

**NORTH CAROLINA STANDARD COURSE OF STUDY**  
**Crosswalk**  
**Grade 8 Science**

The purpose of this document is to provide a general comparison of the 2009 Grade 8 Science Standard Course of Study and the 2023 Grade 8 Science Standard Course of Study. It provides initial insight into similarities and differences between these two sets of standards. This document is not intended to answer all questions about the nuances of the new 2023 standards versus the previous 2009 standards..

**Grade 8 Science Standards**

Note: The 2023 Grade 8 standards and objectives are not intended to be the curriculum, nor do they indicate the whole of a curriculum which will be written by a local public-school unit (PSU) or school. The standards for this course have been developed to serve as the framework which will guide each PSU in the development of the curriculum for Grade 8.

<b>Matter and Its Interactions</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</i></b>	<i>8.P.1 Understand the properties of matter and changes that occur when matter interacts in an open and closed containers.</i>	
PS.8.1.1 Construct an explanation to classify matter as elements, compounds, or mixtures based on how the atoms are arranged in various substances.	8.P.1.1 Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements.	
PS.8.1.2 Use models to illustrate the structure of atoms in terms of the protons, electrons, and neutrons (using the location, charges and comparative size of these subatomic particles), without consideration of isotopes, ions, and energy levels.		New

PS.8.1.3 Analyze and interpret data to explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of Elements.	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.	
PS.8.1.4 Construct an explanation to classify changes in matter as physical changes (including changes in size, shape, and state) or chemical changes that are the result of a chemical reaction (including changes in energy, color, formation of a gas or precipitate).	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.	
PS.8.1.5 Use models to illustrate how atoms are rearranged during a chemical reaction so that balanced chemical equations support the Law of Conservation of Mass (in both open and closed systems).	8.P.1.4. Explain how the idea of atoms and a balanced chemical equation support the law of conservation of mass.	

<b>From Molecules to Organisms - Structures and Processes</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>LS.8.1 Understand the hazards caused by agents of diseases that affect living organisms.</i></b>	<b><i>8.L.1 Understand the hazards caused by agents of diseases that affect living organisms.</i></b>	
LS.8.1.1 Construct an explanation to compare the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.	8.L.1.1 Summarize the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.	
LS.8.1.2 Analyze and interpret data to explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.	8.L.1.2 Explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.	



<b>Ecosystems - Interactions, Energy, and Dynamics</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>LS.8.2 Understand how organisms interact with and respond to the biotic and abiotic factors in their environment.</i></b>	<i>8.L.3 Understand how organisms interact with and respond to the biotic and abiotic components of their environment.</i>	
LS.8.2.1 Carry out investigations to explain how changing biotic and abiotic factors such as food, water, shelter, and space affect populations in an ecosystem.	8.L.3.1 Explain how factors such as food, water, shelter, and space affect populations in an ecosystem.	
LS.8.2.2 Construct an explanation to 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.3.2 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.	
LS.8.2.3 Construct an explanation to summarize how food provides the energy and the building materials required for the growth and survival of all organisms (to include plants).	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).	
LS.8.2.4 Use models to explain how the flow of energy within food webs is interconnected with the cycling of matter (water and carbon).	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).	

<b>Biological Evolution - Unity and Diversity</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>LS.8.3 Understand the evolution of organisms over time based on evidence and processes.</i></b>	<i>8.L.4 Understand the evolution of organisms and landforms based on evidence, theories and processes that impact the earth over time.</i>	
LS.8.3.1 Analyze and interpret data to infer evolutionary relationships by using evidence drawn from fossils and comparative anatomy.	8.L.4.1 Summarize the use of evidence drawn from geology, fossils, and comparative anatomy to form the basis for biological classification systems and the theory of evolution.	
LS.8.3.2 Use models to explain the process of natural selection, in which genetic variations in a population affect individuals' likelihood of surviving and reproducing in its environment.	8.L.4.2 Explain the relationship between genetic variation and an organism's ability to adapt to its environment.	

<b>Earth's Place in the Universe</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>ESS.8.1 Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and landforms.</i></b>	<i>8.E.2 Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and landforms.</i>	
ESS.8.1.1 Analyze and interpret data to conclude the relative age of Earth and relative age of rocks and fossils from index fossils and ordering of rock layers.	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).	

ESS.8.1.2 Engage in argument from evidence to explain the use of fossils, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its life forms.	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.	
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<b>Earth's Systems</b>		
<b>2023 Standards/Objectives</b>	<b>2009 Essential Standards/Clarifying Objectives</b>	<b>Notes</b>
<b><i>ESS.8.2 Understand the hydrosphere including freshwater, estuarine, ocean systems.</i></b>	<i>8.E.1 Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.</i>	
ESS.8.2.1 Use models to explain the structure of the hydrosphere including: water distribution on earth, local river basins, estuaries, and water availability.	8.E.1.1 Explain the structure of the hydrosphere including: water distribution on earth, local river basin and water availability.	
ESS.8.2.2 Use models to explain how temperature and salinity drive major ocean currents and how these currents impact climate, ecosystems, and the distribution of nutrients, minerals, dissolved gases, and life forms.	8.E.1.2 Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: estuaries, marine ecosystems, upwelling, behavior of gases in the marine environment, value and sustainability of marine resources, deep ocean technology and understandings gained.	

Earth and Human Activity		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<b><i>ESS.8.3 Understand the reciprocal relationship between the hydrosphere and humans.</i></b>	<i>8.E.1 Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.</i>	
ESS.8.3.1 Analyze and interpret data to predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: temperature, dissolved oxygen, pH, nitrates and phosphates, turbidity, and bio-indicators.	8.E.1.3 Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: temperature, dissolve oxygen, pH, nitrates and phosphates, turbidity, bio-indicators.	
ESS.8.3.2 Engage in argument from evidence to explain that the good health of humans and the environment requires: monitoring of the hydrosphere, water quality standards, methods of water treatment, maintaining safe water quality, and stewardship.	8.E.1.4 Conclude that the good health of humans requires: monitoring of the hydrosphere, water quality standards, methods of water treatment, maintaining safe water quality, stewardship.	
<b><i>ESS.8.4 Understand the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</i></b>	<i>8.P.2 Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</i>	
ESS.8.4.1 Construct an explanation to classify the primary sources of energy as either renewable (Geothermal, Biomass, Solar, Wind, Hydroelectric) or nonrenewable (Coal, Petroleum, Natural Gas, Nuclear).		New
ESS.8.4.2 Engage in argument from evidence to explain the environmental consequences of the various methods of obtaining, transforming, and distributing energy.	8.P.2.1. Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.	



ESS.8.4.3 Analyze and interpret data to illustrate the relationship between human activities and global temperatures since industrialization.		New
ESS.8.4.4 Obtain, evaluate, and communicate information to compare the long term implications of the use of renewable and nonrenewable energy resources and the importance of stewardship and conservation.	8.P.2.2 Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.	

**Not addressed**

8.L.2 Understand how biotechnology is used to affect living organisms.

8.L.2.1 Summarize aspects of biotechnology including: specific genetic information available, careers, economic benefits to North Carolina, ethical issues, implications for agriculture.

8.L.5 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.

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)..