

EarthComm Correlation to Tennessee Earth Science Standards

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3
Standard Number: 1.0 Earth System															
The student will investigate the origin, composition, and structure of the universe.															
Learning Expectations:															
The student will															
1.1 explore the theories of the origin of the universe and its vastness.														X	
1.2 examine the components of the solar system.														X	
1.3 examine the sun, earth, moon relationships and their gravitational effects.														X	X
1.4 investigate the exploration of space.														X	
Performance Indicators: <i>At Level 1, the student is able to</i>															
<ul style="list-style-type: none"> • identify the components of the universe: galaxies, solar systems, stars, planets, meteors, comets, and asteroids. 														X	
<ul style="list-style-type: none"> • understand the seasons and the phases of the moon. 														X	X
<ul style="list-style-type: none"> • draw the position of the sun, earth, and moon during eclipses and lunar phases. 														X	
<ul style="list-style-type: none"> • predict tidal conditions based on the position of the earth and moon. 							X							X	
<ul style="list-style-type: none"> • investigate the history of space exploration. 														X	
At Level 2, the student is able to															
<ul style="list-style-type: none"> • discuss the 														X	

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

theories of the origin of the universe: Big Bang and Oscillating/Pulsating.																
<ul style="list-style-type: none"> construct a model of our solar system with emphasis on ratio and proportions of both distance and size of planets. 															X	
<ul style="list-style-type: none"> explain the evolution of a star through all stages of its potential development. 																
<ul style="list-style-type: none"> classify galaxies according to their shapes. 															X	
<ul style="list-style-type: none"> explore the role of astronomical events in Earth history such as asteroid/meteor impacts, solar flares, and comets. 															X	
<ul style="list-style-type: none"> investigate the relationship between the length of the day and the inclination and relative position of the sun to the earth (seasons). 															X	X
<ul style="list-style-type: none"> interpret a tide chart using an almanac or the Internet 								X		X					X	
<ul style="list-style-type: none"> describe the relationship between mass and gravity. 																
<ul style="list-style-type: none"> construct a historical timeline of 															X	

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

man's changing perceptions and knowledge regarding astronomy.																
<ul style="list-style-type: none"> explore recent developments in space exploration. 															X	
<ul style="list-style-type: none"> explore the benefits of space technology in our everyday lives. 															X	

At Level 3, the student is able to:

<ul style="list-style-type: none"> compare and contrast earth to other planets in our solar system. 															X	
<ul style="list-style-type: none"> research Tennessee's contribution to earth and space science. 															X	
<ul style="list-style-type: none"> research a career related to Earth systems such as: astronomer, astronaut, planetary geologist, aerospace engineer, and astrophysicist. 															X	

Standard Number: 2.0 Energy in the Earth System

The student will explore issues associated with energy origin and use in the Earth system.

Learning Expectations: The student will

2.1 investigate energy sources.											X					
2.2 explore energy transfer pathways											X					
2.3 evaluate alternative energy sources.											X					

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> differentiate among the forms of energy (light, heat, 											X					
---	--	--	--	--	--	--	--	--	--	--	---	--	--	--	--	--

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

mechanical, and chemical).																
<ul style="list-style-type: none"> illustrate the three types of energy transfer (radiation, conduction, and convection) and give examples 										X						
<ul style="list-style-type: none"> describe energy resources such as fossil fuels, solar, geothermal, nuclear, wind, and hydroelectric. 										X						
<ul style="list-style-type: none"> distinguish between renewable and nonrenewable resources and their conservation. 										X					X	
<i>At Level 2, the student is able to:</i>																
<ul style="list-style-type: none"> investigate the sun as the major source of the Earth's energy. 											X					
<ul style="list-style-type: none"> explore three primary sources of internal energy: gravitational energy from the earth's original formation, friction, and radioactive decay. 		X		X						X						
<ul style="list-style-type: none"> reflect upon a teacher demonstration of energy conservation i.e. drive a nail into a board or vinegar and baking soda. 										X						
<ul style="list-style-type: none"> diagram and evaluate pathways of 										X						

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

energy transfer to demonstrate the law of conservation of energy.																
<ul style="list-style-type: none"> relate the transfer of energy through the geologic cycles: mantle convection, wind, and ocean currents. 		X														
<ul style="list-style-type: none"> describe the impact of energy transfer on human activity (hurricanes, crops growing-- photosynthesis, volcanic eruptions, tsunamis). 	X	X	X				X	X				X			X	
<ul style="list-style-type: none"> compare and contrast alternative energy sources and their environmental impact. 										X					X	
<i>At Level 3, the student is able to</i>																
<ul style="list-style-type: none"> research careers that relate to energy in the earth system such as nuclear engineer, chemical engineer, environmental engineer, geochemical scientist, materials engineer, geologists, meteorologist, and hydrologist. 	X	X	X				X	X				X			X	
<ul style="list-style-type: none"> debate issues related to energy sources, 										X						

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

resources, and local impact.																
------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Standard Number: 3.0 Cycles in the Earth System

Standard: The student will investigate the principle features of the cycles in the Earth system.

Learning Expectations: The student will

3.1 explain the components of the tectonic cycle.		X														
3.2 investigate the rock cycle.				X												
3.3 analyze the hydrologic cycle.												X				
3.4 interpret and assimilate data related to the atmospheric cycle.								X								
3.5 differentiate between the geo-chemical (earth system) cycles.												X				
3.6 evaluate the role of living organisms within the earth system cycles.	X	X	X	X	X	X	X	X	X	X			X		X	
3.7 investigate maps.				X												

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> explore continental drift/plate tectonics theory using models. 		X														
<ul style="list-style-type: none"> distinguish between minerals and rocks. 				X								X				
<ul style="list-style-type: none"> distinguish among sedimentary, igneous, and metamorphic rocks. 				X												
<ul style="list-style-type: none"> diagram the rock cycle including the processes. 				X												
<ul style="list-style-type: none"> label the parts of the hydrologic cycle, given a diagram of the 													X			

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

hydrologic cycle.																
<ul style="list-style-type: none"> collect and interpret basic weather data from meteorological instruments (thermometer, rain gauge, dry/wet thermometer, and barometer). 						X		X				X				
<ul style="list-style-type: none"> demonstrate physical and chemical weathering. 				X		X						X				
<ul style="list-style-type: none"> recognize the basic geochemical cycles: oxygen/carbon dioxide cycle, nitrogen cycle, and carbon cycle. 												X		X		

At Level 2, the student is able to

<ul style="list-style-type: none"> distinguish between diverging and converging plate boundaries using a labeled diagram of mantle convection currents. 		X														
<ul style="list-style-type: none"> explain and map the relationship between plate tectonics to mountain building, volcanoes, and earthquakes. 		X														
<ul style="list-style-type: none"> identify mineral samples using simple property tests (hardness, luster, streak, cleavage/fractur 	X										X					

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

e and perhaps specific gravity, acid, shape, and taste).																
<ul style="list-style-type: none"> identify rock samples as sedimentary, igneous, or metamorphic. 	X			X												
<ul style="list-style-type: none"> identify uses of rocks and minerals. 				X							X					
<ul style="list-style-type: none"> describe the role of water (i.e. weathering, groundwater, river systems, glaciers, and oceans) in the evolution of landform processes. 					X	X	X		X			X				
<ul style="list-style-type: none"> analyze weather data and make simple predictions using weather maps. 								X							X	
<ul style="list-style-type: none"> understand the interrelationships among the geochemical cycles: a fixed amount of each stable element cycles through the earth systems. (The Law of Conservation of Mass). 												X				
<ul style="list-style-type: none"> recognize the interrelationships of geologic processes and human activity such as floods, earthquakes, volcanoes, acid rain, and global warming. 	X		X		X	X	X		X			X			X	
<ul style="list-style-type: none"> write an essay 	X	X	X	X	X	X	X	X	X		X	X			X	

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

on how geology impacts your everyday life.																
<ul style="list-style-type: none"> read and interpret topographic maps. 				X												
At Level 3, the student is able to																
<ul style="list-style-type: none"> construct the geological cycle for a physiographic region or geologic time period in Tennessee. 				X												
<ul style="list-style-type: none"> investigate careers that relate to geology, such as mineralogist, geologist, meteorologist, volcanologist, gemologist, seismologist, paleontologist, and others. 	X	X	X	X	X	X	X	X	X		X	X			X	

Standard Number: 4.0 Geologic History

Standard: The student will explore the geologic history of the Earth.

Learning Expectations: The student will

4.1 interpret and evaluate the nature of geologic time.																X
4.2 investigate the evolution of Earth.													X			X
4.3 interpret and evaluate the evidence for biological evolution in the fossil record.																X
4.4 demonstrate the effect of the environment on the formation and extinction of species.																X

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> explain the law of uniformitarianism 																X
<ul style="list-style-type: none"> recognize that fossils are 																X

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

found in sedimentary rock.																
<ul style="list-style-type: none"> construct "mock" fossils. 																X
<ul style="list-style-type: none"> compare and contrast fossils to modern organisms. 																X
<ul style="list-style-type: none"> recognize the difference between absolute and relative time (i.e. using a family tree.) 																X
<i>At Level 2, the student is able to</i>																
<ul style="list-style-type: none"> recognize that fossils contained in sedimentary rock provide clues to life forms, changes in those life forms, and environmental changes. 																X
<ul style="list-style-type: none"> examine the fossil record to determine the adaptations of organisms. 																X
<ul style="list-style-type: none"> cite and explain the evidence for plate tectonics (fossil record, mountain ranges, rock strata, paleomagnetism, paleoclimates, and configuration of the continents.) 		X														X
<ul style="list-style-type: none"> compare and contrast the mechanisms for determining the advance of geologic history: relative 																X

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

and absolute dating.																
<ul style="list-style-type: none"> construct and interpret a geologic timetable for the evolution of Earth and the history of life. 																X
<ul style="list-style-type: none"> differentiate the relative age of various fossils in sedimentary rock, given a diagram of rock strata. 				X												X
<ul style="list-style-type: none"> interpret the sequence of rock strata using superposition, cross cutting relationships, inclusions, the fossil record, and absolute data techniques. 				X												
<ul style="list-style-type: none"> create a diorama that depicts the ancient environment or habitat in which a given fossil existed. 																X
<i>At Level 3, the student is able to</i>																
<ul style="list-style-type: none"> predict how environmental changes affect the development of new species or extinction of an existing species, given a written scenario. 																X
<ul style="list-style-type: none"> describe what a geologic time traveler might see in the future of Tennessee. 																X
GEOLOGY																

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

Standard Number: 1.0 Maps															
Standard: The student will develop map interpretation skills for topographic and geologic features.															
Learning Expectations: The student will															
1.1 read and interpret topographic maps.	X														
1.2 investigate rock types, time periods, and faults from geologic maps.				X											
1.3 investigate technologies used to map various features.													X		
1.4 apply maps to solve land-use problems and for planning.	X			X		X									
Performance Indicators:															
<i>At Level 1, the student is able to</i>															
• identify longitude and latitude lines.				X											
• investigate the concept of scale as it applies to maps.				X											
• identify basic map symbols and legends.				X											
• define common rock types.				X											
• define elevation.				X											
<i>At Level 2, the student is able to</i>															
• determine latitude and longitude of specific map points.	X														
• determine scaled map distances.	X			X											
• determine elevations of specific points from a topographic map.	X														
• recognize basic topographic map symbols from a legend/key.	X														
• construct a 3-D representation of a topographical map or construct contour lines from a 3-D model.	X														

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

• construct a profile from a topographic map.	X															
• identify landforms and direction of stream flow using a topographic map.				X												
• interpret basic rock types, time periods, and faults from geologic maps.				X												
• determine and measure compass readings from selected sites.																
• identify practical applications for map interpretation skills.				X												
• investigate methods of remote sensing for measuring and monitoring the earth's crust.													X			

At Level 3, the student is able to

• use a GPS instrument to identify latitude, longitude, and elevation of a location.													X			
• create a topographic map of a landform from collected data.	X															
• successfully navigate an orienteering course.																

Standard Number: 2.0 Matter and Minerals

Standard: The student will explore matter and how it relates to the formation of minerals.

Learning Expectations: The student will

2.1 investigate the atom as the basic building block of all matter.																
2.2 apply the periodic table as a learning tool.																
2.3 investigate the structure, geometry, and shape of crystals.											X					
2.4 distinguish between physical and chemical properties of											X					

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

minerals.																
2.5 investigate the location, abundance, and use of minerals.											X					

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> classify a substance as being made of atoms or molecules given its chemical symbol or formula. 																
<ul style="list-style-type: none"> select groups of elements as being reactive or nonreactive metals, nonmetal, or gases; given the periodic table. 																
<ul style="list-style-type: none"> recognize that water is the major solvent that releases minerals from the earth. 											X	X				
<ul style="list-style-type: none"> evaluate the benefits and drawbacks of man's use of mineral resources given a scenario. 											X					

At Level 2, the student is able to

<ul style="list-style-type: none"> identify characteristics of all minerals: naturally occurring, inorganic, solid, definite structure, and compositions. 											X					
<ul style="list-style-type: none"> recognize or create a representative model of an atom, using the periodic table. 																
<ul style="list-style-type: none"> build models of the six major crystal systems. 																
<ul style="list-style-type: none"> recognize that the crystal form of minerals depends upon atomic size, method of bonding, and the environment. 																
<ul style="list-style-type: none"> identify mineral samples using 											X					

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

simple property tests (hardness, luster, streak, cleavage/fracture, specific gravity, and other special properties) and a mineral table.																
• explore the role of gems as minerals and their value.											X					
• create a presentation on minerals including description (specific gravity, crystalline system, chemical formula, physical properties, etc,) illustration, mining techniques, occurrences, and uses.											X					

At Level 3, the student is able to

• classify minerals (silicates, native elements, carbonates, and sulfates), using chemical formulas.											X					
• create a brochure on the mineral resources of Tennessee.											X					
• investigate technological advances related to minerals including their excavation and use (mining and removal techniques).											X		X			

Standard Number: 3.0 Rocks and the Rock Cycle

Standard: The student will investigate the three rock classes and the rock cycle.

Learning Expectations: The student will

3.1 identify and differentiate among the	X			X												
--	---	--	--	---	--	--	--	--	--	--	--	--	--	--	--	--

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

three rock classes.																
3.2 examine the processes responsible for forming the three rock classes.				X												
3.3 examine characteristics within each rock class.	X			X												
3.4 analyze and interpret the rock cycle.				X												

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> distinguish among sedimentary, igneous, and metamorphic rocks. 	X			X												
<ul style="list-style-type: none"> diagram the rock cycle including the processes involved in the formation of each rock class. 				X												
<ul style="list-style-type: none"> recognize that rocks are composed of minerals. 				X							X					
<ul style="list-style-type: none"> identify rock uses. 				X												

At Level 2, the student is able to

<ul style="list-style-type: none"> distinguish between intrusive (plutonic) and extrusive (volcanic) igneous rocks. 	X			X												
<ul style="list-style-type: none"> identify common igneous rocks (granite, rhyolite, basalt, gabbro, obsidian, pumice) using physical properties and a table. 	X			X												
<ul style="list-style-type: none"> identify plutonic bodies (sill, dike, batholith, and laccolith). 	X			X												
<ul style="list-style-type: none"> understand sedimentary processes. 				X												
<ul style="list-style-type: none"> distinguish between clastic vs. non-clastic and detrital vs. chemical. 				X	X											
<ul style="list-style-type: none"> identify sedimentary rock features such as 				X	X											

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

stratification, fossils, graded bedding, ripple marks, mudcracks.																
<ul style="list-style-type: none"> identify basic sedimentary rocks (sandstone, shale, limestone, coquina, coal, conglomerate) using physical properties and a table. 				X	X											
<ul style="list-style-type: none"> differentiate between foliated and non-foliated metamorphic rocks. 				X												
<ul style="list-style-type: none"> compare and contrast regional and contact metamorphism. 				X												
<ul style="list-style-type: none"> identify common metamorphic rocks (gneiss, marble, schist, slate, quartzite) using physical properties and a table. 				X												
At Level 3, the student is able to																
<ul style="list-style-type: none"> interpret and explain Bowen's reaction series. 				X												
<ul style="list-style-type: none"> explain gradational metamorphism with index minerals and metamorphic rock types using a table. 				X							X					
Standard Number: 4.0 Geologic History																
Standard: The student will explore the geologic history of the Earth and evidence of life through time.																
Learning Expectations: The student will																
4.1 interpret and evaluate the nature of geologic time.																X
4.2 investigate the evolution of Earth.													X			X
4.3 investigate the history of life.																X
4.4 interpret and evaluate the fossil record for evidence of biological evolution.																X
4.5 demonstrate the effect of the environment																X

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

in the formation and extinction of species through geologic time using fossils.															
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Performance Indicators:

At Level 1, the student is able to

<ul style="list-style-type: none"> recognize how scientists estimate the age of the Earth is approximately 4.6 billion years. 															X
<ul style="list-style-type: none"> explain the law of uniformitarianism, “the present is the key to the past”. 															X
<ul style="list-style-type: none"> recognize that fossils are found in sedimentary rock. 															X
<ul style="list-style-type: none"> construct “mock” fossils 															X
<ul style="list-style-type: none"> compare and contrast fossil forms of life to modern organisms. 															X
<ul style="list-style-type: none"> recognize the difference between absolute and relative time (i.e. using a family tree.) 															X

At Level 2, the student is able to

<ul style="list-style-type: none"> recognize that fossils contained in sedimentary rock provide evidence for life forms, changes in those life forms, and environmental changes. 															X
<ul style="list-style-type: none"> examine the fossil record to determine the environmental adaptations of organisms. 															X
<ul style="list-style-type: none"> cite and explain the evidence for plate tectonics (fossil record, mountain ranges, rock strata, paleomagnetism, paleoclimates, and configuration of the continents.). 		X													X

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

<ul style="list-style-type: none"> compare and contrast the mechanisms for determining the advance of geologic history: relative and absolute dating. 																X
<ul style="list-style-type: none"> construct and interpret a geologic timetable for the evolution of Earth and the history of life. 																X
<ul style="list-style-type: none"> differentiate the relative age of various fossils in sedimentary rock, given a diagram of rock strata. 				X												X
<ul style="list-style-type: none"> interpret the sequence of rock strata using superposition, cross cutting relationships, inclusions, the fossil record, and absolute data techniques. 				X												
<ul style="list-style-type: none"> create a diorama that depicts the ancient environment or habitat in which a particular fossil existed. 																X

At Level 3, the student is able to

<ul style="list-style-type: none"> predict how environmental changes will affect the development of a new species or extinction of an existing species, given a written scenario. 																X
<ul style="list-style-type: none"> describe what a geologic time traveler might see in the future Tennessee. 																X

Standard Number: 5.0 Plate Tectonics

Standard: The student will relate the theory of plate tectonics to the evidence for continental drift and seafloor spreading.

Learning Expectations: The student will

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

5.1 explore plate boundaries: divergent, convergent, and transform including continental vs. oceanic.		X														
5.2 interpret evidence for plate tectonics using paleomagnetism, fossil record, continental boundaries, and hot spots.	X	X														X
5.3 investigate the driving mechanisms for plate tectonics as convection currents in the mantle.		X														
5.4 Describe the processes associated with volcanoes, earthquakes, and mountain building.	X	X	X													

Performance Indicators.

At Level 1, the student is able to

<ul style="list-style-type: none"> identify plate boundaries on diagrams. 		X														
<ul style="list-style-type: none"> match boundaries of continents by shape as evidence of plate tectonics. 		X														
<ul style="list-style-type: none"> identify the layers of the earth's structure: core, mantle, and crust. 		X														

At Level 2, the student is able to

<ul style="list-style-type: none"> identify geologic features associated with divergent, convergent, and transform (continental and oceanic) plate boundaries. 		X														
<ul style="list-style-type: none"> identify the evidence for plate tectonics using paleomagnetism, fossil record, continental boundaries, and hot spots. 	X	X														X

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

• describe how convection currents drive plate tectonics.		X													
• associate volcanoes and earthquake activity with plate boundaries using a map.	X	X	X												
• distinguish among reverse, normal, and strike-slip faults.		X													
• distinguish between anticline and syncline.															
• label illustrations of movement of convection cells within mantle and their relationship to convergent and divergent plate boundaries.		X													
• correlate plate movement by plotting movement of hot spots through time.	X	X													

At Level 3, the student is able to

• predict the location and arrangement of the continents at a specified future time.		X													
• describe Hawaii at a specified future time.	X														

Standard Number: 6.0 Landforms

Standard: The student will investigate landforms created by many different surficial processes and their relationships to various sources of energy in the Earth System.

Learning Expectations: The student will

6.1 investigate the hydrosphere and its effect on various relationships to landforms.												X			
6.2 associate surface processes such as wind, glaciers, gravity, oceans, rivers, and mankind with resulting landforms.					X		X		X			X		X	
6.3 understand the												X			

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

role of groundwater.															
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Performance Indicators.

At Level 1, the student is able to

<ul style="list-style-type: none"> recognize that the earth's geologic features change. 					X		X		X			X		X	
<ul style="list-style-type: none"> illustrate the hydrologic cycle and distinguish among condensation, evaporation, precipitation, transpiration, groundwater, runoff, bodies of water, etc. 												X			
<ul style="list-style-type: none"> recognize groundwater as a major source of fresh water. 												X			

At Level 2, the student is able to

<ul style="list-style-type: none"> describe the landforms associated with deserts, glaciers, shorelines, and rivers. 					X		X		X			X		X	
<ul style="list-style-type: none"> describe the nature of groundwater and define the elements of groundwater features. 												X			
<ul style="list-style-type: none"> discuss stream discharge using the Tennessee River or local stream system as an example. 					X										
<ul style="list-style-type: none"> describe the term fluvial processes of erosion, transportation, and deposition. 					X										
<ul style="list-style-type: none"> illustrate various drainage basin models and identify different types of drainage patterns. 					X										
<ul style="list-style-type: none"> relate the characteristics of a river's age (youth, maturity and old age) with respect to its velocity, channel 					X										

EARTH SCIENCE	Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution		
	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3

shape, depth, and discharge.																
<ul style="list-style-type: none"> explain the processes by which a stream erodes and transports its load (suspension, saltation, and bedload). 					X											
<ul style="list-style-type: none"> identify meanders, point bars, cut bank, and cutoffs using a map (i.e. lower Mississippi River). 					X											
<ul style="list-style-type: none"> define a floodplain and describe the behavior of a stream channel and natural levee formation during a flood. 					X											
<ul style="list-style-type: none"> describe the formation of river deltas and explain their nature of change. 					X											
<i>At Level 3, the student is able to</i>																
<ul style="list-style-type: none"> investigate careers associated with water systems. 					X											
<ul style="list-style-type: none"> investigate the influence of landforms on man's cultural, social and economic development. 					X		X		X			X			X	