



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.

Seventh 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.

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	Essential Standard	Goal	Objective	Text of objective	
Physical Science: Forces and Motion		Understand motion, the effects of forces on motion and the graphical representations of motion.	Motion and Forces	6.03	Evaluate motion in terms of Newton's Laws: <ul style="list-style-type: none"> • The force of friction retards motion. • For every action there is an equal and opposite reaction. • The greater the force, the greater the change in motion. • An object's motion is the result of the combined effect of all forces acting on the object: • A moving object that is not subjected to a force will continue to move at a constant speed in a straight line • An object at rest will remain at rest. 	
	7.P.1.1	Explain how the motion of an object by can be described by its position, direction of motion, and speed with respect to some other object.				
	7.P.1.2	Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity and magnets).				

2009 Essential Standards			2004 NC SCOS			
Strand	Objective	Essential Standard	Goal	Objective	Text of objective	Comments
		Text of Clarifying objective				
Physical Science: Matter: Property	7.P.1.3	Illustrate the motion of an object using a graph to show a change in position over a period of time.		6.04	Analyze that an object's motion is always judged relative to some other object or point.	
				6.05	Describe and measure quantities that characterize moving objects and their interactions within a system: <ul style="list-style-type: none"> • Time • Distance • Mass • Force • Velocity • Center of mass • Acceleration 	
	7.P.1.4	Interpret distance versus time graphs for constant speed and variable motion.		6.04	Analyze that an object's motion is always judged relative to some other object or point.	
				6.05	Describe and measure quantities that characterize moving objects and their interactions within a system: <ul style="list-style-type: none"> • Time • Distance • Mass • Force • Velocity • Center of mass • Acceleration 	

2009 Essential Standards			2004 NC SCOS			
Strand	Objective	Essential Standard	Goal	Objective	Text of objective	Comments
		Text of Clarifying objective				
Physical Science: Energy: Conservation and Transfer		Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.				
	7.P.2.1	Explain how kinetic and potential energy contribute to the mechanical energy of an object.				
	7.P.2.2	Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).				
	7.P.2.3	Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.				
	7.P.2.4	Explain how simple machines such as inclined planes, pulleys, levers and wheel and axels are used to create mechanical advantage and increase efficiency.	Motion and Forces	6.01	Demonstrate ways that simple machines can change force.	
			6.02	Analyze simple machines for mechanical advantage and efficiency.		
Earth Science: Earth in the Universe						

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Strand	Objective	Essential Standard	Goal	Objective	Text of objective	Comments
		Text of Clarifying objective				
Earth Science: Earth Systems, Structures and Processes		Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth’s atmosphere, weather and climate and the effects of the atmosphere on humans.	Atmosphere	3.01	Explain the composition, properties and structure of the atmosphere: <ul style="list-style-type: none"> • Mixture of gases • Stratified layers • Each layer has distinct properties • As altitude increases, air pressure decreases • Equilibrium 	
	7.E.1.1	Compare the composition, properties and structure of Earth’s atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.				
	7.E.1.2	Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on earth.				
	7.E.1.3	Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result.		3.05	Examine evidence that atmospheric properties can be studied to predict atmospheric conditions and weather hazards: <ul style="list-style-type: none"> • Humidity • Temperature • Wind speed and direction • Air pressure • Precipitation • Tornados • Hurricanes • Floods • Storms 	

2009 Essential Standards			2004 NC SCOS			
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	7.E.1.4	Predict weather conditions and patterns based on information obtained from: <ul style="list-style-type: none"> • Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure). • Weather maps, satellites and radar • Cloud shapes and types and associated elevation 		3.05	Examine evidence that atmospheric properties can be studied to predict atmospheric conditions and weather hazards: <ul style="list-style-type: none"> • Humidity • Temperature • Wind speed and direction • Air pressure • Precipitation • Tornadoes • Hurricanes • Floods • Storms 	
				3.06	Assess the use of technology in studying atmospheric phenomena and weather hazards: <ul style="list-style-type: none"> • Satellites • Weather maps • Predicting • Recording • Communicating information about conditions 	
	7.E.1.5	Explain the influence of convection, global winds and the jet stream on weather and climatic conditions.				
	7.E.1.6	Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.			3.03	Conclude that the good health of environments and organisms requires: <ul style="list-style-type: none"> • The monitoring of air quality • Taking steps to maintain healthy air quality • Stewardship
3.04					Evaluate how humans impact air quality including: <ul style="list-style-type: none"> • Air quality standards • Point and non-point sources of air pollution in North Carolina • Financial and economic trade-offs 	

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					<ul style="list-style-type: none"> Local air quality issues 	
Earth Science: Earth History						
Life Science: Structures and Functions of Living Organisms		Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.				8 th Grade 6.03
	7.L.1.1	Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including: (Euglena. Amoeba. Paramecium. Volvox.				
	7.L.1.2	Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).				8 th Grade 6.01 8 th Grade 6.02 8 th Grade 6.04
	7. L. 1.3	Summarize the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.				
	7.L.1.4	Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.	Nature of the Human Body System	4.01	Describe growth and development of the human organism.	
				4.06	Analyze how human body systems interact to provide for the needs of the human organism: <ul style="list-style-type: none"> Musculoskeletal Cardiovascular Endocrine and Nervous Digestive and Circulatory Excretory Reproductive Respiratory Immune 	

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					<ul style="list-style-type: none"> Nervous system 		
				4.02	Describe how systems within the human body are defined by the functions it performs.		
Life Science: Ecosystems							
Life Science: Evolution and Genetics		Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation among offspring.	Heredity and Genetics	5.02	Explain the significance of reproduction: <ul style="list-style-type: none"> Sorting and recombination of parents' genetic material Potential variation among offspring 	8 th Grade 6.02 8 th Grade 6.04	
	7.L.2.1	Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).			5.01	Explain the significance of genes to inherited characteristics: <ul style="list-style-type: none"> Genes are the units of information Parents transmit genes to their offspring Some medical conditions and diseases are genetic 	
	7.L.2.2	Infer patterns of heredity using information from Punnett squares and pedigree analysis.			5.03	Identify examples and patterns of human genetic traits: <ul style="list-style-type: none"> Dominant and recessive Incomplete dominance 	
					5.04	Analyze the role of probability in the study of heredity: <ul style="list-style-type: none"> Role of each parent in transfer of genetic traits Analysis of pedigrees 	
	7.L.2.3	Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival.			5.06	Evaluate evidence that human characteristics are a product of: <ul style="list-style-type: none"> Inheritance Environmental factors, and Lifestyle choices 	

2009 Essential Standards			2004 NC SCOS		Comments
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		Text of Clarifying objective		Text of objective	
			Nature of the Human Body	4.07 Explain the effects of environmental influences on human embryo development and human health including: <ul style="list-style-type: none"> • Smoking • Alcohol • Drugs • Diet 	
Life Science: Molecular					

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

Objective 3.02 not addressed

Objective 4.03 not addressed

Objective 4.04 not addressed

Objective 4.05 not addressed

Objective 4.08 not addressed

Objective 5.05 not addressed

Objective 6.06 not addressed