

## OFA Science Blueprint

Teachers: Casterline & Riley

**SMART Goal:** By the end of the 2020-2021 school year, 77% of our students will be able to communicate and critically analyze scientific information or ideas in multiple formats through oral, graphical/diagrams, and written methods as measured by scoring a 3 or higher on a 4 point scale.

Unit Name: Earth Science Skills - (5 steps)		
Power Standards	Essential Skills	Connection to NYS Standards
<ul style="list-style-type: none"> <li>➤ I can draw inferences from observations. <b>(ST6: KI2)</b></li> <li>➤ I can calculate density by using the formula and express it with correct units. (<math>D=M/V</math>) <b>(ST1: KI1)</b></li> <li>➤ I can describe how temperature and pressure can affect the density of materials. <b>(ST4:KI2.1)</b></li> <li>➤ I can use collected data to create a graph. <b>(ST6: KI5)</b></li> <li>➤ I can interpret relationships between variables in a graph. <b>(ST6: KI5)</b></li> <li>➤ I can calculate the rate of change between variables using a formula and express it with the correct units. <b>(ST1: KI1)</b></li> </ul>	<p>2. Develop an argument or claim and support it with details and evidence</p> <p>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</p>	<ul style="list-style-type: none"> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST6: KI5: Patterns of Change:</b> Identifying patterns of change is necessary for making predictions about future behavior and conditions.</li> <li>➤ <b>ST4:KI2.1:</b> Use the concepts of density and heat energy to explain observations of weather patterns, seasonal changes, and the movements of Earth's plates.</li> </ul>
Core Vocabulary	Assessments	Resources
Observation Inference Density Direct Relationship Inverse Relationship Cyclic Change Variable	Ticket In/Out- Observation / Inference Check In- Density Ticket In/Out -Graphing Relationships Check In - Graphing / Rate of Change Quiz - Earth Science Skills	WordWall of Vocabulary Image Activity for Observation/Inferences Density CER Activity Bead Drop Graphing Activity Lab Skills Lab Graph Analysis Lab

**Unit Name: Mapping of the Earth and Landscape Unit**

Power Standards	Essential Skills	Connection to NYS Standards
<ul style="list-style-type: none"> <li>➤ I can determine the coordinates for any location on Earth’s surface. <b>(ST4: KI1.1c)</b></li> <li>➤ I can draw isolines by connecting points of equal value on a field map.</li> <li>➤ I can interpret a field map through the use of isolines. <b>(ST6: KI2) (ST6: KI3) (ST4: KI 2.1q) (ST1: KI3)</b></li> <li>➤ I can calculate gradient by interpreting isolines on a field map. <b>(ST4: KI 2.1q) (ST6: KI3) (ST1: KI1)</b></li> <li>➤ I can draw a profile by interpreting isolines on a field map. <b>(ST4: KI 2.1q) (ST6: KI2)</b></li> <li>➤ I can determine the landscape region of various places in NYS by using ESRT p. 2-3. <b>(ST4: KI: 2.1r) (ST6: KI2: Models)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li>   <li>3. Develop, use, and align common language in Vocabulary</li>   <li>6. Make inferences and predictions/Summarize</li>   <li>9. Apply background and content knowledge to skills/Demonstrate</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST4: KI1.1c:</b> 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.</li> <li>➤ <b>ST4: KI1.1d:</b> 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 day. Rotation provides a basis for our system of local time; meridians of longitude are the basis for time zones.</li> <li>➤ <b>ST4: KI 2.1q:</b> 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.</li> <li>➤ <b>ST1: KI3: Mathematical Analysis:</b> Critical thinking skills are used in the solution of mathematical problems.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> </ul>

		<ul style="list-style-type: none"> <li>➤ <b>ST6: KI3: Magnitude &amp; Scale:</b> The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.</li> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically.</li> </ul>
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Latitude Longitude Polaris Altitude Time Zone Meridian Rotation Contour Lines Isoline Topographic Map Gradient Profile	Ticket In - Latitude & Longitude Check In- Latitude,Longitude, Altitude of Polaris & Time Zones Ticket Out - Drawing Isolines Check In - Interpreting Isolines/Gradient Ticket In/ Out- Profiles Final Assessment - Mapping & Landscapes	Latitude & Longitude Practice Activities Shipwreck Activity - Latitude & Longitude Minutes Contour Mapping Lab Owego Topographic Map Isoline Lab

**Unit Name: Weathering of Earth's Surface**

Power Standards	Essential Skills	Connection to NYS Standards
<ul style="list-style-type: none"> <li>➤ I can identify the five characteristics of a mineral. <b>(ST4: KI 3.1b)</b></li> <li>➤ I can identify sedimentary rocks based on texture due to the environment of formation and using ESRT p. 7. <b>(ST4:KI3.1c) (ST6: KI2)</b></li> <li>➤ I can describe the difference between chemical and physical weathering. <b>(ST4.KI2.1s)</b></li> <li>➤ I can explain how weathering processes can affect rock types to produce landforms and features such as caves. <b>(ST4.KI2.1s)</b></li> <li>➤ I can explain how climate, particle size, and composition can affect the rate of weathering of rock material. <b>(ST4.KI2.1s) (ST1: KI1)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>3. Develop, use, and align common language in Vocabulary</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>5. Communicate clearly and effectively in reading, writing, speaking and listening/Collaborate</li> <li>7. Identify main idea, theme, key phrases and issues</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically</li> <li>➤ <b>ST4.KI2.1s:</b> Weathering is the physical and chemical breakdown of rocks at or near Earth's surface. Soils are the result of weathering and biological activity over long periods of time.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST4: KI: 1.2g</b> Earth has continuously been recycling water since the outgassing of water early in its history. This constant recirculation of water at and near Earth's surface is described by the hydrologic (water) cycle.</li> <li>➤ <b>ST4: KI: 2.1r</b> Climate variations, structure, and characteristics of bedrock influence the development of landscape features including mountains, plateaus, plains, valleys, ridges, escarpments, and stream drainage patterns.</li> <li>➤ <b>ST4: KI: 2.1t</b> Natural agents of erosion, generally driven by gravity,</li> </ul>

		remove, transport, and deposit weathered rock particles. Each agent of erosion produces distinctive changes in the material that it transports and creates characteristic surface features and landscapes. In certain erosional situations, loss of property, personal injury, and loss of life can be reduced by effective emergency preparedness.
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Weathering Surface Area Infiltration Transpiration Permeability Water Retention Gradient Horizontal Sorting	Erosion Biological Activity Runoff Porosity Capillarity Discharge Mass Movements Vertical Sorting	Check In- Weathering Quiz - Weathering Check In- Porosity & Permeability Part 1 Test - Weathering & Groundwater Ticket In /Out- Stream Velocity (ESRT p. 6) Check In - Water Velocity & Discharge Ticket In / Out - Erosion & Depositional Features Check In - Deposition Part 2 Test- Erosion & Deposition
		Planet Earth: Caves Water Cycle Diagram Porosity & Permeability CER Landscapes Day 1-3 Activities Landscapes Lab Stream Divides & Drainage Basins Activity Stream Beds Lab / Video Project Erosion/ Deposition Feature Picture Activity Glacial Movement CER Sand Dune Movement Activity Deposition Lab

<b>Unit Name: Earth's Water</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can label and define the parts of the Earth's water cycle. <b>(ST4: KI: 1.2g) (ST6: KI2: Models)</b></li> <li>➤ I can describe surface properties that influence the infiltration or runoff of water. <b>(ST4: KI: 1.2g)</b></li> <li>➤ I can describe how changes in water velocity or discharge can influence the erosion and deposition that can occur in a stream. <b>(ST4: KI: 2.1u)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>3. Develop, use, and align common language in Vocabulary</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>5. Communicate clearly and effectively in reading, writing, speaking and listening/Collaborate</li> <li>7. Identify main idea, theme, key phrases and issues</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST4: KI: 1.2g</b> Earth has continuously been recycling water since the outgassing of water early in its history. This constant recirculation of water at and near Earth's surface is described by the hydrologic (water) cycle.</li> <li>➤ <b>ST4: KI: 2.1u</b> The natural agents of erosion include: Water, Wind, Mass Movements, Wave Action, Glaciers</li> </ul>
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Weathering                      Erosion	Check In- Weathering	Planet Earth: Caves

<p>Surface Area Infiltration Transpiration Permeability Water Retention Gradient Horizontal Sorting</p>	<p>Biological Activity Runoff Porosity Capillarity Discharge Mass Movements Vertical Sorting</p>	<p>Quiz - Weathering Check In- Porosity &amp; Permeability Part 1 Test - Weathering &amp; Groundwater Ticket In /Out- Stream Velocity (ESRT p. 6) Check In - Water Velocity &amp; Discharge Ticket In / Out - Erosion &amp; Depositional Features Check In - Deposition Part 2 Test- Erosion &amp; Deposition</p>	<p>Water Cycle Diagram Porosity &amp; Permeability CER Landscapes Day 1-3 Activities Landscapes Lab Stream Divides &amp; Drainage Basins Activity Stream Beds Lab / Video Project Erosion/ Deposition Feature Picture Activity Glacial Movement CER Sand Dune Movement Activity Deposition Lab</p>
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<b>Unit Name: Erosion &amp; Deposition</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can identify the erosional and depositional features for all agents of erosion. <b>(ST4: KI: 2.1v) (ST4: KI: 2.1u)</b></li> <li>➤ I can predict the deposition of sediments based on size, shape, and density. <b>(ST4: KI: 2.1v)</b></li> <li>➤ I can draw a diagram depicting the sorting of sediments in a horizontal or vertical pile. <b>(ST4: KI: 2.1v)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>3. Develop, use, and align common language in Vocabulary</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>5. Communicate clearly and effectively in reading, writing, speaking and listening/Collaborate</li> <li>7. Identify main idea, theme, key phrases and issues</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST4:KI2.1:</b> Use the concepts of density and heat energy to explain observations of weather patterns, seasonal changes, and the movements of Earth’s plates.</li> <li>➤ <b>ST4: KI: 2.1u</b> The natural agents of erosion include: Water, Wind, Mass Movements, Wave Action, Glaciers</li> <li>➤ <b>ST4: KI: 2.1v</b> 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.</li> </ul>
<p><b>Core Vocabulary</b></p>	<p><b>Assessments</b></p>	<p><b>Resources</b></p>
<p>Weathering                      Erosion</p>	<p>Check In- Weathering</p>	<p>Planet Earth: Caves</p>



<p>Surface Area Infiltration Transpiration Permeability Water Retention Gradient Horizontal Sorting</p>	<p>Biological Activity Runoff Porosity Capillarity Discharge Mass Movements Vertical Sorting</p>	<p>Quiz - Weathering Check In- Porosity &amp; Permeability Part 1 Test - Weathering &amp; Groundwater Ticket In /Out- Stream Velocity (ESRT p. 6) Check In - Water Velocity &amp; Discharge Ticket In / Out - Erosion &amp; Depositional Features Check In - Deposition Part 2 Test- Erosion &amp; Deposition</p>	<p>Water Cycle Diagram Porosity &amp; Permeability CER Landscapes Day 1-3 Activities Landscapes Lab Stream Divides &amp; Drainage Basins Activity Stream Beds Lab / Video Project Erosion/ Deposition Feature Picture Activity Glacial Movement CER Sand Dune Movement Activity Deposition Lab</p>
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<b>Unit Name: Astronomy Part 1 &amp; 2</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can analyze wavelengths of electromagnetic energy to describe the doppler effect.</li> <li>➤ I can provide the evidence used to support the theory of how the universe formed- Big Bang Theory. <b>(ST6: KI2: Models) (ST4: KI1: 1.2a)</b></li> <li>➤ I can put the different structures of the universe in order from largest to smallest. <b>(ST6: KI2: Models)</b></li> <li>➤ I can explain how stars get their energy and the life cycle they go through. <b>(ST4: KI1: 1.2b)</b></li> <li>➤ I can explain the formation, age, and properties of our Sun and Solar System. <b>(ST4: KI1: 1.2c)</b></li> <li>➤ I can define and provide evidence of rotation and revolution. <b>(ST6: KI2: Models) (ST4: KI1: 1.1a) (ST4: KI1: 1.1e) (ST4: KI1: 1.1f) (ST4: KI1: 1.1g)</b></li> <li>➤ I can describe, calculate and compare the shape of the planet's orbits. <b>(ST6: KI2: Models) (ST4: KI1: 1.1b) (ST1: KI1: Mathematical Analysis)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>5. Communicate clearly and effectively in reading, writing, speaking and listening/Collaborate</li> <li>6. Make inferences and predictions/Summarize</li> <li>8. Evaluate and Synthesize multiple sources of information/Research</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST 1: KI1:</b> Engineering design is an iterative process involving modeling and optimization (finding and Design the best solution within given constraints); this process is used to develop technological solutions to problems within given constraints.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST6: KI3:</b> The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.</li> <li>➤ <b>ST4: KI1: 2.2b:</b> The transfer of heat energy within the atmosphere, the hydrosphere, and Earth's surface occurs as the result of radiation, convection, and conduction.</li> <li>➤ <b>ST4: KI1: 1.2a:</b> 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</li> </ul>
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<p>➤ I can explain how the moon's position in orbit around Earth affects phenomena such as tides, eclipses, and moon phases. <b>(ST6: KI2: Models)</b> <b>(ST4: KI1: 1.1a)</b> <b>(ST4: KI1: 1.1i)</b></p>		<p>radiation, a red-shift (the Doppler effect) in the light from very distant galaxies.</p> <ul style="list-style-type: none"> <li>➤ <b>ST6: KI5:</b> Identifying patterns of change is necessary for making predictions about future behavior and conditions. For example: graph and interpret the nature of cyclic change such as sunspots, tides, and atmospheric carbon dioxide.</li> <li>➤ <b>ST4: KI1: 1.2b:</b> 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.</li> <li>➤ <b>ST4: KI1: 1.2c:</b> 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.</li> <li>➤ <b>ST4: KI1: 1.2d:</b> Asteroids, comets, and meteors are components of our solar system.</li> <li>➤ <b>ST1: KI1: Mathematical Analysis:</b> Abstraction and symbolic representation are used to communicate mathematically.</li> <li>➤ <b>ST4: KI1: 1.1a:</b> Most objects in the solar system are in regular and predictable motion.</li> </ul>
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		<ul style="list-style-type: none"> <li>➤ <b>ST4: KI1: 1.1b</b> Nine planets move around the Sun in nearly circular orbits.</li> <li>➤ <b>ST4: KI1: 1.1e</b> The Foucault pendulum and the Coriolis effect provide evidence of Earth's rotation.</li> <li>➤ <b>ST4: KI1: 1.1f:</b> Earth's changing position with regard to the Sun and the moon has noticeable effects.</li> <li>➤ <b>ST4: KI1: 1.1g</b> Seasonal changes in the apparent positions of constellations provide evidence of Earth's revolution.</li> <li>➤ <b>ST4: KI1: 1.1a:</b> Most objects in the solar system are in regular and predictable motion.</li> <li>➤ <b>ST4: KI1: 1.1i:</b> Approximately 70 percent of Earth's surface is covered by a relatively thin layer of water, which responds to the gravitational attraction of the moon and the Sun with a daily cycle of high and low tides.</li> </ul>
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Conduction Convection	Ticket In /Out - Methods of Energy Transfer Ticket In /Out - Electromagnetic Spectrum	Heat Transfer Lab Wavestown Activity

Radiation Red Shift Cosmic Background Radiation Nuclear Fusion Galaxy Constellation Terrestrial Planet Jovian Planet Geocentric Heliocentric Celestial Object Rotation Revolution Perihelion Aphelion Ellipse Solar Eclipse Lunar Eclipse	Check In- Doppler Effect / Universe Formation Quiz - Universe Formation Ticket In/Out - H- R Diagram (ESRT p. 15) Check In - Stars Unit Test - Part 1 Astronomy Check In - Eccentricity of an ellipse Ticket In /Out - Earth's Motions Check In - Rotation /Revolution Ticket In / Out - Moon Phases Check In - Moon Phases, Eclipses, Tides Unit Test - Part 2 Astronomy	Electromagnetic Spectrum Activity H- R Diagram Lab Constellation Project /Go Sky Watch Nova- Pluto & Beyond Kepler's Law Lab Eccentricity Activity Moon Phase Lab
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<b>Unit Name: Meteorology</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can identify selected properties of the atmosphere using my ESRT p.14. <b>(ST6: KI2: Models)</b></li> <li>➤ I can measure the five weather variables using their instruments to describe current atmospheric conditions. <b>(ST6: KI2: Models) (ST4: KI2: 2.1c)( ST4: KI2: 2.1d)</b></li> <li>➤ I can use current atmosphere conditions to construct a station model. <b>(ST6: KI2: Models) (ST4: KI2: 2.1g)</b></li> <li>➤ I can explain the steps of cloud formation. <b>(ST4: KI2: 2.1e) ( ST4: KI2: 2.1f)</b></li> <li>➤ I can describe the moisture and temperature characteristics of air masses. <b>(ST4: KI2: 2.1h)</b></li> <li>➤ I can describe the weather associated with high and low pressure systems. <b>(ST6: KI2: Models) (ST4: KI2: 2.1e)</b></li> <li>➤ I can describe the weather associated with frontal boundaries. <b>(ST6: KI2: Models) (ST4: KI2: 2.1e) (ST4: KI2: 2.1g)</b></li>   <li>➤ I can forecast the weather using data from a synoptic weather map. <b>(ST2: Key Idea 1) (ST6:</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>5. Communicate clearly and effectively in reading, writing, speaking and listening/Collaborate</li> <li>6. Make inferences and predictions/Summarize</li> <li>8. Evaluate and Synthesize multiple sources of information/Research</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST4: KI2: 2.1c:</b> 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.</li> <li>➤ <b>ST4: KI2: 2.1d:</b> Weather variables are measured using instruments such as thermometers, barometers, psychrometers, precipitation gauges, anemometers, and wind vanes.</li> <li>➤ <b>ST4: KI2: 2.1e:</b> Weather variables are interrelated.</li> <li>➤ <b>ST4: KI2: 2.1g:</b> 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.</li> <li>➤ <b>ST4: KI2: 2.1f</b> Air temperature, dewpoint, cloud formation, and precipitation are affected by the expansion and contraction of air due to vertical atmospheric movement.</li> <li>➤ <b>ST4: KI2: 2.1h</b> Atmospheric moisture, temperature and pressure distributions;</li> </ul>
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<p><b>Key Idea 5) (ST6: KI2: Models) (ST4: KI2: 2.1e) (ST4: KI2: 2.1g) (ST4: KI2: 2.1h)</b></p>		<p>jet streams, wind; air masses and frontal boundaries; and the movement of cyclonic systems and associated tornadoes, thunderstorms, and hurricanes occur in observable patterns.</p> <ul style="list-style-type: none"> <li>➤ <b>ST2: Key Idea 1:</b> Information technology is used to retrieve, process, and communicate information as a tool to enhance learning.</li> <li>➤ <b>ST6: Key Idea 5:</b> Identifying patterns of change is necessary for making predictions about future behavior and conditions.</li> </ul>
<p><b>Core Vocabulary</b></p>	<p><b>Assessments</b></p>	<p><b>Resources</b></p>
<p>Atmosphere                      Barometer  Dew Point                        anemometer  Relative Humidity                psychrometer  Isobars                              Isotherms  Air Mass                            Condensation Nuclei  Pressure System                   Fronts  Synoptic Weather Map</p>	<p>Ticket In/Out- Atmosphere (ESRT p.14)  Check In- Weather Variables ,ESRT p.12-14  Quiz- Weather Variables &amp; Station Models  Check In - Clouds  Ticket In/Out - Air masses  Check In- Pressure &amp; Fronts  Quiz - Weather Forecasting  Unit Test</p>	<p>Isotherm /Isobar Lab  Station Model Practice  Station Model Lab  Relative Humidity &amp; Dew Point Lab  Cloud Height Lab  Synoptic Weather Map Lab  Weather Forecasting Project  Storms Activity</p>

<p><b>Unit Name: Climate &amp; Insolation</b></p>		
<p><b>Power Standards</b></p>	<p><b>Essential Skills</b></p>	<p><b>Connection to NYS Standards</b></p>

<ul style="list-style-type: none"> <li>➤ I can describe how climate factors affect the overall temperature and precipitation of an area. <b>(ST4: KI2: 2.2.c) (ST6: KI2: Models)</b></li> <li>➤ I can explain how natural and human influences affect the climate of an area. <b>(ST4: KI2: 2.2d) (ST6: KI2: Models)</b></li> <li>➤ I can explain the daily and yearly changes that affect the angle and intensity of insolation. <b>(ST4: KI1:1.1h) (ST6: KI2: Models)</b></li> <li>➤ I can draw the path of the sun at different times of the day and year. <b>(ST4: KI1:1.1h) (ST6: KI2: Models)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>6. Make inferences and predictions/Summarize</li> <li>8. Evaluate and Synthesize multiple sources of information/Research</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> </ol>	<p><b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</p> <p><b>ST4: KI2: 2.2.b:</b> The transfer of heat energy within the atmosphere, the hydrosphere, and Earth’s surface occurs as a result of radiation, convection, and conduction. • Heating of Earth’s surface and atmosphere by the Sun drives convection within the atmosphere and oceans, producing winds and ocean currents.</p> <p><b>ST4: KI2: 2.2.c:</b> A location’s climate is influenced by latitude, proximity to large bodies of water, ocean currents, prevailing winds, vegetative cover, elevation, and mountain ranges.</p> <p><b>ST4: KI2: 2.2d:</b> Temperature and precipitation patterns are altered by: natural events such as El Niño and volcanic eruptions human influences including deforestation, urbanization, and the production of greenhouse gases such as carbon dioxide and methane.</p> <p><b>ST4: KI1:1.1h:</b> The Sun’s apparent path through the sky varies with latitude and season.</p>
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Orographic Effect	Ticket In /Out- ESRT p. 4 & 14	Driest Place on Earth Video



Windward Leeward Specific Heat El Niño La Niña Greenhouse gases Insolation Vernal Equinox Autumnal Equinox Summer Solstice Winter Solstice	Check In - 5 Factors of Climate (Imaginary Continent) Quiz - Climate Ticket In/Out- Daily /Yearly Changes of Insolation Check In- Seasonal Changes (orbital diagram) Quiz - Insolation Unit Test - Climate & Insolation	Climate Change CER Climograph Activity Imaginary Continent Activity Seasons Lab Angle of Insolation Activity Paths of the Sun Drawing Activity
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<b>Unit Name: Plate Tectonics</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can read ESRT p. 10 to determine the Earth’s interior temperature, pressure and density at different depths. <b>(ST6: KI2: Models) (ST6:KI3) (ST6:KI5) (ST4: KI2: 2.1j)</b></li> <li>➤ I can compare and contrast the two types of crusts. <b>(ST4: KI2: 2.1j)</b></li> <li>➤ I can provide evidence for the theory of continental drift and seafloor spreading to help support the theory of plate tectonics. <b>(ST6: KI2: Models) (ST4: KI2.1k)</b></li> <li>➤ I can describe the features and plate movement at each boundary labeled on ESRT p. 5. <b>(ST6: KI2: Models) (ST4: KI2: 2.1n)</b></li> <li>➤ I can identify igneous rocks based on texture due to the environment of formation and using ESRT p. 6. <b>(ST4:KI3.1c) (ST6: KI2)</b></li> <li>➤ I can identify metamorphic rocks based on texture due to the environment of formation and using ESRT p. 7. <b>(ST4:KI3.1c) (ST6: KI2)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>6. Make inferences and predictions/Summarize</li> <li>8. Evaluate and Synthesize multiple sources of information/Research</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST6:KI3: Magnitude and Scale:</b> The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.</li> <li>➤ <b>ST4: KI2: 2.1j:</b> 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).</li> <li>➤ <b>ST4: KI2.1k:</b> The outward transfer of Earth’s internal heat drives convective circulation in the mantle that moves the lithospheric plates comprising Earth’s surface.</li> <li>➤ <b>ST6:KI5: Patterns of Change:</b> Identifying patterns of change is necessary for making predictions about future behavior and conditions.</li> <li>➤ <b>ST4: KI2: 2.1n:</b> Many of Earth’s surface features such as mid-ocean ridges/rifts, trenches/subduction</li> </ul>
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<ul style="list-style-type: none"> <li>➤ I can describe the driving force behind plate movement. (ST4: KI2: 2.1l)</li> <li>➤ I can predict plate movement based on extinct seamounts formed from mantle hot spots. (ST4: KI2: 2.1n; ST6:KI5: Patterns of Change)</li> <li>➤ I can determine the epicenter of an earthquake using triangulation. (ST4: KI2: 2.1n)</li> <li>➤ I can analyze seismic waves to predict and explain shadow zone locations for an earthquake.</li> <li>➤ I can use the earthquake magnitude scales to determine epicenter and the human impact. (ST4: KI2: 2.1l)</li> </ul>		<p>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.</p> <p>➤ <b>ST4: KI2: 2.1l:</b> 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. Earthquakes and volcanoes present geologic hazards to humans. Loss of property, personal injury, and loss of life can be reduced by effective emergency preparedness.</p>
Core Vocabulary	Assessments	Resources
<p>Moho Pangaea</p>	<p>Ticket In /Out- ESRT p. 10</p>	<p>Earth's Interior Activity Continental Drift Activity</p>

<p>Mid-Ocean Ridge Trench Subduction Collision Rift Hot Spot Fault Epicenter Travel Time Focus Time of Origin Seismic Wave P-Wave S-Wave Triangulation Shadow Zone Mercalli Scale Richter Scale</p>	<p>Check In - Continental Drift &amp; Seafloor Spreading Ticket In / Out - ESRT p. 5 Quiz - Plate Tectonics # 1 Ticket In / Out - ESRT p. 11 Check In - Earthquakes / Seismic Waves /Epicenters Quiz - Earthquakes &amp; Epicenters Ticket In / Out- Shadow Zones Unit Test - Plate Tectonics</p>	<p>Seafloor Spreading Activity Lithospheric Plate Activity Plate Boundary Activity / Map Interpretation Finding Epicenter Lab Locating an Epicenter Lab Mercalli Scale Activity</p>
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<b>Unit Name: Geologic History</b>		
<b>Power Standards</b>	<b>Essential Skills</b>	<b>Connection to NYS Standards</b>

<ul style="list-style-type: none"> <li>➤ I can develop an understanding of the model of Earth’s geologic time. <b>(ST6: KI2: Models; ST4: KI1: 1.2h)</b></li> <li>➤ I can analyze Earth’s geologic time scale to compare the length of time of various organisms existence and geologic events to one another. <b>(ST4: KI1:1.2i; ST6: KI3)</b></li> <li>➤ I can place rock strata or geologic events in order from oldest to youngest. <b>(ST4:KI1:1.2j; ST6: KI2: Models)</b></li> <li>➤ I can correlate rock strata to determine the relative age of fossils or events over a small geographic area. <b>(ST4:KI1:1.2j; ST6: KI2: Models)</b></li> <li>➤ I can calculate the absolute age of organism or rock by using the half-life values of radioactive isotopes. <b>(ST4:KI1:1.2j)</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Analyze text or data strategically for: understanding, connections, structures, essential information, and annotation</li> <li>2. Develop an argument or claim and support it with details and evidence</li> <li>3. Develop, use, and align common language in Vocabulary</li> <li>4. Organize information/See relationships, patterns/Use Models of Organization/Plan</li> <li>6. Make inferences and predictions/Summarize</li> <li>8. Evaluate and Synthesize multiple sources of information/Research</li> <li>9. Apply background and content knowledge to skills/Demonstrate</li> <li>10. Think critically and creatively/Strategize/Problem Solve (multi-step)</li> </ol>	<ul style="list-style-type: none"> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.</li> <li>➤ <b>ST6: KI3: Magnitude &amp; Scale:</b>The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems. For Example: develop a scale model of units of geologic time</li> <li>➤ <b>ST4: KI1: 1.2h:</b> 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.</li> <li>➤ <b>ST4: KI1:1.2i:</b> 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.</li> <li>➤ <b>ST6: KI2: Models:</b> Models are simplified representations of objects,</li> </ul>
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		<p>structures, or systems used in analysis, explanation, interpretation, or design.</p> <p>➤ <b>ST4:KI1:1.2j:</b> Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate bedrock at various locations.</p> <ul style="list-style-type: none"><li>-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.</li><li>- 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.</li></ul> <p>➤ <b>ST4:KI1:1.2j</b> Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate</p>
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		bedrock at various locations. 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.
<b>Core Vocabulary</b>	<b>Assessments</b>	<b>Resources</b>
Period Eon Epoch Era Index Fossils Correlation Unconformities Strata Outcrop Principle of Original Horizontality Principle of Cross Cutting Relationships Principle of Superposition Radioactive Isotopes Half-Life	Ticket In / Out - ESRT p. 8-9 Check In - Geologic Time Scale Ticket In / Out - Relative Age Dating Quiz - Geologic Time and Relative Age Dating Check In - Relative & Absolute Age Dating Unit Test Geologic History	Geologic Time Scale Lab Rock Correlation Lab Geologic Profiles