changes the features of Earth's surface.</li> <li>5. Describe the cause of earthquakes and volcanoes and describe how these forces change the Earth's surface.</li> <li>6. Analyze the relationship between erosion and deposition and describe how weathering, erosion, and deposition change Earth's surface.</li> <li>7. Understand how Earth's atmosphere formed and describe the layers of the atmosphere.</li> <li>8. Explain how air pressure and temperature change as altitude increases.</li> <li>9. Define weather, list the variables used to describe weather, and explain how weather is related to the water cycle.</li> <li>10. Determine what drives weather patterns and explain why it is useful to understand weather patterns.</li> <li>11. Define climate and describe how climates are classified.</li> <li>12. Analyze climate variation over time and explain what causes seasons.</li> <li>13. Explain how human activities affect climate and how scientists make predictions about future climate change.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.</li> <li>● 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications.</li> <li>● 8.1.8.A.3 Use and/or develop a simulation that solves or supports a real world problem or theory.</li> <li>● 8.1.8.A.4 Graph and calculate data within a spreadsheet and summarize the results</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>MS-ESS1-4:</b> Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6 billion-year-old history.</li> <li>● <b>MS-ESS2-1:</b> Develop a model to describe the cycling of Earth's materials and the flow of</li> </ul>

	<p>energy that drives this process.</p> <ul style="list-style-type: none"> <li>● <b>MS-ESS2-2:</b> Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.</li> <li>● <b>MS-ESS2-3:</b> Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.</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>○ Device used 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>○ Modeling or independent student led research</li> </ul> </li> </ul>
<p><b>Assessments</b></p>	<ul style="list-style-type: none"> <li>● Simulation tasks and peer review</li> <li>● Formal Assessments by way of tests and quizzes</li> <li>● Multimedia presentation</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>● 9.2.8.B.1 Research careers within the 16 Career Clusters and determine attributes of career success.</li> <li>● 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.</li> <li>● 9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.</li> <li>● 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.</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>	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.
<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 5: Exploring the Universe

<b>Timeframe</b>	February-April
<b>Overview</b>	Students will examine various laws and functions of physical science and relate them to the principles that will help them gain new perspective about our universe.
<b>Resources</b>	<ul style="list-style-type: none"> <li>● iScience Online &amp; Digital Texts</li> <li>● iScience Materials</li> <li>● Chapter 19 - Lesson 2-3</li> <li>● Chapter 20 - Lesson 1-3</li> </ul>
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. In what ways do forces affect an object's motion?</li> <li>2. What natural phenomena do the motions of Earth and the Moon produce?</li> </ol>
<b>Essential Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Describe how different forces affect objects and differentiate between balanced and unbalanced forces.</li> <li>2. Explain how certain factors affect the way gravity acts on an object.</li> <li>3. Analyze and explain how acceleration, net force, and mass of an object are related.</li> <li>4. Explain what happens to an object when another object exerts a force on it.</li> <li>5. Understand the movement of the Earth.</li> <li>6. Explain why Earth is warmer at the equator and colder at the poles and how the seasons change.</li> <li>7. Describe how the Moon moves and why its appearance changes.</li> <li>8. Differentiate between a solar and a lunar eclipse.</li> <li>9. Explain the effect of the Moon and the Sun on Earth's oceans.</li> </ol>
<b>Technology Infusion</b>	<ul style="list-style-type: none"> <li>● 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.</li> <li>● 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications.</li> <li>● 8.1.8.A.3 Use and/or develop a simulation that solves or supports a real world problem or theory.</li> <li>● 8.1.8.A.4 Graph and calculate data within a spreadsheet and summarize the results</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>● <b>MS-ESS1-1:</b> Develop and use a model of the Earth-Sun-Moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.</li> <li>● <b>MS-ESS1-2:</b> Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</li> <li>● <b>MS-ESS1-3:</b> Analyze and interpret data to determine scale properties of objects in the solar system.</li> <li>● <b>MS-ESS2-4:</b> Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.</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>○ Device used 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> </ul>



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<b>Integration of 21st Century Learning Skills</b>	<ul style="list-style-type: none"> <li>● 9.2.8.B.1 Research careers within the 16 Career Clusters and determine attributes of career success.</li> <li>● 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.</li> <li>● 9.2.8.B.6 Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.</li> <li>● 9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.</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>
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<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>

