Subject: Science Grade: 7 Unit #: 1 Title: Geology

UNIT OVERVIEW

<table>
<tr><th colspan="3">STAGE ONE: Identify Desired Results</th></tr>
<tr><td rowspan="5">Established Goals/ Standards

2.1 c The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere.
2.1e Rocks are composed of minerals. Only a few rock-forming minerals make up most of the rocks of Earth. Minerals are identified on the basis of physical properties such as streak, hardness, and reaction to acid.
2.1g The dynamic processes that wear away Earth's surface include weathering and erosion.
2.1h The process of weathering breaks down rocks to form sediment. Soil consists of sediment, organic material, water, and air.
2.1i Erosion is the transport of sediment. Gravity is the driving force behind erosion. Gravity can act directly or through agents such as moving water, wind, and glaciers.
2.2a The interior of Earth is hot. Heat flow and movement of material within Earth cause sections of Earth's crust to move. This may result in earthquakes, volcanic eruption, and the creation of mountains and ocean basins.
2.2g Rocks are classified according to their method of formation. The three classes of rocks are sedimentary, metamorphic, and igneous. Most rocks show characteristics that give clues to their formation conditions.
2.2h The rock cycle model shows how types of rock or rock material</td><td colspan="2">Long-Term Transfer Goal</td></tr>
<tr><td colspan="2">At the end of this unit, students will use what they have learned to independently…
Students will understand that present day evidence gives us clues about the past which will be demonstrated by a trip to the Genesee Gorge where students will analyze rock formations and collect rock samples to map the geologic history of Rochester over time.</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>Enduring Understandings
Students will understand that…

Density drives the movement and change in Earth's interior which causes change in geologic formations.

Describe and/or explain how rocks or rock materials may be transformed from one rock to another.</td><td>Essential Questions
Students will consider such questions as…
How has Rochester changed over time?</td></tr>
<tr><td colspan="2">Acquisition</td></tr>
<tr><td>What knowledge will students learn as part of this unit?

● Identify and correctly use key vocabulary terms- lithosphere, hydrosphere, atmosphere, crust, mineral, crystal, hardness, Moh's scale, rock, metamorphic, sedimentary,</td><td>What skills will students learn as part of this unit?
● Interpret rock cycle diagram and mineral identification chart
● Identify minerals through the use of physical property tests such as streak, hardness, reaction to acid
● Read non-fictional text for information while employing reading strategies.
● Scientific skills (asking questions, gathering and analyzing data, making predictions, drawing conclusions based on evidence)
● Making evidence based claims to support the theory of Pangaea and continental drift</td></tr>
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may be transformed from one type of rock to another. 3.1a Substances have characteristic properties. Some of these properties include color, odor, phase at room temperature, density, solubility, heat and electrical conductivity, hardness, and boiling and freezing points. 3.1h Density can be described as the amount of matter that is in a given amount of space. If two objects have equal volume, but one has more mass, the one with more mass is denser. 2.1c The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere. 2.1e Rocks are composed of minerals. Only a few rock-forming minerals make up most of the rocks of Earth. Minerals are identified on the basis of physical properties such as streak, hardness, and reaction to acid. 2.1f Fossils are usually found in sedimentary rocks. Fossils can be used to study past climates and environments. 2.2a The interior of Earth is hot. Heat flow and movement of material within Earth cause sections of Earth's crust to move. This may result in earthquakes, volcanic eruption, and the creation of mountains and ocean basins. 2.2b Analysis of earthquake wave data (vibrational disturbances) leads to the conclusion that there are layers within Earth. These layers—the crust, mantle, outer	igneous, luster, cleavage, streak, composition, sediments, weathering, erosion, cementation, compaction, melting, pressure, heat, density, earthquake, convection current, convection, tectonic plates, divergent, subduction, mountain, collision, convergence, earthquake, compression, transverse, fault, convection current, Richter's scale, boundaries, Pangaea ● Rocks are composed of minerals ● There are three classes of rocks, igneous, sedimentary, and metamorphic classified based on how they were formed ● Earth's composition	● Reading and interpreting graphs and maps ● Modeling the layers of the earth and crustal movement ● Structured accountable talk

core, and inner core—have distinct properties. 2.2c Folded, tilted, faulted, and displaced rock layers suggest past crustal movement. 2.2d Continents fitting together like puzzle parts and fossil correlations provided initial evidence that continents were once together. 2.2e The Theory of Plate Tectonics explains how the "solid" lithosphere consists of a series of plates that "float" on the partially molten section of the mantle. Convection cells within the mantle may be the driving force for the movement of the plates. 2.2f Plates may collide, move apart, or slide past one another. Most volcanic activity and mountain building occur at the boundaries of these plates, often resulting in earthquakes. 2.2g Rocks are classified according to their method of formation. The three classes of rocks are sedimentary, metamorphic, and igneous. Most rocks show characteristics that give clues to their formation conditions. 2.2h The rock cycle model shows how types of rock or rock material may be transformed from one type of rock to another.	● Earth's crust is broken into plates ● Earth's continents once fit together like a puzzle ● Heat flow and movement within the earth causes crustal movement resulting in earthquakes, volcanic eruption, mountains, and earth basins ● Scientists analyze earthquake wave data that support the layers within earth ● Crustal movement causes displacement of the lithosphere	

STAGE TWO: Determine Acceptable Evidence	
	Assessment Evidence

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<td rowspan="2">Criteria to assess understanding: (This is used to build the scoring tool.)

Rubric for field study to the Genesee Gorge where students will analyze rock formations and collect rock samples to map the geologic history of Rochester over time.

● Density = greater density sinks because molecules are packed tighter
● Earth is composed of 4 layers which are arranged by differences in density = inner core, outer core, mantle, crust
● The hydrosphere, lithosphere, and atmosphere contain all of earth’s water, land, and air.
● The crust (the outermost layer of the earth) is a part of the lithosphere which is broken into plates and floats on the mantle
● The continents (each a part of a plate) used to be one supercontinent,</td>
<td>Performance Task focused on Transfer:

Field study analyzing rock formations and collecting rock samples at the Genesee Gorge to provide evidence that supports Rochester was once underwater and has changed over time.</td>
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<td>Other Assessment Evidence:

Students identify an unknown mineral based on physical properties and mineral identification chart.
Students then construct the rock cycle on their own and respond to reflection questions.
Model- Pangaea
Plate tectonic poster describing the causes and effects of plate movements to show how Earth is changing over time.
Summary responses: claim with evidence (5 week assessment rubric)</td>
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Pangaea. ● There are 4 pieces of evidence that support Pangaea: fossil evidence, mountain ranges, coastlines, and rock layers. ● Identification of minerals through physical properties: hardness, streak, color, luster, and reaction to acid. ● Rocks are composed of minerals. ● The three rock types are classified by their method of formation and are constantly changing. ● Convection currents in the mantle cause crustal plates to move causing different geologic formations and rock types. ● Sedimentary rocks are formed by weathering, erosion, and deposition.	

T, M, A *(Code for Transfer, Meaning Making and Acquisition)*	**STAGE THREE: Plan Learning Experiences**	
	Learning Events:	Evidence of learning: *(formative assessment)*
A	Lesson 1: Class introductions, setting of a safe and nurturing classroom environment.	Bellwork/Bridge Ticket out the door Graphic organizers Stop and think questions Reflect questions Assessment rubrics Whole group/small group discussions Summary Closure
A, M	Lesson 2: Build communication, problem solving and observational skills through Tallest Structure team building activity.	
A	Lesson 3: Intro to overarching question "How has Rochester changed over time?". Observations, initial claim.	
A	Lesson 4: What is volume? How to measure liquid volume (lab based activity)	
A	Lesson 5: What is mass? How do we measure it? Bubblegum (first 5 week assessment)	
A, M	Lesson 6: Introduction to density with density column	
A, M	Lesson 7: Density day 2 (particle diagrams)	
A, M	Lesson 8: interior layers of the earth stations and then spheres (hydrosphere, lithosphere, and atmosphere)	
T	Lesson 9: Layers of the earth poster with explicit connection to density (use five week assessment rubric for claim and evidence) *post exemplar on project board	
A, M	Lesson 10: Intro to Pangaea puzzle and 4 pieces of evidence (how do we know Pangaea existed? Through the rocks)	
M, T	Lesson 11: Review pieces of evidence for Pangaea and add to project board. Mind map? *Make a claim with evidence (How has Rochester changed over time) *post exemplar on project board	
T	Lesson 12: Test	
A, M	Lesson 13: What are rocks? Introduction to 3 types of rock through lab.	

A, M	Lesson 14: Continuation of lesson 12	
M	Lesson 15: Non-fictional rock cycle reading connecting the 3 types of rock lab. Construct the rock cycle. *post exemplar on project board	
A, M	Lesson 16: Class constructed rock cycle diagram and practice questions with actual diagram	
A	Lesson 17: Mineral property stations	
A, M	Lesson 18: Mineral identification practice	
T	Lesson 19: Mineral impossible lab (claim and evidence 5 week assessment) *5 week assessment	
A, M	Lesson 20: Where are rocks formed? At plate boundaries… how does that happen? Molasses demo, shows how the convection currents cause plates to move, Nonfiction reading comprehension	
A, M	Lesson 21: Plate boundary stations (all three types) 5 stations, convergent, divergent, transform, subduction, convection currents *consider manipulative model for all plate boundaries	
T	Lesson 22: Focus on divergent and convergent boundaries forming igneous and metamorphic rocks (mystery story?)	
M, T	Lesson 23: Plate boundary graphic organizer and poster connecting boundaries to rock types *exemplar on project board Would Rochester have these types of rocks? Why or why not?	
A, M	Lesson 24: Sedimentary rock, not formed at a boundary, in layers with fossils. Intro to weathering and erosion (stream table demo)	
	Lesson 25: Weathering, erosion, and deposition stations	
M	Lesson 26: Connections between Rochester's location (not on a boundary) to the type of rock that is present (sedimentary)	
M, T	Visuals of Rochester and the types of rock that are present *exemplar on project board *5 week assessment	
	Lesson 27: Review mind map	

M, T T T T	Lesson 28 - 29: Field Study prep Second week of December: field study expedition Lesson 30 - 34: Field study presentation prep and actual presentation Lesson 35: Test	