

## EarthComm Correlation to North Carolina High School Earth/Environmental Science

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	<b>G1</b>	<b>G2</b>	<b>G3</b>	<b>U1</b>	<b>U2</b>	<b>U3</b>	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>N1</b>	<b>N2</b>	<b>N3</b>	<b>E1</b>	<b>E2</b>	<b>E3</b>

**COMPETENCY GOAL 1: The learner will develop abilities necessary to do and understand scientific inquiry in the earth and environmental sciences.**

**Objectives**

<b>1.01 Identify questions and problems in the earth and environmental sciences that can be answered through scientific investigations.</b>	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
<b>1.02 Design and conduct scientific investigations to answer questions related to earth and environmental science.</b>	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Create testable hypotheses	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Identify variables.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Use a control or comparison group when appropriate.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Select and use appropriate measurement tools.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Collect and record data.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Organize data into charts and graphs.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Analyze and interpret data.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Communicate findings.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
<b>1.03 Evaluate the uses of satellite images and imaging techniques in the earth and environmental sciences.</b>															
<b>1.04 Apply safety procedures in the laboratory and in field studies:</b>	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Recognize and avoid potential hazards.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• Safely manipulate materials and equipment needed for scientific investigations.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	
<b>1.05 Analyze reports of scientific investigations and environmental issues from an informed scientifically literate viewpoint including considerations of:</b>	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Appropriate sample.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Adequacy of experimental controls.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Replication of findings.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Alternative interpretations of the data.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
<b>1.06 Identify and evaluate a range of possible solutions to earth and environmental issues at the local, national, and global level including considerations of:</b>	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Interdependent human and natural systems.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Diverse perspectives.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Short and long range impacts.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Economic development, environmental quality and sustainability.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Opportunities for and consequences of personal decisions.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
• Risks and benefits of technological advances.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
<b>COMPETENCY GOAL 2: The learner will build an understanding of lithospheric materials, tectonic processes, and the human and environmental impacts of natural and human-induced changes in the lithosphere.</b>																
<b>Objectives</b>																
<b>2.01 Analyze the dependence of the physical properties of minerals on the arrangement and bonding of their atoms.</b>	X			X					X		XX					

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<b>2.02 Analyze the historical development of the theory of plate tectonics.</b>	xx	xx	xx	x						x	x				x
<b>2.03 Investigate and analyze the processes responsible for the rock cycle:</b>															
• Analyze the origin, texture and mineral composition of rocks.	x	x		xx							x				
• Trace the path of elements through the rock cycle.		x		xx							x				
• Relate rock formation to plate tectonics.	xx	xx		xx							x				
• Identify forms of energy that drive the rock cycle.	x	xx	x	xx											
• Analyze the relationship between the rock cycle and processes in the atmosphere and hydrosphere.	x	x		xx											
<b>2.04 Analyze seismic waves including velocity and refraction to:</b>															
• Infer Earth's internal structure.	xx	xx	xx	x											
• Locate earthquake epicenters.		x	xx												
• Measure earthquake magnitude.		x	xx	x											
• Evaluate the level of seismic activity in North Carolina.		x	x	x											
<b>2.05 Create and interpret topographic, soil and geologic maps using scale and legends.</b>	x	x	x	xx	x	x		x	x	x	x	x			
<b>2.06 Investigate and analyze the importance and impact of the economic development of earth's finite rock, mineral, soil, fossil fuel and other natural resources to society and our daily lives:</b>	x	x	x	x	x	x	x				xx	xx	xx		

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• Availability.	X	X		XX	X	X	X			XX	XX	XX				
• Geographic distribution.	X	X		XX	X	X	X			XX	XX	XX				
• Conservation/Stewardship.				X		X				XX	XX	XX				
• Recycling.										XX	XX	XX				
• Environmental impact.	X	X	X	X	X	X				XX	XX	XX				
• Challenge of rehabilitation of disturbed lands.	XX		X	X	X	XX				XX	XX	XX				
<b>2.07 Analyze the sources and impacts of society's use of energy.</b>	X	X	X	X	X	X				XX	XX	XX		X		
• Renewable and non-renewable sources.	XX	XX	XX	X		X				XX	XX	XX				
• The impact of human choices on Earth and its systems (e.g., global warming, smog, thermal pollution).	X				X	X				XX	XX	XX		XX	X	
<b>COMPETENCY GOAL 3: The learner will build an understanding of the origin and evolution of the earth system.</b>																
<b>Objectives</b>																
<b>3.01 Assess evidence to interpret the order and impact of events in the geologic past:</b>	X	X		X						X	X	X		X	X	X
• Relative and absolute dating techniques.				XX						X	X	X		X	X	X
• Statistical models of radioactive decay.																
• Fossil evidence of past life.				X						X	X	X		X	X	XX
• Uniformitarianism.				XX												
• Stratigraphic principles.				XX												
• Divisions of Geologic Time	X	X		XX					X		X			X	X	
• Origin of the earth system.	X	XX		XX						X	X		XX	X	X	
• Origin of life.													X	X	X	
<b>3.02 Evaluate the geologic history of North Carolina.</b>	X	X	X	X												

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<b>COMPETENCY GOAL 4: The learner will build an understanding of the hydrosphere and its interactions and influences on the lithosphere, the atmosphere, and environmental quality.</b>															
<b>Objectives</b>															
<b>4.01 Evaluate erosion and depositional processes:</b>				X	XX	X		X	X		X				
• Formation of stream channels with respect to the work being done by the stream (i.e. down-cutting, lateral erosion, and transportation).				X	XX	XX		X	X						
• Nature and characteristics of sediments.				XX	XX	X		X	X			X			
• Effects on water quality.					X	X						XX			
• Effect of human choices on the rate of erosion.				X	XX	X									
<b>4.02 Analyze mechanisms for generating ocean currents and upwelling:</b>								X							X
• Temperature.								XX							X
• Coriolis effect.								X							X
• Climatic influence.								XX							XX
<b>4.03 Analyze the mechanisms that produce the various types of shorelines and their resultant landforms:</b>	X			X	X	X	X		X	X		X			
• Nature of underlying geology.	X			XX	X	X	X								
• Long and short term sea-level history.	X						XX		X						
• Formation and breaking of waves on adjacent topography.	X						X								
• Human impact.	X				X		X								
<b>4.04 Evaluate water resources:</b>					X	X	X			X		X			
• Storage and movement of groundwater.					X	X						XX			

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• Ecological services provided by the ocean							XX					X			
• Environmental impacts of a growing human population.					X	X				X		XX			
• Causes of natural and manmade contamination.					X	X				X		XX			
<b>4.05 Investigate and analyze environmental issues and solutions for North Carolina's river basins, wetlands, and tidal environments:</b>					X	X	X		X			X			
• Water quality.					X	X						XX			
• Shoreline changes.									X			X			
• Habitat preservation.												X			
<b>COMPETENCY GOAL 5: The learner will build an understanding of the dynamics and composition of the atmosphere and its local and global processes influencing climate and air quality.</b>															
<b>Objectives</b>															
<b>5.01 Analyze air masses and the life cycle of weather systems:</b>								XX							X
• Planetary wind belts.								XX							X
• Air masses.								XX							X
• Frontal systems.								XX							X
• Cyclonic systems.								XX							X
<b>5.02 Evaluate meteorological observing, analysis, and prediction:</b>					X	X	X	XX		X		X			XX
• Worldwide observing systems.					X	X	X	XX		X		X			XX
• Meteorological data depiction.							X	XX							XX

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<b>5.03 Analyze global atmospheric changes including changes in CO<sub>2</sub>, CH<sub>4</sub>, and stratospheric O<sub>3</sub> and the consequences of these changes:</b>							x	x	x	x		x	x	x	
• Climate change.							x		x	x		x	x	xx	
• Changes in weather patterns.							xx	x		x		x		xx	
• Increasing ultraviolet radiation.										x			x	xx	
• Sea level changes.							x	x	x			x		x	
<b>COMPETENCY GOAL 6: The learner will acquire an understanding of the earth in the solar system and its position in the universe.</b>															
<b>Objectives</b>															
<b>6.01 Analyze the theories of the formation of the universe and solar system.</b>														xx	
<b>6.02 Analyze planetary motion and the physical laws that explain that motion:</b>														xx	x
• Rotation.														xx	x
• Revolution.														xx	x
• Apparent diurnal motions of the stars, sun and moon.														xx	
• Effects of the tilt of the earth's axis.														xx	x
<b>6.03 Examine the sources of stellar energies.</b>														xx	
• Life cycle of stars.														xx	
• Hertzsprung – Russell Diagram.														xx	
<b>6.04 Assess the spectra generated by stars and our sun as indicators of motion and composition (the Doppler effect).</b>														xx	
<b>6.05 Evaluate astronomers' use of various technologies to extend their senses:</b>														x	

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• Optical telescopes.													X		
• Cameras.													X		
• Radio telescopes.													X		
• Spectroscope.													X		