



This document is designed to help North Carolina educators teach the Essential Standards (Standard Course of Study). NCDPI staff are continually updating and improving these tools to better serve teachers.

**Eighth Grade Science**  
 2009-to-2004 Standards Crosswalk

This document is a general comparison of the current 2004 Science Standard Course of Study and the new 2009 Science Essential Standards. It provides initial insight into sameness and difference between these two sets of standards. This document is not intended to answer all questions about the nuance of the new standards versus the old - in fact, we imagine you will develop questions as you do a close reading of the new standards. Please send the science section of NC DPI any thoughts, feedback, questions and ideas about additional resources that would help you start preparing to teach the Essential Standards. Email Beverly Vance at [bvance@dpi.state.nc.us](mailto:bvance@dpi.state.nc.us).

**Important Note: The current 2004 SCOS will continue to be the operational standards in the 2010-11 and 2011-12 school years** as resource materials are developed to support the new Science Essential Standards, professional development is conducted and assessments are designed to align to the new Science Essential Standards. We expect the new Essential Standards to be taught and assessed in schools for the first time in the 2012-13 school year. That said, we are providing Essential Standards resources now and over the next two-years so that schools and teachers can get a head start on internalizing and planning to teach the new standards.

2009 Essential Standards		2004 NC SCOS			Comments
Strand	Objective	Goal	Objective	Text of objective	
	Essential Standard				
	Text of Clarifying objective				
Physical Science: Forces and Motion					

2009 Essential Standards			2004 NC SCOS			
Strand	Objective	Essential Standard	Goal	Objective	Text of objective	Comments
		Text of Clarifying objective				
Physical Science: Matter: Properties and Change		<b>Understand the properties of matter and changes that occur when matter interacts in a closed system.</b>	Understanding of Chemistry	4.02	Evaluate evidence that elements combine in a multitude of ways to produce compounds that account for all living and nonliving substances.	
	8.P.1.1	Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements.		4.03	Explain how the periodic table is a model for: <ul style="list-style-type: none"> <li>• Classifying elements</li> <li>• Identifying the properties of elements</li> </ul>	
	8.P.1.2	Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.		4.06	Describe and measure quantities related to chemical/physical changes within a system: <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Volume</li> <li>• Mass</li> <li>• Precipitate</li> <li>• Gas production</li> </ul>	
	8.P.1.3	Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.		4.07	Identify evidence supporting the law of conservation of matter. <ul style="list-style-type: none"> <li>• During an ordinary chemical reaction matter cannot be created or destroyed.</li> <li>• In a chemical reaction, the total mass of the reactants equals the total mass of the products.</li> </ul>	
	8.P.1.4	Explain how the idea of atoms and a balanced chemical equation support the law of conservation of mass.				
Physical Science: Energy:		<b>Explain the environmental implications associated with the various methods of obtaining, managing and using energy resources.</b>				6 <sup>th</sup> Grade 7.01
	8.P.2.1	Explain the environmental consequences of the various methods of obtaining, transforming, and distributing energy.				

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	8.P.2.2	Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.				6 <sup>th</sup> Grade 7.03, 7.04, 7.05
Earth Science: Earth in the						
Earth Science: Earth Systems, Structures and Processes	<b>Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.</b>		The Hydrosphere	3.02	Explain the structure of the hydrosphere including: <ul style="list-style-type: none"> <li>• Water distribution on earth</li> <li>• Local river basin</li> <li>• Local water availability</li> </ul>	
	8.E.1.1	1 Explain the structure of the hydrosphere including: <ul style="list-style-type: none"> <li>• Water distribution on earth.</li> <li>• Local river basin and water availability.</li> </ul>				
	8.E.1.2	Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: <ul style="list-style-type: none"> <li>• Estuaries.</li> <li>• Marine ecosystems.</li> <li>• Upwelling.</li> <li>• Behavior of gases in the marine environment.</li> <li>• Value and sustainability of marine resources.</li> <li>• Deep ocean technology and understandings gained.</li> </ul>				
				3.03	Evaluate evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: <ul style="list-style-type: none"> <li>• Estuaries</li> <li>• Marine ecosystems</li> <li>• Upwelling</li> <li>• Behavior of gases in the marine environment</li> <li>• Value and sustainability of marine resources</li> <li>• Deep ocean technology and understandings gained</li> </ul>	

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	<p><b>Essential Standard</b></p> <p>Text of Clarifying objective</p>		Text of objective	
	<p>8.E.1.3</p> <p>Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including:</p> <ul style="list-style-type: none"> <li>• Temperature.</li> <li>• Dissolved oxygen.</li> <li>• pH.</li> <li>• Nitrates and phosphates.</li> <li>• Turbidity.</li> <li>• Bio-indicators</li> </ul>		<p>3.05</p> <p>Analyze hydrospheric data over time to predict the health of a water system including:</p> <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Dissolved oxygen</li> <li>• pH</li> <li>• Nitrates</li> <li>• Turbidity</li> <li>• Bio-indicators</li> </ul>	
			<p>3.06</p> <p>Evaluate technologies and information systems used to monitor the hydrosphere.</p>	
	<p>8.E.1.4</p> <p>Conclude that the good health of humans requires:</p> <ul style="list-style-type: none"> <li>• Monitoring of the hydrosphere.</li> <li>• Water quality standards.</li> <li>• Methods of water treatment.</li> <li>• Maintaining safe water quality.</li> <li>• Stewardship and human impact.</li> </ul>		<p>3.07</p> <p>Describe how humans affect the quality of water:</p> <ul style="list-style-type: none"> <li>• Point and non-point sources of water pollution in North Carolina</li> <li>• Possible effects of excess nutrients in North Carolina waters</li> <li>• Economic trade-offs</li> <li>• Local water issues</li> </ul>	
			<p>3.08</p> <p>Recognize that the good health of environments and organisms requires:</p> <ul style="list-style-type: none"> <li>• Monitoring of the hydrosphere</li> <li>• Water quality standards</li> <li>• Methods of water treatment</li> <li>• Maintaining safe water quality</li> <li>• Stewardship</li> </ul>	

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Strand	Objective	Essential Standard	Goal	Objective	Text of objective	Comments
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Earth Science: Earth History		<b>Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and landforms.</b>	Evidence of Evolution in Organisms and Landforms	5.01	Interpret ways in which rocks, fossils, and ice cores record Earth's geologic history and the evolution of life including: <ul style="list-style-type: none"> <li>• Geologic Time Scale</li> <li>• Index Fossils</li> <li>• Law of Superposition</li> <li>• Unconformity</li> <li>• Evidence for climate change</li> <li>• Extinction of species</li> <li>• Catastrophic events</li> </ul>	
	8.E.2.1	Infer the age of Earth and relative age of rocks and fossils from index fossils and ordering of rocks layers (relative dating and radioactive dating)				
	8.E.2.2	Explain the use of fossils, ice cores, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its changing life forms.		5.03	Examine evidence that the geologic evolution has had significant global impact including: <ul style="list-style-type: none"> <li>• Distribution of living things</li> <li>• Major geological events</li> <li>• Mechanical and chemical weathering</li> </ul>	
Life Science: Structures and Functions of Living Organisms		<b>Understand the hazards caused by agents of diseases that affect living organisms.</b>	Microbiology	7.02	Describe diseases caused by microscopic biological hazards including: <ul style="list-style-type: none"> <li>• Viruses</li> <li>• Bacteria</li> <li>• Parasites</li> <li>• Contagions</li> <li>• Mutagens</li> </ul>	
	8.L.1.1	Summarize the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.				
		7.03		Analyze data to determine trends or patterns to determine how an infectious disease may spread including: <ul style="list-style-type: none"> <li>• Carriers</li> <li>• Vectors</li> <li>• Conditions conducive to disease</li> <li>• Calculate reproductive potential of bacteria</li> </ul>		
	8.L.1.2	Explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.				

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Life Science: Ecosystems	8.L.2.1	Understand how biotechnology is used to affect living organisms.	Microbiology	7.05	Investigate aspects of biotechnology including: <ul style="list-style-type: none"> <li>• Specific genetic information available</li> <li>• Careers</li> <li>• Economic benefits to North Carolina</li> <li>• Ethical issues</li> <li>• Impact for agriculture</li> </ul>	
		Summarize aspects of biotechnology including: (Specific genetic information available. Careers. Economic benefits to North Carolina. Ethical issues. Implications for agriculture.				
	8.L.3.1	Understand how organisms interact with and respond to the biotic and abiotic components of their environment.				6 <sup>th</sup> Grade 7.02, 7.03
	8.L.3.2	Explain how factors such as food, water, shelter, and space affect populations in an ecosystem.				
8.L.3.3	Summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including: coexistence and cooperation, competition (predator/prey), parasitism, and mutualism.					
	8.L.3.3	Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen).	The Hydrosphere	3.04	Describe how terrestrial and aquatic food webs are interconnected.	Expanded from 6 <sup>th</sup> Grade 4.01

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Life Science: Evolution and Genetics		<b>Understand the evolution of organisms and landforms based on evidence, theories and processes that impact the earth over time.</b>	Evidence of Evolution in Organisms and Landforms	5.01	Interpret ways in which rocks, fossils, and ice cores record Earth's geologic history and the evolution of life including: <ul style="list-style-type: none"> <li>• Geologic Time Scale</li> <li>• Index Fossils</li> <li>• Law of Superposition</li> <li>• Unconformity</li> <li>• Evidence for climate change</li> <li>• Extinction of species</li> <li>• Catastrophic events</li> </ul>	
	8.L.4.1	Summarize the use of evidence drawn from geology, fossils, and comparative anatomy as the basis of the theory of evolution.				
	8.L.4.2	Explain the relationship between genetic variation and an organism's ability to adapt to its environment.		5.03	Examine evidence that the geologic evolution has had significant global impact including: <ul style="list-style-type: none"> <li>• Distribution of living things</li> <li>• Major geological events</li> <li>• Mechanical and chemical weathering</li> </ul>	
Life Science: Molecular Biology		<b>Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms.</b>				
	8.L.5.1	Summarize how food provides the energy and the molecules required for building materials, growth and survival of all organisms (to include plants).				
	8.L.5.2	Explain the relationship among a healthy diet, exercise, and the general health of the body (emphasis on the relationship between respiration and digestion).				

**Goals 1 and 2 from 2004 SCOS are now embedded in the Standards.**

**Objective 3.01 not addressed**

**Objective 4.01 not addressed**

**Objective 4.04 addressed in 6<sup>th</sup> grade 6.P.3.3**

**Objective 4.08 not addressed**

**Objective 4.09 not addressed**

**Objective 4.10 not addressed**

**Objective 5.02 not addressed**

**Objective 5.04 addressed in 6<sup>th</sup> grade 6.E.2.4**

**Objective 5.05 addressed in 6<sup>th</sup> grade 6.E.2.4**

**Objective 6.01 addressed in 7<sup>th</sup> grade 7.L.1.2**

**Objective 6.02 addressed in 7<sup>th</sup> grade 7.L.1.2**

**Objective 6.03 addressed in 7<sup>th</sup> grade 7.L.1.1**

**Objective 6.04 addressed in 7<sup>th</sup> grade 7.L.1.2**

**Objective 7.01 not addressed**

**Objective 7.04 not addressed**