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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Engineering Design Dates	• Asking Questions and Defining Problems • Developing and Using Models • Analyzing and Interpreting Data • Engaging in Argument from Evidence • ETS1.A: Defining and Delimiting Engineering Problems • ETS1.B: Developing Possible Solutions • ETS1.C: Optimizing the Design Solution • readings -“	• The more precisely a design 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 are 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 the criteria and constraints of a problem. • Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. • Models of all kinds are important for testing solutions. • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. • The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. • **Vocab**:	•	•
	STANDARDS: • 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.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Structure and Properties of Matter Dates	• Developing and Using Models • Planning and Carrying Out Investigations • Engaging in Argument from Evidence • Obtaining, Evaluating, and Communicating Information • PS1.A: Structure and Properties of Matter • PS1.B: Chemical Reactions • PS3.A: Definitions of Energy • readings -“	• (NYSED) Substances are made of one type of atom or combinations of different types of atoms. Individual atoms are particles and can combine to form larger particles that range in size from two to thousands of atoms. • (NYSED) Each substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. • Solids may be formed from molecules, or they may be extended structures with repeating subunits • (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. • (NYSED) Mixtures are physical combinations of one or more samples of matter and can be separated by physical means. • (NYSED) Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different particles, and these new substances have different properties from those of the reactants. • (NYSED) The term “heat” as used in everyday language refers both to thermal energy (the motion of particles within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. • (NYSED) Temperature is not a form of energy. Temperature is a measurement of the average kinetic energy of the particles in a sample of matter. • **Vocab**:	•	•
	STANDARDS: • MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. • MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. • MS-PS1-4. Develop a model that pred • MS-PS1-7. Use evidence to illustrate that density is a property that can be used to identify samples of matter. • MS-PS1-8. Plan and conduct an investigation to demonstrate that mixtures are combinations of substances			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Chemical Reactions Dates	• Developing and Using Models • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Scientific Knowledge is Based on Empirical Evidence • Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena • PS1.A: Structure and Properties of Matter • PS1.B: Chemical Reactions • ETS1.B: Developing Possible Solutions • ETS1.C: Optimizing the Design Solution • readings -“	• (NYSED) Each substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it • (NYSED) Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different particles and these new substances have different properties from those of the reactants. • The total number of each type of atom is conserved, and thus the mass does not change. • (NYSED) Some chemical reactions release energy, others absorb energy • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design. • The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. • **Vocab**:	•	•
	STANDARDS: • MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. • MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. • MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy during a chemical and/or physical process.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Forces and Interactions Dates	• Asking Questions and Defining Problems • Planning and Carrying Out Investigations • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence • Scientific Knowledge is Based on Empirical Evidence • PS2.A: Forces and Motion • PS2.B: Types of Interactions • readings -“	• 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. • 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) • **Vocab**:	•	•
	STANDARDS: • 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 and conduct 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 and the distance between them. • 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.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Energy Dates	• Developing and Using Models • Planning and Carrying Out Investigations • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence • Scientific Knowledge is Based on Empirical Evidence • PS3.A: Definitions of Energy • PS3.B: Conservation of Energy and Energy Transfer • PS3.C: Relationship Between Energy and Forces • ETS1.A: Defining and Delimiting an Engineering Problem • ETS1.B: Developing Possible Solutions • readings -“	• 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. • (NYSED) Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, phases (states), and amounts of matter present • When the motion energy of an object changes, there is inevitably some other change in energy at the same time. • (NYSED) The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the mass of the sample, and the environment. • Energy is spontaneously transferred out of hotter regions or objects and into colder ones. • (NYSED) An electric circuit is a closed path in which an electric current can exist • 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 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 • **Vocab**:	•	•
	STANDARDS: • MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. • MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. • MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.* • MS-PS3-4. Plan and conduct an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the temperature of the sample of matter. • MS-PS3-5. Construct, use, and present an argument to support the claim that when work is done on or by a system, the energy of the system changes as energy is transferred to or from the system. • MS-PS3-6. Make observations to provide evidence that energy can be transferred by electric currents.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Waves and Electromagnetic Radiation Dates	● Developing and Using Models ● Using Mathematics and Computational Thinking ● Obtaining, Evaluating, and Communicating Information ● Scientific Knowledge is Based on Empirical Evidence ● PS4.A: Wave Properties ● PS4.B: Electromagnetic Radiation ● PS4.C: Information Technologies and Instrumentation ● readings -“	● A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. ● A sound wave needs a medium through which it is transmitted. ● 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. ● (NYSED) The path that light travels can be traced as straight lines, except when it hits a surface between different transparent materials (e.g., air and water, air and glass) obliquely where the light path bends. ● A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. ● (NYSED) However, because light can travel through space, it cannot be a mechanical wave, like sound or water waves. ● Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. ● **Vocab**:	●	●
	STANDARDS: ● MS-PS4-1. Develop a model and use mathematical representations to describe waves that includes frequency, wavelength, and how the amplitude of a wave is related to the energy in a wave. ● MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. ● MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Structure, Function, and Information Processing Dates	● Developing and Using Models ● Planning and Carrying Out Investigations ● Constructing Explanations and Designing Solutions ● Obtaining, Evaluating, and Communicating Information ● LS1.A: Structure and Function ● LS1.D: Information Processing ● readings -“	● 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. ● 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 ● Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. ● (NYSED) Plants respond to stimuli such as gravity (geotropism) and light (phototropism). ● **Vocab**:	●	●
	STANDARDS: ● MS-LS1-1. Plan and 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 parts of cells contribute to the function. ● MS-LS1-3. Construct an explanation supported by evidence for how the body is composed of interacting systems consisting of cells, tissues, and organs working together to maintain homeostasis. ● MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli, resulting in immediate behavior and/or storage as memories.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Matter and Energy in Organisms and Ecosystems Dates	• Developing and Using Models • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence • Scientific Knowledge is Based on Empirical Evidence • LS1.C: Organization for Matter and Energy Flow in Organisms • LS2.A: Interdependent Relationships in Ecosystems • LS2.B: Cycle of Matter and Energy Transfer in Ecosystems • LS2.C: Ecosystem Dynamics, Functioning, and Resilience • PS3.D: Energy in Chemical Processes and Everyday Life • readings -“	• Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. • Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. • Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. • In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. • Growth of organisms and population increases are limited by access to resources • Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. • Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations • The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. • Cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. • **Vocab**:	•	•
	STANDARDS: • MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. • MS-LS1-7. Develop a model to describe how food molecules are rearranged through chemical reactions to release energy during cellular respiration and/or form new molecules that support growth as this matter moves through an organism. • MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. • MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. • MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Interdependent Relationships in Ecosystems Dates	• Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence • LS2.A: Interdependent Relationships in Ecosystems • LS2.C: Ecosystem Dynamics, Functioning, and Resilience • LS4.D: Biodiversity and Humans • ETS1.B: Developing Possible Solutions • readings -“	• Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. • (NYSED) Biodiversity describes the variety of species found in Earth’s ecosystems. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of its health. • food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. • (NYSED) Humans impact biodiversity both positively and negatively. • There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. • **Vocab**:	•	•
	STANDARDS: • MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms in a variety of ecosystems. • MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and protecting ecosystem stability.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Growth, Development, and Reproduction of Organisms Dates	• Developing and Using Models • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence • Obtaining, Evaluating, and Communicating Information • LS1.B: Growth and Development of Organisms • LS3.A: Inheritance of Traits • LS3.B: Variation of Traits • LS4.B: Natural Selection • readings -“	• Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. • 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. • Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. • Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. • In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. • In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Some changes are beneficial, others harmful, and some neutral to the organism. • (NYSED) Mutations may result in changes to the structure and function of proteins • 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. • **Vocab**:	•	•
	STANDARDS: • 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 environmental and genetic factors influence the growth of organisms. • MS-LS3-1. Develop and use a model to explain 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 how asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. • MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Natural Selection and Adaptations Dates	• Analyzing and Interpreting Data • Using Mathematics and Computational Thinking • Constructing Explanations and Designing Solutions • Scientific Knowledge is Based on Empirical Evidence • LS4.A: Evidence of Common Ancestry and Diversity • LS4.B: Natural Selection • LS4.C: Adaptation • readings -“	• The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth. • Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. • Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy • (NYSED) Natural selection can lead to an increase in the frequency of some traits and the decrease in the frequency of other traits. • Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. • **Vocab**:	•	•
	STANDARDS: • MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. • MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. • MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. • MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals’ probability of surviving and reproducing in a specific environment. • MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Space Systems Dates	● Developing and Using Models ● Analyzing and Interpreting Data ● ESS1.A: The Universe and Its Stars ● ESS1.B: Earth and the Solar System ● readings -“	● 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. ● (NYSED) The solar system consists of the Sun and a collection of objects, including planets, their moons, comets, 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 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 appears to have formed from a disk of dust and gas, drawn together by gravity. ● **Vocab**:	●	●
	STANDARDS: ● 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.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
History of Earth Dates	• Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Scientific Knowledge is Open to Revision in Light of New Evidence • ESS1.C: The History of Planet Earth • ESS2.A: Earth's Materials and Systems • ESS2.B: Plate Tectonics and Large-Scale System Interactions • ESS2.C: The Roles of Water in Earth's Surface Processes • readings -"	• 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. • 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. • 2.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 • Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. • **Vocab**:	•	•
	STANDARDS: • 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 temporal 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.			

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TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Earth's Systems Dates	• Developing and Using Models • Constructing Explanations and Designing Solutions • ESS2.A: Earth's Materials and Systems • ESS2.C: The Roles of Water in Earth's Surface Processes • ESS3.A: Natural Resources • readings -"	• 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. • (NYSED) Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation, sublimation, deposition, precipitation, infiltration, and runoff. • (NYSED) Global movements of water and its changes in form are driven by sunlight and gravity • 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. • **Vocab**:	•	•
	STANDARDS: • MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. • MS-ESS2-4. 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-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 geologic processes.			

TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Weather and Climate Dates	• Asking Questions and Defining Problems • Developing and Using Models • Planning and Carrying Out Investigations • ESS2.C: The Roles of Water in Earth's Surface Processes • ESS2.D: Weather and Climate • ESS3.D: Global Climate Change • readings -"	• 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 local weather patterns. • Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. • 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 weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. • Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). • **Vocab**:	•	•

STANDARDS:

- 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 Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
- MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century

TOPIC & MONTH	CONTENT	SKILLS	ASSESSMENT	Essential Question
Human Impacts Dates	● Analyzing and Interpreting Data ● Constructing Explanations and Designing Solutions ● Engaging in Argument from Evidence ● ESS3.B: Natural Hazards ● ESS3.C: Human Impacts on Earth Systems ● readings -“	● 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 ● 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 ● **Vocab**:	●	●
	STANDARDS: ● 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.* ● 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.			