SUBJECT AREA: Earth Science/Goodseit
GRADE LEVEL: All Grades
SEMESTER: Fall-Spring

UNIT TITLE/ESSENTIAL QUESTION(S)	UNIT SKILLS AND CONTENT	CORE TEXTS AND MATERIALS	FORMATIVE & SUMMATIVE ASSESSMENTS	COMMON CORE/CONTENT STANDARDS
Measurements -What are the factors that affect an object's density? -What is the relationship between density and an object's ability to float? -In what ways does density relate to real world situations?	● Identify the parts of a triple beam balance and graduated cylinder in a virtual laboratory setting using Explore Learning. ● Make accurate mass and volume measurements in an online laboratory setting using Explore Learning. ● Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning. ● Relate previous scientific terms to density. ● Make density calculations with appropriate units. ● Think critically as to how density relates to real life situations. ● Annotate in a virtual setting using Google doc highlighter and commenting tool. ● Engage in a virtual classroom setting through Pear Deck, Jamboard, break-out rooms, and ZOOM ● Follow rubrics and checklists as a way to self-assess progress.	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● Google forms, questions ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● Rubrics for student reference ● Lab Assignments on Explore Learning Summative Assessments-	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** Analysis, Inquiry, and Design: Key Idea 1: Abstraction and symbolic representation are used to communicate mathematically. Interconnectedness: Key Idea 6: In order to arrive at the best solution that meets

			• Google Form assignments • Google Question assignments • Test Wizard assignments	criteria within constraints, it is often Common necessary to make trade-offs.
Measuring Earth (Latitude/Longitude) -Why is it important to know an exact location rather than just an estimate? -How does latitude and longitude play a role in our lives? (GPS) -What are the implications of having errors in latitude and longitude coordinates? -What are some new applications of GPS that may benefit society?	• Consider the reasons as to why some think the Earth is flat. • Plot latitude and longitude coordinates on a map. • Interpret maps to determine the compass direction the coordinates are in. • Use the North star, Polaris, to determine latitude. • Find the latitude and longitude of cities in their own state, New York, using page 3 of the ESRT. • Use longitude to determine the time in cities around the world. • Follow rubrics and checklists as a way to self-assess progress.	• Explore Learning • Jamboard • Pear Deck • Test Wizard • EdPuzzle • Screen Recordings using Screencast - o - matic • Google forms, questions • Earth Science Reference Table • Key Terms posted for student reference on each topic	Formative Assessments - • Thumbs/thumbs down on ZOOM • Pear Deck assignments, including exit slips • Break-out rooms on ZOOM • Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box • Peer assessment on Jamboard • Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards • First to Five check ins and Good, OK, Bad Check In on Jamboard • EdPuzzle • Rubrics for student reference • Lab Assignments on Explore Learning Summative Assessments- • Google Form assignments • Google Question assignments	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 1.1c Earth's coordinate system of latitude and longitude, with the equator and prime meridian as reference lines, is based upon Earth's rotation and our observation of the Sun and stars. 1.1d Earth rotates on an imaginary axis at a rate of 15 degrees per hour. To people on Earth, this turning of the planet makes it seem as though the Sun, the moon, and the stars are moving around Earth once a

			• Test Wizard assignments • Evaluating coordinates for errors • Designing a new application for GPS.	day. Rotation provides a basis for our system of local time; meridians of longitude are the basis for time zones.
Topography - Making Connections to the Real World? What are some applications for a topographic map? -In what ways are topographic maps useful to people? -How is a topographic map similar to a fingerprint? -Why do contour lines on a topographic map never cross? -How are topographic maps helpful when studying the topography of the land? -What are the steps engineers need to take or the considerations they need to make when creating flood-proof structures? -Why do people continue to live in flood-prone areas? -Should NYC spend money rebuilding in a flood proof area or relocate people? Is it fair to rescue workers? -What do you think can be done to reduce flooding in NYC?	• Analyze and interpret topographic maps to express in words, the shape of the land (is it a flat or mountainous terrain, are there depressions present, is elevation increasing or decreasing), if the land has a gentle slope or if it is steep, direction of river flow, and the relative speed of that river, possible elevations of a mountain or hill top and possible elevations inside a depression, draw contour lines on a topographic map when only the elevations are given on a map, and calculate the gradient of the land to determine how quickly the slope of the land changes over a given distance. • Create topographic profiles from a topographic map to better understand the topography of the land. • Read and annotate informational text and/or diagrams/maps and derive key information as a means of self-learning. • Analyze topographic maps of Brooklyn, NY and Lapwai, Idaho to determine differences between a topographic map of an urban area vs. a rural area.	• Explore Learning • Jamboard • Pear Deck • Test Wizard • EdPuzzle • Screen Recordings using Screencast - o - matic • Google forms, questions • Earth Science Reference Table • Key Terms posted for student reference on each topic	Formative Assessments - • Thumbs/thumbs down on ZOOM • Pear Deck assignments, including exit slips • Break-out rooms on ZOOM • Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box • Peer assessment on Jamboard • Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards • First to Five check ins and Good, OK, Bad Check In on Jamboard • EdPuzzle • Rubrics for student reference • Lab Assignments on Explore Learning Summative Assessments- • Google Form assignments	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 2.1q Topographic maps represent landforms through the use of contour lines that are isolines connecting points of equal elevation. Gradients and profiles can be determined from changes in elevation over a given distance.

	● Analyze a topographic map of Brooklyn, NY to determine the best location to be in the event of a major flooding, as seen with Hurricane Sandy, supporting the decision with topographical evidence. ● Read and annotate informational text to determine how topography can affect hurricanes and how hurricanes affect the topography of the land. ● Engage in a collaborative discussion to determine why people continue to live in flood-prone areas and the steps engineers need to take in order to build flood-proof structures. ● Making Connections to the Real World: Work as part of a collaborative team for **Rebuild by Design** that is working on the **Lower Manhattan Coastal Resiliency (LMCR) Project,** a flood-proofing and park-building measure that extends from the Lower East Side up to the north of Battery Park City to determine whether or not they should spend money to rebuild along these flood-prone areas. What innovations could be done to decrease the amount of flooding? (Rebuild by Design and LMCR are actual projects that are currently underway in NYC - this lesson is hoping to open students up to STEM careers in Earth Science as		● Google Question assignments ● Test Wizard assignments ● Evaluating maps for errors	

	well as make them aware of projects going on in the city they live in). ● Work collaboratively to evaluate topographic maps for errors - this shows a true understanding of the features of topographic maps. ● Follow rubrics and checklists as a way to self-assess progress.			
Rocks and Minerals **-**What makes gemstones so valuable and desirable to people all over the world? What has driven this emphasis placed on gems? -Are rare earth minerals worth the environmental hazards that occur when mining for them? -If diamond and graphite have the same chemical composition of carbon (C), why do they have different physical properties? -Should we continue to mine for rare earth minerals? -Why do we study rocks? -You are going on a far way trip for two years and you want to keep a record of it. What are some ways you could preserve your memories and experiences so that one day you can share them	● Collaboratively discuss the impacts rare earth minerals have on our lives. ● Annotate and interpret informational texts while self-assessing annotations using the "Annotation Checklists". ● Identify how minerals form. ● Define the physical properties of minerals. ● Analyze minerals samples to determine their physical properties. ● Identify what makes each mineral have its own physical properties. ● Annotate, analyze, and interpret p. 16 of the ESRT "Properties of Common Minerals". ● Make connections between questions and the ESRT. ● Identify the conditions needed to form each of the rocks types and their interconnectedness.	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● EdPuzzle ● Rubrics for student reference ● Lab Assignments on Explore Learning	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** STANDARD 6 Key Idea 2: Interconnectedness: Models are simplified representations of objects, structures, or systems used in analysis.

with others? How do you think rocks record the history of their origin and the journey to where they were found? -Think of a time when you went through a change. What changed? How did you feel about it? -How are the three rock types related?			Summative Assessments- ● Google Form assignments ● Google Question assignments ● Test Wizard assignments ● CER assignment - mining for rare earth minerals ● CER assignment - Fossils fuels vs alternative	For example: • use flowcharts to identify rocks and minerals STANDARD 6 Key Idea 6: Interconnectedness: In order to arrive at the best solution that meets criteria within constraints, it is often Common necessary to make trade-offs. For example: • debate the effect of human activities as they relate to quality of life on Earth systems (global warming, land use, preservation of natural resources, pollution) STANDARD 7 Interdisciplinary Problem Solving Key Idea 1: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena. For example: • analyze the issues related to local energy needs and develop a viable energy generation plan for the community • investigate the political, economic, and environmental impact of global distribution and use of mineral resources and fossil fuels • consider environmental and social implications of various solutions to an environmental Earth resources problem 2.1w Sediments of inorganic and organic origin often accumulate in depositional environments. Sedimentary rocks form when sediments are compacted and/or cemented after burial or as the result of chemical precipitation from seawater. Major Understandings: 3.1a Minerals have physical properties determined by their chemical composition and crystal structure. • Minerals can be identified by well-defined physical and chemical properties, such as cleavage, fracture, color, density, hardness, streak, luster, crystal shape, and reaction with acid. •

				Chemical composition and physical properties determine how minerals are used by humans. 14 Earth Science PERFORMANCE INDICATOR 3.1 continued 3.1b Minerals are formed inorganically by the process of crystallization as a result of specific environmental conditions. These include: • cooling and solidification of magma • precipitation from water caused by such processes as evaporation, chemical reactions, and temperature changes •rearrangement of atoms in existing minerals subjected to conditions of high temperature and pressure. 3.1c Rocks are usually composed of one or more minerals. • Rocks are classified by their origin, mineral content, and texture. • Conditions that existed when a rock formed can be inferred from the rock's mineral content and texture. • The properties of rocks determine how they are used and also influence land usage by humans.
Weathering and Erosion **Water Cycle** **-**How can weathering affect people? -Will a cube weather faster than a sphere? Why? -Why is there no soil on other rocky planets like Mars and Venus? -How does erosion affect people's lives? -How can wind be damaging?	-Distinguish between the different types of weathering: physical and chemical. -Discuss the effects weathering has on the shape and size of sediments. How can studying sediments tell us about the conditions in an environment? Were the sediments exposed to wind erosion, stream erosion, glacial erosion? How do we know? What was the environment once like? -Discuss the impact erosion has on humans. Ex: Mudslides, beach erosion -Discuss the impact humans have on the rate of erosion. Ex: Is climate change causing a change in weather patterns? Are those weather patterns leading to an increase in beach erosion (from hurricanes)? What does an increase in beach erosion mean for people?	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow,	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4

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				finger lakes, and outwash plains. • Wave Action: Erosion and deposition cause changes in shoreline features, including beaches, sandbars, and barrier islands. Wave action rounds sediments as a result of abrasion. Waves approaching a shoreline move sand parallel to the shore within the zone of breaking waves. • Wind: Erosion of sediments by wind is most common in arid climates and along shorelines. Wind-generated features include dunes and sand-blasted bedrock. • Mass Movement: Earth materials move downslope under the influence of gravity. 2.1v Patterns of deposition result from a loss of energy within the transporting system and are influenced by the size, shape, and density of the transported particles. Sediment deposits may be sorted or unsorted. 2.1w Sediments of inorganic and organic origin often accumulate in depositional environments. Sedimentary rocks form when sediments are compacted and/or cemented after burial or as the result of chemical precipitation from seawater.
Earth's Interior and Tectonic Plates -What might be some reasons for developing the technology to drill into the Earth's interior? -How do the movements of the plates on Earth affect the biosphere (life on Earth)? -How can new oceanic crust continue to form when the surface of the Earth is finite? -What causes some areas to be more prone	● Annotate and Interpret p. 10 and 11 of the ESRT. ● Distinguish between the layers of Earth's interior and each of their associated properties. ● Examine the characteristics associated with the three different plate boundaries (convergent, divergent, and transform) by reading and annotating informational text. ● Locate plate boundaries using page 5 of the ESRT and consequently the areas that are prone to earthquakes and volcanic eruptions.	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to

to earthquake than others? -Why is Iceland at high risk for volcanic eruptions? -Would a magnetic reversal affect life on Earth? Explain. -What are the effects of earthquakes? -Should the government invest money in relocating people or creating earthquake-proof structures for those that live in earthquake prone areas?	● Conversely, students should be able to identify the areas that are least prone to earthquakes and volcanic eruptions. ● This will lead to students to be able to make informed decisions about where the most dangers lie. For example, why is NY less prone to earthquakes than California? ● Distinguish between island arc volcanoes/continental arc volcanoes and hot spot volcanoes. For example: Why is there a volcano in Yellowstone if it is not on a plate boundary? ● Define the "shadow zone" within the Earth. ● Compare and contrast seismic waves (P and S waves). ● Determine the distance to the epicenter of an earthquake by reading seismograms and interpreting page 11 of the ESRT.		● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● Rubrics for student reference ● Lab Assignments on Explore Learning Summative Assessments- ● Google Form assignments ● Google Question assignments ● Test Wizard assignments ● Reasoning, deduction, and annotating: Using informational text, which neighborhoods are more prone to earthquakes?	special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 2.1j Properties of Earth's internal structure (crust, mantle, inner core, and outer core) can be inferred from the analysis of the behavior of seismic waves (including velocity and refraction). • Analysis of seismic waves allows the determination of the location of earthquake epicenters, and the measurement of earthquake magnitude; this analysis leads to the inference that Earth's interior is composed of layers that differ in composition and states of matter. 2.1k The outward transfer of Earth's internal heat drives convective circulation in the mantle that moves the lithospheric plates comprising Earth's surface. 2.1l The lithosphere consists of separate plates that ride on the more fluid asthenosphere and move slowly in relationship to one another, creating convergent, divergent, and transform plate boundaries. These motions indicate Earth is a dynamic geologic system. • These plate boundaries are the sites of most earthquakes, volcanoes, and young mountain ranges. • Compared to continental crust, oceanic crust is thinner and denser. New ocean crust continues to form at mid-ocean ridges. • Earthquakes and volcanoes present geologic hazards

				to humans. Loss of property, personal injury, and loss of life can be reduced by effective emergency preparedness. 2.1m Many processes of the rock cycle are consequences of plate dynamics. These include the production of magma (and subsequent igneous rock formation and contact metamorphism) at both subduction and rifting regions, regional metamorphism within subduction zones, and the creation of major depositional basins through downwarping of the crust. 2.1n Many of Earth's surface features such as mid-ocean ridges/rifts, trenches/subduction zones/island arcs, mountain ranges (folded, faulted, and volcanic), hot spots, and the magnetic and age patterns in surface bedrock are a consequence of forces associated with plate motion and interaction. 2.1o Plate motions have resulted in global changes in geography, climate, and the patterns of organic evolution.
Geologic History and Landscapes -If I had a garbage can that was never touched, how might I know which garbage is the oldest? -What types of rocks would you expect to contain fossils? Explain. -How could you describe to your friend the time of an event you wanted them to	● Order a geologic sequence based on methods of relative dating - Law of Superposition and Law of Cross-Cutting Relationships. ● Interpret the geologic history of NYS using p. 8 and 9 of the ESRT. ● Determine the exact age of a rock using radioactive dating. ● Calculate the amount of a radioactive isotope remaining after a certain number of years.	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out

attend without telling them the actual time? -What is your favorite book or movie? How would you feel if several pages or a scene was missing from the middle?			● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● Rubrics for student reference ● Lab Assignments on Explore Learning Summative Assessments- ● Google Form assignments ● Google Question assignments ● Test Wizard assignments ● Creating your own geologic cross-section for peer evaluation.	experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 1.2h The evolution of life caused dramatic changes in the composition of Earth's atmosphere. Free oxygen did not form in the atmosphere until oxygen-producing organisms evolved. 1.2i The pattern of evolution of life-forms on Earth is at least partially preserved in the rock record. • Fossil evidence indicates that a wide variety of life-forms has existed in the past and that most of these forms have become extinct. • Human existence has been very brief compared to the expanse of geologic time. 1.2j Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate bedrock at various locations. • The characteristics of rocks indicate the processes by which they formed and the environments in which these processes took place. • Fossils preserved in rocks provide information about past environmental conditions. • Geologists have divided Earth's history into time units based upon the fossil record. • Age relationships among bodies of rocks can be determined using principles of original horizontality, superposition, inclusions, cross-cutting relationships, contact metamorphism, and unconformities. The presence of volcanic ash layers, index fossils, and meteoritic debris can provide

				additional information. • The regular rate of nuclear decay (half-life time period) of radioactive isotopes allows geologists to determine the absolute age of materials found in some rocks.
Weather and Climate -Should we continue to rebuild and/or live along hurricane prone areas? -How is climate change affecting hurricanes?	● Distinguish between cold, warm, occluded, and stationary fronts on a weather map. ● Interpret the impacts these fronts have on nearby areas. ● Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning. ● Distinguish between weather and climate. ● Understand how mountains, latitude, cloud cover affect the climate of an area.	● Explore Learning ● Jamboard ● Pear Deck ● Test Wizard ● EdPuzzle ● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	Formative Assessments - ● Thumbs/thumbs down on ZOOM ● Pear Deck assignments, including exit slips ● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● Rubrics for student reference ● Lab Assignments on Explore Learning Summative Assessments- ● Google Form assignments	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 2.1a Earth systems have internal and external sources of energy, both of which create heat. 2.1b The transfer of heat energy within the atmosphere, the hydrosphere, and Earth's interior results in the formation of regions of different

			• Google Question assignments • Test Wizard assignments	densities. These density differences result in motion. 2.1c Weather patterns become evident when weather variables are observed, measured, and recorded. These variables include air temperature, air pressure, moisture (relative humidity and dewpoint), precipitation (rain, snow, hail, sleet, etc.), wind speed and direction, and cloud cover. 2.1d Weather variables are measured using instruments such as thermometers, barometers, psychrometers, precipitation gauges, anemometers, and wind vanes. 2.1e Weather variables are interrelated. For example: • temperature and humidity affect air pressure and probability of precipitation • air pressure gradient controls wind velocity 2.1f Air temperature, dewpoint, cloud formation, and precipitation are affected by the expansion and contraction of air due to vertical atmospheric movement. 2.1g Weather variables can be represented in a variety of formats including radar and satellite images, weather maps (including station models, isobars, and fronts), atmospheric cross-sections, and computer models. 2.1h Atmospheric moisture, temperature and pressure distributions; jet streams, wind; air masses and frontal boundaries; and the movement of cyclonic systems and associated tornadoes, thunderstorms, and hurricanes occur in observable patterns. Loss of property, personal injury, and loss of life can be reduced by effective emergency preparedness.
Astronomy -Should we colonize Mars? What are the ethical considerations involved? -Should we mine for minerals on asteroids?	• Identify the phases of the moon, the effect of the moon and sun on the tides, and how the movement of the earth and moon create lunar and solar eclipses.	• Explore Learning • Jamboard • Pear Deck • Test Wizard • EdPuzzle	Formative Assessments - Formative Assessments - • Thumbs/thumbs down on ZOOM • Pear Deck assignments, including exit slips	**Common Core Learning Standards Addressed in this Unit:** CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

	● Distinguish between terrestrial and jovian planets. ● Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning. ● Read and annotate word problems, informational texts, and the Earth Science Reference Table (p. 15). ● Make informed decisions about mining for minerals in space and colonizing Mars.	● Screen Recordings using Screencast - o - matic ● Google forms, questions ● Earth Science Reference Table ● Key Terms posted for student reference on each topic	● Break-out rooms on ZOOM ● Questions posted on Jamboard; student responses through the use of sticky notes, writing on screen, or text box ● Peer assessment on Jamboard ● Use of color coded sticky notes on (Red = pink, no red available, yellow, and green) as assessment cards ● First to Five check ins and Good, OK, Bad Check In on Jamboard ● Rubrics for student reference ● Lab Assignments on Explore Learning Summative Assessments- ● Google Form assignments ● Google Question assignments ● Test Wizard assignments ● CER assignment - Mining for minerals on asteroids ● CER assignment - colonizing Mars	CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics. **NYS Curriculum Standards Addressed in this Unit:** 1.2a The universe is vast and estimated to be over ten billion years old. The current theory is that the universe was created from an explosion called the Big Bang. Evidence for this theory includes: • cosmic background radiation • a red-shift (the Doppler effect) in the light from very distant galaxies. 1.2b Stars form when gravity causes clouds of molecules to contract until nuclear fusion of light elements into heavier ones occurs. Fusion releases great amounts of energy over millions of years. • The stars differ from each other in size, temperature, and age. • Our Sun is a medium-sized star within a spiral galaxy of stars known as the Milky Way. Our galaxy contains billions of stars, and the universe contains billions of such galaxies. 1.2c Our solar system formed about five billion years ago from a giant cloud of gas and debris. Gravity caused

				Earth and the other planets to become layered according to density differences in their materials. • The characteristics of the planets of the solar system are affected by each planet's location in relationship to the Sun. • The terrestrial planets are small, rocky, and dense. The Jovian planets are large, gaseous, and of low density. 1.2d Asteroids, comets, and meteors are components of our solar system. • Impact events have been correlated with mass extinction and global climatic change. • Impact craters can be identified in Earth's crust.