Grade 8 Science Curriculum Map

Topic	GLCEs/ HSCEs/ Common Core Literacy Standards	Essential Questions	Skills /Vocabulary	Assessment Summative	Resources
Scientific Process Skills	E1.1A E1.1B E1.1C E1.1D E1.1E E1.1f E.1.1g E.1.1h E1.1i	Generate scientific questions. Conduct scientific investigations using appropriate tools & techniques. Properly write scientific hypotheses. Test a hypothesis showing an understanding of variables and methods. Identify patterns in data. Use evidence to support a conclusion drawn from a scientific investigation. Evaluate scientific processes and/or conclusions being able to determine possible sources of error.	<u>Vocabulary:</u> scientific method experimental design scientific question hypothesis independent variable dependent variable controlled variable constants charts tables graphs data conclusions evidence analyze validity <u>Skills</u> Design & conduct scientific experiments Analyze data Use proper scientific tools Lab safety Evaluate for validity	Design and conduct a scientific experiment Write a lab report using proper scientific format	*Teaching the Scientific Method: Instructional Strategies to Boost Student Understanding* *Teaching Science Process Skills* Internet resources Shared departmental resources

Atmosphere	E.FE.07.11 E.FE.07.12	What types of gases are in Earth's atmosphere? What role do these gases play? Compare & contrast Earth's atmosphere at different elevations	<u>Vocabulary:</u> atmosphere air pressure barometric pressure <u>Skills:</u> Reading charts & graphs Drawing conclusions from scientific data	Poster Project: Atmosphere Layers & Characteristics of Each Layer Content/ Vocabulary Quiz	SEPUP *Weather & Climate* Prentice Hall *Weather & Climate* www.NOAA.org
Effect of Oceans on Weather & Climate	E.ES.07.71 E.ES.07.72 E.ES.07.73	Compare and contrast the difference and relationship between weather and climate. How does the constant motion of the oceans and atmosphere affect weather? Explain how oceans transfer heat and affects climate around the world.	<u>Vocabulary:</u> atmosphere convection ocean currents wind weather climate air mass jet stream <u>Skills</u>: Map Reading Observation vs. inference Making inferences based on data	Make a world map of ocean currents and climate zones Type 2 Writing: Explaining the World Map (See Collin's Writing Bank) Content/ Vocabulary Quiz	SEPUP *Weather & Climate* Prentice Hall *Weather & Climate* www.NOAA.org
Sun's Energy & the Water Cycle	E.ES.07.11 E.ES.07.12 E.ES.07.13 E.ES.07.81 E.ES.07.82	What is the relationship between the warming by the sun of the Earth and the water cycle as it applies to the atmosphere? How does the warming of Earth's atmosphere by the sun cause convection within the	<u>Vocabulary:</u> water cycle evaporation water vapor condensation clouds transpiration cloud formation precipitation	Type 4 Writing: Traveling as a Drop of Water on the Water Cycle (See Collin's Writing Bank) Content/ Vocabulary Quiz	SEPUP *Weather & Climate* Prentice Hall *Weather & Climate* www.NOAA.org

		Earth's atmosphere and oceans, producing wind and ocean currents? How is the flow of water connected between the components of a watershed, including surface and groundwater?	infiltration surface runoff radiation conduction convection energy watershed groundwater Skills: Step-by-step processes Cause and effect Modeling		
Weather Conditions & Weather Maps	E.ES.07.74	What kinds of weather conditions are associated with frontal boundaries? How does the movement of major air masses and the jet stream affect North America's weather? How can one predict the weather based on reading weather maps?	Vocabulary: frontal boundaries cold front warm front stationary front occluded front air mass jet stream barometric pressure dew point humidity Skills Map Reading Making inferences Writing Hypotheses	Type 2 Writing: Be a Meteorologist: Write a weather report based upon a regional weather map (See Collin's Writing Bank) Content/ Vocabulary Quiz	SEPUP *Weather & Climate* Prentice Hall *Weather & Climate* www.NOAA.org
Interior of the Earth	E3.2A E3.2B Constructing & Reflecting	What are the interior layers of the Earth and the characteristics of each? Where is Earth's magnetic	Vocabulary: asthenosphere concentric layers crust intensity	Type 3 Writing: Journey to the Center of the Earth and/or Develop a Model of the Earth's Interior	Prentice Hall *Inside Earth* Chapter 1 & Reference to P & S Waves in Chapter 2 www.spaceweather.com

	(C&R) E1.2C	field generated? Why is the magnetic field important? What effect does the make up of the interior of the Earth have on P & S wave arrival times?	internal sources of energy lithosphere lower mantle magnetic field outer core primary seismic waves rigid lithosphere secondary seismic waves upper mantle thermal energy Skills: Modeling Writing Hypotheses	Project & Presentation (See Collin's Writing Bank) Type 2 Writing: Importance of Magnetic Field (Current events of solar flares/ storms & effect on magnetic field) (See Collin's Writing Bank) Prentice Hall Enrichment Activity: Magnetic Reversal Through the Ages Content/ Vocabulary Quiz	for daily updates on solar flares/ storms that affect Earth's magnetic field
Plate Tectonics	E3.3A E3.3B C & R E1.1D E1.1g E1.1i	How are plate tectonics responsible for features and processes of the geosphere?	Vocabulary: Sea-floor spreading mid-ocean ridges subduction earthquakes volcanoes mountain ranges plate boundaries plate collision plate tectonics theory tectonic plates lithosphere mantle convection geosphere density	Concept Web using vocabulary words to show understanding of interconnectedness Activity: Modeling sea-floor spreading & subduction Content/ Vocabulary Quiz	Prentice Hall *Inside Earth*: Chapter 1

			Skills: Modeling Drawing conclusions based on evidence		
Result of Plate Tectonics	E3.2C	How does oceanic crust compare to continental crust?	Vocabulary: continental crust density oceanic crust Skills: Compare/ Contrast	Type 2 or 3 writing (See Collin's Writing Bank) Content/ Vocabulary Quiz	Prentice Hall *Inside Earth*: Chapter 1
Plate Tectonics	E3.3C	How can the motion history of geologic features, like Hawaii, be described in terms of distance, rate, and time?	Vocabulary: Hot spot volcanoes Pangaea continental drift theory Alfred Wegener sonar Skills: calculations of Distance = Rate X Time, map skills, measuring, scaling on a map	Hot Spot & Mantle Plume Activity (See self-created binder activity adapted from Tom Braziunas, North Seattle Community College) Content/ Vocabulary Quiz	Prentice Hall *Inside Earth*: Chapter 1, Chapter 3 "A Teacher's Guide to the Geology of Hawaii Volcanoes National Park" copyrighted by the Hawaii Natural History Association
Plate Boundaries	E3.4A	Can you use the distribution of earthquakes and volcanoes to determine the types of plate boundaries?	Vocabulary: convergent boundary divergent boundary earthquakes plate boundaries transform boundary volcanoes Skills: graphing using longitude and latitude on a world map	Prentice Hall Activity: Using longitude and latitude, map 20 active volcanoes and 20 recent major earthquakes. Compare locations to a map of plate boundaries. Content/ Vocabulary Quiz	Prentice Hall *Inside Earth*: Chapter 1, Chapter 2

Magnitude & Effects of Earthquakes & Volcanoes	E3.4B E3.4C	How are the sizes of earthquakes and volcanoes measured and characterized? How do earthquakes and volcanic eruptions affect humans?	<u>Vocabulary</u>: volcano pressure magma molten rock earthquake explosivity Moment Magnitude Scale Richter Scale Mercalli Scale silica viscosity composite volcano (stratovolcano) cinder cone volcano shield volcano hot spot volcano pyroclastic flow volcanic ash ash cloud <u>Skills</u> Model designing and building	"Earthquake Safe" Structures – designing and constructing a structure to "survive" and "earthquake" out of spaghetti and marshmallows Historic Volcanic Eruption Research – Choices 1. Type 4 Writing – Eyewitness Journal (See Collin's Writing Bank) 2. Brochure regarding the history of eruptions/ earthquakes in a particular area of the world 3. Poster 4. Power Point Presentation Content/ Vocabulary Quiz	Prentice Hall *Inside Earth* Chapters 2,3 Web based research
Type of Rocks & Rock Cycle	E3.1A	What is the difference in formation and characteristics of igneous, sedimentary, and metamorphic rocks?	<u>Vocabulary</u>: contact metamorphism cooling crystallization deposition erosion extrusive foliation grain shape	Rock Cycle: Crayon Lab & Lab Report Content/ Vocabulary Quiz	Rock Classification Charts Prentice Hall *Inside Earth* Chapter 5

			igneous rocks intrusive lithification magma metamorphic rocks metamorphism molten rock non-foliated texture plate tectonic context regional metamorphism rock cycle rock sequence sedimentary rocks sedimentation weathering <u>Skills</u> Formal Scientific Writing		
Rock Cycle & Plate Tectonics	E3.1B	What is the relationship between the rock cycle and plate tectonics theory with regards to igneous, sedimentary, and metamorphic rocks?	<u>Vocabulary</u>: contact metamorphism metamorphism plate tectonic context regional metamorphism	Content/ Vocabulary Quiz	Prentice Hall *Inside the Earth* Chapter 5
Global Warming	E5.4A E5.4B E5.4D	In what ratio do we find greenhouse gases in our atmosphere naturally? How is that changing? Describe the natural mechanisms that can significantly change climate. What are the global	<u>Vocabulary</u> carbon dioxide climate change climate change models coral bleaching emissions fossil fuels greenhouse effect greenhouse gases human industrialization	Type 4 Writing: Letter to the Editor (See Collin's Writing Bank) Content/ Vocabulary Quiz	Documentary "The Eleventh Hour" plus curriculum guide www.EPA.gov (Environmental Protection Agency) www.edf.org (Environmental Defense Fund)

		consequences of warmer oceans and changing climatic zones?	ice core methane natural mechanisms ozone polar ice caps radiation <u>Skills</u> Distinguishing between valid and invalid information (esp. using Internet resources)		
Position & Motion of our Solar System within the universe	E5.1A	How does the position of our Solar System fit into the overall scale, structure, and age of the universe? How does the motion of our Solar System fit into the overall scale, structure, and age of the universe?	<u>Vocabulary</u>: age of universe big bang theory cosmic background radiation cosmological red shift doppler red shift expanding universe Milky Way galaxy motion of solar system scale of universe structure of universe <u>Skills</u> Reading & Writing Scientific Notation Scale Factor	Create a mathematical scale showing distances within our Solar System Content/ Vocabulary Quiz	Prentice Hall *Astronomy* Chapter 5 www.NASA.gov
Formation of our solar system	E5.3A	How did our solar system form from a nebula of dust and gas in the spiral arm of the Milky Way galaxy about	<u>Vocabulary</u>: Milky Way galaxy nebular cloud spiral arm	Content/ Vocabulary Quiz	Prentice Hall *Astronomy* Chapter 5 www.NASA.gov

		4.6 billion years ago?			
Space Parameters	E5.2e	What information can we gather from the Hertzsprung-Russell (H-R) diagram? How can the H-R diagram be used to deduce other parameters (distance) in space?	<u>Vocabulary</u>: Hertzsprung-Russell (H-R) diagram life cycle of stars star size star temperature star types stellar evolution <u>Skills</u> Reading charts/ diagrams	Algorithm of the life cycle of stars Plotting an H-R diagram Content/ Vocabulary Quiz	*The Lives of Stars* by Ken Croswell Prentice Hall *Astronomy* Chapter 5 www.NASA.gov