

**SUBJECT AREA: Earth Science/Goodseit**

**GRADE LEVEL: 9-12**

**SEMESTER: Fall and Spring**

UNIT TITLE/ESSENTIAL QUESTION(S)	UNIT SKILLS AND CONTENT	CORE TEXTS AND MATERIALS	FORMATIVE & SUMMATIVE ASSESSMENTS	CSRE ALIGNMENT	COMMON CORE/CONTENT STANDARDS
<p><b>Unit 1</b> Measurements</p> <ul style="list-style-type: none"> <li>How does density play a role in the environment?</li> </ul>	<p>RGHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Explain the parts of a diagram, reference table, or equation.</li> <li>Create and defend a scientific claim using evidence from outside sources.</li> <li>Explain the central idea or conclusion of a text.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>Identify the parts of a triple beam balance and graduated cylinder in a virtual laboratory setting using Explore Learning.</li> <li>Make accurate mass and volume measurements in an online laboratory setting using Explore Learning.</li> <li>Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning.</li> <li>Relate previous scientific terms to density.</li> <li>Make density calculations with appropriate units.</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li><a href="#">What do we use petroleum (oil) for?</a></li> <li><a href="#">What happens when oil spills? (oil and density)</a></li> <li><a href="#">Oil Spills</a></li> <li><a href="#">2010 BP Oil Spill: Worst Environmental Disaster in U.S. History</a></li> <li><a href="#">8 Advances in Oil Spill Science in the Decade Since Deepwater Horizon</a></li> <li><a href="#">Ten years later, BP oil spill continues to harm wildlife—especially dolphins</a></li> <li><a href="#">Pros and Cons of Offshore Drilling</a></li> <li><a href="#">Can the world live without oil?</a></li> <li><a href="#">Profiling the biggest offshore oil spills in the petroleum industry</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li><a href="#">EdPuzzle videos</a> for formative assessment</li> <li><a href="#">Earth Science Reference Table</a></li> <li>Key Terms <ul style="list-style-type: none"> <li><a href="#">Measurements</a></li> </ul> </li> <li>Explore Learning Lab Assignments <ul style="list-style-type: none"> <li><a href="#">Measuring Mass</a></li> </ul> </li> </ul>	<p>Formative Assessments -</p> <ul style="list-style-type: none"> <li>Thumbs up/thumbs during class</li> <li>Fist to five questioning</li> <li>Short assessments using Google docs allowing for real-time responses and feedback</li> <li>Exit slips</li> <li>Facilitator-led groups during class</li> <li>Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>Use of color coded sticky notes or boxes on handout (possibly on Jamboard, (Red = pink, no red available, yellow, and green) as assessment cards</li> </ul> </li> <li>Edpuzzle assessments</li> <li>Lab Assignments on Explore Learning and/or in class</li> <li>Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments-</p>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> <li>Connect in-school learning with the world outside the classroom.</li> <li>Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b> 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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b> 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 criteria within constraints, it is often Common necessary to make trade-offs.</p> <p><b>NGSS Standards Addressed in this Unit:</b> HS-ETS1-3. Constructing Explanations and Designing Solutions</p>

	<ul style="list-style-type: none"> <li>Think critically as to how density relates to real life situations.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Measuring Volume</a></li> <li><a href="#">Measuring Density</a></li> </ul> <p>New Visions Resources</p> <ul style="list-style-type: none"> <li><a href="#">Gas Laws' simulator</a></li> <li><a href="#">States of Matter Simulator</a></li> </ul>	<ul style="list-style-type: none"> <li>Advocacy brochure: Explain whether the benefits of oil outweigh the environmental risks associated with it? <ul style="list-style-type: none"> <li>Students will write a claim advocating their position as an environmentalist or oil company representative using evidence and reasoning from the provided resources. Students will present their argument to government officials deciding whether or not to open new coastal waters to offshore drilling. Environmentalists should consider realistic ways to reduce oil amounts in their argument. Oil company representatives should consider realistic consequences of offshore oil drilling.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>ETS1.B: Developing Possible Solutions HS-ESS2-7. Engaging in Argument from Evidence</li> </ul>
<p><b>Unit 2</b></p> <p>Measuring Earth (Latitude/Longitude)</p> <ul style="list-style-type: none"> <li>Why should we learn about</li> </ul>	<p>RCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Explain the parts of a diagram, reference table, or equation.</li> <li>Relate two or more key scientific terms, symbols, or scientific phrases</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li><a href="#">GPS Benefits</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li><a href="#">EdPuzzle videos</a> for formative assessment</li> <li><a href="#">Earth Science Reference Table</a></li> </ul>	<p>Formative Assessments -</p> <ul style="list-style-type: none"> <li>Thumbs up/thumbs down during class</li> <li>Fist to five questioning</li> <li>Short assessments using Google docs allowing for real-time responses and feedback</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p>

<p>latitude and longitude?</p>	<ul style="list-style-type: none"> <li>● Explain the central idea or conclusion of a text.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>● Consider the reasons as to why some think the Earth is flat.</li> <li>● Plot latitude and longitude coordinates on a map.</li> <li>● Interpret maps to determine the compass direction the coordinates are in.</li> <li>● Use the North star, Polaris, to determine latitude.</li> <li>● Find the latitude and longitude of cities in their own state, New York, using page 3 of the ESRT.</li> <li>● Use longitude to determine the time in cities around the world.</li> <li>● Follow rubrics and checklists as a way to self-assess progress.</li> </ul>	<ul style="list-style-type: none"> <li>● Key Terms <ul style="list-style-type: none"> <li>○ <a href="#">Measuring Earth</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Exit slips</li> <li>● Facilitator-led groups during class</li> <li>● Collaborative assignments with peer assessment</li> <li>● Use of assessment cards (Red, yellow, and green)</li> <li>● Edpuzzle assessments</li> <li>● Lab Assignments on Explore Learning and/or in class</li> <li>● Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments-</p> <ul style="list-style-type: none"> <li>● <a href="#">Test Wizard</a></li> <li>● Google Quizzes/Questions</li> <li>● Design a new application for GPS. <ul style="list-style-type: none"> <li>○ Students will create a problem that GPS can solve. They will brainstorm challenges associated with their application and how realistic the application might be.</li> </ul> </li> </ul>	<p>different perspectives, experiences, strengths, needs, and opinions.</p> <ul style="list-style-type: none"> <li>● Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> <li>● Connect in-school learning with the world outside the classroom.</li> <li>● Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>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.</p> <p><b>NGSS Standards Addressed in this Unit:</b></p> <ul style="list-style-type: none"> <li>● HS-ETS1-3. Constructing Explanations and Designing Solutions <ul style="list-style-type: none"> <li>○ ETS1.B: Developing Possible Solutions</li> </ul> </li> <li>● HS-ETS1-1. Asking Questions and Defining Problems</li> </ul>
<p><b>Unit 3</b></p> <p>Topography</p> <ul style="list-style-type: none"> <li>● How can an understanding of topography save lives?</li> </ul>	<p>RCCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● Explain the parts of a diagram, reference table, or equation.</li> <li>● Relate two or more key scientific terms, symbols, or scientific phrases</li> <li>● Explain the central idea or conclusion of a text.</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li>● <a href="#">Rebuild by Design</a></li> <li>● <a href="#">Lower Manhattan Coastal Resiliency Project</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li>● <a href="#">EdPuzzle videos</a> for formative assessment</li> <li>● <a href="#">Earth Science Reference Table</a></li> <li>● Key Terms <ul style="list-style-type: none"> <li>○ <a href="#">Topographic Maps</a></li> </ul> </li> </ul>	<p>Formative Assessments -</p> <ul style="list-style-type: none"> <li>● Thumbs up/thumbs during class</li> <li>● Fist to five questioning</li> <li>● Short assessments using Google docs allowing for real-time responses and feedback</li> <li>● Exit slips</li> <li>● Facilitator-led groups during class</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>● Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly different perspectives, experiences,</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p> <p>CCSS.ELA-LITERACY.RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of</p>

	<p>Content Skills:</p> <ul style="list-style-type: none"> <li>Analyze and interpret topographic maps to express in words, the shape of the land (flat, mountainous, valley), slope of the land, direction of river flow, and the relative speed of that river, possible elevations of a mountain or hill top and of a depression, draw contour lines, and calculate the gradient of the land to determine how quickly the slope of the land changes over a given distance.</li> <li>Create topographic profiles to better understand the topography of the land..</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Explore Learning Lab Assignments <ul style="list-style-type: none"> <li><a href="#">Reading a Topographic Map</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>Use of assessment cards (red, yellow, and green)</li> </ul> </li> <li>Edpuzzle assessments</li> <li>Lab Assignments on Explore Learning and/or in class</li> <li>Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments-</p> <ul style="list-style-type: none"> <li>“Prove Me Wrong” Assignment</li> <li>Students will work collaboratively as a team for <b>Rebuild by Design</b> that is working on the <b>Lower Manhattan Coastal Resiliency (LMCR) Project</b>, a flood-proofing and park-building measure that extends from the Lower East Side up to the north of Battery Park City. The area was battered during Hurricane Sandy. Students will analyze the topography of lower Manhattan to determine its relationship with flooding. Students will present ideas to the mayor’s office on the innovations that could be done to decrease the amount of flooding in the</li> </ul>	<p>strengths, needs, and opinions.</p> <ul style="list-style-type: none"> <li>Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> <li>Connect in-school learning with the world outside the classroom.</li> <li>Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p>a complex process, phenomenon, or concept; provide an accurate summary of 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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b>  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.</p> <p><b>NGSS Standards Addressed in this Unit:</b>  HS-ETS1-3. Constructing Explanations and Designing Solutions</p> <ul style="list-style-type: none"> <li>ETS1.B: Developing Possible Solutions</li> <li>HS-ESS1-5. Engaging in Argument from Evidence</li> </ul>
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			<p>event of another hurricane? (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 well as make them aware of projects going on in the city they live in).</p>		
<p><b>Unit 4</b></p> <p><b>Rocks and Minerals</b></p> <ul style="list-style-type: none"> <li>Is the mining of rare Earth minerals worth the cost?</li> </ul>	<p>RCCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Explain the parts of a diagram, reference table, or equation.</li> <li>Relate two or more key scientific terms, symbols, or scientific phrases</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>Identify how minerals form.</li> <li>Define the physical properties of minerals.</li> <li>Identify what makes each mineral have its own physical properties.</li> <li>Annotate, analyze, and interpret p. 16 of the ESRT "Properties of Common Minerals".</li> <li>Identify the conditions needed to form each of the rocks types and their interconnectedness.</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li><a href="#">REE - Rare Earth Elements and their Uses</a></li> <li><a href="#">China Wrestles with the Toxic Aftermath of Rare Earth Mining</a></li> <li><a href="#">How Rare-Earth Mining Has Devastated China's Environment</a></li> <li><a href="#">Forensic Geology and the Murder-case of Aldo Moro</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li><a href="#">Earth Science Reference Table</a></li> <li>Key Terms <ul style="list-style-type: none"> <li><a href="#">Mineral Characteristics</a></li> <li><a href="#">Mineral Properties</a></li> </ul> </li> <li>Explore Learning Lab Assignments <ul style="list-style-type: none"> <li><a href="#">Mineral Properties</a></li> <li><a href="#">Rock Classification</a></li> <li><a href="#">Rock Cycle</a></li> </ul> </li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>Thumbs up/thumbs during class</li> <li>Fist to five questioning</li> <li>Short assessments using Google docs allowing for real-time responses and feedback</li> <li>Exit slips</li> <li>Facilitator-led groups during class</li> <li>Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>Use of color coded sticky notes or boxes on handout (possibly on Jamboard, (Red = pink, no red available, yellow, and green) as assessment cards</li> </ul> </li> <li>Edpuzzle assessments</li> <li>Lab Assignments on Explore Learning and/or in class</li> <li>Google Quizzes, Questions, Docs</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly different perspectives, experiences, strengths, needs, and opinions.</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p> <p>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.</p> <p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>Major Understandings:</p> <p>3.1a Minerals have physical properties determined by their</p>

			<p>Summative Assessments:</p> <ul style="list-style-type: none"> <li>• Google Quizzes/Questions</li> <li>• Students will create a crime scene leaving geologic evidence for their peers to solve.</li> <li>• Students will advocate their claim to the government on whether money should be spent to clean up China's environment using evidence and reasoning.</li> </ul>		<p>chemical composition and crystal structure.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Chemical composition and physical properties determine how minerals are used by humans.</li> </ul> <p>3.1b Minerals are formed inorganically by the process of crystallization as a result of specific environmental conditions. These include:</p> <ul style="list-style-type: none"> <li>• cooling and solidification of magma</li> <li>• precipitation from water caused by such processes as evaporation, chemical reactions, and temperature changes</li> <li>• rearrangement of atoms in existing minerals subjected to conditions of high temperature and pressure.</li> </ul> <p>3.1c Rocks are usually composed of one or more minerals.</p> <ul style="list-style-type: none"> <li>• Rocks are classified by their origin, mineral content, and texture.</li> <li>• Conditions that existed when a rock formed can be inferred from the rock's mineral content and texture.</li> <li>• The properties of rocks determine how they are used and also influence land usage by humans.</li> </ul> <p><b>NGSS Standards Addressed in this Unit:</b></p>
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					<p>HS-ESS2-1. Developing and Using Models  HS-ESS1-5. Engaging in Argument from Evidence</p>
<p><b>Unit 5</b></p> <p>Weathering and Erosion, Water Cycle</p> <p>Why should erosion matter?</p> <ul style="list-style-type: none"> <li>How are people affecting the rate of erosion?</li> <li>What effects does an increase in the rate of erosion have on the environment and people? (To consider: Is climate change causing a change in weather? How could a change in weather relate to erosion?)</li> </ul>	<p>RCCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Explain the parts of a diagram, reference table, or equation.</li> <li>Create and defend a scientific claim using evidence from outside sources.</li> <li>Explain the central idea or conclusion of a text.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>Distinguish between the different types of weathering: physical and chemical.</li> <li>Discuss the effects weathering has on the shape and size of sediments. How can studying sediments tell us about the environment? (Were the sediments exposed to wind erosion, stream erosion, glacial erosion? How do we know? What was the environment once like?)</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li><a href="#">Humans and Erosion</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li><a href="#">EdPuzzle videos</a> for formative assessment</li> <li><a href="#">Earth Science Reference Table</a></li> <li>Key Terms</li> <li>Explore Learning Lab Assignments <ul style="list-style-type: none"> <li><a href="#">Weathering</a></li> <li><a href="#">Erosion Rates</a></li> <li><a href="#">River Erosion</a></li> <li><a href="#">Porosity</a></li> </ul> </li> </ul> <p>New Visions Resources</p> <ul style="list-style-type: none"> <li>New Visions - What's Changing Earth's Surface Lab</li> <li>Patterns of Stream Erosion and Deposition Lab</li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>Thumbs up/thumbs during class</li> <li>Fist to five questioning</li> <li>Short assessments using Google docs allowing for real-time responses and feedback</li> <li>Exit slips</li> <li>Facilitator-led groups during class</li> <li>Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>Use of color coded sticky notes or boxes on handout (possibly on Jamboard, (Red = pink, no red available, yellow, and green) as assessment cards</li> </ul> </li> <li>Edpuzzle assessments</li> <li>Lab Assignments on Explore Learning and/or in class</li> <li>Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments:</p> <ul style="list-style-type: none"> <li><a href="#">Test Wizard</a></li> <li>Google Quizzes/Questions</li> <li>Students will create a plan of action explaining what we as</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>Connect in-school learning with the world outside the classroom.</li> <li>Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p> <p>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.</p> <p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>2.1s 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.</p> <p>2.1t Natural agents of erosion, generally driven by gravity, remove, transport, and deposit weathered rock particles. Each</p>

			<p>a society can do to slow the rate of erosion.</p> <ul style="list-style-type: none"> <li>○ Students will work collaboratively to create a presentation of their choice advocating their plan.</li> <li>○ Explain why it is important to slow the rate of erosion.</li> <li>○ What initiatives/plans can be set forth to slow the rate of erosion?</li> </ul>		<p>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.</p> <p>2.1u The natural agents of erosion include:</p> <ul style="list-style-type: none"> <li>•Streams</li> <li>•Glaciers</li> <li>•Wave Action</li> <li>•Wind</li> <li>•Mass Movement</li> </ul> <p>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.</p> <p><b>NGSS Standards Addressed in this Unit:</b>  HS-ETS1-3. Constructing Explanations and Designing Solutions</p> <ul style="list-style-type: none"> <li>● ETS1.B: Developing Possible Solutions</li> </ul>
<p><b>Unit 6</b></p> <p>Earth's Interior and Tectonic Plates</p> <p>How can we design an earthquake proof city?</p>	<p>RCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● Explain the parts of a diagram, reference table, or equation.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>● Annotate and Interpret p. 10 and 11 of the ESRT.</li> <li>● Distinguish between the layers of Earth's interior</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li>● <a href="#">Planning for an Earthquake</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li>● <a href="#">EdPuzzle videos</a> for formative assessment</li> <li>● <a href="#">Earth Science Reference Table</a></li> <li>● Key Terms</li> <li>● Explore Learning Lab Assignments <ul style="list-style-type: none"> <li>○ <a href="#">Building Pangaea</a></li> <li>○ <a href="#">Plate Tectonics</a></li> </ul> </li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>● Thumbs up/thumbs down during class</li> <li>● Fist to five questioning</li> <li>● Short assessments using Google docs allowing for real-time responses and feedback</li> <li>● Exit slips</li> <li>● Facilitator-led groups during class</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>● Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly different perspectives, experiences,</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>.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.</p> <p>CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and</p>



	<p>and each of their associated properties.</p> <ul style="list-style-type: none"> <li>● Examine the characteristics associated with the three different plate boundaries (convergent, divergent, and transform).</li> <li>● Locate plate boundaries using page 5 of the ESRT and consequently the areas that are and are not prone to earthquakes and volcanic eruptions.</li> <li>● Distinguish between island arc volcanoes/continental arc volcanoes and hot spot volcanoes.</li> <li>● Define the “shadow zone” within the Earth.</li> <li>● Compare and contrast seismic waves (P and S waves).</li> <li>● Determine the distance to the epicenter of an earthquake by reading seismograms and interpreting page 11 of the ESRT.</li> </ul>	<p>New Visions Resources</p> <ul style="list-style-type: none"> <li>● Generate, sort, solve strategy</li> <li>● Inferred Properties of Earth's Interior: Three Level Guide to Diagram Interpretation</li> </ul>	<ul style="list-style-type: none"> <li>● Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>○ Use of color coded sticky notes or boxes on handout (possibly on Jamboard, (Red = pink, no red available, yellow, and green) as assessment cards</li> </ul> </li> <li>● Edpuzzle assessments</li> <li>● Lab Assignments on Explore Learning and/or in class</li> <li>● Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments:</p> <ul style="list-style-type: none"> <li>● <a href="#">Test Wizard</a></li> <li>● Google Quizzes/Questions</li> <li>● Imagine that your group is a panel of scientists and engineers in a U.S. city that is located 20 miles from a major fault. The city government has appointed your group to write a proposal recommending how the city can best prepare itself for an earthquake. (The last major earthquake occurred 50 years ago.) Based on the reading, your group needs to figure out which parts of the city</li> </ul>	<p>strengths, needs, and opinions.</p> <ul style="list-style-type: none"> <li>● Connect in-school learning with the world outside the classroom.</li> <li>● Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p>phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>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).</p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p>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.</p> <p>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.</p> <p>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</p>
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			<p>should be "priority areas" and what should be done to protect each section of the city from major damage.</p>		<p>subduction and rifting regions, regional metamorphism within subduction zones, and the creation of major depositional basins through downwarping of the crust.</p> <p>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.</p> <p>2.1o Plate motions have resulted in global changes in geography, climate, and the patterns of organic evolution.</p> <p><b>NGSS Standards Addressed in this Unit:</b> HS-ESS2-2. Analyzing and Interpreting Data</p>
<p><b>Unit 7</b></p> <p>Geologic History and Landscapes</p> <p>How do rocks tell us the history of the past?</p>	<p>RCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● Explain the parts of a diagram, reference table, or equation.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>● Order a geologic sequence based on methods of relative dating - Law of Superposition and Law of Cross-Cutting Relationships.</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li>● <a href="#">Anthropocene</a></li> <li>● <a href="#">Geology of the Northeastern United States</a></li> <li>● <a href="#">Fundamental Geologic Principles</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li>● <a href="#">EdPuzzle videos</a> for formative assessment</li> <li>● <a href="#">Earth Science Reference Table</a></li> <li>● Key Terms</li> <li>● Explore Learning Lab Assignments <ul style="list-style-type: none"> <li>○ <a href="#">Half Life</a></li> </ul> </li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>● Thumbs up/thumbs during class</li> <li>● Fist to five questioning</li> <li>● Short assessments using Google docs allowing for real-time responses and feedback</li> <li>● Exit slips</li> <li>● Facilitator-led groups during class</li> <li>● Collaborative assignments with peer assessment <ul style="list-style-type: none"> <li>○ Use of color coded sticky notes or</li> </ul> </li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>● Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly different perspectives, experiences, strengths, needs, and opinions.</li> <li>● Advocate for varied ways of learning (i.e. project-based</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p> <p>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.</p> <p>CCSS.ELA-LITERACY.RST.9-10.3</p>

	<ul style="list-style-type: none"> <li>● Interpret the geologic history of NYS using p. 8 and 9 of the ESRT.</li> <li>● Determine the exact age of a rock using radioactive dating.</li> <li>● Calculate the amount of a radioactive isotope remaining after a certain number of years.</li> </ul>	<p>New Visions Resources</p> <ul style="list-style-type: none"> <li>● Performance Task: Does this fossil exist in NYS?</li> </ul>	<p>boxes on handout (possibly on Jamboard, (Red = pink, no red available, yellow, and green) as assessment cards</p> <ul style="list-style-type: none"> <li>● Edpuzzle assessments</li> <li>● Lab Assignments on Explore Learning and/or in class</li> <li>● Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments:</p> <ul style="list-style-type: none"> <li>● <a href="#">Test Wizard</a></li> <li>● Google Quizzes/Questions</li> <li>● Students will create their own geologic cross-section for peer evaluation. <ul style="list-style-type: none"> <li>○ Students will utilize the geologic principles of superposition, cross cutting relationships, and correlation when creating and evaluating the cross sections.</li> </ul> </li> </ul>	<p>learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</p> <ul style="list-style-type: none"> <li>● Connect in-school learning with the world outside the classroom.</li> <li>● Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>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</p>
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					<p>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.</p> <p><b>NGSS Standards Addressed in this Unit:</b> HS-ESS2-2. Analyzing and Interpreting Data</p>
<p><b>Unit 8</b></p> <p>Weather and Climate</p> <p>How do we create the environment we want to live in?</p>	<p>RCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain the parts of a diagram, reference table, or equation.</li> <li>• Create and defend a scientific claim using evidence from outside sources.</li> <li>• Explain the central idea or conclusion of a text.</li> </ul> <p>Content Skills:</p>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li>• <a href="#">ONENYC2050 Building a Strong and Fair City: A Livable Climate</a></li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li>• <a href="#">EdPuzzle videos</a> for formative assessment</li> <li>• <a href="#">Earth Science Reference Table</a></li> <li>• Key Terms</li> <li>• Explore Learning Lab Assignments <ul style="list-style-type: none"> <li>○ <a href="#">Weather Maps</a></li> </ul> </li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>• IXL Target Skill assessments and review</li> <li>• Thumbs up/thumbs down</li> <li>• Use of assessment cards (Red, yellow, and green) as assessment cards</li> <li>• Fist to Five check ins</li> <li>• Edpuzzle assessments</li> <li>• Lab Assignments on Explore Learning</li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>• Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b> 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,</p>

	<ul style="list-style-type: none"> <li>● Distinguish between cold, warm, occluded, and stationary fronts on a weather map.</li> <li>● Interpret the impacts these fronts have on nearby areas.</li> <li>● Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning.</li> <li>● Distinguish between weather and climate.</li> <li>● Understand how mountains, latitude, cloud cover affect the climate of an area.</li> </ul>	<ul style="list-style-type: none"> <li>○ <a href="#">Hurricane Motion</a></li> <li>○ <a href="#">Coastal Winds and Clouds</a></li> <li>○ <a href="#">Comparing Climates</a></li> </ul> <p>New Visions Resources:</p> <ul style="list-style-type: none"> <li>● Atmosphere and Weather Variables Lesson Plan</li> <li>● Modeling Movement of Air in the Atmosphere Lab</li> </ul>	<ul style="list-style-type: none"> <li>● Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments:</p> <ul style="list-style-type: none"> <li>● Students will research Mayor Bill de Blasio’s “Livable Climate” aspect of the ONENYC2050 program. <ul style="list-style-type: none"> <li>○ Students will take photos of their environment of ways they see people affecting the environment - positive or negative.</li> <li>○ How are our actions affecting the environment? Based on the photographs of the environment, what problems should be addressed in the mayor’s climate plan?</li> <li>○ How realistic/effective are the mayor’s goals? Students will devise a plan that can enforce the mayor’s goals.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Connect in-school learning with the world outside the classroom.</li> <li>● Collaborate with peers to demonstrate their knowledge and growth over time and align to the varied learning styles and interests of those in the class community.</li> </ul>	<p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b>  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 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,</p>
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					<p>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.</p> <p><b>NGSS Standards Addressed in this Unit:</b> HS-ESS1-3. Obtaining, Evaluating and Communicating Information HS-ESS2-2. Analyzing and Interpreting Data HS-ESS2-7. Engaging in Argument from Evidence</p>
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<p><b>Unit 9</b></p> <p>Astronomy</p> <p>Should Mars be colonized?</p> <p>Should we mine for minerals on asteroids?</p>	<p>RCHS Focus Skills for this unit:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● Explain the parts of a diagram, reference table, or equation.</li> <li>● Create and defend a scientific claim using evidence from outside sources.</li> <li>● Explain the central idea or conclusion of a text.</li> </ul> <p>Content Skills:</p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Distinguish between terrestrial and jovian planets.</li> <li>● Analyze and annotate scientific diagrams/drawings to derive key information as a means of self-learning.</li> <li>● Read and annotate word problems, informational texts, and the Earth Science Reference Table (p. 15).</li> </ul>	<p>Core Texts:</p> <ul style="list-style-type: none"> <li>● <a href="#">Colonizing Mars</a></li> <li>● <a href="#">Space Mining</a></li> <li>●</li> </ul> <p>Digital Resources:</p> <ul style="list-style-type: none"> <li>● <a href="#">EdPuzzle videos</a> for formative assessment</li> <li>● <a href="#">Earth Science Reference Table</a></li> <li>● Key Terms</li> <li>● Explore Learning Lab Assignments <ul style="list-style-type: none"> <li>○ <a href="#">2D Eclipse</a></li> <li>○ <a href="#">Phases of the Moon</a></li> <li>○ <a href="#">Big Bang Theory</a></li> <li>○ <a href="#">Orbital Motion - Kepler's Laws</a></li> <li>○ <a href="#">HR Diagram</a></li> </ul> </li> </ul> <p>New Visions Resources</p> <ul style="list-style-type: none"> <li>● Modeling Celestial Phenomena and Making Predictions Performance Task</li> </ul>	<p>Formative Assessments:</p> <ul style="list-style-type: none"> <li>● IXL Target Skill assessments and review</li> <li>● Thumbs up/thumbs down during class</li> <li>● Fist to five questioning</li> <li>● Short assessments using Google docs allowing for real-time responses and feedback</li> <li>● Exit slips</li> <li>● Facilitator-led groups during class</li> <li>● Collaborative assignments with peer assessment</li> <li>● Use of assessment cards (Red, yellow, and green)</li> <li>● Edpuzzle assessments</li> <li>● Lab Assignments on Explore Learning and/or in class</li> <li>● Google Quizzes, Questions, Docs</li> </ul> <p>Summative Assessments:</p> <ul style="list-style-type: none"> <li>● CER assignment - Mining for minerals on asteroids <ul style="list-style-type: none"> <li>○ Students will write a claim with their position and use evidence and reasoning to support it.</li> </ul> </li> <li>● CER assignment - colonizing Mars <ul style="list-style-type: none"> <li>○ Students will write a claim with their position and use evidence and</li> </ul> </li> </ul>	<p>In this unit, students will...</p> <ul style="list-style-type: none"> <li>● Acknowledge and try to incorporate the ideas of peers respectfully, recognizing that other students may have vastly different perspectives, experiences, strengths, needs, and opinions.</li> <li>● Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> <li>● Connect in-school learning with the world outside the classroom.</li> </ul>	<p><b>Common Core Learning Standards Addressed in this Unit:</b></p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p><b>NYS Curriculum Standards Addressed in this Unit:</b></p> <p>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</p>
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			reasoning to support it.		<p>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.</p> <p>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.</p> <p><b>NGSS Standards Addressed in this Unit:</b> HS-ESS2-7. Engaging in Argument from Evidence</p>
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