Enriched Earth Science Curriculum Map

Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
S.1 – SWBAT formulate questions about themselves and their surroundings **S.2** – SWBAT collect data using observation and surveys, and record appropriately **S.3** – SWBAT construct a table to represent a collection of data **S.4** – SWBAT identify the parts of a graph **S.5** – SWBAT display data in a	SWBAT define **observation** and **inference**, and can differentiate between the two. SWBAT measure and define **mass**, **weight**, **area**, **volume**, **temperature**, and **time** using metric units. SWBAT convert between base metric units and those with prefixes **centi-**, **kilo-**, and **milli-**. SWBAT identify **direct**, **inverse**, and **cyclic relationships** from	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science Reference Tables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with	Month of September **UNIT - Observations, Inferences, and Measurement**

graph **S.7** – SWBAT read and interpret data in graphs **S.8** – SWBAT formulate conclusions and make predictions from graphs SWBAT determine what will be measured and how in a laboratory setting, using appropriate methods and formulas. SWBAT organize and neatly label their work. SWBAT analyze problems by observing patterns. SWBAT perform calculations involving mass, length, area,	both data and graphs. SWBAT read and interpret the appropriate **Earth Science Reference Tables** when necessary. **Additional Vocabulary:** Scientific notation Quantitative Qualitative Magnitude Scale Volume Area Mass Weight Independent Variable Dependent Variable		www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorksciceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board Digital balance Ruler Graduated Cylinder Timer/Stopwatch	Castle Learning and/or Problem-Attic website **Labs** - Graphing Skills Observations & Inferences Scientific Method Density Metric Measurement Lab Safety Percentage Error Sunspot Analysis **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

volume, time, temperature, and Density. **MP.2** – SWBAT reason abstractly and quantitatively. **MP.4** – SWBAT model Mathematically. **HSN-Q.A.1** – SWBAT use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **HAS-CED.A.4** – SWBAT rearrange formulas to highlight a quantity of interest, using					

the same reasoning as in solving equations.					
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
HSN-Q.A.1 – SWBAT use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **HSN-Q.A.2** – Define appropriate quantities for the purpose of descriptive modeling. **HSN-Q.A.3** –	SWBAT **define model** and **explain** how models are used to describe Earth's appearance. SWBAT **describe** Earth as an **oblate spheroid** and explain, using observations, why it is that shape. SWBAT **calculate** the **circumference** of a circle/Earth by using **Eratosthenes Method**. SWBAT **describe** Earth's **latitude**	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets**	First Three Weeks of October **UNIT - Earth's Shape & Mapping Earth's Surface**

Choose a level of accuracy appropriate for the purpose of descriptive modeling. **MP.2** – SWBAT reason abstractly and quantitatively. **MP.4** – SWBAT model mathematically. **S.1** – SWBAT formulate questions about themselves and their surroundings. **S.2** – SWBAT collect data using observation and surveys, and record appropriately SWBAT determine what will be measured and how in a laboratory	**and longitude coordinate system** and determine locate coordinates from maps such as those on pages 3, 4, and 5 of the Earth Science Reference Tables. SWBAT state the **time** in an area, given a map of continental US **time zones**. SWBAT use Earth's **angular rate of rotation** (15°/hour) to determine an observer's longitude. SWBAT **find a location on a map** based upon its latitude, given the altitude of Polaris. SWBAT **determine the**		www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board Magnifying glasses Various topographic maps,including the 1:24,000 scale USGS Chenango Forks Quadrangle	created with Castle Learning and/or Problem-Attic website **Labs** - Latitude & Longitude Earth's Shape USGS Topographic Maps/ Chenango Forks Quadrangle Drawing Map Profiles Field Mapping Eratosthenes Circumference **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

setting, using appropriate methods and formulas. SWBAT organize and neatly label their work. SWBAT analyze problems by observing patterns.	**direction of flow** of a river/stream on a topographic map. SWBAT **calculate the gradient** between two points on a topographic map. SWBAT correctly **draw isolines/contour lines** on a field Map. SWBAT **identify areas of steep and gentle gradients** on topographic maps based upon the spacing of contour lines. SWBAT correctly **draw a topographic map profile** between two points on a field map.				

	SWBAT **determine the contour interva**l on a field map. SWBAT **identify directions on a map** based upon the four cardinal Directions. SWBAT **determine the distance between two points on a map** using a map scale. **Additional Vocabulary:** Index Contour Compass Rosette				
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
HSN-Q.A.3 – Choose a level of accuracy appropriate for the purpose	**HS-ESS2-3** – SWBAT explain that rocks and minerals can be identified and	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist	Late October through mid-November **UNIT-**

of descriptive modeling. **MP.2** – SWBAT reason abstractly and quantitatively **S.1** – SWBAT formulate questions about themselves and their surroundings **S.2** – SWBAT collect data using observation and surveys, and record appropriately SWBAT determine what will be measured and how in a laboratory setting, using appropriate methods and formulas. SWBAT organize and neatly label their work.	classified using various tests and protocols that determine their physical and chemical properties. **HS-ESS2-5** – SWBAT perform mechanical and chemical investigations with water and a variety of solid materials to provide the evidence for connections between the hydrologic cycle and system interactions commonly known as the rock cycle. **ESS2.B** – SWBAT explain that minerals are the building blocks of igneous, metamorphic, and		Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com	solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs** - Mineral Identification Sedimentary Rock Identification Igneous Rock Identification Metamorphic Rock Identification	**Properties of Rocks and Minerals**

SWBAT analyze problems by observing patterns. **WHST.9.12.**1 – SWBAT write arguments focused on rocks and minerals. **WHST.9.12.2** – SWBAT write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. **SL.11-12.5** – SWBAT make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of	sedimentary rocks and can be identified using physical and chemical characteristics. These rock types are evidence of stages of constant recycling of Earth material by surface processes and convection currents in the mantle. **(HS- ESS2-3) HS-ESS3-1** – SWBAT construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. Examples of key		SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board Mineral Kits Mineral Test kits, which include magnifying glasses, glass plates, streak plates, iron nails, copper pennies, steel files, and dilute hydrochloric acid in dropper bottles. Sedimentary Rock Kits Igneous Rock Kits Metamorphic Rock Kits	**Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

findings, reasoning, and evidence and to add interest.	natural resources could include access to fresh water (such as rivers, lakes, and groundwater), regions of fertile soils such as river deltas, and high concentrations of minerals and fossil fuels. **HS-ESS3-2** – SWBAT evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. Emphasis is on the conservation, recycling, and reuse of resources (such as minerals and metals) where possible, and on minimizing impacts				

	where it is not. Examples could include developing best practices for agricultural soil use, mining (for coal, tar sands, and oil shales), and pumping (for petroleum and natural gas). Science knowledge indicates what can happen in natural systems—not what should happen. SWBAT use and understand the diagrams and tables on pages 6,7, and 16 of the Earth Science Reference Tables.				
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
HSN-Q.A.3 – Choose a level of accuracy	**HS-ESS1-5** - SWBAT evaluate evidence of the	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth	**Tests** - all tests throughout the year are written using Castle	All of December **UNIT -**

appropriate for the purpose of descriptive modeling. **MP.2** – SWBAT reason abstractly and quantitatively **S.1** – SWBAT formulate questions about themselves and their Surroundings **S.2** – SWBAT collect data using observation and surveys, and record appropriately SWBAT determine what will be measured and how in a laboratory setting, using appropriate methods and formulas. SWBAT organize and neatly label	past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. Emphasis is on the ability of plate tectonics to explain the ages of crustal rocks. Examples of evidence could include that the age of oceanic crust increases with distance from mid-ocean ridges as a result of plate spreading and that the North American continental crust contains a much older central ancient core compared to the surrounding continental crust as a result of complex and numerous		Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc.	Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs** - Divergent Boundaries Subduction Boundaries Continental Drift Locating an Epicenter	**Plate Tectonics, Earthquakes, and Volcanoes**

their work. SWBAT analyze problems by observing patterns. **WHST.9.12.1** – SWBAT write arguments focused on plate tectonics and associated processes. **WHST.9.12.2** – SWBAT write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical Processes. **SL.11-12.5** – SWBAT make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive	plate interactions. **HS-ESS2-1** – SWBAT develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. Emphasis is on how the appearance of land features (such as mountains, valleys, and plateaus) and sea-floor features (such as trenches, ridges, and seamounts) are a result of both constructive processes (such as volcanism, tectonic uplift, and deposition) and destructive processes (such		www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board Safety compass Ruler Meter Sticks Classroom AS-1 Seismometer Seismograms	Indonesian Tsunami New York State Landscape Regions The Rock Cycle **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SBWAT identify, state the various characteristics of, and locate various types of tectonic plate boundaries using page 5 from the Earth Science Reference Tables. SWBAT draw and/or recognize the patterns of convection currents in the asthenosphere at divergent and convergent tectonic plate boundaries. SWBAT identify and explain the existence of the landforms	as weathering, subduction, and coastal erosion). **HS-ESS2.A** – Earth Materials & Systems SWBAT explain that Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. **HS-ESS2.B** – Plate Tectonics & Large-Scale System Interactions SWBAT explain that plate tectonics is the unifying theory that explains the past and current movements of the rocks at				

(volcanoes, island arcs, oceanic trenches, etc.) associated with convergent, divergent, and transform tectonic plate boundaries. SWBAT state the properties of primary and secondary seismic Waves. SWBAT calculate the difference in arrival times of primary and secondary seismic waves. SWBAT determine the distance to the epicenter of an earthquake, using "Earthquake P-Wave & S-Wave Travel Time" chart on page 11 of the Earth Science Reference Tables and a provided seismogram.	Earth's surface and provides a framework for understanding its geologic history. Plate movements are responsible for most continental and ocean-floor features and for the distribution of most rocks and minerals within Earth's crust. **HS-ESS2.A** – Earth Materials and Systems SWBAT recognize that Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. Evidence from deep probes and seismic waves, reconstructions of historical				

SWBAT correctly draw epicenter distances from seismometers/cities on a map to triangulate the location of an earthquake epicenter. SWBAT calculate earthquake origin times and primary and secondary seismic waves travel times using the Earth Science Reference Tables. SWBAT recognize that the worldwide patterns of earthquakes and volcanoes correspond to tectonic plate boundaries.	changes in Earth's surface and its magnetic field, and an understanding of physical and chemical processes lead to a model of Earth with a hot but solid inner core, a liquid outer core, a solid mantle and crust. Motions of the mantle and its plates occur primarily through thermal convection, which involves the cycling of matter due to the outward flow of energy from Earth's interior and gravitational movement of denser materials toward the interior. **HS-ESS2.B** – Plate Tectonics & Large-Scale System				

	Interactions SWBAT understand that residual heat from Earth's formation and the radioactive decay of unstable isotopes in Earth's interior continually generate energy that is absorbed by Earth's mantle and crust, driving mantle convection. Plate tectonics can be viewed as the surface expression of mantle convection. **PS4-A** - Wave Properties SWBAT understand how geologists use seismic waves and their reflection at interfaces between layers to probe structures deep in				

	the planet.				
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
HSN-Q.A.3 – SWBAT choose a level of accuracy appropriate for the purpose of descriptive modeling. **MP.2** – SWBAT reason abstractly and quantitatively. **S.1** – SWBAT formulate questions about themselves and their Surroundings. **S.2** – SWBAT collect data using observation and surveys, and record appropriately. SWBAT determine what will be	**HS-ESS2-1** – SWBAT develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. Emphasis is on how the appearance of land features (such as mountains, valleys, and plateaus) and sea-floor features (such as trenches, ridges, and seamounts) are a result of both constructive processes (such as volcanism, tectonic uplift, and	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website	January through early February **UNIT - Weathering and Erosion (Surface Processes)**

measured and how in a laboratory setting, using appropriate methods and formulas. SWBAT organize and neatly label their work. SWBAT analyze problems by observing patterns. **WHST.9.12.1** – SWBAT write arguments focused on weathering, erosion, and deposition and all associated processes. **WHST.9.12.2** – SWBAT write informative/explanatory texts, including the narration of historical events, scientific procedures/experi	deposition) and destructive processes (such as weathering, subduction, and coastal erosion). **HS-ESS2-2** – SWBAT analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to Earth's systems. Examples of data could also include descriptions of other system interactions, such as how the loss of ground vegetation causes an increase in water runoff and soil erosion; how dammed rivers increase groundwater recharge, decrease sediment		www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this unit.	**Labs** - Weathering of a Sugar Cube/Alka- Seltzer Rates of Weathering Stream Discharge Drainage Patterns of NYS Direction of Worldwide Rivers Flow **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

ments, or technical Processes. **SL.11-12.5** – SWBAT make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.	transport, and increase coastal erosion; or how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent. **HS-ESS2-5** – SWBAT plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. Emphasis is on mechanical and chemical investigations with water and a variety of solid materials to provide the evidence for connections between the hydrologic cycle and system interactions				

	commonly known as the rock cycle. Examples of mechanical investigations could include stream transportation (erosion) and deposition using a stream table, infiltration and runoff by measuring permeability and porosity of different materials, or frost wedging by the expansion of water as it freezes. Examples of chemical investigations could include chemical weathering and recrystallization (by testing the solubility of different materials) or melt generation (by examining how water lowers the				

	melting temperature of most solids). **HS-ESS2-7** – SWBAT construct an argument based on evidence about the coevolution of Earth's systems and life on Earth. Emphasis is on the dynamic causes, effects, and feedbacks between the biosphere and Earth's other systems, whereby geoscience factors control the evolution of life, which in turn continuously alters Earth's surface. Examples could include how photosynthetic life altered the atmosphere through the production				

	of oxygen, which in turn increased weathering rates and allowed for the evolution of animal life; how microbial life on land increased the formation of soil, which in turn allowed for the evolution of land plants; or how the evolution of corals created reefs that altered patterns of erosion and deposition along coastlines and provided habitats for the evolution of new life forms. SWBAT define and differentiate between physical weathering and chemical weathering.				
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/

					Days)
1.2g - 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. Water is returned from the atmosphere to Earth's surface by precipitation. Water returns to the atmosphere by evaporation or transpiration from plants. A portion of the precipitation becomes runoff over the land or infiltrates into the ground to become stored in the soil or groundwater below the water table. Soil capillarity influences these processes. The amount of precipitation that seeps into the	Students will be able to define ***permeability*** and describe the factors affecting its rate within soils. Students will be able to define ***porosity*** and describe the factors affecting its rate within soils. Students will be able to define ***capillarity*** and describe the factors affecting its rate within soils. Students will be able to describe how wells draw water from the ground. Students will be able to describe an ***artesian well*** formation.	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Cumulative Summative Assessment** – NYS Earth Science Regents	February **UNIT - Groundwater & Soil Characteristics**

ground or runs off is influenced by climate, slope of the land, soil, rock type, vegetation, land use, and degree of saturation. Porosity, permeability, and water retention affect runoff and infiltration. **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.			Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this unit.	Examination in June	
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
2.1u - Wave Action: Erosion and deposition cause changes in shoreline features, including	Beach erosion/depositional patterns Ocean currents as outlined on the Earth Science Reference Tables	Listed in Standards	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS	February **UNIT - Coastal Processes/ Oceanography**

beaches, sandbars, and barrier islands. Wave action rounds sediments as a result of abrasion. Waves approaching a shoreline move sand parallel to the shore within the zone of breaking waves. Wind: Erosion of sediments by wind is most common in arid climates and along shorelines. Wind-generated features include dunes and sand-blasted bedrock.	Tides and coastal changes Shoreline management and environmental impacts		School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv	Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs -** Stream Divides & River Systems Ocean Water vs. Fresh Water **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

			Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this unit.		
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
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	Students will be able to describe the factors contributing to and the effects of periods of global warming and cooling. Students will observe and analyze the effect humans are having on Earth's climate. Students will be able to work in groups to create a poster presentation.	Listed in Standards and Content	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle,	March **UNIT - Meteorology**

reduced by effective emergency preparedness. 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. 2.1o Plate motions have resulted in global changes in geography, climate, and the patterns of organic evolution. 2.1i Seasonal changes can be explained using concepts of density and heat energy. These	Students will be able to describe the effect that the angle of insolation has on how warm or cold the climate is. Students will be able to describe and name the instruments used to measure temperature, air pressure, wind direction, wind speed, and relative humidity/dew point. Students will be able to use "Selected Properties of Earth's Atmosphere" chart on page 14 in the Earth Science Reference Tables to describe the various layers of Earth's atmosphere. Students will be able to explain why the layers of the atmosphere develop, based on the concept of density. Students will be able to observe trends		developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this	Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs -** Absorption & Radiation of Energy Isolines Shipwrecks of Lake Ontario Weather Patterns Reading Isobars Air Pressure and Wind Speeds Hurricane Tracking Determining Cloud Base NY Metar Lab	

changes include the shifting of global temperature zones, the shifting of planetary wind and ocean current patterns, the occurrence of monsoons, hurricanes, flooding, and severe weather. 2.1r Climate variations, structure, and characteristics of bedrock influence the development of landscape features including mountains, plateaus, plains, valleys, ridges, escarpments, and stream drainage patterns. 2.2 Students explain how incoming solar radiations, ocean currents, and land masses affect weather and climate 2.2c A location's climate is influenced by latitude, proximity to large bodies of water, ocean	and identify patterns in data at different altitudes. Students will be able to infer the characteristics of the layers of the atmosphere from the graph and data table. Students will be able to identify the troposphere, stratosphere, mesosphere, and thermosphere. Students will be able to define what a ***pause*** is in terms of atmospheric science. Students will be able to state the 3 modes of heat conduction (conduction, convection, and radiation) and how they occur. Students will demonstrate an understanding of how the Sun's energy is		unit.	Station Model Interpretation Humidity & Dewpoint Coastal & Continental Weather Patterns **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

currents, prevailing winds, vegetative cover, elevation, and mountain ranges. 1.1f Earth's changing position with regard to the Sun and the moon has noticeable effects. Earth revolves around the Sun with its rotational axis tilted at 23.5 degrees to a line perpendicular to the plane of its orbit, with the North Pole aligned with Polaris. During Earth's one-year period of revolution, the tilt of its axis results in changes in the angle of incidence of the Sun's rays at a given latitude; these changes cause variation in the heating of the surface. This produces seasonal variation in weather. 2.1	absorbed/reflected by Earth. Students will be able to state how a surface's properties affect its ability to absorb/radiate heat. Students will know that heat is also infrared light. Students will be able to state that dark-colored rough surfaces absorb and re-radiate heat better than smooth, reflective ones. Students will be able to collect temperature data, put it into graph form, and interpret those data as it applies to thermodynamics. Students will be able to define relative and absolute humidity and factors affecting their levels. Students will be able to use a sling psychrometer to				

Students use the concepts of density and heat energy to explain observations of weather patterns, seasonal changes, and the movements of the Earth's plates 2.1c Weather patterns become evident when weather variables are observed, measured, and recorded. These variables include air temperature, air pressure, moisture (relative humidity and dewpoint), precipitation (rain, snow, hail, sleet, etc.), wind speed and direction, and cloud cover. 2.1d Weather variables are measured using instruments such as thermometers, barometers, psychrometers, precipitation gauges, anemometers, and wind vanes. 2.1e Weather variables	measure dew point and humidity using page 12 in the Earth Science Reference Tables. Students will be able to define dewpoint and describe how it is a truer measure of atmospheric moisture content. Students will be able to describe that water condenses to form clouds/fog when air rises, expands, cools, and condenses. Students will be able to identify basic cloud types and describe the weather conditions associated with them. Students will be able to state the relationship between air pressure and wind speed in a tropical storm system. Students will be able				

are interrelated. temperature and humidity affect air pressure and probability of precipitation air pressure gradient controls wind velocity 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. 2.1i Seasonal changes can be explained using concepts of density and heat energy. These changes include the shifting of global temperature zones, the shifting of planetary wind and ocean current patterns, the	to interpret data and plot it on a dual y-axis plot. Students will be able to accurately plot latitude and longitude coordinates. Students will be able to define relative humidity and state how it changes as temperature changes. Students will be able to use page 12 on the Earth Science Reference Tables and a sling psychrometer to measure relative humidity. Students will be able to state that as air masses rise, they expand, cool, and condense. Students will be able to state that atmospheric condensation must occur on condensation nuclei.				

occurrence of monsoons, hurricanes, flooding, and severe weather. 2.2 Students explain how incoming solar radiations, ocean currents, and land masses affect weather and climate 2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land. 2.1f Air temperature, dewpoint, cloud formation, and precipitation are affected by the expansion and contraction of air due to vertical atmospheric movement. 2.1h Atmospheric moisture, temperature and pressure distributions; jet	Students will be able to define air pressure and state what causes it. Students will be able to measure air pressure with a barometer and perform conversions between mm Hg and inches using the scale on page 13 of the Earth Science Reference Tables.. Students will be able to state the relationship between relative humidity and temperature. Students will understand that as air temperature and dewpoint get closer together, relative humidity increases. Students will be able to state the effects of changing altitude, temperature, and moisture content on air pressure. Students will be able to define **isobar** and				

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. 1.2g 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. Water is returned from the atmosphere to Earth's surface by precipitation. Water returns to the atmosphere by evaporation or transpiration from	correctly draw isobars on a pressure field map. Students will be able to correctly draw isobars on an air pressure field map. Students will be able to locate high and low pressure centers on an isobar map. Students will be able to identify areas of high and low wind speeds on an isobar map. Students will be able to correctly calculate pressure gradients using an isobar map. Students will be able to predict the direction of travel of storm/pressure systems on a map. Students will be able to correctly use the Global Wind and Moisture Belts chart in their Earth Science Reference Tables.				

plants. A portion of the precipitation becomes runoff over the land or infiltrates into the ground to become stored in the soil or groundwater below the water table. Soil capillarity influences these processes. The amount of precipitation that seeps into the ground or runs off is influenced by climate, slope of the land, soil, rock type, vegetation, land use, and degree of saturation. Porosity, permeability, and water retention affect runoff and infiltration. 1.2e Earth's early atmosphere formed as a result of the outgassing of water vapor, carbon dioxide, nitrogen, and lesser amounts of other gases from	Students will be able to correctly read station models on a synoptic weather map. Students will be able to describe the temperature and moisture characteristics of an air mass by looking at its name. Students will be able to use page 13 in their Earth Science Reference Tables to identify and correctly write the symbols of air masses. Students will be able to predict the source region of an air mass on a map of North America. Students will be able to identify cold, warm, stationary, and occluded fronts on a synoptic weather map. Students will be able to describe the structures of cold				

its interior. 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. 2.2a Insolation (solar radiation) heats Earth's surface and atmosphere unequally due to variations in: the intensity caused by differences in atmospheric transparency and angle of incidence which vary with time of day, latitude, and season characteristics of the materials absorbing the energy such as color, texture, transparency, state of matter, and specific heat	and warm fronts, along with their associated weather. Students will be able to read/decode the information presented on a station model. Students will be able to use the key on p.13 of the Earth Science Reference Tables to interpret station model data. Students will be able to correctly draw a station model, given a set of meteorological data. Students will be able to calculate past pressure from interpreting the data on a station model diagram.				

duration, which varies with seasons and latitude. 2.2b The transfer of heat energy within the atmosphere, the hydrosphere, and Earth's surface occurs as the 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.					
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
1.1f Earth's changing position with regard to the Sun and the moon has noticeable effects.	Students will be able to define and describe the celestial hemisphere. Students will be able to use altitude and	Listed in Standards and Content	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by Michael Breed to suit	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist solely of questions taken	April through early May **UNIT - Astronomy & Earth's Motions**

Earth revolves around the Sun with its rotational axis tilted at 23.5 degrees to a line perpendicular to the plane of its orbit, with the North Pole aligned with Polaris. During Earth's one-year period of revolution, the tilt of its axis results in changes in the angle of incidence of the Sun's rays at a given latitude; these changes cause variation in the heating of the surface. This produces seasonal variation in weather. 1.1b Nine planets move around the Sun in nearly circular orbits. The orbit of each planet is an ellipse with the Sun located at one of the foci. Earth is orbited by one moon and many	azimuth coordinates to locate objects in the sky. Students will be able to define the term gravity and how it affects objects and orbital paths. Students will be able to describe how inertia affects the paths of orbiting objects. Students will be able to describe and identify the changing paths of the Sun across the sky at various times of the year. Students will be able to describe how the path of the Sun changes at different latitudes, such as the Equator and the poles. Students will be able to identify the star, Polaris, and explain why stars appear to circumnavigate it.		our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorksciencteacher.com	from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs -** Sunspot Analysis Dimension of the Solar System Apparent Diurnal Motion of the Sun Duration of Insolation The Ellipse	**in Space**

artificial satellites. 1.1a Most objects in the solar system are in regular and predictable motion. These motions explain such phenomena as the day, the year, seasons, phases of the moon, eclipses, and tides. Gravity influences the motions of celestial objects. The force of gravity between two objects in the universe depends on their masses and the distance between them. 1.1 Students explain complex phenomena, such as tides, variations in day length, solar insolation, apparent motion of the planets, and annual	Students will be able to describe the apparent rising and setting of the Moon. Students will be able to explain the difference between rotation and revolution. Students will be able to recognize that constellations change throughout the year due to Earth revolving around the Sun. Students will be able to list the components of the solar system. Students will be able to look up data about the solar system using the Solar System Data Table on page 15 in their Earth Science Reference Tables. Students will be able to recognize that the orbits of objects are actually elliptical and not circular in shape.		SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this unit.	Properties of Stars (H-R Diagram) Phases of the Moon **Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

traverse of the constellations 1.1a Most objects in the solar system are in regular and predictable motion. These motions explain such phenomena as the day, the year, seasons, phases of the moon, eclipses, and tides. Gravity influences the motions of celestial objects. The force of gravity between two objects in the universe depends on their masses and the distance between them. 1.1b Nine planets move around the Sun in nearly circular orbits. The orbit of each planet is an ellipse with the Sun located at one of the foci.	Students will be able to calculate eccentricity, using the formula on page 1 of the Earth Science Reference Tables.. Students will be able to identify the part of an orbit where the orbiting object travels fastest and/or slowest. Students will be able to recognize that planets closer to the sun have shorter periods of revolution and greater revolutionary rates than planets farther from the Sun. Students will be able to state that Earth moves 1 degree/ day in its orbit around the Sun. Students will be able to state relative orbital speeds of planets, based upon their distance from the Sun.				

Earth is orbited by one moon and many artificial satellites. 1.1c Earth's coordinate system of latitude and longitude, with the equator and prime meridian as reference lines, is based upon Earth's rotation and our observation of the Sun and stars. 1.1d Earth rotates on an imaginary axis at a rate of 15 degrees per hour. To people on Earth, this turning of the planet makes it seem as though the Sun, the moon, and the stars are moving around Earth once a day. Rotation provides a basis for our system of local time; meridians of longitude are the basis for time zones. 1.1e The Foucault pendulum and the Coriolis effect provide evidence of	Students will be able to use planetary data to convert scale distances between planets of the solar system. Students will be able to construct a scale model of the solar system on adding machine tape. Students will be able to draw an ellipse using the appropriate tools Students will be able to measure the focal distance and major axis of an ellipse and calculate its eccentricity Students will be able to compare ellipse eccentricities to those of the planets of the solar system Students will be able to predict where an object travels fastest in its orbit around the Sun. Students will be able to describe why				

Earth's rotation. 1.1f Earth's changing position with regard to the Sun and the moon has noticeable effects. Earth revolves around the Sun with its rotational axis tilted at 23.5 degrees to a line perpendicular to the plane of its orbit, with the North Pole aligned with Polaris. During Earth's one-year period of revolution, the tilt of its axis results in changes in the angle of incidence of the Sun's rays at a given latitude; these changes cause variation in the heating of the surface. This produces seasonal variation in weather. 1.1g Seasonal changes in the apparent positions of	constellations in the nighttime sky change throughout the year. Students will be able to state the calendar dates of the spring and fall equinoxes and the summer and winter solstices. Students will be able to state the latitude of the noon sun being directly overhead on each of the calendar dates listed above. Students will be able to recognize these calendar dates on a diagram of Earth in its orbit around the Sun. Students will be able to explain how the length of daylight / daily temperatures changes in NYS over the course of a year. Students will be able to draw and label Earth in its orbit				

constellations provide evidence of Earth's revolution. 1.1h The Sun's apparent path through the sky varies with latitude and season. 1.1i 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. Describe current theories about the origin of the universe and solar system. 1.2 Students describe current theories about the origin of the universe and solar system 1.2a The universe is vast and estimated to be over ten billion years old. The current	around the Sun in its correct orientation on June 21, December 21, March 21, and September 21. They will also label where the Sun's direct rays strike Earth on those dates. Students will be able to relate that the angle of insolation is directly related to its angle of incidence. Students will be able to describe how Earth's shape, season of the year, and time of day affect the angle/intensity of insolation. Students will be able to describe how the Sun's path changes throughout the course of a year as the seasons change. Students will be able to state the length of the lunar cycle (29.5 days).				

theory is that the universe was created from an explosion called the Big Bang. Evidence for this theory includes: cosmic background radiation a red-shift (the Doppler effect) in the light from very distant galaxies. 1.2b Stars form when gravity causes clouds of molecules to contract until nuclear fusion of light elements into heavier ones occurs. Fusion releases great amounts of energy over millions of years. The stars differ from each other in size, temperature, and age. Our Sun is a medium-sized star within a spiral galaxy of stars known as the	Students will be able to explain why the same side of the Moon always faces Earth. (rate of rotation is equal to the rate of revolution) Students will be able to recognize the eight primary phases of the Moon and be able to draw the Moon's appearance as viewed from Earth in each of the corresponding eight positions in its orbit. Students will be able to describe the differences between total solar, annular solar, and lunar eclipses. Students will be able to recognize the positioning of the Sun, Earth, and Moon in creating solar and lunar eclipses. Students will be table to define the				

Milky Way. Our galaxy contains billions of stars, and the universe contains billions of such galaxies. 1.2c Our solar system formed about five billion years ago from a giant cloud of gas and debris. Gravity caused Earth and the other planets to become layered according to density differences in their materials. The characteristics of the planets of the solar system are affected by each planet's location in relationship to the Sun. The terrestrial planets are small, rocky, and dense. The Jovian planets are large, gaseous, and of low density. 1.2d Asteroids, comets,	term ***light year***. Students will be able to describe the time frame it takes for sunlight to reach the various planets of the solar system. Students will be able to describe what a galaxy is and where the solar system is located in the Milky Way galaxy. Students will be able to describe the similarities and differences between the heliocentric and geocentric models of the universe. Students will be able to use the Electromagnetic Spectrum Chart on page 14 of the Earth Science Reference Tables to compare the wavelengths and frequencies of cosmic rays, x-rays, ultraviolet, visible, infrared, television, microwave, and radio forms of				

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. 2.1i Seasonal changes can be explained using concepts of density and heat energy. These changes include the shifting of global temperature zones, the shifting of planetary wind and ocean current patterns, the occurrence of monsoons, hurricanes, flooding, and severe weather. 2.2a Insolation (solar radiation) heats Earth's surface and atmosphere unequally due to	electromagnetic radiation. Students will be able to explain how bright line and/or dark line spectra can be used to identify the elements present in a star or glowing nebula in space. Students will investigate the relationships between the temperatures, brightnesses, and diameters of stars. Students will be able to recognize red-shifted spectra as objects moving away from Earth. Students will be able to describe evidence supporting the cosmic background radiation. Students will be able to state the current estimate for the age of the Universe - 13.567 billion years. Students will				

variations in: the intensity caused by differences in atmospheric transparency and angle of incidence which vary with time of day, latitude, and season characteristics of the materials absorbing the energy such as color, texture, transparency, state of matter, and specific heat duration, which varies with seasons and latitude.	observe the bright line spectra of hydrogen, helium, oxygen, air, argon, krypton, and neon.				
Standards	**Content**	**Skills/Practices**	**Materials/ Resources**	**Assessments (All)** Daily/Weekly/ Benchmarks	**Timeline** (Months/Weeks/ Days)
1.2j Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate	Students will be able to identify meteorites as the causes of impact craters. Students will be able	Listed in Standards and Content	CK12 Organization Digital Textbook - Secondary Earth Science, as customized by	**Tests** - all tests throughout the year are written using Castle Learning or problem-attic software, and consist	Last half of May **UNIT - Earth's History**

bedrock at various locations. The characteristics of rocks indicate the processes by which they formed and the environments in which these processes took place. Fossils preserved in rocks provide information about past environmental conditions. Geologists have divided Earth 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	to describe the global and local consequences of meteorite impacts of varying sizes. Students will be able to define what a fossil is and some of the characteristics of organisms that promote preservation as a fossil. Students will be able to describe how fossils form in a depositional environment. Students will be able to list various types of fossils: casts, molds, imprints, amber, ice, tar, petrification, and carbonaceous films. Students will be able to describe information provided by fossils: species change over time, biodiversity in the past, changes in Earth's surface, Earth's past climate,		Michael Breed to suit our curriculum School-issued Chromebooks Earth Science ReferenceTables Mill's Notes Packet Lab Manual developed by Michael Breed www.problem-attic.com www.newsela.com www.castlelearning.com www.ck12.org www.edpuzzle.com Various videos from iTunes, Netflix, PBS, etc. www.newyorkscienceteacher.com	solely of questions taken from previous administrations of NYS Earth Science Regents examinations. **Quizzes** - Castle Learning and problem-attic.com **Homework** assignments from textbook, CK12.org, Castle Learning, Edpuzzle, Newsela.com, teacher-created handouts and worksheets, readings from selected works, and review book **Test Review Packets** created with Castle Learning and/or Problem-Attic website **Labs -** Half-life of M&M'ium Bedrock Correlation of Cayuga Lake Sequence of Events Important geologic events in NYS	

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. 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	and appearances/activities of extinct species. Students will be able to use the concepts of relative dating, the Principle of Superposition, the Law of Crosscutting Relationships, index fossils, and unconformities in order to be able to list the sequence of formation of rock layers in an outcrop in chronological fashion. Students will be able to define the term ***stratigraphic column.*** Students will be able to reconstruct a stratigraphic column by correlating rock layers from 12 different rock outcrops from the same area. Students will learn some of the geologic background of central New York		SUNY Oneonta Earth Science Listserv Document Camera and projector Promethean Board All necessary lab equipment to complete labs for this unit.	**Cumulative Summative Assessment** – NYS Earth Science Regents Examination in June	

time. 1.2f Earth's oceans formed as a result of precipitation over millions of years. The presence of an early ocean is indicated by sedimentary rocks of marine origin, dating back about four billion years.	State. Students will be able to describe the process of radioactive decay. Students will be able to define half life, parent atom, and daughter atom. Students will be able to calculate the age of an object, given the relative abundances of parent and daughter atoms and the half life of the radioisotope measured. Students will be able to state that carbon-14 is the radioisotope used for organic remains less than 50,000 years old. Students will be able to read the "Half-Lives of Selected Radioisotopes" and the "Geologic History of New York State"				

	charts in the Earth Science Reference Tables.. Students will be able to model the half life of a radioisotope. Students will be able to graphically plot the data collected during today's lab activity. Students will be able to predict the reliability of larger data sets. Students will be able to use pages 8 & 9 on the Earth Science Reference Tables efficiently and accurately. Students will be able to differentiate between eras, eons, periods, and epochs. Students will be able to recognize that humans have occupied Earth for a tiny percentage of its history. Students will be able				

	to state that Earth formed 4.5 billion years ago.				