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

The North Carolina 2023 K-12 Science Standards are intended to foster conceptual understanding and help develop scientifically literate students. The standards provide foundational knowledge and practices within each grade band and course. The standards are organized within 11 strands which articulate vertical alignment. As students progress from one grade to the next, the depth of knowledge and level of sophistication increases.

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.

The scientific method provides a common framework for introducing the traditional experimental design and hypothesis-testing process. The methodologies or approaches utilized by scientists can vary depending on the nature of their research questions and available tools. Steps that all scientists follow when conducting scientific investigations usually involve asking questions, the collection and analysis of relevant data, the use of logical reasoning, opportunities to communicate and collaborate with others, and the development of explanations.

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.

The North Carolina Science Standards maintain the respect for local control of each Public School Unit (PSU). These 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 PSU or school. The K-12 Science Standard Course of Study has been developed to serve as the framework for a well-planned science curriculum which provides opportunities for investigations, experimentation, and technological design.

Fourth Grade	
Strand: Motion and Stability- Forces and Interactions	
Standard	**Objectives**
PS.4.1 Understand how various forces affect the motion of an object.	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**
PS.4.2 Understand that energy can be transferred from place to place by sound, light, heat, and electric currents.	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**
PS.4.3 Understand the nature of light and how light interacts with objects.	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**
LS.4.1 Understand the effects of environmental changes, adaptations, and behaviors that enable organisms to survive in changing habitats.	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**
ESS.4.3 Understand changes caused by human impact on the environment.	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.