Weeks	Marking Period 1	Weeks	Marking Period 3
1-2	Science Practices (Metric System, Scientific Inquiry, Engineering Practices & Lab Safety)	21-22	Motion & Stability: Forces & Interaction & Energy (Physics)
3-10	Earth's Systems: The History of Planet Earth, Earth's Materials & Systems, Plate Tectonics & Large-Scale System Interactions (Plate Tectonics)	23-24	Earth's Place in the Universe: The Universe and Its Stars & Earth and the Solar System (Astronomy)
		25-26	Earth's Systems : The Roles of Water in the Earth's Processes(Oceanography)
		27 28 29 30	Earth's Systems: Weather and Climate & Earth and Human Activity (Meteorology)
Weeks	**Marking Period 2**	**Weeks**	**Marking Period 4**
11 12	Earth's Place in the Universe: History of Planet Earth & Biological Evolution (Geologic Time)	31-34	Continued - Earth's Systems: Weather and Climate & Earth and Human Activity (Meteorology)
13-20	Motion & Stability: Forces & Interaction & Energy (Physics)		
		35	STEM Final Project: Google Science Fair
		36-40	***(Will have periodic benchmark dates throughout the year, but will complete the majority of the project during these weeks)***

Time Frame	**2 weeks**

Topic

Science Practices: Understand Science Explanations, Generate Scientific Evidence through Active Investigation, Reflect on Scientific Knowledge, Participate Productively in Science

Essential Questions

- How do we build and refine models that describe and explain the natural and designed world?
- What constitutes useful scientific evidence?
- How is scientific knowledge constructed?
- How does scientific knowledge benefit, deepen, and broaden from scientists sharing and debating ideas and information with peers?

Enduring Understandings

- Measurement and observation tools are used to categorize, represent, and interpret the natural world.
- Develop and use a model to describe phenomena and/or describe unobservable mechanisms. ***[This understanding will be used across all disciplines in the Honors 8th grade curriculum]***
- Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. ***This understanding will be used across all disciplines in the Honors 8th grade curriculum]***
- Analyze and interpret data to provide evidence for phenomena. ***This understanding will be used across all disciplines in the Honors 8th grade curriculum]***
- Construct a scientific explanation based on valid and reliable evidence obtained from sources and the assumption that theories and laws that describe nature operate today as they did in the past and will continue to so in the future. ***This understanding will be used across all disciplines in the Honors 8th grade curriculum]***
- Evidence is used for building, refining, and/or critiquing scientific explanations.
- Scientific knowledge builds upon itself over time.
- The growth of scientific knowledge involves critique and communication – social practices that are governed by a core set of values and norms.

Alignment to NJCCCS

NJCCCS(Science): 5.1.8.A.1, 5.1.8.A.2, 5.1.8.B.1, 5.1.8.B.2, 5.1.8.B.3, 5.1.8.B.4, 5.1.8.C.1, 5.1.8.C.2, 5.1.8.C.3, 5.1.8.D.1, 5.1.8.D.2, 5.1.8.D.3, 5.1.8.D.4
NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.

Key Concepts and Skills

- Core scientific concepts and principles represent the conceptual basis for model-building and facilitate the generation of new and productive questions.
- Results of observation and measurement can be used to build conceptual-based models and to search for core explanation.
- Evidence is generated and evaluated as part of building and refining models and explanations.
- Mathematics and technology are used to gather, analyze, and communicate results.
- Carefully collected evidence is used to construct and defend arguments.

- Scientific reasoning is used to support scientific conclusions.
- Scientific models and understandings of fundamental concepts and principles are refined as new evidence is considered.
- Predictions and explanations are revised to account more completely for available evidence.
- Science is a practice is which an established body of knowledge is continually revised, refined, and extended.
- Science involves practicing productive social interactions with peers, such as partner talk, whole-group discussions, and small-group work.
- In order to determine which arguments and explanations are most persuasive, communities of learners work collaboratively to pose, refine, and evaluate questions, investigations, models and theories.
- Instruments of measurement can be used to safely gather accurate information for making scientific investigations and model-building.
- Organisms are treated humanely, responsibly, and ethically.

Learning Activities

- Lab Equipment, Metric System & Scientific Notation Station Lab
- Metric Road Trip
- Scientific Inquiry vs. Scientific Method activity
- Design Your Own Scientific Inquiry Lab

Assessments

- Scientific method & Lab Safety worksheets
- Various Lab Reports
- Observational Assessment
- Lab safety station assessment

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Metric System & Scientific Notation Station Lab : math integration
- Metric Road Trip Interactive: technology & math
- Scientific Inquiry Lab: language arts

Technology Integration

- Google Slide presentations
- Google Classroom & Google Drive for assignments & assessments
- Chromebook Integration
- Interactive Smart board activities
- Integration using the Elmo
- Internet Research
- Video Streaming using You tube for current events & Mr. Parr

Time Frame	**8 weeks**

Topic

Earth's Place in the Universe: The History of Planet Earth
Earth's Systems: The History of Planet Earth, Earth's Materials & Systems, Plate Tectonics & Large-Scale System Interactions
Earth & Human Activity: Natural Resources & Natural Hazards
Engineering Design: Defining & Delimiting Engineering Problems

Essential Questions

- How does the movement of tectonic plates impact the surface of Earth?
- How do the materials on Earth's crust change over time?
- How does water influence weather, circulate in the oceans, and shape Earth's surface?
- How can natural hazards be predicted?

Enduring Understandings

- Cause and effect relationships may be used to predict phenomena as in changes in one part of an Earth system affect other parts of the system.
- Energy flow and movement of a material from the Earth's interior causes geologic events on the Earth's surface.
- Patterns in geological events (tectonic plate movement, fossil record, rock cycle) can provide information about future geological events.
- Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, such as in the processes of weathering and erosion, glaciation, and the rock cycle.
- Earth's interior (convection currents) and tectonic plate boundaries can be observed at various scales using models to study a system that is too large to comprehend.

Alignment to Standards

NJCCCS(Science):5.4.6.C.2, 5.4.6.C.3, 5.4.8.C.1, 5.4.8.C.2, 5.4.8.D.1, 5.4.8.D.2, 5.4.8.D.3
NGSS: MS-ESS1-4, MS-ESS2-2, MS-ESS2-3, MS-ESS3-1, MS-ESS3-2, MS-ESS3-3, MS-ESS3-4, MS-ETS1-4

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1

Key Concepts and Skills

- Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.
- 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.
- 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.
- 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.

- Mapping the history of natural hazards in a region, combined with an understanding of related geological forces can help forecast the locations and likelihoods of future events.
- Water's movement- both on land and underground- cause weathering and erosion, which change the land's surface features and create underground formations.

Learning Activities

- Earthquake Simulation Activity
- STEM: Mountain Building & Glaciation Activity
- Plate Boundary Map
- STEM: Musical Plates: Earthquake/Volcano Plotting Project
- STEM: Epicenter Triangulation Lab
- STEM: Interactive Rock Cycle Activity
- STEAM: Pangaea Ultima Project: What will the Earth look like in 150 million years?

Assessments

- Various Lab Reports
- Math applications worksheets & quizzes
- Observational assessment
- Writing conclusions to specific activities
- Unit Test
- Final Project: Pangaea Ultima

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Musical Plate Activity: technology, social studies, language arts & math
- Epicenter Triangulation Lab: math, language arts & social studies
- Plate Boundary Map: social studies & language arts
- Text Mapping: language arts
- Pangaea Ultima Final Project: technology, language arts, math, engineering, art, and social studies
- Mountain Building Activity: technology & social studies

Technology Integration

- Google Slide Presentations
- Chromebook Integration
- Google Classroom & Google Drive for assignments and assessments
- Elmo Integration
- Interactive Smart Board activities
- Internet Research
- Webquest on Plate Tectonics (integration with Musical Plates activity)
- Video streaming using You Tube: current world geological events

Time Frame	**2 weeks**

Topic

Earth's Place in the Universe: The History of Planet Earth
Biological Evolution: Evidence of Common Ancestry and Diversity; Adaptation

Essential Questions

- How do people figure out that the Earth and life on Earth have changed over time?
- How does genetic variation among organisms in a species affect survival and reproduction?
- How does environment influence genetic traits in populations over multiple generations?

Enduring Understandings

- Earth's components form systems, which can be represented using models. These models can also show these systems and their interactions.
- Earth's systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and globally.
- Earth's history is so great that it can be observed at various scales using models to study this system that is too large to comprehend on a larger scale.
- Graphs, charts, and images of fossils and the fossil record can be used to identify patterns in the evolutionary time frame of Earth's species.
- Patterns of the extinction of Earth's species over time can be used to identify cause and effect relationships.

Alignment to Standards

NJCCCS(Science): 5.4.8.B.1, 5.4.8.B.2
NGSS: MS-ESS1-4, MS-LS4-1, MS-LS4-2, MS-LS4-6

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1

Key Concepts and Skills

- The geologic time scale interpreted from rock strata provides a way to organize Earth's history.
- Analysis of rock strata and the fossil record provide only relative dates, not an absolute scale.
- The collection of fossils and their placement in chronological order (ex, through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record.
- The fossil record documents the existence, diversity extinction, and change of many life forms throughout history of life of Earth.
- Anatomical similarities and differences between various organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent.

Learning Activities

- Biological Geologic Time Timeline Spiral
- What's Up? : Relative Age Activity
- STEM: Geologic Time/Rock Cycle Webquest

- M & M Radiometric Decay Lab
- Geologic Time Station Lab

Assessments

- Various Lab Reports
- Writing Conclusions for laboratory activities
- Observational Assessment
- Notes specific quizzes
- Unit Test

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Biological Geologic Timeline Spiral: social studies, art & technology
- Radiometric Decay Lab: math & language arts
- Geologic Time/Rock Cycle Web Quest: language arts, math & technology
- Text Mapping: language arts

Technology Integration

- Google Slide Presentations
- Google Classroom & Goggle Drive for assignments & assessments
- Chromebook Integration
- Interactive Smart Board activities
- Internet Research
- Elmo integration
- Video Streaming using You Tube videos (Mr. Parr, etc.)

Time Frame	**10 weeks**

Topic

Motion & Stability: Forces and Motion, Types of Interactions
Energy: Definitions of Energy, Conservation of Energy and Energy Transfer, Relationship between Energy and Forces
Waves & Their Applications in Technologies for Information Transfer: Wave Properties
Engineering Design: Defining and Delimiting an Engineering Problem, Developing Possible Solutions and Optimizing the Design Solution

Essential Questions

- How can one describe physical interactions between objects and within systems of objects?
- How can energy be transferred from one object or system to another?
- How will the end user decide whether or not the design is successful?

Enduring Understandings

- Models can be used to represent motion and forces, (application of Newton's Laws of Motion and understanding gravitational forces) and their interactions with other forces.

- Cause and effect relationships may be used to predict speed, acceleration, momentum, forces, etc. in natural or designed systems.
- Explanations of stability and change in natural and designed systems, such as an object's motion depends upon the sum of its forces and mass, can be constructed by examining the changes over time and forces at different scales.
- Energy may take different forms (e.g. energy in fields, thermal energy, energy of motion).
- The transfer of energy can be tracked as energy flows through a designed natural system.
- Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.
- Apply scientific ideas or principles to design, construct, and test a design of object, tool, process or system, especially when developing prototypes and building a working roller coaster.
- Construct and interpret graphical displays of data to identify linear and nonlinear relations when solving for speed and acceleration.

Content Standards

NJCCCS(Science): 5.2.8.C.1, 5.2.8.C.2, 5.2.8.D.1, 5.2.8.D.2, 5.2.8.E.1, 5.2.8.E.2
NGSS: MS-PS2-1, MS-PS2-2, MS-PS2-4, MS-PS3-1, MS-PS3-2, MS-PS3-3, MS-PS3-4, MS-PS3-5, MS-PS4-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1, 8.2.8.C.1, 8.2.8.C.2, 8.2.8.C.3, 8.2.8.C.4, 8.2.8.C.5, 8.2.8.C.6, 8.2.8.C.7, 8.2.8.C.8, 8.2.8.D.1, 8.2.8.D.2, 8.2.8.D.3, 8.2.8.D.4, 8.2.8.D.5, 8.2.8.D.6

Key Concepts and Skills

- 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 3rd 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 arbitrary chosen reference frame and arbitrarily chosen units of size.
- 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 a 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).
- Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.
- A system of objects may also contain stored (potential) energy, depending on their relative positions.
- When the motion of an object changes, there is inevitably some other change in energy at

the same time.

- When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.
- The more precisely a design's task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful.
- Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions.
- A solution needs to be tested, and then modified on the basis of the test results in order to improve it.
- There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.
- A sound wave needs a medium through which it is transmitted.

Learning Activities

- Energy Transformation Station Lab
- STEM: Potential & Kinetic Energy Lab using the Car & Ramp
- STEM: Speed Car Lab
- STEM: Newton's 2nd Law Lab using the Car & Ramp
- STEM: Elastic & Inelastic Collision Lab using Energy Car
- STEM: Gravity Drop Lab
- STEM: K'nex Activities
- STEM: Enhanced Rollercoaster Challenge

Assessments

- Multiple Written Lab Reports (formal & unformal)
- Math applications worksheets & quizzes
- Observational assessment
- Writing conclusions to specific activities
- Kinetic/Potential Energy Formula Quiz
- Speed, velocity, momentum & F=ma Math Quiz
- Forces & Vectors Quiz
- Unit Test (Energy & Motion/Forces)

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Text Mapping: language arts
- Rollercoaster Challenge : engineering, technology & math
- Labs using the Car & Ramp : engineering, math, language arts, technology
- Labs using the Energy Car: engineering, math, language arts & technology
- Gravity Drop Labs: math, language arts & technology
- K'nex Activities: math, technology & engineering

Technology Integration

- Google Slide Presentations

- Google Classroom & Google Drive for assignments & assessments
- Integration of Chromebooks
- Interactive use of Smart Board
- Integration of Elmo
- Internet Research
- Video streaming to show energy transformation, forces, vectors, motion

Time Frame	**2 weeks**

Topic

Earth's Place in the Universe: The Universe and Its Stars, Earth and the Solar System

Essential Questions

- What is Earth's Place in the Universe?
- What makes up our solar system and how can the motion of Earth explain the seasons and eclipses?

Enduring Understandings

- The predictable observable patterns of movement in the sun, Earth, and moon system occur because of the gravitational interaction and energy between the three.
- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small like our universe.
- Models can be used to represent our solar system and their interactions within our universe.

Alignments to Standards

NJCCCS(Science): 5.4.8.A.1, 5.4.8.A.2, 5.4.8.A.3, 5.4.8.A.4
NGSS: MS-ESS1-1, MS-ESS1-2, MS-ESS1-3

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1

Key Concepts and Skills

- Patterns of the apparent motion of the sun, the moon, and the 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.
- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.
- This model of the solar system can explain eclipses of the sun and the moon.
- Earth's axis is fixed in direction over the short-term but titled 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 appears to have formed from a disk of dust and gas, drawn together by gravity.

Learning Activities

- Light on the Spherical Earth Lab

- Gravity Lab
- Tilt, Light & Seasons Lab
- Lunar Lollipops
- 3-D Constellations
- STEM Project: Cosmic Calendar Project

Assessments

- Quizzes on moon phases, eclipses, and seasons
- Various Lab Reports
- Unit test
- Written Conclusions for certain activities
- Observational Assessment

21st Century Skills

x	Creativity	**x**	Critical Thinking	**X**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**X**	Media Literacy		

Interdisciplinary Connections

- Written diary of lunar phases: language arts
- Text Mapping: language arts
- Tilt, Light & Seasons Lab: math & social studies
- 3-D Constellations: math, art, engineering, language arts
- Gravity Lab: math
- How Far is that Star?: math

Technology Integration

- Google Slide Presentations
- Google Classroom & Google Drive for assignments & assessments
- Integration of Chromebooks
- Interactive Smart Board Activities
- Elmo integration
- Video Streaming from You Tube
- Internet Research

Time Frame	**2 weeks**

Topic

Earth's Systems: The Role of Water in Earth's Surface Processes

Essential Questions

- How does water influence weather, circulate in the oceans, and shape Earth's surface?

Enduring Understandings

- The energy from the sun is transferred throughout the oceans and atmosphere and this cause and effect relationship may be used to predict phenomena (ocean current patterns, salinity variations, and other changes) in natural or designed systems.

- Earth's components from systems that have cycles and patterns that allow us to make predictions. Patterns in rates of change and other numerical relationships can provide information about natural systems.
- These systems continually interact at different rates of time, affecting the Earth locally and globally. Models can be used to represent ocean systems and their interactions-such as inputs, processes and outputs- and energy, matter, and information flows within a system to help explain water levels rising, weather patterns, and climate change.

Alignment to Standards

NJCCCS(Science): 5.4.8.E.1, 5.4.8.G.1, 5.4.8.G.2
NGSS: MS-PS4-1, MS-ETS1-4, MS-ESS3-2, MS-ESS3-3, MS-ESS3-5

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1, 8.1.8.F.1

Key Concepts and Skills

- Global movements of water and its changes in the form are propelled by gravity and sunlight.
- Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.
- Water's movement- both on land and underground- cause weathering and erosion, which change the land's surface features and create underground formations.
- The ocean exerts a major influence on the weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.

Learning Activities

- Mapping the Ocean Floor Activity
- Current weather events as related to the ocean currents and temperature changes
- Ocean Current Map Activity
- STEM: Erosion & Longshore Drift of the Jersey Shore
- STEM: Jerseys Unique Coastline: How did it happen?
- Beach Profiling Lab

Assessments

- Quizzes on currents, tides and waves
- Unit Test
- Written Lab Reports to accompany activities
- Observational Assessment

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Mapping the Ocean Floor Activity : math
- Ocean Current Map Activity: social studies & language arts
- Jersey's Coastline: math, social studies & technology

- Beach Profiling Lab: math & technology
- Text Mapping: language arts

Technology Integration

- Google Slide Presentations
- Google Classroom & Google Drive for assignments & assessments
- Integration of Chromebooks
- Interactive Smart Board Activities
- Integration of Elmo
- Internet Research
- Video Streaming for current events
- Video projections & animations showing current mapping of ocean floor

Time Frame	**8 weeks**

Topic

Earth's Systems: The Roles of Water in Earth's Surface Processes, Weather & Climate
Earth & Human Activity: Natural Resources, Natural Hazards, Human Impacts on Earth's Systems & Global Climate Change
Waves and Their Applications in Technologies for Information Transfer: Electromagnetic Radiation
Engineering Design**: Defining & Delimiting Engineering Problems**

Essential Questions

- How does water influence weather, circulate in the oceans, and shape Earth's surface?
- What factors interact and influence weather and climate?
- How can natural hazards be predicted?
- How do human activities affect Earth's systems?

Enduring Understandings

- The energy from the sun is transferred throughout the oceans and atmosphere.
- Earth's components form systems, and these systems continually interact at different rates of time, affecting the Earth regionally and globally.
- Earth's components from systems that have cycles and patterns that allows us to make predictions.
- These systems continually interact at different rates of time, affecting the Earth locally and globally.
- Graphs, charts, and images can be used to identify patterns in weather patterns locally or climate globally.
- All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for health of people and the natural environment.
- The uses of technologies and any limitations on their use are driven by individual societal needs, desires, and values; by the findings of scientific research; and by differences in factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.

Alignment to Standards

NJCCCS(Science): 5.4.8.C.3, 5.4.8.E.1, 5.4.8.F.1, 5.4.8.F.2, 5.4.8.F.3, 5.4.8.G.2
NGSS: MS-PS4-2,MS-ESS2-4, MS-ESS2-5, MS-ESS2-6

NJCCCS(Technology): 8.1.8.A.2, 8.1.8.A.4, 8.1.8.A.5, 8.1.8.D.1, 8.1.8.D.2, 8.1.8.D.4, 8.1.8.D.5, 8.1.8.E.1

Key Concepts and Skills

- Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land.
- The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of weather patterns.
- Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.
- Because these patterns are so complex, weather can only be predicted probabilistically.
- The ocean exerts a major influence on the weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.
- When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light.
- The path of light travels can be traced as straight lines, except at surfaces between different transparent materials (eg. Air and water, air and glass) where the light at asurface between media.
- However, because light can travel through space, it cannot be a matter wave, like sound or water waves.
- 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.
- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing extinction of other species.
- Human activities, such as the release of greenhouse gases from the burning of fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming).
- Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

Learning Activities

- Hurricane Tracking Activity: Sandy vs. Katrina
- Create/interpret Weather Maps
- STEM: The Future of Weather Forecasting
- STEM: Interpreting Climographs
- STEM: Climate Change: Humans vs. Nature

- In the "Eye" of the Storm: The Great Debate

Assessments

- Chapter & Unit Tests (Atmosphere, Weather Factors & Weather/Climate)
- Weather Map Lab Activity
- Hurricane Tracking: Sandy vs. Katrina Assessment
- Observational Assessment
- STEM: Climate Change Research Project
- STEM: Climatology Project

21st Century Skills

x	Creativity	**x**	Critical Thinking	**x**	Communication	**x**	Collaboration
x	Skills	**x**	Information Literacy	**x**	Media Literacy		

Interdisciplinary Connections

- Text Mapping: language arts
- Weather Map Activity: social studies & technology
- In the "Eye" of the Storm : language arts, technology & forensics
- Hurricane Tracking: math, technology, & language arts
- Climographs: math & technology
- Various Climate Change Activities: language arts & technology

Technology Integration

- Google Slide Presentations
- Google Classroom & Google Drive for assignments & assessments
- Integration of Chromebooks
- Interactive Smart Board Activities
- Elmo integration
- Internet Research
- Video Streaming for current events & animations