Pace Charter School of Hamilton

52 Lafayette Avenue

Hamilton, NJ 08610

pacecharter.com

Science: 6th Grade

The Pace Charter School of Hamilton Science Department is committed to equipping the students of Hamilton Township with scientific habits of mind and scientific skill sets. Our sincere goal is for every student of Hamilton Township to leave our halls with an increased level of scientific literacy which will enable them to evaluate competing claims in a rapidly changing society. We aspire to have science make sense to every student, and for each of them to think critically and skeptically about the world they live in. Beyond this central goal, our general intent is to prepare our students for college, technical coursework, career, and life-long interest and curiosity for the sciences.

Science is a field of human endeavor that seeks the truth about how the natural world functions via what is commonly called "the scientific method." Although there is not one single scientific method, the heart of science centers on deductive reasoning and making claims based upon evidence. To reflect these central scientific values, the question that guides our Science Department is: "How do I/we know what is really true?" As we plan curricula, lessons, and activities, our focus is on presenting relevant material, placing emphasis on students analyzing data and solving problems, and ensuring effective communication among all parties.

Pace Charter School of Hamilton's Science Program Beliefs:

- Make sense of the world with the lens of science
- Demonstrate curiosity about the natural world
- Analyze argumentative claims based on available evidence
- Practice a balance of open-mindedness and skepticism as they navigate their world
- Make progress in attaining scientific literacy
- Apply scientific concepts to solve problems in sensible and creative ways
- Design solutions to real world problems using the integration of science, technology, engineering and mathematics
- Use data in making decisions and drawing conclusions
- See the relevance of science to their lives
- Be proud, life-long students of science!

Pace Charter School
Grade: 6

Curriculum and Pacing Guide
Content Area: Science

Careers in Science Unit 1 - Nature of Science and Design	**Duration of Unit** 2 weeks
Essential Questions	*In this unit, students will know about the practice of science and they will know how technology affects everyday life.* • What is science? • Who are scientists? • What is the scientific method? • How do scientists learn about the world around them? • How do scientists investigate problems in many different ways? • What are different science tools? • What are some careers in science? • Who are pioneers in the fields of science? • What role does race and gender have when it comes to being successful and respected in the field? • How does technology solve problems and provide solutions? • What is the design process? • How does technology affect our everyday life?
NJSLS Subject Area Standards/ Literacy Companion Standards (Reading & Writing)	MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. NJSLSA.W4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.L2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

	NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
Learning Objectives	• Investigate how scientists use inquiry to learn about the real world around them • Analyze how scientists investigate problems in many different ways • Obtain information and interpret data using many different kinds of tools in a safe way • Draw scientific conclusions and will support them with evidence • Analyze how technology solves problems and provides solutions • Investigate how technology can mimic the human muscular and skeletal systems • Define simple design problems and will design models using the design process
Learning Activities	• Classify good and bad scientific questions • Identify questions that cannot be answered empirically and rewrite questions so that they can be answered empirically • Interpret data from an investigation after testing different methods • Interpret data about temperature by comparing temperatures using their sense of touch and thermometers • Research the history of scientists and report on the struggles they may have faced in the field. (ex. race, gender, disabilities, etc.) • Draw a conclusion about different brands of towels by repeating trials • Observe how bananas prepared in different ways change over time • Infer from the patterns seen in a scientific investigation • Design a strong glue • Predict which design of a water transport system will work best • communicate how a model represents the real thing • Design a game using the program Scratch • Make and redesign a model of a robotic arm
Formative Assessment	• Science Journals • White board activities • Private polls (heads down, thumbs up) • Class participation • Class discussions • Kahoots • Gizmos discussions • Quizzes • Exit slips

Alternative Assessment	• Lab Reports • Careers in Science Paper • Diversity in the Field Paper • Gizmos Reports • Current Events

Summative Assessment	• Chapter Tests
	• Projects
	  ○ Career project
	  ○ Help wanted poster

Technology Standards	• 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes. • 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data. • 8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program. • 8.2.5.ED.1: Explain the functions of a system and its subsystems. • 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints). • 8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use. • 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.
21st Century Life and Career Practices	• 9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals. • 9.1.5.FP.1: Illustrate the impact of financial traits on financial decisions. • 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global. • 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology. • 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue. • 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.
Interdisciplinary Connections	NJSLS - Mathematics: Various Laboratory Activities Relevant to Unit Topics Covered

	6EE.B.7. Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers. 6SP.B.5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

Instructional Materials/Resources/ Technology Resources	• Board approved textbook
	• Lab materials
	  ○ Scientists' Questions
	  ○ Keep Bread Fresh
	  ○ Using Thermometers
	  ○ Absorbing Water
	  ○ Banana Changing Over Time
	  ○ Strong Glue
	  ○ Transport System
	  ○ Model Arm
	  ○ Redesign Model Arm
	• PBS Learning Media
	• Career reading packet
	• Women in science posters
	• Diverse famous scientists packet
	• Scratch
	• Promethean Board
	• Google Classroom
	• BrainPOP
	• Gizmos

Accommodations and Modifications	**504** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **IEP** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time

	• Additional time to complete classroom tests/quizzes **ELL** No students at this time **Gifted and Talented** • Provide extension, enrichment, acceleration, and complexity in specific areas of strength • Meet the needs of various learners through flexible grouping, being sure not to depend on advanced learners to often "teach" others. • Invite students to explore different points of view on a topic and compare them • Provide exploration and extension learning opportunities • Ask students higher-level questions • Provide open-ended, creative assessments • Provide more advanced/challenging test items **At Risk:** • I&RS (Intervention & Referral Services) • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes

Earth's Systems Unit 2 - Earth's Systems and Weather	**Duration of Unit** 5 weeks
Essential Questions	*In this unit, students will explore the systems of earth and weather patterns. They will conduct investigations about our atmosphere and predict weather patterns.* • How does water move through the atmosphere? • What happens to the sun's energy when it reaches Earth? • What are the major air masses and the temperature and humidity associated with each? • What are the four main types of fronts and the weather associated with each? • How does altitude affect air pressure and density? • What is the relationship between temperature and density on air pressure? • How do you predict the weather? • What can you learn from weather maps? • What factors affect temperature and precipitation?
NJSLS Subject Area Standards/ Literacy Companion Standards (Reading & Writing)	MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

	MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. NJSLSA.W4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.L2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
Learning Objectives	• State how people and other living things use water • Describe how Earth's water is distributed • Explain how Earth's water move through the water cycle • Describe the changes that occur in ponds and lakes • Describe how water moves through underground layers of soil and rock • Explain how people obtain water from an aquifer • Describe the composition of the atmosphere • State how the atmosphere is a system • Describe how barometers can be used to measure air pressure • Explain how altitude affects air pressure and density • Identify and explain the four main layers of the atmosphere and their characteristics • Describe how water moved to and from the atmosphere during the water cycle • Describe humidity and how it is measured • Explain how clouds form • Name the three main types of clouds • Identify the common types of precipitation • Describe floods and droughts and their effect • Identify the major air masses that affect the weather in North America and describe how they move • Name the main types of fronts • Explain the type of weather that is associated with cyclones and anticyclones • List the main kinds of storm and explain how they form • Describe measures that can be taken to ensure safety in a storm • Explain how weather forecasters use observations, data, and technology to predict the weather

	• Describe what can be learned from information shown on weather maps • Identify factors that influence temperature and precipitation
Learning Activities	• Observe the process of condensation • Research and make a circle graph showing how Earth's water is used • Use a map of their state to locate and classify the surface waters in and near their community • Model the formation of a lake • Observe how water moves through soil • Infer the shape of an object inside a shoebox (no looking) • Identify the difference in density between saltwater and freshwater • Weigh a balloon that is full of air and explore the properties of air • Use a soda bottle to make a barometer • Calculate the temperature at different altitudes • Measure the temperature of air in a plastic bag in sunlight • Use a metal spiral to model convection in the atmosphere • Observe evaporation in action • Observe how moisture condenses on a jar of ice cold water • Observe fog formation in a bottle of warm, moist air • Model the formation of clouds in a jar • Observe water solidifying into crystals • Use liquids of different densities to model how air masses move • Identify and describe major air masses of North America • Model how air masses interact along fronts • Create a model tornado in a bottle • Design a building to withstand storm winds • Compare weather forecasts to actual weather • Explore how satellites rotate the Earth by using a globe • Interpret symbols on a weather map to determine conditions in various locations • Explore how sunlight falls on various latitudes of Earth • Explore how the angle of a light source affects the temperature of a surface • Investigate the weather characteristics of a variety of land areas around the world
Formative Assessment	• Science Journals • White board activities • Private polls (heads down, thumbs up) • Class participation • Class discussions • Kahoots • Gizmos discussions • Quizzes • Exit slips
Alternative Assessment	• Lab Reports • Gizmos reports

	• Current Events • Water Cycle Writing Prompt • Mini Meteorologist

Summative Assessment	• Chapter Tests • Projects ○ Weather Report
Technology Standards	• 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options. • 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format. • 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). • 8.2.8.ITH.2: Compare how technologies have influenced society over time. • 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. • 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.
21st Century Life and Career Practices	• 9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors. • 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. • 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget. • 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. • 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. • 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option. • 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect. • 9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change. • 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. • 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.
Interdisciplinary Connections	NJSLS - Mathematics Various Laboratory Activities Relevant to Unit Topics Covered

	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. 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.
Instructional Materials/Resources/ Technology Resources	● Board approved Textbook ● Lab materials ○ Density and sinking ○ Stress on Land ○ Condensation ○ Water Mapping ○ Lake Formation ○ Water and Soil ○ Seeing By Touching ○ Water Density ○ Modeling Beach Waves ○ Wind and Currents ○ Temperature and Currents ○ Burning Candle ○ Balloon Mass ○ Soda Bottle Barometer ○ Temperature and Altitude ○ Plastic and Heat ○ Heated Air ○ Evaporation and Condensation ○ Fog and Cloud Creation ○ Water to Hail ○ Density and Air Mass ○ Weather Fronts ○ Bottled Tornado ○ Storm Safety ○ Predicting Weather ○ Satellites and Maps ● Promethean Board ● Google Classroom ● BrainPOP ● Gizmos

Accommodations and Modifications	**504** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **IEP** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **ELL** No students at this time **Gifted and Talented** • Provide extension, enrichment, acceleration, and complexity in specific areas of strength • Meet the needs of various learners through flexible grouping, being sure not to depend on advanced learners to often "teach" others. • Invite students to explore different points of view on a topic and compare them • Provide exploration and extension learning opportunities • Ask students higher-level questions • Provide open-ended, creative assessments • Provide more advanced/challenging test items **At Risk:** • I&RS (Intervention & Referral Services) • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes

Earth's Interior & Surface Unit 3 - Earth's History & Processes	**Duration of Unit** 10 weeks
Essential Questions	*In this unit, students will explore the structure of earth and how our planet has changed. They will conduct investigations about our ever changing world.*

	• What does Earth's interior look like? • What are the layers of Earth? • How do convection currents happen in the Mantle? • What are the characteristics and properties of minerals? • What are the three types of rocks? • How do scientists observe and classify rocks? • What is the rock cycle? • What breaks down rocks? • What breaks down rocks? • What speeds up the process of weathering? • What processes wear down and build up Earth's surface? • How does sea-floor spreading affect Earth's crust? • How does stress in the crust change Earth's surface? • Is there a pattern in the location of natural hazards, such as earthquakes and volcanoes? • What other events or forces make it challenging for scientists to reconstruct Earth's history? • What is the geologic timescale?
NJSLS Subject Area Standards/ Literacy Companion Standards (Reading & Writing)	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. 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. 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. NJSLSA.W4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.L2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

	NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Learning Objectives	• Explain how geologists learn about Earth's inner structures • Identify the characteristics of the Earth's Crust, mantle, and core. • Describe how temperature and pressure change inside Earth • List the characteristics used to identify rocks • Identify the 3 major types of rock • Describe the rock cycle • Explain the theory of plate tectonics • Explain how stress in the crust changes Earth's surface • Describe three major types of faults • Compare and contrast the land features that result from plate movement • Describe how the energy of an earthquake travels through Earth • Explain how scientists locate the epicenter of an earthquake • Explain that patterns that seismographic data reveal • Identify where and why volcanic regions and hot spot volcanoes are found on Earth's surface • List landforms that lava and ash create • Explain how magma that harden beneath Earth's surface creates landforms • Explain how weathering and erosion affect Earth's surface • Exalin what causes chemical and mechanical weathering • Describe the factors that determine how fast weathering occurs • Identify and describe methods of soil conservation • Describe the processes that wear down and build up Earth's surface • Explain how water, wind, and ice affect erosion • Describe how geologist determine the relative age of rocks • Explain how the unconformities and folding can alter the order of rock layer • Identify different fossils and describe what fossils tell about organisms and environments of the past • Describe how geologist determine the relative age of rocks • Explain how the unconformities and folding can alter the order of rock layer • Explain how and why the geological time scale is used to show Earth's history • Describe the major events in the Paleozoic, Mesozoic, and Cenozoic Eras
Learning Activities	• Use indirect observations to study the interior of a model Earth • Observe and compare rock characteristics • Use interconnecting plastic blocks to model the rock cycle • Investigate density changes by moistening a washcloth with water and watching its edges sink • Explore sea-floor spreading and magnetic striping using paper models of the ocean

	• Use modeling clay of various colors to model tectonic plate boundaries • Explore the effect of a deforming force on an object • Model three types of stress • Model two types of waves that travel through a spring toy • Model a device to detect waves moving through matter • Model hot spot volcanoes uses a plastic box • Use honey and cooking oil to model lava flow • Explore the effect lava has on the slopes of volcanoes and the land around them • Inflate a balloon under sand to model a volcanic landform • Model chemical weathering of rocks and explore the time it takes • Investigate how ice helps to break down rock • Explore weathering by oxidation • Explore speeding up rates of weathering • Explore ways of preventing soil erosion • Explore the way plants use nutrients from the soil • Explore how weathering affects erosion • Use soap and dripping water to model erosion • Use sand frozen into a plastic cup with ice and a bar of soap to model glacial erosion by abrasion • Use a hand lens to observe sand and see what it is made up of • Use cornmeal in a pan and a straw to stimulate wind erosion • Examine a rock sample and make detailed drawings and descriptions of any shapes they see within a rock • Explore how fossils of soft parts form • Use clay to create a model of the sequence of rock layers • Create a timeline of their own lives • Compare the major units of geologic time to distance in a long hallway • Divide a famous person's life into block of time and compare it to how geologic time is divided • Graph the range of various life forms • Model an asteroid impact and observe the effects of the impact
Formative Assessment	• Science Journals • White board activities • Private polls (heads down, thumbs up) • Class participation • Class discussions • Kahoots • Quizzes • Gizmos discussions • Exit slips
Alternative Assessment	• Lab Reports • Gizmos reports • Current Events • Rock Cycle Poster • Earthquake News Report • Volcano News Report

Summative Assessment	• Chapter Tests
	• Projects
	  ○ Natural Disaster News Report
	  ○ Earth's Timeline

Technology Standards	• 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options. • 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format. • 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). • 8.2.8.ITH.2: Compare how technologies have influenced society over time. • 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. • 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.
21st Century Life and Career Practices	• 9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors. • 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. • 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget. • 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. • 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. • 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option. • 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect. • 9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change. • 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. • 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.
Interdisciplinary Connections	<u>NJSLS - Mathematics</u> Various Laboratory Activities Relevant to Unit Topics Covered 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. 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.

Instructional Materials/Resources/ Technology Resources	• Board approved textbook
	• Lab materials
	  ○ Investigating Earth's Interior
	  ○ Identifying Rocks
	  ○ Rock Cycle
	  ○ Density and sinking
	  ○ Sea-floor Spreading
	  ○ Plate Tectonic Boundaries
	  ○ Stress on Land
	  ○ Seismic Waves Through Earth
	  ○ Hot Spot
	  ○ Lava Flow
	  ○ Volcanic Landforms
	  ○ Types of Weathering
	  ○ Dust Bowl - Soil Erosion
	  ○ Plants and Soil
	  ○ Weathering and Erosion
	  ○ Types of Erosion
	  ○ Rocks and Fossils
	  ○ Geologic Time Scale
	  ○ Asteroid Impact
	• Promethean Board
	• Google Classroom
	• BrainPOP
	• Gizmos
	• EdPuzzle

Accommodations and Modifications	**504** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **IEP** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **ELL** No students at this time **Gifted and Talented** • Provide extension, enrichment, acceleration, and complexity in specific areas of strength • Meet the needs of various learners through flexible grouping, being sure not to depend on advanced learners to often "teach" others. • Invite students to explore different points of view on a topic and compare them • Provide exploration and extension learning opportunities • Ask students higher-level questions • Provide open-ended, creative assessments • Provide more advanced/challenging test items **At Risk:** • I&RS (Intervention & Referral Services) • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes

Resources and the Environment Unit 4 - Earth and Human Activity	**Duration of Unit** 12 Weeks

Essential Questions	*In this unit, students will explore Earth's weather and atmosphere. They will conduct experiments to determine the human impact on Earth's systems.* • How does water move through the atmosphere? • What happens to the sun's energy when it reaches Earth? • What causes surface currents? • What causes deep currents? • What causes climate? • What factors affect temperature and precipitation? • How are human activities affecting Earth's climates? • How are human activities affecting our freshwater supply? • What are some examples of renewable energy technologies that could reduce human impact on the climate? • How would renewable resources reduce climate change impacts? • What are some steps that we can take to reduce human impact on climate change?
NJSLS Subject Area Standards/ Literacy Companion Standards (Reading & Writing)	MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. 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. MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services. MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment NJSLSA.W4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.L2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

	NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
Learning Objectives	• State how people and other living things use water • Describe how Earth's water is distributed • Identify characteristics of the ocean and ocean water • Identify the features and main sections of the ocean floor • Explain how waves form and change and describe the characteristics of waves • Describe how waves affect shorelines and beaches • Identify what causes surface currents and explain how surface currents affect climate • Identify the causes of deep currents and describe the effects that deep currents have • Describe the composition of the atmosphere • State how the atmosphere is a system • Describe how heat is measured and transferred • Identify factors used to define climate and the six major regions • Explain the principle that scientists follow in studying ancient climates • Identify natural factors that can cause climate change • Explain how human activities are affecting the temperature of the atmosphere • Determine how the human population has increased • Identify examples of technologies that could reduce human impact on the climate • Explain steps that we can take to reduce human impact on climate change • Explain how the rising temperatures are affecting our ocean ecosystem, specifically the coral reefs
Learning Activities	• Research and make a circle graph showing how Earth's water is used • Use a map of their state to locate and classify the surface waters in and near their community • Identify the difference in density between saltwater and freshwater • Model waves and beach erosion • Use rope to simulate beach waves • Observe the effect of wind blowing on the movement of surface and deep water currents • Explore the way temperature affects the movement of deep currents • Explore how sunlight falls on various latitudes of Earth • Explore how the angle of a light source affects the temperature of a surface • Investigate the weather characteristics of a variety of land areas around the world

	• Compare precipitation data to classify climates • Analyze a photograph of tree rings to make inferences about weather in the past and draw conclusions about growing conditions during a trees life • Explore the scientific principles that underlie the greenhouse effect • Investigate how bubbles trapped in ice give clues to early weather conditions • Analyze data for the human population growth rate • Explore the coral reefs through a virtual field trip
Formative Assessment	• Science Journals • White board activities • Private polls (heads down, thumbs up) • Class participation • Class discussions • Kahoots • Gizmos discussions • Quizzes • Exit slips
Alternative Assessment	• Lab Reports • Gizmos reports • Current Events • Coral Reef Research • Coral Reef webquest/virtual trip • Climate Change News Report

Summative Assessment	• Chapter Tests
	• Projects
	  ○ Coral Reef Poster
	  ○ Climate Change interview

Technology Standards	• 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options. • 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format. • 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). • 8.2.8.ITH.2: Compare how technologies have influenced society over time. • 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. • 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.

21st Century Life and Career Practices	• 9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors. • 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. • 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget. • 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. • 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. • 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option. • 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect. • 9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change. • 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. • 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.
Interdisciplinary Connections	<u>NJSLS - Mathematics</u> Various Laboratory Activities Relevant to Unit Topics Covered 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. 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.

Instructional Materials/Resources/ Technology Resources	• Board approved textbook
	• Lab materials
	  ○ Modeling Beach Waves
	  ○ Wind and Currents
	  ○ Temperature and Currents
	  ○ Climate and Location
	  ○ Different Climates
	  ○ Tree Rings and Climate
	  ○ Greenhouse Gases
	  ○ Decomposing materials
	  ○ Land as a Resource
	  ○ Water as a Resource
	  ○ Reducing Water Pollution
	  ○ Washing away
	• Promethean Board
	• Google Classroom
	• Coral Reef Documentary
	• Gizmos
	• BrainPOP
	• Legends of Learning

Accommodations and Modifications	**504** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **IEP** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **ELL** No students at this time **Gifted and Talented** • Provide extension, enrichment, acceleration, and complexity in specific areas of strength • Meet the needs of various learners through flexible grouping, being sure not to depend on advanced learners to often “teach” others. • Invite students to explore different points of view on a topic and compare them • Provide exploration and extension learning opportunities

	• Ask students higher-level questions • Provide open-ended, creative assessments • Provide more advanced/challenging test items **At Risk:** • I&RS (Intervention & Referral Services) • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes

Astronomy Unit 5 - Earth's Place in the Universe	**Duration of Unit** 7 weeks
Essential Questions	*In this unit, students will be able to explain the motion of the stars and planets. They will understand that the universe is immensely large and astronomers are still learning about the many unknowns.* • How do the Earth, moon, and sun interact? • How do objects in the sky appear to move? • How does the Earth move? • What causes the seasons? • What determines gravity? • What keeps objects in orbit? • What causes the moon's phases? • What are eclipses? • What are tides? • How do astronomers describe the scale of the universe? • How were rockets developed? • How does a rocket work? • What are the major types of galaxies?
NJSLS Subject Area Standards/ Literacy Companion Standards (Reading & Writing)	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. 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. NJSLSA.W4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. NJSLSA.L2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

	NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
Learning Objectives	• Identify objects and constellations visible without a telescope in the night sky • Describe the apparent motions of stars and planet throughout the year • Demonstrate how Earth moves in space • Explain what causes the cycle of season on Earth • Identify what determine the strength of the force of gravity between two objects • Describe two factors that keep the moon and Earth in orbit • Explain what causes the phases of the moon • Describe solar and lunar eclipses • Explain what causes tides • Describe the features and characteristics of the moon • Explain how rockets were developed • Demonstrate how a rocket works • Describe the history of human spaceflight including the space race • Describe modern and future plans for crewed space exploration • Describe conditions in space, including near vacuum, extreme temperatures, and microgravity • Identify the benefits that space technology has provided for modern society • Describe the geocentric model and heliocentric model of the solar system; and who created them • Identify the layers of the sun's interior and atmosphere • Describe the characteristic that the inner planets have in common • Describe the characteristic that the outer planets have in common • Explain how stars are classified • Define a star system • Identify the major types of galaxies • State what the big bang theory says about the universe
Learning Activities	• Create and study a model of the Big Dipper • Model apparent motion of constellations • Model using a glabe and a lamp with a bare bulb to model Earth's rotation

	• Predict how the sun's shadow changes through the sat and then test their predictions • Explore how the tilt of Earth's axis affects the light that Earth receives as it orbits the sun • Graph data to explore what factors affect the force of gravity • Use magnets to model the force of gravity • Explore why observers on Earth always see the same side of the moon • Model solar and lunar eclipses • Use a map and high tide times in coastal cities to predict high tide times on other coastal cities • Model the moon's effect on Earth's tides • Model the formation of craters and development hypotheses about how the speeds and masses of objects that hit the moon affect crater size • Use a balloon to model a rocket and infer how it works • Build a simple rocket • Use a map to identify locations where astronauts landed and speculate on what astronauts saw at each place • Select material they might use to build a spacesuit • Examine everyday items and materials and try to determine which if them were developed based on space science research • Investigate the relative the relative sizes of the sun and Earth • Explore how stars are different from each other • Use a visual model to investigate why the Milky Way looks hazy • Use a balloon to model the expansion of the universe • Explore the possible futures of the universe
Formative Assessment	• Science Journals • White board activities • Private polls (heads down, thumbs up) • Class participation • Class discussions • Kahoots • Gizmos discussions • Quizzes • Exit slips
Alternative Assessment	• Lab Reports • Gizmos Reports • Current Events • Moon Phases Poster • Model of the Solar System • Alien Project
Summative Assessment	• Chapter Tests • Projects ○ Create an Alien

Technology Standards	• 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options. • 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format. • 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). • 8.2.8.ITH.2: Compare how technologies have influenced society over time. • 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. • 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.
21st Century Life and Career Practices	• 9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors. • 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. • 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget. • 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. • 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. • 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option. • 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect. • 9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change. • 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. • 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.
Interdisciplinary Connections	<u>NJSLS - Mathematics</u> Various Laboratory Activities Relevant to Unit Topics Covered 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. 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.

Instructional Materials/Resources/ Technology Resources	• Board approved textbook
	• Lab materials
	  ○ Model of Stars
	  ○ Sun's Shadows
	  ○ Reason for the Seasons
	  ○ Gravity and Earth
	  ○ Moon Movement
	  ○ High Tide and Moon
	  ○ Caters on the Moon
	  ○ Model Rocket
	  ○ Moon Landing
	  ○ Space Technology
	  ○ Stars and Galaxies
	  ○ Big Bang and Future
	• NASA
	• Constellation.com
	• Promethean Board
	• Google Classroom
	• BrainPOP
	• Gizmos
	• EdPuzzle

Accommodations and Modifications	**504** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **IEP** • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes **ELL** No students at this time **Gifted and Talented** • Provide extension, enrichment, acceleration, and complexity in specific areas of strength • Meet the needs of various learners through flexible grouping, being sure not to depend on advanced learners to often "teach" others.

	• Invite students to explore different points of view on a topic and compare them • Provide exploration and extension learning opportunities • Ask students higher-level questions • Provide open-ended, creative assessments • Provide more advanced/challenging test items **At Risk:** • I&RS (Intervention & Referral Services) • Provide copy of class notes • Use a consistent daily routine • Break down tasks into manageable units • Check homework on a daily basis • Frequently check for understanding • Allow for repetition and/or clarification of directions, as needed • Allow wait time for processing before calling on student for response • Announce test with adequate prep time • Additional time to complete classroom tests/quizzes