

**East Newark Public School**

**Science Curriculum**

**Grade 8**



**Equity Statement:**

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

**Course Description:**

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

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

**Course Modifications:**

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

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

**Best Practices:**

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

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

**Grade 8 Scope and Sequence:**

Unit	Estimated Pacing
Motion and Energy	12 weeks
Interactions of Matter	17 weeks
Understanding the Universe	5 weeks
Natural Selection	6 weeks

Marking Period	Unit Title	Recommended Instructional Days
2-3	Motion and Energy	12 weeks
NJSLS - Science: Title	NJSLS - Science: Performance Expectations	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
Motion and Stability: Forces and Interactions	<ul style="list-style-type: none"> <li>● <b>MS-PS2-1:</b> Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.</li> <li>● <b>MS-PS2-2:</b> Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.</li> <li>● <b>MS-PS2-4:</b> Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</li> <li>● <b>MS-PS2-5:</b> Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.</li> </ul>	<p><b><u>Essential Question/s:</u></b></p> <ol style="list-style-type: none"> <li>1. What are some ways to describe motion?</li> <li>2. How do forces change the motion of objects?</li> <li>3. How does energy cause change?</li> <li>4. How do sound and light waves travel and interact with matter?</li> </ol> <p><b><u>Activity Description:</u></b></p> <ul style="list-style-type: none"> <li>● Launch Lab: How do you get there from here? (iScience, Owl, pg. 9)</li> <li>● MiniLab: Why is a reference point useful? (iScience, Owl, pg. 11)</li> <li>● Describe the difference between distance and displacement.</li> <li>● Accurately describe an object’s position using a reference point.</li> <li>● Launch Lab: How can motion change? (iScience, Owl, pg. 17)</li> <li>● Define speed and use a distance-time graph to calculate average speed.</li> <li>● Speed Challenge Activity</li> <li>● Explain ways that velocity changes.</li> <li>● Skill Practice: What do you measure to calculate speed? (iScience, Owl, pg. 25)</li> <li>● Launch Lab: In what ways can velocity change? (iScience, Owl, pg. 27)</li> <li>● Describe three ways that an object can accelerate.</li> <li>● Balloon Powered Car</li> <li>● Launch Lab: Can you make a ball move without touching it? (iScience, Owl, pg. 45)</li> <li>● List contact and noncontact forces.</li> </ul>
Energy	<ul style="list-style-type: none"> <li>● <b>MS-PS3-1:</b> Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.</li> <li>● <b>MS-PS3-4:</b> Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as</li> </ul>	

	measured by the temperature of the sample.	
<b>FOUNDATION Disciplinary: Core Idea</b>	<b>FOUNDATION Disciplinary: Statement</b>	
PS2.A: Forces and Motion	<ul style="list-style-type: none"> <li>For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law).</li> <li>The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.</li> <li>All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared.</li> </ul>	<ul style="list-style-type: none"> <li>Describe how friction affects the motion of objects sliding past each other.</li> <li>Explain Newton's laws of motion.</li> <li>Force Diagram: Students will cut pictures from newspapers or magazines showing objects in motion. Students will draw arrows indicating velocity and force. Students should write a caption for each photo explaining how the forces interact to affect the motion.</li> <li>Describe the effect of inertia on the motion of an object.</li> <li>Launch Lab: How do opposite forces compare? (iScience, Owl, pg. 70).</li> <li>Write an informational essay on Isaac Newton and his Laws of Motion.</li> <li>Define energy, describe the different forms of energy and explain how energy is used.</li> <li>Launch Lab: How far will it go? (iScience, Owl, pg. 97)</li> <li>Understand the law of conservation of energy and explain how energy can be transformed.</li> <li>Skill practice: How can you transfer energy to make a vehicle move? (iScience, Owl, pg. 103)</li> <li>Understand the relationship between energy and work.</li> <li>Describe examples of simple machines and explain how they make work easier.</li> <li>MiniLab: Can you model a wave? (iScience, Owl, pg. 125)</li> <li>Describe how sound waves are produced, and why the speed of sound waves varies depending on the material.</li> <li>Differentiate between light waves and sound waves.</li> <li>Explain what happens to light waves when they interact with matter.</li> <li>Differentiate between regular and diffuse reflection.</li> <li>Describe the images formed by mirrors and lenses.</li> <li>Explain how the human eye enables a person to see.</li> </ul>
PS2.B: Types of Interactions	<ul style="list-style-type: none"> <li>Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun.</li> <li>Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively).</li> </ul>	<p><b>Interdisciplinary Connections: Content: ;NJSLS#:</b></p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> <li>RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</li> <li>RST.6-8.3 - Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.</li> <li>WHST.6-8.7 - Conduct short research projects to answer a question (including a self-generated question), drawing on several sources</li> </ul>
PS3.A: Definitions of Energy	<ul style="list-style-type: none"> <li>Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.</li> </ul>	

	<ul style="list-style-type: none"> <li>Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present.</li> </ul>	<p>and generating additional related, focused questions that allow for multiple avenues of exploration.</p> <p>Mathematics -</p> <ul style="list-style-type: none"> <li>MP.2 - Reason abstractly and quantitatively.</li> <li>6.NS.C.5 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</li> <li>6.EE.A.2 - Write, read, and evaluate expressions in which letters stand for numbers.</li> <li>7.EE.B.3 - Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</li> <li>7.EE.B.4 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</li> <li>8.EE.A.1 - Know and apply the properties of integer exponents to generate equivalent numerical expressions.</li> <li>8.EE.A.2 - Use square root and cube root symbols to represent solutions to equations of the form <math>x^2 = p</math> and <math>x^3 = p</math>, where <math>p</math> is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that <math>\sqrt{2}</math> is irrational.</li> <li>8.F.A.3 - Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.</li> </ul> <p>Technology -</p> <ul style="list-style-type: none"> <li>8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.</li> <li>8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).</li> </ul>
PS3.B: Conservation of Energy and Energy Transfer	The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment.	
<b>FOUNDATION Science and Engineering Practices: Core Idea</b>	<b>FOUNDATION Science and Engineering Practices: Statement</b>	
Constructing Explanations and Designing Solutions	Apply scientific ideas or principles to design an object, tool, process or system.	
Planning and Carrying Out Investigations	<ul style="list-style-type: none"> <li>Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.</li> <li>Conduct an investigation and evaluate the experimental design to produce data to serve as the basis for evidence that can meet the goals of the investigation.</li> </ul>	
Scientific Knowledge is Based on Empirical Evidence	Science knowledge is based upon logical and conceptual connections between evidence and explanations.	
Engaging in Argument from Evidence	Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.	
Analyzing and Interpreting Data	Construct and interpret graphical displays of data to identify linear and nonlinear relationships.	

<b>FOUNDATION</b> <b>Crosscutting Concepts:</b> <i>Core Idea</i>	<b>FOUNDATION</b> <b>Crosscutting Concepts:</b> <i>Statement</i>	
Systems and System Models	Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.	
Influence of Science, Engineering, and Technology on Society and the Natural World	The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.	
Stability and Change	Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales.	
Cause and Effect	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	
Scale, Proportion, and Quantity	Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.	
<b>Social and Emotional Learning:</b> <i>Competencies</i>	<b>Social and Emotional Learning:</b> <i>Sub-Competencies</i>	
<ul style="list-style-type: none"> <li>● Self-Awareness</li> <li>● Self-Management</li> <li>● Responsible Decision Making</li> <li>● Social Awareness</li> <li>● Relationship Skills</li> <li>● Motivation</li> </ul>	<ul style="list-style-type: none"> <li>● Emotional Awareness</li> <li>● Internal Regulation</li> <li>● Behavior Control</li> <li>● Goal Persuance</li> <li>● Appreciating Social and Environment Diversity</li> <li>● Adaptive Behavior</li> <li>● Communication</li> <li>● Social Engagement</li> <li>● Constructive Thinking</li> <li>● Consequence Evaluation</li> <li>● Respect for Self and Others</li> </ul>	

	<ul style="list-style-type: none"> <li>• Enthusiasm</li> <li>• Initiative</li> <li>• Resilience</li> </ul>		
<b>Assessments (Formative)</b> <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		<b>Assessments (Summative)</b> <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
<b>Formative Assessments:</b> <ul style="list-style-type: none"> <li>• Participation in class discussions/debates</li> <li>• Exit tickets</li> <li>• Quizzes</li> <li>• In-class assignments/activities</li> <li>• Presentations</li> <li>• Group assignments</li> <li>• IXL results</li> </ul>		<b>Benchmarks:</b> <ul style="list-style-type: none"> <li>• CER assignments</li> </ul> <b>Summative Assessments:</b> <ul style="list-style-type: none"> <li>• Unit test</li> <li>• Unit project</li> <li>• Lab activities</li> </ul>	
<b>Differentiated Student Access to Content:  Teaching and Learning Resources/Materials</b>			
<b>Core Resources</b>	<b>Alternate Core Resources  IEP/504/At-Risk/ESL</b>	<b>ELL Core Resources</b>	<b>Gifted &amp; Talented Core Resources</b>
<ul style="list-style-type: none"> <li>• iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 1 - Lesson 1-3</li> <li>○ Chapter 2 - Lesson 1-4</li> <li>○ Chapter 3 - Lesson 1-3</li> <li>○ Chapter 4 - Lesson 1-3</li> </ul> </li> <li>• Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Modified/leveled readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 1 - Lesson 1-3</li> <li>○ Chapter 2 - Lesson 1-4</li> <li>○ Chapter 3 - Lesson 1-3</li> <li>○ Chapter 4 - Lesson 1-3</li> </ul> </li> <li>• Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Translated and modified readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 1 - Lesson 1-3</li> <li>○ Chapter 2 - Lesson 1-4</li> <li>○ Chapter 3 - Lesson 1-3</li> <li>○ Chapter 4 - Lesson 1-3</li> </ul> </li> <li>• Translated teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>• iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 1 - Lesson 1-3</li> <li>○ Chapter 2 - Lesson 1-4</li> <li>○ Chapter 3 - Lesson 1-3</li> <li>○ Chapter 4 - Lesson 1-3</li> </ul> </li> <li>• Teacher created reading guides and presentations</li> </ul>
<b>Supplemental Resources</b>			
<ul style="list-style-type: none"> <li>• Chromebooks</li> <li>• SmartBoard</li> <li>• IXL</li> <li>• Teacher Online Resources</li> <li>• Newsela.com</li> <li>• Quizlet</li> <li>• Kahoot</li> <li>• Applicable educational videos</li> <li>• CK12 Online Resources</li> <li>• <a href="https://www.ngssphenomena.com/">https://www.ngssphenomena.com/</a></li> </ul>			



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

Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
<ul style="list-style-type: none"> <li>• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment.</li> <li>• Jigsaws</li> <li>• Think-Pair-Share</li> <li>• Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate</li> <li>• Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.</li> </ul>	<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>• Use prompts and model directions</li> <li>• Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>• Extended time for revisions or opportunity to identify and develop areas of personal interest</li> </ul>	<ul style="list-style-type: none"> <li>• Utilize visual supports and graphic organizers</li> <li>• Use prompts and model directions</li> <li>• Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>• Device used for translation purposes</li> <li>• Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.</li> </ul>	<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> <li>• Use of higher leveled text and/or writing assignments</li> <li>• Utilize differentiation in the areas of acceleration, enrichment, and grouping</li> </ul>

<p align="center"><b>NJSLS CAREER READINESS, LIFE LITERACIES &amp; KEY SKILLS</b></p>	<p align="center"><b>Disciplinary Concept:</b></p>	
	<i>Core Ideas:</i>	Information and Media Literacy
	<i>Performance Expectation/s:</i>	<ul style="list-style-type: none"> <li>• <b>9.4.8.IML.7:</b> Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.</li> <li>• <b>9.4.8.IML.12:</b> Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.</li> </ul>
	<p align="center"><b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b></p>	
	<ul style="list-style-type: none"> <li>• Act as a responsible and contributing community members and employee.</li> <li>• Attend to financial well-being.</li> <li>• Consider the environmental, social and economic impacts of decisions.</li> <li>• Demonstrate creativity and innovation.</li> <li>• Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>• Model integrity, ethical leadership and effective management</li> <li>• Plan education and career paths aligned to personal goals.</li> <li>• Use technology to enhance productivity increase collaboration and communicate effectively.</li> <li>• Work productively in teams while using cultural/global competence.</li> </ul>	

Marking Period	Unit Title	Recommended Instructional Days
2-3	Interactions of Matter	17 weeks
NJSLs - Science: <i>Title</i>	NJSLs - Science: <i>Performance Expectations</i>	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLs-S within Unit
Matter and its Interactions	<ul style="list-style-type: none"> <li>● <b>MS-PS1-1:</b> Develop models to describe the atomic composition of simple molecules and extended structures.</li> <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-PS1-4:</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> <li>● <b>MS-PS1-5:</b> Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.</li> </ul>	<p><b>Essential Question/s:</b></p> <ol style="list-style-type: none"> <li>1. What are physical properties of matter?</li> <li>2. What are chemical properties of matter?</li> <li>3. How are temperature and thermal energy related?</li> <li>4. How do heat and thermal energy differ?</li> <li>5. What is the effect of having a small specific heat?</li> <li>6. What happens to a material when it is heated?</li> <li>7. In what ways can thermal energy be transferred?</li> <li>8. How does a thermometer work?</li> <li>9. How does a refrigerator keep food cold?</li> <li>10. What are the energy transformations in a car engine?</li> <li>11. How do particles move in solids, liquids, and gases?</li> <li>12. How are the forces in between particles different in solids, liquids, and gases?</li> <li>13. How is temperature related to particle motion?</li> <li>14. How are temperature and thermal energy different?</li> <li>15. What happens to thermal energy when matter changes from one state to another?</li> <li>16. How does the kinetic molecular theory describe the behavior of a gas?</li> <li>17. How are temperature, pressure, and volume related in Boyle's Law?</li> <li>18. How is Boyle's Law different from Charles's law?</li> <li>19. What are atoms, and what are they made of?</li> <li>20. How would you describe the size of an atom?</li> <li>21. How has the atomic model changed over time?</li> <li>22. What happens during nuclear decay?</li> <li>23. How does a neutral atom change when its number of protons, electrons, or neutrons changes?</li> <li>24. How is an electron's energy related to its distance from the nucleus?</li> <li>25. Why do atoms gain, lose, or share electrons?</li> <li>26. How do elements join together to form chemical compounds?</li> <li>27. How do elements differ from the compounds they create?</li> </ol>
FOUNDATION Disciplinary: <i>Core Idea</i>	FOUNDATION Disciplinary: <i>Statement</i>	
PS1.A: Structure and Properties of Matter	<ul style="list-style-type: none"> <li>● Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.</li> <li>● Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).</li> <li>● Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.</li> </ul>	

	<ul style="list-style-type: none"> <li>• Gases and liquids are made of molecules or inert atoms that are moving about relative to each other.</li> <li>• In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.</li> <li>• The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.</li> </ul>	<p>28. What are some common properties of a covalent compound?</p> <p>29. What are some signs that a chemical reaction might have occurred?</p> <p>30. What happens to atoms during a chemical reaction?</p> <p>31. What happens to the total mass in a chemical reaction?</p> <p>32. How do substances and mixtures differ?</p> <p>33. How do solutions compare and contrast with heterogeneous mixtures?</p> <p>34. In what three ways do compounds differ from mixtures?</p> <p>35. Why do some substances dissolve in water and others do not?</p> <p>36. How do concentration and solubility differ?</p> <p>37. How can the solubility of a solute be changed?</p>
PS1.B: Chemical Reactions	<ul style="list-style-type: none"> <li>• Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.</li> <li>• The total number of each type of atom is conserved, and thus the mass does not change.</li> </ul>	<p><b>Activity Description:</b></p> <ul style="list-style-type: none"> <li>• Measurement: Mass, Volume, Density, Weight</li> <li>• Analyze chemical properties of matter.</li> <li>• Launch Lab: How can you describe temperature? (iScience, Owl, pg. 165)</li> <li>• Explain how temperature and kinetic energy are related and explain how heat and thermal energy differ.</li> <li>• Describe how thermal energy can be transferred and explain what happens to a material when it is heated.</li> <li>• Describe the motion of particles and explain how the forces between those particles are different in solids, liquids, and gases.</li> </ul>
PS3.A: Definitions of Energy	<ul style="list-style-type: none"> <li>• The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary)</li> <li>• The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's</li> </ul>	<ul style="list-style-type: none"> <li>• Comic Book: Changes of State</li> <li>• Phenomenon Investigation: Rings in snow around trees</li> <li>• Act it Out: Particle Motion</li> <li>• Create illustrations to differentiate between temperature and thermal energy and describe how temperature is related to particle motion.</li> <li>• Launch Lab: Do liquid particles move? (iScience, Owl, pg. 208)</li> <li>• Flow Chart: Students will create two flow charts, one showing what happens during state changes between liquids and solids and another showing what happens during state changes between liquids and gases.</li> <li>• Launch Lab: Are volume and pressure of a gas related? (iScience, Owl, pg. 218)</li> <li>• Explain the behavior of gases using Boyle’s Law and Charles’s Law.</li> <li>• Launch Lab: What’s in there? (iScience, Owl, pg. 235)</li> <li>• Define atom, describe the size of an atom, and describe how the atomic model has changed over time.</li> <li>• Create a Venn diagram to compare and contrast the atomic theories of Democritus and Dalton.</li> </ul>

	total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. (secondary)	<ul style="list-style-type: none"> <li>• Understand what happens during nuclear decay.</li> <li>• Create a model of an atom</li> <li>• Launch Lab: How is the periodic table organized? (iScience, Owl, pg. 267)</li> <li>• Project: Adopt An Element</li> <li>• Create Electron Dot Diagrams</li> <li>• Explain why atoms gain, lose, or share electrons and understand how an electron's energy is related to its distance from the nucleus.</li> <li>• Analyze how elements differ from the compounds they create.</li> <li>• Green Science: New Green Airships (iScience, Owl, pg. 274)</li> <li>• Differentiate between covalent, ionic, and metallic bonds.</li> <li>• Explain what happens to atoms and the total mass during a chemical reaction and list some signs that a chemical reaction might have occurred.</li> <li>• Annotate a chemical equation</li> <li>• Differentiate between endothermic and exothermic reactions.</li> <li>• List factors that can affect the rate of a chemical reaction.</li> <li>• Launch Lab: What makes black ink black? (iScience, Owl, pg. 335)</li> <li>• Explain why some substances dissolve in water and others do not.</li> <li>• Launch Lab: How are they different? (iScience, Owl, pg. 343)</li> </ul> <p><b>Interdisciplinary Connections: Content: ;NJSLS#:</b></p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> <li>• RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</li> <li>• RST.6-8.7 - Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).</li> </ul> <p>Mathematics -</p> <ul style="list-style-type: none"> <li>• MP.2 - Reason abstractly and quantitatively. (</li> <li>• MP.4 - Model with mathematics.</li> <li>• 6.RP.A.3 - Use ratio and rate reasoning to solve real-world and mathematical problems.</li> <li>• 6.SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</li> <li>• 6.SP.B.5 - Summarize numerical data sets in relation to their context.</li> </ul>
<b>FOUNDATION Science and Engineering Practices: Core Idea</b>	<b>FOUNDATION Science and Engineering Practices: Statement</b>	
Developing and Using Models	Develop a model to predict and/or describe phenomena.	
Analyzing and Interpreting Data	Analyze and interpret data to determine similarities and differences in findings.	
Scientific Knowledge is Based on Empirical Evidence	Science knowledge is based upon logical and conceptual connections between evidence and explanations.	
Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena	Laws are regularities or mathematical descriptions of natural phenomena.	
<b>FOUNDATION Crosscutting Concepts: Core Idea</b>	<b>FOUNDATION Crosscutting Concepts: Statement</b>	
Scale, Proportion, and Quantity	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	
Patterns	Macroscopic patterns are related to the nature of microscopic and atomic-level structure.	
Cause and Effect	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	
Energy and Matter	Matter is conserved because atoms are conserved in physical and chemical processes.	
<b>Social and Emotional Learning:</b>	<b>Social and Emotional Learning:</b>	

<i>Competencies</i>	<i>Sub-Competencies</i>		
<ul style="list-style-type: none"> <li>● Self-Awareness</li> <li>● Self-Management</li> <li>● Responsible Decision Making</li> <li>● Social Awareness</li> <li>● Relationship Skills</li> <li>● Motivation</li> </ul>	<ul style="list-style-type: none"> <li>● Emotional Awareness</li> <li>● Internal Regulation</li> <li>● Behavior Control</li> <li>● Goal Persuance</li> <li>● Appreciating Social and Environment Diversity</li> <li>● Adaptive Behavior</li> <li>● Communication</li> <li>● Social Engagement</li> <li>● Constructive Thinking</li> <li>● Consequence Evaluation</li> <li>● Respect for Self and Others</li> <li>● Enthusiasm</li> <li>● Initiative</li> <li>● Resilience</li> </ul>	<ul style="list-style-type: none"> <li>● 6.NS.C.5 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</li> <li>● 8.EE.A.3 - Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.</li> </ul> <p>Technology -</p> <ul style="list-style-type: none"> <li>● 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.</li> <li>● 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).</li> </ul>	
<b>Assessments (Formative)</b> <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		<b>Assessments (Summative)</b> <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
<b>Formative Assessments:</b> <ul style="list-style-type: none"> <li>● Participation in class discussions/debates</li> <li>● Exit tickets</li> <li>● Quizzes</li> <li>● In-class assignments/activities</li> <li>● Presentations</li> <li>● Group assignments</li> <li>● IXL results</li> </ul>		<b>Benchmarks:</b> <ul style="list-style-type: none"> <li>● CER assignments</li> </ul> <b>Summative Assessments:</b> <ul style="list-style-type: none"> <li>● Unit test</li> <li>● Unit project</li> <li>● Lab activities</li> </ul>	
<b>Differentiated Student Access to Content: Teaching and Learning Resources/Materials</b>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core Resources
<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 5 - Lesson 1-2</li> <li>○ Chapter 6 - Lesson 1-3</li> <li>○ Chapter 7 - Lesson 1-2</li> <li>○ Chapter 8 - Lesson 1-3</li> <li>○ Chapter 9 - Lesson 1-3</li> <li>○ Chapter 10 - Lesson 1-3</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Modified/leveled readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 5 - Lesson 1-2</li> <li>○ Chapter 6 - Lesson 1-3</li> <li>○ Chapter 7 - Lesson 1-2</li> <li>○ Chapter 8 - Lesson 1-3</li> <li>○ Chapter 9 - Lesson 1-3</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Translated and modified readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 5 - Lesson 1-2</li> <li>○ Chapter 6 - Lesson 1-3</li> <li>○ Chapter 7 - Lesson 1-2</li> <li>○ Chapter 8 - Lesson 1-3</li> <li>○ Chapter 9 - Lesson 1-3</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 5 - Lesson 1-2</li> <li>○ Chapter 6 - Lesson 1-3</li> <li>○ Chapter 7 - Lesson 1-2</li> <li>○ Chapter 8 - Lesson 1-3</li> <li>○ Chapter 9 - Lesson 1-3</li> <li>○ Chapter 10 - Lesson 1-3</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 10 - Lesson 1-3</li> <li>● Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 10 - Lesson 1-3</li> <li>● Translated teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>Teacher created reading guides and presentations</li> </ul>
<b>Supplemental Resources</b>			
<ul style="list-style-type: none"> <li>Chromebooks</li> <li>SmartBoard</li> <li>IXL</li> <li>Teacher Online Resources</li> <li>Newsela.com</li> <li>Quizlet</li> <li>Kahoot</li> <li>BrainPop</li> <li>Applicable educational videos</li> <li>CK12 Online Resources</li> <li><a href="https://www.ngssphenomena.com/">https://www.ngssphenomena.com/</a></li> </ul>			
<b>Differentiated Student Access to Content: Recommended <i>Strategies &amp; Techniques</i></b>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
<ul style="list-style-type: none"> <li>Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment.</li> <li>Jigsaws</li> <li>Think-Pair-Share</li> <li>Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate</li> <li>Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.</li> </ul>	<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>Use prompts and model directions</li> <li>Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>Extended time for revisions or opportunity to identify and develop areas of personal interest</li> </ul>	<ul style="list-style-type: none"> <li>Utilize visual supports and graphic organizers</li> <li>Use prompts and model directions</li> <li>Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>Device used for translation purposes</li> <li>Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.</li> </ul>	<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> <li>Use of higher leveled text and/or writing assignments</li> <li>Utilize differentiation in the areas of acceleration, enrichment, and grouping</li> </ul>
	<b>Disciplinary Concept:</b>		
	<b>Core Ideas:</b>	Information and Media Literacy	
	<b>Performance Expectation/s:</b>	<ul style="list-style-type: none"> <li><b>9.4.8.IML.7:</b> Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.</li> </ul>	

NJSLs CAREER READINESS, LIFE LITERACIES & KEY SKILLS		<ul style="list-style-type: none"> <li>● <b>9.4.8.IML.12:</b> Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.</li> </ul>
	<b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b>	
	<ul style="list-style-type: none"> <li>● Act as a responsible and contributing community members and employee.</li> <li>● Attend to financial well-being.</li> <li>● Consider the environmental, social and economic impacts of decisions.</li> <li>● Demonstrate creativity and innovation.</li> <li>● Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>● Model integrity, ethical leadership and effective management</li> <li>● Plan education and career paths aligned to personal goals.</li> <li>● Use technology to enhance productivity increase collaboration and communicate effectively.</li> <li>● Work productively in teams while using cultural/global competence.</li> </ul>	

Marking Period	Unit Title	Recommended Instructional Days
3	Understanding the Universe	5 weeks
NJSLs - Science: <i>Title</i>	NJSLs - Science: <i>Performance Expectations</i>	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLs-S within Unit
Earth's Place in the Universe	<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> </ul>	<p><b><u>Essential Question/s:</u></b></p> <ol style="list-style-type: none"> <li>1. What kinds of objects are in the solar system?</li> <li>2. What makes up the universe, and how does gravity affect the universe?</li> </ol> <p><b><u>Activity Description:</u></b></p> <ul style="list-style-type: none"> <li>● Launch Lab: How do you know which distance unit to use? (iScience, Owl, pg. 375)</li> <li>● Compare and contrast the inner planets and the outer planets.</li> <li>● Modeling the Solar System - Give each student an index card with one of the objects in the solar system labeled on it. Group students in pairs, and give each pair an index card. Then, have the class arrange themselves in the correct order to make a model of the solar</li> </ul>
Earth's Systems	<ul style="list-style-type: none"> <li>● <b>MS-ESS2-1:</b> Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.</li> <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</li> </ul>	

	structures to provide evidence of the past plate motions.	
<b>FOUNDATION Disciplinary: Core Idea</b>	<b>FOUNDATION Disciplinary: Statement</b>	
ESS1.C: The History of Planet Earth	<ul style="list-style-type: none"> <li>The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.</li> <li>Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.</li> </ul>	<p>system. After students are finished, have each pair explain which object they represent and give one fact about the object.</p> <ul style="list-style-type: none"> <li>Explain an astronomical unit and describe why it is used.</li> <li>Create a Venn diagram to compare and contrast a period of revolution and a period of rotation.</li> <li>Careers in Science: History from Space (iScience, Owl, pg. 381)</li> <li>Explain why Venus is hotter than Mercury.</li> <li>Describe the kind of atmosphere found on the inner planets.</li> <li>MiniLab: How can you model the inner planets? (iScience, Owl, pg. 386)</li> <li>Create an adventure story about exploring the surface of Mars. Include five facts about Mars in the story.</li> <li>Describe what the outer planets are made of.</li> <li>Launch Lab: How do we see distant objects in the solar system? (iScience, Owl, pg. 391)</li> <li>Describe the characteristics of dwarf planets, comets, and asteroids.</li> <li>Describe how scientists classify stars, explain how stars shine, how they are layered, how they form, how mass affects their evolution, and how star matter is recycled in space.</li> <li>Launch Lab: Does the universe move? (iScience, Owl, pg. 439)</li> <li>Describe the Milky Way and explain its connection to the solar system.</li> <li>Explain the Big Bang theory.</li> </ul>
ESS2.A: Earth's Materials and Systems	<ul style="list-style-type: none"> <li>All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.</li> <li>The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future.</li> </ul>	
ESS2.B: Plate Tectonics and Large-Scale System Interactions	Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.	
ESS2.C: The Roles of Water in Earth's Surface Processes	Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations.	
<b>FOUNDATION Science and Engineering Practices: Core Idea</b>	<b>FOUNDATION Science and Engineering Practices:</b>	

**Interdisciplinary Connections: Content: ;NJSLS#:**

ELA/Literacy -

- RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts.
- RST.6-8.7 - Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- RST.6-8.9 - Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- WHST.6-8.2 - Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- SL.8.5 - Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.



	<i>Statement</i>	
Constructing Explanations and Designing Solutions	Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	Mathematics - <ul style="list-style-type: none"> <li>● MP.2 - Reason abstractly and quantitatively.</li> <li>● 6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</li> <li>● 7.EE.B.6 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</li> </ul> Technology - <ul style="list-style-type: none"> <li>● 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.</li> <li>● 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).</li> </ul>
Developing and Using Models	Develop and use a model to describe phenomena.	
Analyzing and Interpreting Data	Analyze and interpret data to provide evidence for phenomena.	
Scientific Knowledge is Open to Revision in Light of New Evidence	Science findings are frequently revised and/or reinterpreted based on new evidence.	
<b>FOUNDATION Crosscutting Concepts: <i>Core Idea</i></b>	<b>FOUNDATION Crosscutting Concepts: <i>Statement</i></b>	
Scale, Proportion, and Quantity	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.	
Stability and Change	Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.	
Patterns	Patterns in rates of change and other numerical relationships can provide information about natural systems.	
<b>Social and Emotional Learning: <i>Competencies</i></b>	<b>Social and Emotional Learning: <i>Sub-Competencies</i></b>	
<ul style="list-style-type: none"> <li>● Self-Awareness</li> <li>● Self-Management</li> <li>● Responsible Decision Making</li> <li>● Social Awareness</li> <li>● Relationship Skills</li> </ul>	<ul style="list-style-type: none"> <li>● Emotional Awareness</li> <li>● Internal Regulation</li> <li>● Behavior Control</li> <li>● Goal Persuance</li> <li>● Appreciating Social and Environment Diversity</li> </ul>	

<ul style="list-style-type: none"> <li>● Motivation</li> </ul>	<ul style="list-style-type: none"> <li>● Adaptive Behavior</li> <li>● Communication</li> <li>● Social Engagement</li> <li>● Constructive Thinking</li> <li>● Consequence Evaluation</li> <li>● Respect for Self and Others</li> <li>● Enthusiasm</li> <li>● Initiative</li> <li>● Resilience</li> </ul>		
<p align="center"><b>Assessments (Formative)</b> <i>To show evidence of meeting the standard/s, students will successfully engage within:</i></p>		<p align="center"><b>Assessments (Summative)</b> <i>To show evidence of meeting the standard/s, students will successfully complete:</i></p>	
<p><b><u>Formative Assessments:</u></b></p> <ul style="list-style-type: none"> <li>● Participation in class discussions/debates</li> <li>● Exit tickets</li> <li>● Quizzes</li> <li>● In-class assignments/activities</li> <li>● Presentations</li> <li>● Group assignments</li> <li>● IXL results</li> </ul>		<p><b><u>Benchmarks:</u></b></p> <ul style="list-style-type: none"> <li>● CER assignments</li> </ul> <p><b><u>Summative Assessments:</u></b></p> <ul style="list-style-type: none"> <li>● Unit test</li> <li>● Unit project</li> <li>● Lab activities</li> </ul>	
<p align="center"><b>Differentiated Student Access to Content: Teaching and Learning Resources/Materials</b></p>			
<p align="center"><b>Core Resources</b></p>	<p align="center"><b>Alternate Core Resources IEP/504/At-Risk/ESL</b></p>	<p align="center"><b>ELL Core Resources</b></p>	<p align="center"><b>Gifted &amp; Talented Core Resources</b></p>
<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 11 - Lesson 1-3</li> <li>○ Chapter 12 - Lesson 2-4</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● Modified/leveled readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 11 - Lesson 1-3</li> <li>○ Chapter 12 - Lesson 2-4</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● Translated and modified readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 11 - Lesson 1-3</li> <li>○ Chapter 12 - Lesson 2-4</li> </ul> </li> <li>● Translated teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 11 - Lesson 1-3</li> <li>○ Chapter 12 - Lesson 2-4</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>
<p align="center"><b>Supplemental Resources</b></p>			
<ul style="list-style-type: none"> <li>● Chromebooks</li> <li>● SmartBoard</li> <li>● IXL</li> <li>● Teacher Online Resources</li> <li>● Newsela.com</li> <li>● Quizlet</li> <li>● Kahoot</li> <li>● Applicable educational videos</li> </ul>			

- CK12 Online Resources
- <https://www.ngssphenomena.com/>

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

Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
<ul style="list-style-type: none"> <li>• Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment.</li> <li>• Jigsaws</li> <li>• Think-Pair-Share</li> <li>• Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate</li> <li>• Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.</li> </ul>	<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>• Use prompts and model directions</li> <li>• Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>• Extended time for revisions or opportunity to identify and develop areas of personal interest</li> </ul>	<ul style="list-style-type: none"> <li>• Utilize visual supports and graphic organizers</li> <li>• Use prompts and model directions</li> <li>• Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>• Device used for translation purposes</li> <li>• Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.</li> </ul>	<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> <li>• Use of higher leveled text and/or writing assignments</li> <li>• Utilize differentiation in the areas of acceleration, enrichment, and grouping</li> </ul>

<b>NJSLS CAREER READINESS, LIFE LITERACIES &amp; KEY SKILLS</b>	<b>Disciplinary Concept:</b>	
	<b>Core Ideas:</b>	Information and Media Literacy
	<b>Performance Expectation/s:</b>	<ul style="list-style-type: none"> <li>• <b>9.4.8.IML.7:</b> Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.</li> <li>• <b>9.4.8.IML.12:</b> Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.</li> </ul>
	<b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b>	
	<ul style="list-style-type: none"> <li>• Act as a responsible and contributing community members and employee.</li> <li>• Attend to financial well-being.</li> <li>• Consider the environmental, social and economic impacts of decisions.</li> <li>• Demonstrate creativity and innovation.</li> <li>• Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>• Model integrity, ethical leadership and effective management</li> <li>• Plan education and career paths aligned to personal goals.</li> <li>• Use technology to enhance productivity increase collaboration and communicate effectively.</li> <li>• Work productively in teams while using cultural/global competence.</li> </ul>	

Marking Period	Unit Title	Recommended Instructional Days
4	Adaptations and Natural Selection	6 weeks
NJSLs - Science: <i>Title</i>	NJSLs - Science: <i>Performance Expectations</i>	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLs-S within Unit
Biological Evolution: Unity and Diversity	<ul style="list-style-type: none"> <li>● <b>MS-LS4-1:</b> Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.</li> <li>● <b>MS-LS4-2:</b> Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.</li> <li>● <b>MS-LS4-3:</b> Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.</li> <li>● <b>MS-LS4-4:</b> Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.</li> <li>● <b>MS-LS4-6:</b> Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.</li> </ul>	<p><b><u>Essential Question/s:</u></b></p> <ol style="list-style-type: none"> <li>1. How do species adapt to new environments over time?</li> </ol> <p><b><u>Activity Description:</u></b></p> <ul style="list-style-type: none"> <li>● Vocabulary activities.</li> <li>● Article analysis.</li> <li>● Describe how traits are inherited.</li> <li>● Explain why scientists study genetics.</li> <li>● Describe Gregor Mendel's investigations and discoveries about heredity.</li> <li>● MiniLab: Can you model Mendel's principles? (iScience, Owl, pg. 797)</li> <li>● Explain how you can use tools to predict genetic outcomes.</li> <li>● Describe the role mutations can play in the inheritance of disease.</li> <li>● Research a genetic disease and create a GoogleSlides presentation on it.</li> <li>● MiniLab: How can you predict outcomes using a Punnett square? (iScience, Owl, pg. 803)</li> <li>● Demonstration: Predictions are Not Guarantees</li> <li>● Skill Practice: What can you learn by analyzing a pedigree? (iScience, Owl, pg. 809)</li> <li>● Lab: What's in a face? (iScience, Owl, pg. 818)</li> <li>● Launch Lab: How does variation help survival? (iScience, Owl, pg. 811).</li> <li>● MiniLab: How can you observe change over time? (iScience, Owl, pg. 813)</li> <li>● Describe how natural selection occurs.</li> <li>● Explain what an adaptation is.</li> </ul>

<b>FOUNDATION</b> <b>Disciplinary:</b> <i>Core Idea</i>	<b>FOUNDATION</b> <b>Disciplinary:</b> <i>Statement</i>	
LS4.A: Evidence of Common Ancestry and Diversity	<ul style="list-style-type: none"> <li>The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.</li> <li>Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent.</li> <li>Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy.</li> </ul>	<ul style="list-style-type: none"> <li>Create a Venn diagram to compare and contrast functional adaptations and behavioral adaptations.</li> <li>Explain why traits change over time.</li> <li>Natural Selection Choice Board Project</li> <li>Essay: Charles Darwin</li> </ul> <p><b>Interdisciplinary Connections: Content: ;NJSLS#:</b></p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> <li>RST.6-8.1- Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</li> <li>RST.6-8.7 - Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).</li> <li>RST.6-8.9 - Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-LS4-3)</li> <li>WHST.6-8.2 - Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</li> <li>WHST.6-8.9 - Draw evidence from informational texts to support analysis, reflection, and research.</li> <li>SL.8.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.</li> <li>SL.8.4 - Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.</li> </ul>
LS4.B: Natural Selection	Natural selection leads to the predominance of certain traits in a population, and the suppression of others.	
LS4.C: Adaptation	Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.	<p>Mathematics -</p> <ul style="list-style-type: none"> <li>MP.4 - Model with mathematics.</li> <li>6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</li> <li>6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</li> </ul>
<b>FOUNDATION</b> <b>Science and Engineering Practices:</b> <i>Core Idea</i>	<b>FOUNDATION</b> <b>Science and Engineering Practices:</b> <i>Statement</i>	

Analyzing and Interpreting Data	<ul style="list-style-type: none"> <li>Analyze and interpret data to determine similarities and differences in findings.</li> <li>Analyze displays of data to identify linear and nonlinear relationships.</li> </ul>	<ul style="list-style-type: none"> <li>6.SP.B.5 - Summarize numerical data sets in relation to their context.</li> <li>7.RP.A.2 - Recognize and represent proportional relationships between quantities.</li> </ul> <p>Technology -</p> <ul style="list-style-type: none"> <li>8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.</li> <li>8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).</li> </ul>
Constructing Explanations and Designing Solutions	<ul style="list-style-type: none"> <li>Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.</li> <li>Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena.</li> </ul>	
Using Mathematics and Computational Thinking	Use mathematical representations to support scientific conclusions and design solutions.	
<b>FOUNDATION Crosscutting Concepts: Core Idea</b>	<b>FOUNDATION Crosscutting Concepts: Statement</b>	
Patterns	Graphs, charts, and images can be used to identify patterns in data.	
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	
Cause and Effect	Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	
<b>Social and Emotional Learning: Competencies</b>	<b>Social and Emotional Learning: Sub-Competencies</b>	
<ul style="list-style-type: none"> <li>Self-Awareness</li> <li>Self-Management</li> <li>Responsible Decision Making</li> <li>Social Awareness</li> <li>Relationship Skills</li> <li>Motivation</li> </ul>	<ul style="list-style-type: none"> <li>Emotional Awareness</li> <li>Internal Regulation</li> <li>Behavior Control</li> <li>Goal Persuance</li> <li>Appreciating Social and Environment Diversity</li> <li>Adaptive Behavior</li> <li>Communication</li> <li>Social Engagement</li> </ul>	

	<ul style="list-style-type: none"> <li>● Constructive Thinking</li> <li>● Consequence Evaluation</li> <li>● Respect for Self and Others</li> <li>● Enthusiasm</li> <li>● Initiative</li> <li>● Resilience</li> </ul>		
<b>Assessments (Formative)</b> <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		<b>Assessments (Summative)</b> <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
<b>Formative Assessments:</b> <ul style="list-style-type: none"> <li>● Participation in class discussions/debates</li> <li>● Exit tickets</li> <li>● Quizzes</li> <li>● In-class assignments/activities</li> <li>● Presentations</li> <li>● Group assignments</li> <li>● IXL results</li> </ul>		<b>Benchmarks:</b> <ul style="list-style-type: none"> <li>● CER assignments</li> </ul> <b>Summative Assessments:</b> <ul style="list-style-type: none"> <li>● Unit test</li> <li>● Unit project</li> <li>● Lab activities</li> <li>● Organ Essay</li> </ul>	
<b>Differentiated Student Access to Content:</b> <b>Teaching and Learning Resources/Materials</b>			
<b>Core Resources</b>	<b>Alternate Core Resources</b> <i>IEP/504/At-Risk/ESL</i>	<b>ELL Core Resources</b>	<b>Gifted &amp; Talented Core Resources</b>
<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 21 - Lessons 1-2</li> <li>○ Chapter 22 - Lessons 1-3</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● Modified/leveled readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 21 - Lessons 1-2</li> <li>○ Chapter 22 - Lessons 1-3</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● Translated and modified readings from iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 21 - Lessons 1-2</li> <li>○ Chapter 22 - Lessons 1-3</li> </ul> </li> <li>● Translated teacher created reading guides and presentations</li> </ul>	<ul style="list-style-type: none"> <li>● iScience (Owl) Textbook <ul style="list-style-type: none"> <li>○ Chapter 21 - Lessons 1-2</li> <li>○ Chapter 22 - Lessons 1-3</li> </ul> </li> <li>● Teacher created reading guides and presentations</li> </ul>
<b>Supplemental Resources</b>			
<ul style="list-style-type: none"> <li>● Chromebooks</li> <li>● SmartBoard</li> <li>● IXL</li> <li>● Teacher Online Resources</li> <li>● Newsela.com</li> <li>● Quizlet</li> <li>● Kahoot</li> <li>● BrainPop</li> <li>● Applicable educational videos</li> <li>● CK12 Online Resources</li> <li>● <a href="https://www.ngssphenomena.com/">https://www.ngssphenomena.com/</a></li> </ul>			

Differentiated Student Access to Content: Recommended <i>Strategies &amp; Techniques</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
<ul style="list-style-type: none"> <li>Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment.</li> <li>Jigsaws</li> <li>Think-Pair-Share</li> <li>Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate</li> <li>Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.</li> </ul>	<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>Use prompts and model directions</li> <li>Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>Extended time for revisions or opportunity to identify and develop areas of personal interest</li> </ul>	<ul style="list-style-type: none"> <li>Utilize visual supports and graphic organizers</li> <li>Use prompts and model directions</li> <li>Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions</li> <li>Device used for translation purposes</li> <li>Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.</li> </ul>	<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> <li>Use of higher leveled text and/or writing assignments</li> <li>Utilize differentiation in the areas of acceleration, enrichment, and grouping</li> </ul>
<b>NJSLS CAREER READINESS, LIFE LITERACIES &amp; KEY SKILLS</b>	<b>Disciplinary Concept:</b>		
	<b>Core Ideas:</b>	Information and Media Literacy	
	<b>Performance Expectation/s:</b>	<ul style="list-style-type: none"> <li><b>9.4.8.IML.7:</b> Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.</li> <li><b>9.4.8.IML.12:</b> Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.</li> </ul>	
	<b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b>		
	<ul style="list-style-type: none"> <li>Act as a responsible and contributing community members and employee.</li> <li>Attend to financial well-being.</li> <li>Consider the environmental, social and economic impacts of decisions.</li> <li>Demonstrate creativity and innovation.</li> <li>Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>Model integrity, ethical leadership and effective management</li> <li>Plan education and career paths aligned to personal goals.</li> <li>Use technology to enhance productivity increase collaboration and communicate effectively.</li> <li>Work productively in teams while using cultural/global competence.</li> </ul>		



New Jersey Legislative Statutes and Administrative Code  
 (place an "X" before each law/statute if/when present within the curriculum map)

	Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>		Holocaust Law: <i>N.J.S.A. 18A:35-28</i>		LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>		Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>	x	Standards in Action: <i>Climate Change</i>
--	---	--	---	--	---	--	--	---	---