

NORTH CAROLINA STANDARD COURSE OF STUDY

Crosswalk

Grade 7 Science

The purpose of this document is to provide a general comparison of the 2009 Grade 7 Science Standard Course of Study and the 2023 Grade 7 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 7 Science Standards

Note: The 2023 Grade 7 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 7.

Motion and Stability - Forces and Interactions		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>PS.7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.</i>	<i>7.P.1 Understand motion, the effects of forces on motion and the graphical representations of motion.</i>	
PS.7.1.1 Construct an explanation to summarize the motion of an object by its position, direction of motion, and speed in respect to some other object.	7.P.1.1 Explain how the motion of an object can be described by its position, direction of motion, and speed with respect to some other object.	
PS.7.1.2 Use models to illustrate the effects of balanced and unbalanced forces acting on an object (including friction, gravity, and magnetism).	7.P.1.2 Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity and magnets).	
PS.7.1.3 Analyze and interpret graphical data to summarize the motion of an object to show a change in position over a period of time.	7.P.1.3 Illustrate the motion of an object using a graph to show a change in position over a period of time.	

PS.7.1.4 Analyze and interpret graphical data to summarize the motion of an object to show a change in distance over a period of time for constant speed and variable motion.	7.P.1.4 Interpret distance versus time graphs for constant speed and variable motion.	
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Energy		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.</i>	<i>7.P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.</i>	
PS.7.2.1 Construct an explanation to summarize how kinetic and potential energy contribute to the mechanical energy of an object.	7.P.2.1 Explain how kinetic and potential energy contribute to the mechanical energy of an object.	
PS.7.2.2 Engage in argument from evidence to explain how energy can be transformed from one form to another, specifically potential energy and kinetic energy (models could include roller coasters, pendulums, or cars on ramps as examples).	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).	
PS.7.2.3 Carry out investigations to conclude that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) in a mechanical system using qualitative data.	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.	
PS.7.2.4 Carry out investigations to compare the efficiency of simple machines in relation to their advantages for particular purposes (to include inclined planes, pulleys, levers and wheel and axles) using qualitative data.	7.P.2.4 Explain how simple machines such as inclined planes, pulleys, levers and wheel and axles are used to create mechanical advantage and increase efficiency.	

From Molecules to Organisms - Structures and Processes		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>LS.7.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</i>	<i>7.L.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</i>	
LS.7.1.1 Construct an explanation to conclude how the structures of single-celled organisms carry out all of the basic functions of life including: Euglena, Amoeba, Paramecium, Volvox.	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)	
LS.7.1.2 Use models to explain how the relevant structures within cells (including cell membrane, cell wall, nucleus, mitochondria, chloroplasts, and vacuoles) function to support the life of plant, animal, and bacterial cells.	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).	
LS.7.1.3 Use models to explain how the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms functions to support life.	7.L.1.3. Summarize the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.	
LS.7.1.4 Construct an explanation to summarize how the major systems of the human body interact with each other to support life (including digestion, respiration, reproduction, circulation, excretion, nervous).	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.	

Heredity - Inheritance and Variation of Traits		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>LS.7.2 Understand the relationship of the mechanisms of reproduction, patterns of inheritance, and potential variation among offspring.</i>	<i>7.L.2 Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation among offspring.</i>	
LS.7.2.1 Construct an explanation supported with scientific evidence to summarize the role of genes on chromosomes as inherited cellular structures which contribute to an organism's traits (not to include the structure of DNA).		New
LS.7.2.2 Use models to explain how asexual reproduction results in offspring with identical genetic information while sexual reproduction results in offspring with genetic variation (not to include specific phases of mitosis and meiosis).	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).	
LS.7.2.3 Use models (Punnett squares) to infer and predict patterns of the inheritance of single genetic traits from parent to offspring (including dominant and recessive traits).	7.L.2.2 Infer patterns of heredity using information from Punnett squares and pedigree analysis.	

Earth's Systems		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</i>	<i>7.E.1 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.</i>	

ESS.7.1.1 Analyze and interpret data to 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.1.1 Compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.	
ESS.7.1.2 Use models to explain how the energy of the Sun and Earth's gravity drive the cycling of water, including changes of state, as it moves through multiple pathways in Earth's systems and relates to weather patterns on Earth.	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.	
ESS.7.1.3 Analyze and interpret data to explain the relationship between the movement of air masses, high and low pressure systems, frontal boundaries and weather conditions that may result.	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.	
ESS.7.1.4 Use models to predict weather conditions based on observations (including clouds, air masses, fronts), measurements (wind speed and direction, air temperature, humidity and air pressure), weather maps, satellites and radar.	7.E.1.4 Predict weather conditions and patterns based on information obtained from: 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.	
ESS.7.1.5 Use models to explain the influence of convection, global winds, and the jet stream on weather and climatic conditions.	7.E.1.5 Explain the influence of convection, global winds and the jet stream on weather and climatic conditions.	

Earth and Human Activity		
2023 Standards/Objectives	2009 Essential Standards/Clarifying Objectives	Notes
<i>ESS.7.2 Understand the reciprocal relationship between the atmosphere and humans.</i>	<i>7.E.1 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.</i>	
ESS.7.2.1 Engage in argument from evidence to explain that the good health of humans and environment requires: monitoring of the atmosphere, maintaining air quality and stewardship.	7.E.1.6 Conclude that the good health of humans require: monitoring the atmosphere, maintaining air quality and stewardship.	
ESS.7.2.2 Analyze and interpret data to explain how changes in the structure and composition of the atmosphere affects the greenhouse effect and global temperatures.		New
ESS.7.2.3 Obtain, evaluate, and communicate information to explain the impacts on humans and mitigation strategies of potentially hazardous environmental factors (including air quality index, UV index, Heat Index, Wildfires) and storms (hurricanes, blizzards, tornadoes, severe thunderstorms, floods).		New with some content from 2009 clarifying objective 7.E.1.3.

Not addressed

7.L.2.3 Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival. (moved to High School Biology).