

NORTH CAROLINA STANDARD COURSE OF STUDY K-12 Science, Third Grade

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Engaging in science encourages students' curiosity, interests, and prepares them for the broadest range of postsecondary opportunities, be it college, career, or military service. The 2023 K-12 Science Standards are designed to allow students to become active participants in science - building their understanding of the natural world through observations and investigations.

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The Science and Engineering Practices (SEP) are embedded in the standards to support a greater emphasis on how students develop science knowledge and the durable skills within the NC Portrait of a Graduate. While one practice is identified in each objective, teachers should utilize other practices to support students' progress towards mastering the standards.

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Third Grade	
Strand: Matter and its Interactions	
Standard	Objectives
<i>PS.3.1 Understand the structure and properties of matter before and after they undergo a change.</i>	PS.3.1.1 Engage in argument from evidence to infer that air is a substance that surrounds us, takes up space, and has mass.
	PS.3.1.2 Carry out investigations to classify solids, liquids, and gases based on their basic properties.
	PS.3.1.3 Engage in argument from evidence to explain observable changes to the properties of matter when heated or cooled.

Strand: Motion and Stability- Forces and Interactions	
Standard	Objectives
<i>PS.3.2 Understand motion and factors that affect motion.</i>	PS.3.2.1 Carry out investigations to infer changes in speed or direction resulting from forces acting on an object.
	PS.3.2.2 Carry out investigations to compare the relative speeds (faster or slower) of objects that travel the same distance in different amounts of time.
	PS.3.2.3 Use models to explain the effect of Earth's gravity on the motion of any object on or near the Earth.

Strand: Energy	
Standard	Objectives
<i>PS.3.3 Understand how energy can be transferred from one object to another.</i>	PS.3.3.1 Ask questions to explain how heat is created by friction.
	PS.3.3.2 Carry out investigations to explain how energy can be transferred from a warmer object to a cooler one by contact or at a distance.

Strand: From Molecules to Organisms- Structures and Processes	
Standard	Objectives
<i>LS.3.1 Understand human body systems and how they are essential for life: protection, movement, and</i>	LS.3.1.1 Use models to infer the functions of the skeletal and muscular systems.
	LS.3.1.2 Obtain, evaluate, and communicate scientific information to explain why skin is necessary for protection and for the body to remain healthy.

<i>support.</i>	
Standard	Objectives
LS.3.2 Understand how plant structures aid in survival.	LS.3.2.1 Carry out investigations to explain the structures and functions of plants and how they are essential for life.
	LS.3.2.2 Use models to exemplify the distinct stages of the life cycle of seed plants.

Strand: Ecosystems - Interactions, Energy, and Dynamics	
Standard	Objectives
LS.3.3 Understand how environmental factors aid in the survival of plants.	LS.3.3.1 Carry out investigations to explain how environmental conditions determine how well plants survive and grow.
	LS.3.3.2 Construct an explanation to infer how the basic properties and components of soil determine its ability to support the growth and survival of many plants.

Strand: Earth's Place in the Universe	
Standard	Objectives
ESS.3.1 Remember the major components and patterns observed in the earth/moon/sun system.	ESS.3.1.1 Use models to recognize that the Earth is part of a system called the solar system that includes the sun (a star), planets, and many moons, and that the Earth is the third planet from the sun.
	ESS.3.1.2 Carry out investigations to recognize that changes in the length and direction of an object's shadow indicate the apparent changing position of the sun during the day.
	ESS.3.1.3 Obtain, evaluate and communicate information to recognize the patterns of the stars (including the sun) stay the same as they appear to move across the sky.

Strand: Earth's Systems	
Standard	Objectives
ESS.3.2 Understand the structures of the Earth's surface using models.	ESS.3.2.1 Use models to compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
	ESS.3.2.2 Use models to compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands).

NORTH CAROLINA STANDARD COURSE OF STUDY K-12 Science, Fourth Grade

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Fourth Grade	
Strand: Motion and Stability- Forces and Interactions	
Standard	Objectives
<i>PS.4.1 Understand how various forces affect the motion of an object.</i>	PS.4.1.1 Ask questions to summarize the relationship of magnetic interactions between two objects not in contact with each other.
	PS.4.1.2 Carry out investigations to explain how electrically charged objects push or pull on other objects to produce motion.
Strand: Energy	
Standard	Objectives
<i>PS.4.2 Understand that energy can be transferred from place to place by sound, light, heat, and electric currents.</i>	PS.4.2.1 Ask questions to identify basic forms of energy (light, sound, heat, and electrical) that cause motion or create change.
	PS.4.2.2 Use models to explain a simple electrical circuit and the necessary components.
	PS.4.2.3 Carry out investigations on common materials to classify them as insulators or conductors of electricity.
Strand: Waves and Their Applications in Technologies for Information Transfer	
Standard	Objectives
<i>PS.4.3 Understand the nature of light and how light interacts with objects.</i>	PS.4.3.1 Carry out investigations to infer the path light travels from a light source to a mirror and how it is reflected (by the mirror) using different angles.
	PS.4.3.2 Carry out investigations to explain how light is refracted and absorbed.
Strand: From Molecules to Organisms- Structures and Processes	
Standard	Objectives
<i>LS.4.1 Understand the effects of environmental changes, adaptations, and behaviors that enable organisms to survive in changing habitats.</i>	LS.4.1.1 Use models to explain that plants and animals have external structures that function to support survival.
	LS.4.1.2 Use models to explain that animals receive different types of information through their senses, process the information, and respond to the information in different ways.
	LS.4.1.3 Engage in argument from evidence to explain how differences among animals of the same population sometimes gives individuals an advantage in surviving and reproducing in changing habitats.

Strand: Biological Evolution- Unity and Diversity	
Standard	Objectives
LS.4.2 Understand the use of fossils as evidence of the history of Earth and its changing life forms.	LS.4.2.1 Analyze and interpret data to compare fossils to one another and living organisms.
	LS.4.2.2 Analyze and interpret data to explain how fossils suggest ideas about Earth's early environment.

Strand: Earth's Place in the Universe	
Standard	Objectives
ESS.4.1 Understand the causes of day and night and phases of the moon.	ESS.4.1.1 Use models to explain the cause of day and night based on the rotation of the Earth on its axis.
	ESS.4.1.2 Use models to explain the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).

Strand: Earth's Systems	
Standard	Objectives
ESS.4.2 Understand patterns of change in the Earth's surface over time.	ESS.4.2.1 Carry out investigations to classify minerals using tests for the physical properties of hardness, color, luster, cleavage and streak.
	ESS.4.2.2 Carry out investigations to classify rocks as metamorphic, sedimentary, or igneous based on their composition, how they are formed, and the processes that create them.
	ESS.4.2.3 Use models to explain changes in Earth's surface over time (to include slow changes of erosion and weathering, and fast changes of earthquakes, landslides, and volcanic activity).

Strand: Earth and Human Activity	
Standard	Objectives
<i>ESS.4.3 Understand changes caused by human impact on the environment.</i>	ESS.4.3.1 Ask questions to infer whether changes in an organism's environment are beneficial or harmful.
	ESS.4.3.2 Engage in argument from evidence to explain how humans can adapt their behavior to live in changing environments (e.g. recycling wastes, establishing rain gardens, planting native species to prevent flooding and erosion).
	ESS.4.3.3 Obtain, evaluate and communicate information to compare solutions to environmental problems impacting plants and animals.



NORTH CAROLINA STANDARD COURSE OF STUDY K-12 Science, Fifth Grade

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Fifth Grade	
Strand: Matter and its Interactions	
Standard	Objectives
<i>PS.5.1 Understand the interactions of matter and energy and the changes that occur.</i>	PS 5.1.1 Carry out investigations to compare the weight of objects before and after an interaction.
	PS 5.1.2 Carry out investigations to explain whether the mixing of two or more substances results in new substances.
	PS 5.1.3 Carry out investigations to compare how heating and cooling affect some materials and how this relates to their purpose and practical applications.
Strand: Motion and Stability- Forces and Interactions	
Standard	Objectives
<i>PS.5.2 Understand force, motion, and the relationship between them.</i>	PS.5.2.1 Carry out investigations to explain how factors such as gravity, friction, and change in mass affect the motion of objects.
	PS.5.2.2 Use mathematics and computational thinking to infer the motion of an object (including position, direction, and speed).
Strand: From Molecules to Organisms- Structures and Processes	
Standard	Objectives
<i>LS.5.1 Understand how structures and systems of the human body perform functions necessary for life.</i>	LS.5.1.1 Use models to recognize the organizational structure of humans as a multicellular organism (cell, tissue, organ, system, organism).
	LS.5.1.2 Use models to compare the major systems of the human body (digestive, respiratory, circulatory, muscular, skeletal, nervous) as it relates to their functions necessary for life.



Strand: Ecosystems- Interactions, Energy, and Dynamics	
Standard	Objectives
LS.5.2 Understand the interdependence of plants and animals within their ecosystem.	LS.5.2.1 Engage in argument from evidence to compare the characteristics of several common ecosystems (including estuaries and salt marshes, oceans, lakes and ponds, rivers and streams, forests, and grasslands) in terms of their ability to support a variety of populations.
	LS.5.2.2 Use models to classify organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers .
	LS.5.2.3 Use models to infer the effects that may result from the interconnected relationships of plants and animals to their ecosystem.

Strand: Heredity- Inheritance and Variation of Traits	
Standard	Objectives
LS.5.3 Understand some characteristics of an organism are inherited and other characteristics are acquired.	LS.5.3.1 Ask questions to compare instincts and learned behaviors.
	LS.5.3.2 Ask questions to compare inherited and acquired traits.

Strand: Earth's Systems	
Standard	Objectives
ESS.5.1 Understand how Earth systems (hydrosphere and atmosphere) impact patterns of weather and climate.	ESS.5.1.1 Analyze and interpret data to compare daily and seasonal changes in weather conditions (including wind speed and direction, precipitation, and temperature) and patterns.
	ESS.5.1.2 Analyze and interpret weather data to explain current and upcoming weather conditions (including severe weather such as hurricanes and tornadoes) in a given location.
	ESS.5.1.3 Construct an explanation to summarize the ocean's influences on weather and climate in North Carolina.
	ESS.5.1.4 Use models to explain how the sun's energy drives the processes of the water cycle (including evaporation, transpiration, condensation, precipitation).

