

East Newark Public School

Science Curriculum

Grade 7



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 seventh grade science program is designed to introduce and develop a foundation in science through three 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 7 Scope and Sequence:

Unit	Estimated Pacing
Life: Structure and Function	4 Weeks
Reproduction, Genetics and Heredity	4 Weeks
Earth and Geologic Changes	9 Weeks
Exploring the Universe	3 Weeks

Marking Period	Unit Title	Recommended Instructional Days
1	Life: Structure and Function	4 Weeks
NJSLS - Science: Title	NJSLS - Science: Performance Expectations	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
From Molecules to Organisms: Structures and Processes	<ul style="list-style-type: none"> ● MS-LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. ● MS-LS1-2: Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. ● MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. ● MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. 	<p>Essential Question/s:</p> <ol style="list-style-type: none"> 1. What characteristics do all living things share? 2. How did scientists' understanding of cells develop? 3. What basic substances make up a cell? 4. How are prokaryotic cells and eukaryotic cells similar, and how are they different? 5. What do the structures in a cell do? 6. How does a cell obtain energy? 7. How do some cells make food molecules? 8. How do unicellular and multicellular organisms differ? 9. How does cell differentiation lead to the organization within a multicellular organism? <p>Activity Description:</p> <ul style="list-style-type: none"> ● Launch Lab: Is it alive? (iScience - Leopard, pg. 9) ● Create a graphic organizer to detail the characteristics of all living things. ● MiniLab: Do you blink? (iScience - Leopard, pg. 12) ● Careers in Science: The Amazing Adaptation of an Air-Breathing Catfish (iScience - Leopard, pg. 17) ● MiniLab: How can you observe DNA? (iScience - Leopard, pg. 47) ● Create a model of a eukaryotic cell and compare it to a prokaryotic cell. ● Students work in small groups to draw at least five different organelles and create an informational chart explaining each organelle's structure and function. Each group will share their chart. ● MiniLab: How is a balloon like a cell membrane? (iScience - Leopard, pg. 63) ● Students work in pairs to create a graphic organizer to show the relationship among diffusion, osmosis and facilitated diffusion.
FOUNDATION Disciplinary: Core Idea	FOUNDATION Disciplinary: Statement	
LS1.A: Structure and Function	<ul style="list-style-type: none"> ● All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). ● Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. 	

	<ul style="list-style-type: none"> In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. 	<ul style="list-style-type: none"> Create a graphic organizer to differentiate between cellular respiration, fermentation, and photosynthesis. Design a concept map to show the relationship between cellular respiration in animals and photosynthesis in plants. Use microscopes to observe cells, tissues, and organs, and observe, sketch, and describe individual cells within the tissues. Create a graphic organizer to list human body systems, the organs that make up each system, and the function of each system. Write an informational essay describing a specific organ of the human body, and how it is a larger part of a complex system that enables the body to function. <p>Interdisciplinary Connections: Content: ;NJSLS#:</p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> SL.8.5 - Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-2) RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-3) RI.6.8 - Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MS-LS1-3) WHST.6-8.1 - Write arguments focused on discipline content. (MS-LS1-3) WHST.6-8.7 - Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-LS1-1) <p>Mathematics -</p> <ul style="list-style-type: none"> 6.EE.C.9 - Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-3) <p>Technology -</p> <ul style="list-style-type: none"> 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
LS1.D: Information Processing	Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	
FOUNDATION Science and Engineering Practices: Core Idea	FOUNDATION Science and Engineering Practices: Statement	
Planning and Carrying Out Investigations	Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.	
Developing and Using Models	Develop and use a model to describe phenomena.	
Engaging in Argument from Evidence	Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.	
Obtaining, Evaluating, and Communicating Information	Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.	
FOUNDATION Crosscutting Concepts: Core Idea	FOUNDATION Crosscutting Concepts: Statement	
Scale, Proportion, and Quantity	Phenomena that can be observed at one scale may not be observable at another scale.	

Structure and Function	Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	<ul style="list-style-type: none"> 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).
Cause and Effect	Cause and effect relationships may be used to predict phenomena in natural systems.	
Social and Emotional Learning: Competencies	Social and Emotional Learning: Sub-Competencies	
<ul style="list-style-type: none"> Self-Awareness Self-Management Responsible Decision Making Social Awareness Relationship Skills Motivation 	<ul style="list-style-type: none"> Emotional Awareness Internal Regulation Behavior Control Goal Persuance Appreciating Social and Environment Diversity Adaptive Behavior Communication Social Engagement Constructive Thinking Consequence Evaluation Respect for Self and Others Enthusiasm Initiative Resilience 	
<p align="center">Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i></p>		<p align="center">Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i></p>
<p>Formative Assessments:</p> <ul style="list-style-type: none"> Participation in class discussions/debates Exit tickets Quizzes In-class assignments/activities Presentations Group assignments IXL results 		<p>Benchmarks:</p> <ul style="list-style-type: none"> CER assignments <p>Summative Assessments:</p> <ul style="list-style-type: none"> Unit test Unit project Lab activities Organ Essay
<p>Differentiated Student Access to Content: Teaching and Learning Resources/Materials</p>		

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"> ● iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 1, Lesson 1 ○ Chapter 2, Lessons 1-4 ○ Chapter 3, Lesson 2 ● Teacher created reading guides and presentations 	<ul style="list-style-type: none"> ● Modified/leveled readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 1, Lesson 1 ○ Chapter 2, Lessons 1-4 ○ Chapter 3, Lesson 2 ● Teacher created reading guides and presentations 	<ul style="list-style-type: none"> ● Translated and modified readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 1, Lesson 1 ○ Chapter 2, Lessons 1-4 ○ Chapter 3, Lesson 2 ● Translated teacher created reading guides and presentations 	<ul style="list-style-type: none"> ● iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 1, Lesson 1 ○ Chapter 2, Lessons 1-4 ○ Chapter 3, Lesson 2 ● Teacher created reading guides and presentations
Supplemental Resources			
<ul style="list-style-type: none"> ● Chromebooks ● SmartBoard ● IXL ● Teacher Online Resources ● Newsela.com ● Quizlet ● Kahoot ● Applicable educational videos ● CK12 Online Resources ● https://www.ngsspheomena.com/ 			
Differentiated Student Access to Content: Recommended <i>Strategies & 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"> ● Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. ● Jigsaws ● Think-Pair-Share ● Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate ● Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy. 	<ul style="list-style-type: none"> ● Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Extended time for revisions or opportunity to identify and develop areas of personal interest 	<ul style="list-style-type: none"> ● Utilize visual supports and graphic organizers ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Device used for translation purposes ● Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response. 	<ul style="list-style-type: none"> ● Encourage students to explore concepts in depth and encourage independent studies or investigations. ● Modeling or independent student-led research ● Use of higher leveled text and/or writing assignments ● Utilize differentiation in the areas of acceleration, enrichment, and grouping

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

Marking Period	Unit Title	Recommended Instructional Days
1	Reproduction, Genetics and Heredity	4 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
From Molecules to Organisms: Structures and Processes	<ul style="list-style-type: none"> ● MS-LS1-4: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. ● MS-LS1-5: Construct a scientific explanation based on evidence for how 	<p><u>Essential Question/s:</u></p> <ol style="list-style-type: none"> 1. What is sexual reproduction, and why is it beneficial? 2. What is asexual reproduction, and why is it beneficial? 3. How do the types of asexual reproduction differ? 4. Why did Mendel perform cross-pollination experiments? What did he conclude about inherited traits? 5. How do dominant and recessive factors interact? 6. How do children get traits from their parents? 7. Why do some people look more like their dad and some look more like their mom?

	environmental and genetic factors influence the growth of organisms.	
Heredity: Inheritance and Variation of Traits	<ul style="list-style-type: none"> ● MS-LS3-1: 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. ● MS-LS3-2: Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. 	<ol style="list-style-type: none"> 8. What is a Punnett Square and how does it help us predict the traits of offspring? 9. Why do some children show traits that neither of their parents display? 10. Why are some people born with birth defects or diseases? 11. What is DNA? 12. What is the role of RNA in protein production? 13. What is the relationship between DNA, genes, and chromosomes? 14. How do structural changes to genes (mutations) located on chromosomes affect proteins or affect the structure and function of an organism?
Biological Evolution: Unity and Diversity	<ul style="list-style-type: none"> ● MS-LS4-5: Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms. 	
FOUNDATION Disciplinary: Core Idea	FOUNDATION Disciplinary: Statement	
LS1.B: Growth and Development of Organisms	<ul style="list-style-type: none"> ● Animals engage in characteristic behaviors that increase the odds of reproduction. ● Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. ● Genetic factors as well as local conditions affect the growth of the adult plant. ● Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary) 	
LS3.A: Inheritance of Traits	<ul style="list-style-type: none"> ● Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of 	<p>Activity Description:</p> <ul style="list-style-type: none"> ● Launch Lab: Why do offspring look different? (iScience - Leopard, pg. 117) ● Work in pairs to create a comic demonstrating asexual reproduction. Students should include caption bubbles in their comic to indicate a conversation that is humorous, but still scientifically accurate. ● Writing prompt - Justify the use of cloning to save endangered animals. ● LaunchLab: What makes you unique? - Observe the traits of classmates (ear lobes, tongue rolling, hairline, etc.) and compile a data chart. Discuss why different students have different traits. ● Small groups will investigate one of the following phenomena, create a Google Slides presentation, and present findings: Human genetic disorders like Cystic Fibrosis and Sickle Cell Anemia may occur within families; Risk of having a child with Down Syndrome can increase with age due to risk of mutation. ● Read Science & Society: Pioneering the Science of Genetics (iScience - Leopard, pg. 161) - Research genetic diseases. Report on how genome-based research might help cure these diseases in the future. ● LaunchLab: What is the span of your hand? (iScience - Leopard, pg. 163). ● Create a chart to illustrate dominant and recessive human traits and their characteristics. ● MiniLab: Can you infer genotype? (iScience - Leopard, pg. 165). ● Properly complete a Punnett Square and use it to predict the genes of offspring. ● SpongeBob SquarePants Genetics practice. ● Lab: Gummy Bear Genetics (iScience - Leopard, pg. 182)

	<p>specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.</p> <ul style="list-style-type: none"> Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. 	<ul style="list-style-type: none"> Writing prompt - How do the changes in the sequence of DNA affect traits? What is the importance of DNA replication occurring without any mistakes? <p>Interdisciplinary Connections: Content: ;NJSLS#:</p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-4) RI.6.8 - Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MS-LS1-4) RST.6-8.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. (MS-LS3-1) 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). (MS-LS3-1) SL.8.5 - Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS3-1) WHST.6-8.1 - Write arguments focused on discipline content. (MS-LS1-4) <p>Mathematics -</p> <ul style="list-style-type: none"> MP.4 - Model with mathematics. (MS-LS3-2) 6.SP.A.2 - Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-4) 6.SP.B.4 - Summarize numerical data sets in relation to their context. (MS-LS1-4) 6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS3-2) <p>Technology -</p> <ul style="list-style-type: none"> 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
LS3.B: Variation of Traits	<ul style="list-style-type: none"> In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism. In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. 	
LS4.B: Natural Selection	In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring.	
FOUNDATION Science and Engineering Practices: Core Idea	FOUNDATION Science and Engineering Practices: Statement	
Engaging in Argument from Evidence	Use an oral and written argument 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.	
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.	<ul style="list-style-type: none"> 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).
Developing and Using Models	Develop and use a model to describe phenomena.	
Obtaining, Evaluating, and Communicating Information	Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.	
FOUNDATION Crosscutting Concepts: <i>Core Idea</i>	FOUNDATION Crosscutting Concepts: <i>Statement</i>	
Cause and Effect	<ul style="list-style-type: none"> Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. Cause and effect relationships may be used to predict phenomena in natural systems. 	
Structure and Function	Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	
Social and Emotional Learning: <i>Competencies</i>	Social and Emotional Learning: <i>Sub-Competencies</i>	
<ul style="list-style-type: none"> Self-Awareness Self-Management Responsible Decision Making Social Awareness Relationship Skills Motivation 	<ul style="list-style-type: none"> Emotional Awareness Internal Regulation Behavior Control Goal Persuance Appreciating Social and Environment Diversity Adaptive Behavior Communication 	

	<ul style="list-style-type: none"> • Social Engagement • Constructive Thinking • Consequence Evaluation • Respect for Self and Others • Enthusiasm • Initiative • Resilience 		
Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
Formative Assessments: <ul style="list-style-type: none"> • Participation in class discussions/debates • Exit tickets • Quizzes • In-class assignments/activities • Presentations • Group assignments • IXL results 		Benchmarks: <ul style="list-style-type: none"> • CER assignments Summative Assessments: <ul style="list-style-type: none"> • Unit test • Unit project • Lab activities 	
Differentiated Student Access to Content: Teaching and Learning Resources/Materials			
Core Resources	Alternate Core Resources IEP/504/At-Risk/ESL	ELL Core Resources	Gifted & Talented Core Resources
<ul style="list-style-type: none"> • iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 4, Lessons 1-2 ○ Chapter 5, Lessons 1-3 • Teacher created reading guides and presentations 	<ul style="list-style-type: none"> • Modified/leveled readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 4, Lessons 1-2 ○ Chapter 5, Lessons 1-3 • Teacher created reading guides and presentations 	<ul style="list-style-type: none"> • Translated and modified readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 4, Lessons 1-2 ○ Chapter 5, Lessons 1-3 • Translated teacher created reading guides and presentations 	<ul style="list-style-type: none"> • iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 4, Lessons 1-2 ○ Chapter 5, Lessons 1-3 • Teacher created reading guides and presentations
Supplemental Resources			
<ul style="list-style-type: none"> • Chromebooks • SmartBoard • IXL • Teacher Online Resources • Newsela.com • Quizlet • Kahoot • Applicable educational videos • 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"> • Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. • Jigsaws • Think-Pair-Share • Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate • Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy. 	<ul style="list-style-type: none"> • Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Extended time for revisions or opportunity to identify and develop areas of personal interest 	<ul style="list-style-type: none"> • Utilize visual supports and graphic organizers • Use prompts and model directions • Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions • Device used for translation purposes • Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response. 	<ul style="list-style-type: none"> • Encourage students to explore concepts in depth and encourage independent studies or investigations. • Modeling or independent student-led research • Use of higher leveled text and/or writing assignments • Utilize differentiation in the areas of acceleration, enrichment, and grouping

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

Marking Period	Unit Title	Recommended Instructional Days
2	Earth and Geologic Changes	9 weeks
NJSLs - Science: Title	NJSLs - Science: Performance Expectations	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLs-S within Unit
Earth's Place in the Universe	<ul style="list-style-type: none"> ● MS-ESS1-4: 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. 	<p>Essential Question/s:</p> <ol style="list-style-type: none"> 1. How do Earth's systems interact in the carbon cycle? 2. How do Earth systems interact in the phosphorus cycle? 3. How do materials in the geosphere differ? 4. Why does the geosphere have a layered structure? 5. What is the theory of plate tectonics? 6. What evidence do scientists use to support the theory of plate tectonics? 7. How do the forces created by plate motion change Earth's surface? 8. What causes earthquakes? 9. What causes volcanoes to form? 10. How do earthquakes and volcanoes change Earth's surface? 11. How are weathering and soil formation related? 12. How do weathering, erosion, and deposition change Earth's surface? 13. How are erosion and deposition related? 14. What are natural resources? 15. How do the three types of natural resources differ? 16. How does pollution affect air resources, water resources, and land resources? 17. How can people monitor resource use? 18. How can people conserve resources? <p>Activity Description:</p> <ul style="list-style-type: none"> ● Create a graphic organizer to illustrate how systems interact on Earth. ● Choose an example of an interaction among Earth systems and write a short lesson to present to a group of fourth grade students. ● Draw your own representation of the carbon cycle and include the effect humans have on it; students may need to conduct further research.
	<ul style="list-style-type: none"> ● MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. ● MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. ● MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. 	
	<ul style="list-style-type: none"> ● MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. ● MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. ● MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. 	

	<ul style="list-style-type: none"> ● MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. 	<ul style="list-style-type: none"> ● Write a short news article that explains the link between phosphorus, algal blooms, and the death of fish and other aquatic organisms. ● Mineral Identification Lab ● Create a graphic organizer to detail the structure of the geosphere. ● Use a Venn Diagram to compare and contrast the rocks and conditions in Earth's lithosphere compared to those in the asthenosphere. ● Launch Lab: Can you put the pieces together? (iScience - Leopard, pg. 501). ● Write and illustrate a short book about tectonic plate boundaries to be used as a review guide. ● Launch Lab: Was it built on solid ground? (iScience - Leopard, pg. 509) ● Earthquake Newspaper Research Assignment ● Mapping earthquake activity ● Careers in Science: Will it erupt again? (iScience - Leopard, pg. 517). ● Launch Lab: How does temperature affect weathering? (iScience - Leopard, pg. 519). ● Phenomena Investigation: Arches of Rock ● MiniLab: Mechanical Weathering ● Use a graphic organizer to explain the differences between weathering, erosion, and deposition. ● Launch Lab: Where does it come from? (iScience - Leopard, pg. 537) ● Create a graphic organizer to differentiate between the three types of resources. ● Writing prompt: How is geothermal energy used to generate electricity? ● Green Science: Clean Energy from Underground (iScience - Leopard, pg. 545); Research: Geothermal heat pumps have been available since the 1940s. Why do you think more homes are not using them? ● Phenomenal Inquiry: Oil Spills (iScience - Leopard) ● Work in pairs to create a concept map of the four types of air pollution. Include definitions, causes, and effects for each type. Add to the concept map and include water pollution and land pollution. ● Skill Practice: How can you communicate about pollution? (iScience - Leopard, pg. 553). ● Research climate change. Create a flyer detailing ways to protect our ozone layer.
FOUNDATION Disciplinary: <i>Core Idea</i>	FOUNDATION Disciplinary: <i>Statement</i>	
ESS1.C: The History of Planet Earth	<ul style="list-style-type: none"> ● 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. ● Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. 	
ESS2.A: Earth's Materials and Systems	<ul style="list-style-type: none"> ● 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. ● 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. 	
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.	
ESS3.A: Natural Resources	Humans depend on Earth's land, ocean, atmosphere, and biosphere for many	

	different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.	<p>Interdisciplinary Connections: Content: ;NJSLS#:</p> <p>ELA/Literacy -</p> <ul style="list-style-type: none"> RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS1-4) 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). (MS-ESS2-3) 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-ESS2-3) 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. (MS-ESS1-4) WHST.6-8.7 - Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ESS3-3) WHST.6-8.8 - Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS3-3) <p>Mathematics -</p> <ul style="list-style-type: none"> 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. (MS-ESS1-4) 6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS3-3) 7.RP.A.2 - Recognize and represent proportional relationships between quantities. (MS-ESS3-3) 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. (MS-ESS2-3)
ESS3.B: Natural Hazards	Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.	
ESS3.C: Human Impacts on Earth Systems	<ul style="list-style-type: none"> Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. 	
FOUNDATION Science and Engineering Practices: Core Idea	FOUNDATION Science and Engineering Practices: Statement	
Constructing Explanations and Designing Solutions	<ul style="list-style-type: none"> 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. Apply scientific principles to design an object, tool, process or system. 	
Developing and Using Models	Develop and use a model to describe phenomena.	
Analyzing and Interpreting Data	Analyze and interpret data to determine similarities and differences in findings.	

Engaging in Argument from Evidence	Construct an oral and written argument 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.	<ul style="list-style-type: none"> 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. (MS-ESS1-4) MP.2 - Reason abstractly and quantitatively. (MS-ESS2-3) <p>Technology -</p> <ul style="list-style-type: none"> 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. 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).
FOUNDATION Crosscutting Concepts: <i>Core Idea</i>	FOUNDATION Crosscutting Concepts: <i>Statement</i>	
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.	
Cause and Effect	<ul style="list-style-type: none"> Cause and effect relationships may be used to predict phenomena in natural or designed systems. Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. 	
Patterns	Graphs, charts, and images can be used to identify patterns in data.	
Influence of Science, Engineering, and Technology on Society and the Natural World	<ul style="list-style-type: none"> All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. 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. Thus technology use varies from region to region and over time. 	
Science Addresses Questions About the Natural and Material World	Scientific knowledge can describe the consequences of actions but does not	

	necessarily prescribe the decisions that society takes.		
Social and Emotional Learning: Competencies	Social and Emotional Learning: Sub-Competencies		
<ul style="list-style-type: none"> • Self-Awareness • Self-Management • Responsible Decision Making • Social Awareness • Relationship Skills • Motivation 	<ul style="list-style-type: none"> • Emotional Awareness • Internal Regulation • Behavior Control • Goal Persuance • Appreciating Social and Environment Diversity • Adaptive Behavior • Communication • Social Engagement • Constructive Thinking • Consequence Evaluation • Respect for Self and Others • Enthusiasm • Initiative • Resilience 		
Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
Formative Assessments: <ul style="list-style-type: none"> • Participation in class discussions/debates • Exit tickets • Quizzes • In-class assignments/activities • Presentations • Group assignments • IXL results 		Benchmarks: <ul style="list-style-type: none"> • CER assignments Summative Assessments: <ul style="list-style-type: none"> • Unit test • Unit project • Lab activities • Essay 	
Differentiated Student Access to Content: Teaching and Learning Resources/Materials			
Core Resources	Alternate Core Resources IEP/504/At-Risk/ESL	ELL Core Resources	Gifted & Talented Core Resources
<ul style="list-style-type: none"> • iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 13, Lessons 1-2 ○ Chapter 14, Lessons 1-3 	<ul style="list-style-type: none"> • Modified/leveled readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 13, Lessons 1-2 	<ul style="list-style-type: none"> • Translated and modified readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 13, Lessons 1-2 	<ul style="list-style-type: none"> • iScience (Leopard) Textbook <ul style="list-style-type: none"> ○ Chapter 13, Lessons 1-2 ○ Chapter 14, Lessons 1-3

<ul style="list-style-type: none"> ○ Chapter 15, Lessons 1-3 ● Teacher created reading guides and presentations 	<ul style="list-style-type: none"> ○ Chapter 14, Lessons 1-3 ○ Chapter 15, Lessons 1-3 ● Teacher created reading guides and presentations 	<ul style="list-style-type: none"> ○ Chapter 14, Lessons 1-3 ○ Chapter 15, Lessons 1-3 ● Translated teacher created reading guides and presentations 	<ul style="list-style-type: none"> ○ Chapter 15, Lessons 1-3 ● Teacher created reading guides and presentations
Supplemental Resources			
<ul style="list-style-type: none"> ● Chromebooks ● SmartBoard ● IXL ● Teacher Online Resources ● Newsela.com ● Quizlet ● Kahoot ● Applicable educational videos ● CK12 Online Resources ● https://www.ngssphenomena.com/ 			
Differentiated Student Access to Content: Recommended <i>Strategies & 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"> ● Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. ● Jigsaws ● Think-Pair-Share ● Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate ● Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy. 	<ul style="list-style-type: none"> ● Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Extended time for revisions or opportunity to identify and develop areas of personal interest 	<ul style="list-style-type: none"> ● Utilize visual supports and graphic organizers ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Device used for translation purposes ● Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response. 	<ul style="list-style-type: none"> ● Encourage students to explore concepts in depth and encourage independent studies or investigations. ● Modeling or independent student-led research ● Use of higher leveled text and/or writing assignments ● Utilize differentiation in the areas of acceleration, enrichment, and grouping
	Disciplinary Concept:		
	<i>Core Ideas:</i>	Information and Media Literacy	

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

Marking Period	Unit Title	Recommended Instructional Days
2	Exploring the Universe	4 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"> ● MS-ESS1-1: 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. ● MS-ESS1-2: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. ● MS-ESS1-3: Analyze and interpret data to determine scale properties of objects in the solar system. 	<p><u>Essential Question/s:</u></p> <ol style="list-style-type: none"> 1. What information do you need to describe the motion of an object? 2. How are speed, velocity, and acceleration related? 3. How can a graph help you understand the motion of an object? 4. How do different types of forces affect objects? 5. What factors affect the way gravity acts on objects? 6. How do balanced and unbalanced forces differ? 7. How do unbalanced forces affect an object's motion? 8. What happens to an object when another object exerts a force on it? 9. How does Earth move? 10. Why is Earth warmer at the equator and cooler at the poles? 11. Why do the seasons change as Earth moves around the Sun? 12. How does the moon move around Earth?

<p>Motion and Stability: Forces and Interactions</p>	<ul style="list-style-type: none"> ● MS-PS2-1: Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects. ● MS-PS2-2: 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. ● MS-PS2-3: Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. ● MS-PS2-4: Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. ● MS-PS2-5: 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. 	<p>13. Why does the moon’s appearance change?</p> <p>Activity Description:</p> <ul style="list-style-type: none"> ● Launch Lab: How can you describe motion? (iScience - Leopard, pg. 691) ● Use a graphic organizer to differentiate between speed, constant speed, and changing speed. ● Work in small groups and create a poster that shows 2-3 examples of an everyday change in velocity. ● MiniLab: How can velocity change? (iScience - Leopard, pg. 694). ● Create a displacement-time graph based on a set of data. ● Launch Lab: How can you change an object’s shape and motion? (iScience - Leopard, pg. 701). ● MiniLab: How does friction affect an object’s motion? (iScience - Leopard, pg. 703). ● Students will work in pairs to write lyrics for a song or a rap about Newton’s discoveries. ● Work in small groups to construct a diagram that shows three forces acting on an object in the same direction and two forces acting in the opposite direction. Give the forces values that would cause no change in motion. ● Launch Lab: How are forces and motion related? (iScience - Leopard, pg. 709). ● Create a Venn Diagram to compare and contrast Newton’s Second and Third Law of Motion. ● Informational Essay: Isaac Newton’s Laws of Motion ● Writing prompt: Do Newton’s three laws apply to all motion in the universe? Explain. Follow up: Which kinds of motion do not necessarily follow Newton’s three laws? ● Lab: Design an amusement park attraction using Newton’s laws (iScience - Leopard, pg. 716). ● Launch Lab: Does Earth’s shape affect temperature on Earth’s surface? (iScience - Leopard, pg. 727) ● Phenomena Inquiry: Snow Today, Gone Tomorrow ● Small groups of students will use themselves as props to demonstrate how the force of gravity depends on the distance between two objects and the masses of the objects. ● Writing prompt: The December solstice is often called the winter solstice. Do you think this is an appropriate label? Explain. ● Discussion: Why can we never see the far side of the moon? <p>Interdisciplinary Connections: Content: ;NJSLS#:</p>
<p>FOUNDATION Disciplinary: <i>Core Idea</i></p>	<p>FOUNDATION Disciplinary: <i>Statement</i></p>	
<p>ESS1.A: The Universe and Its Stars</p>	<ul style="list-style-type: none"> ● Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. ● Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. 	
<p>ESS1.B: Earth and the Solar System</p>	<ul style="list-style-type: none"> ● This model of the solar system can explain eclipses of the sun and the moon. Earth’s spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. ● The solar system consists of the sun and a collection of objects, including 	

	<p>planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.</p> <ul style="list-style-type: none"> • The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. 	
PS2.A: Forces and Motion	<ul style="list-style-type: none"> • 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). • 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. • 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. 	<p>ELA/Literacy -</p> <ul style="list-style-type: none"> • RST.6-8.1 - Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS1-3) • RST.6-8.3 - Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS2-1) • 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). (MS-ESS1-3) • SL.8.5 - Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.(MS-ESS1-1) • WHST.6-8.7 - Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS2-1) <p>Mathematics -</p> <ul style="list-style-type: none"> • MP.2 - Reason abstractly and quantitatively. (MS-ESS1-3) • MP.4 - Model with mathematics. (MS-ESS1-1) • 6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS1-1)
PS2.B: Types of Interactions	<ul style="list-style-type: none"> • Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. • 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. • 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). 	<ul style="list-style-type: none"> • 6.EE.A.2 - Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-1) • 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. (MS-PS2-1) • 7.RP.A.2 - Recognize and represent proportional relationships between quantities. (MS-ESS1-1) • 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. (MS-PS2-1) • 7.EE.B.4 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and

FOUNDATION Science and Engineering Practices: Core Idea	FOUNDATION Science and Engineering Practices: Statement	<p>inequalities to solve problems by reasoning about the quantities. (MS-PS2-1)</p> <p>Technology -</p> <ul style="list-style-type: none"> 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. 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).
Developing and Using Models	Develop and use a model to describe phenomena.	
Analyzing and Interpreting Data	Analyze and interpret data to determine similarities and differences in findings.	
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"> 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. 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. 	
Asking Questions and Defining Problems	Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.	
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.	
Scientific Knowledge is Based on Empirical Evidence	Science knowledge is based upon logical and conceptual connections between evidence and explanations.	
FOUNDATION Crosscutting Concepts: Core Idea	FOUNDATION Crosscutting Concepts: Statement	

Patterns	Patterns can be used to identify cause-and-effect relationships.	
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.	
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 forces at different scales.	
Cause and Effect	Cause and effect relationships may be used to predict phenomena in natural or designed systems.	
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.	
Interdependence of Science, Engineering, and Technology	Engineering advances have led to important discoveries in virtually every field of science and scientific discoveries have led to the development of entire industries and engineered 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.	
Social and Emotional Learning: <i>Competencies</i>	Social and Emotional Learning: <i>Sub-Competencies</i>	
<ul style="list-style-type: none"> ● Self-Awareness ● Self-Management ● Responsible Decision Making ● Social Awareness 	<ul style="list-style-type: none"> ● Emotional Awareness ● Internal Regulation ● Behavior Control ● Goal Persuance 	

<ul style="list-style-type: none"> Relationship Skills Motivation 	<ul style="list-style-type: none"> Appreciating Social and Environment Diversity Adaptive Behavior Communication Social Engagement Constructive Thinking Consequence Evaluation Respect for Self and Others Enthusiasm Initiative Resilience 		
<p align="center">Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i></p>		<p align="center">Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i></p>	
<p><u>Formative Assessments:</u></p> <ul style="list-style-type: none"> Participation in class discussions/debates Exit tickets Quizzes In-class assignments/activities Presentations Group assignments IXL results 		<p><u>Benchmarks:</u></p> <ul style="list-style-type: none"> CER assignments <p><u>Summative Assessments:</u></p> <ul style="list-style-type: none"> Unit test Unit project Lab activities Essay 	
<p align="center">Differentiated Student Access to Content: Teaching and Learning Resources/Materials</p>			
<p align="center">Core Resources</p>	<p align="center">Alternate Core Resources <i>IEP/504/At-Risk/ESL</i></p>	<p align="center">ELL Core Resources</p>	<p align="center">Gifted & Talented Core Resources</p>
<ul style="list-style-type: none"> iScience (Leopard) Textbook <ul style="list-style-type: none"> Chapter 19, Lessons 1-3 Chapter 20, Lessons 1-2 Teacher created reading guides and presentations 	<ul style="list-style-type: none"> Modified/leveled readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> Chapter 19, Lessons 1-3 Chapter 20, Lessons 1-2 Teacher created reading guides and presentations 	<ul style="list-style-type: none"> Translated and modified readings from iScience (Leopard) Textbook <ul style="list-style-type: none"> Chapter 19, Lessons 1-3 Chapter 20, Lessons 1-2 Translated teacher created reading guides and presentations 	<ul style="list-style-type: none"> iScience (Leopard) Textbook <ul style="list-style-type: none"> Chapter 19, Lessons 1-3 Chapter 20, Lessons 1-2 Teacher created reading guides and presentations
<p align="center">Supplemental Resources</p>			
<ul style="list-style-type: none"> Chromebooks SmartBoard IXL Teacher Online Resources Newsela.com Quizlet 			

- Kahoot
- Applicable educational videos
- 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"> ● Encourage creative expression and thinking by allowing students to choose how to approach a problem or assignment. ● Jigsaws ● Think-Pair-Share ● Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate ● Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy. 	<ul style="list-style-type: none"> ● Provide graphic organizers for additional support or encourage students to create digital multimedia to showcase knowledge. ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Extended time for revisions or opportunity to identify and develop areas of personal interest 	<ul style="list-style-type: none"> ● Utilize visual supports and graphic organizers ● Use prompts and model directions ● Provide opportunities to model talk during read alouds, and scaffold talk during whole class and small group discussions ● Device used for translation purposes ● Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response. 	<ul style="list-style-type: none"> ● Encourage students to explore concepts in depth and encourage independent studies or investigations. ● Modeling or independent student-led research ● Use of higher leveled text and/or writing assignments ● Utilize differentiation in the areas of acceleration, enrichment, and grouping

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	Disciplinary Concept:	
	<i>Core Ideas:</i>	Information and Media Literacy
	<i>Performance Expectation/s:</i>	<ul style="list-style-type: none"> ● 9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose. ● 9.4.8.IML.12: Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
	Career Readiness, Life Literacies, & Key Skills Practices	
	<ul style="list-style-type: none"> ● Act as a responsible and contributing community members and employee. ● Attend to financial well-being. ● Consider the environmental, social and economic impacts of decisions. ● Demonstrate creativity and innovation. ● Utilize critical thinking to make sense of problems and persevere in solving them. ● Model integrity, ethical leadership and effective management 	

- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence.

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

	Amistad Law: <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>
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