

Texas Educator Certification Examination Program

Field 814: Core EC–6 Science

Examination Framework

August 2025

Domain	Range of Competencies
IV. Science	001–004

**814: CORE EC–6 SCIENCE
EXAMINATION FRAMEWORK**

DOMAIN IV—SCIENCE

Competency 001 (Life Science): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' understanding of all living organisms' structures and functions that allow them to survive, relationships between organisms and environments, and systems and cycles within environments, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Science (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of classifying organisms based on their characteristics (e.g., physical characteristics, basic needs, how they care for their young, structures and functions).
- B. Demonstrate knowledge of how to promote students' understanding of the life cycles of plants and animals, and of how to compare the ways organisms resemble their parents based on their life cycles.
- C. Demonstrate knowledge of how to promote students' understanding of the interrelationships among organisms and between organisms and their environment (e.g., food webs, biotic and abiotic factors), and the cycling of matter and energy through ecosystems.
- D. Demonstrate knowledge of how to promote students' understanding of patterns, cycles, and systems within environments (e.g., floods, fossilization), and of how to analyze the effects of human interaction with ecosystems.
- E. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to life science and how it connects to other disciplines.
- F. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, appropriate interventions, and flexible grouping to address the assessed strengths and needs of all students related to life science and how it connects to other disciplines.
- G. Apply knowledge of how recurring themes and concepts (i.e., patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) relate to life science, and demonstrate understanding of the connection of life science to other disciplines.

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Competency 002 (Earth and Space Science): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' understanding of the recognizable patterns, systems, and processes in the natural world and the solar system and of the identification of earth materials and natural resources and products made from these materials, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Science (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of patterns (e.g., day and night, seasonal changes) and effects caused by the cyclical movement of the Sun, Earth, and the Moon.
- B. Demonstrate knowledge of how to promote students' understanding of the physical properties of earth materials (e.g., rocks, layers of Earth, bodies of water).
- C. Demonstrate knowledge of how to promote students' understanding of the composition, structure, landforms, and processes of Earth's geologic system and how it interacts with other Earth systems and of how to describe Earth processes that create patterns of change (e.g., water cycle, rock cycle, erosion, volcanic eruptions).
- D. Demonstrate knowledge of how to promote students' understanding of weather phenomena, patterns, processes, and changes across the world and their causes, and of how to differentiate between weather and climate.
- E. Demonstrate knowledge of how to promote students' understanding of the importance of natural resources and their management and of how to analyze the relationships between human activity and Earth's systems and natural resources (e.g., construction, agriculture, conservation, transportation, recycling).
- F. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to Earth and space science and how it connects to other disciplines.
- G. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students related to Earth and space science and how it connects to other disciplines.
- H. Apply knowledge of how recurring themes and concepts (i.e., patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) relate to Earth and space science, and demonstrate understanding of the connection of Earth and space science to other disciplines.

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Competency 003 (Physical Science): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' understanding of the nature of forces, patterns in force interactions, and the fundamental concepts of matter and energy, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Science (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of the composition, structure, states, and properties of matter; determining how physical properties change when materials are manipulated (e.g., combined, heated, folded, frozen); and identifying signs of a chemical change.
- B. Demonstrate knowledge of how to promote students' understanding of methods and tools used to classify objects based on observable physical properties (e.g., color, texture, temperature, mass, relative density).
- C. Demonstrate knowledge of how to promote students' understanding of the differences between mixtures and solutions.
- D. Demonstrate knowledge of how to promote students' understanding of forces (e.g., pushes, pulls, friction) that cause changes in motion and of how to describe the effects of forces (e.g., magnetism, gravity) on objects.
- E. Demonstrate knowledge of how to promote students' understanding of different forms of energy (e.g., kinetic, thermal, chemical, potential), the processes of energy transfers and transformations, and the conservation of energy and of how to identify Earth's energy resources and the advantages and disadvantages of their use.
- F. Apply knowledge of how to use and interpret the results of formative and summative assessments to understand students' thinking, identify strengths and progress toward mastery, and identify and respond to gaps in knowledge and understanding related to physical science and how it connects to other disciplines.
- G. Apply knowledge of key factors to consider in planning and delivering differentiated and explicit instruction, scaffolding, interventions, and flexible grouping to address the assessed strengths and needs of all students related to physical science and how it relates to other disciplines.
- H. Apply knowledge of how recurring themes and concepts (i.e., patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) relate to physical science, and demonstrate understanding of the connection of physical science to other disciplines.

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Competency 004 (Scientific and Engineering Practices): *Apply knowledge of evidence-based and research-based instructional practices, strategies, and activities for developing students' understanding of asking questions, planning and conducting investigations to answer questions, explaining phenomena using appropriate tools and models, and working collaboratively to identify problems and design solutions using appropriate tools and models, as described in the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Science (Kindergarten through Grade 6).*

For example:

- A. Demonstrate knowledge of how to promote students' understanding of how to ask questions; identify problems; and safely plan a classroom, laboratory, or field investigation using scientific, environmentally appropriate, and ethical practices.
- B. Demonstrate knowledge of how to promote students' understanding of using tools, models, and data to answer questions, explain phenomena, or design solutions to problems.
- C. Demonstrate knowledge of how to promote students' understanding of analyzing and interpreting data to derive meaning, to identify features and patterns, and to discover relationships or correlations to develop evidence-based arguments or evaluate designs.
- D. Demonstrate knowledge of how to promote students' understanding of using critical thinking, scientific reasoning, and problem solving to construct evidence-based explanations and communicate findings, conclusions, and proposed solutions.
- E. Demonstrate knowledge of how to promote students' understanding of the importance of the contributions of scientists and of scientific research and innovation for society.
- F. Demonstrate knowledge of how to promote students' understanding of recognizing that some questions are outside the realm of science because they deal with phenomena that are not currently scientifically testable.
- G. Demonstrate knowledge of how to promote students' understanding of distinguishing between scientific decision-making practices and ethical and social decisions that involve the sciences.
- H. Demonstrate knowledge of how to promote students' understanding of recognizing the importance of observation in scientific practices and how observation leads to inferences and conclusions.
- I. Demonstrate knowledge of how to promote students' understanding of recognizing the difference between hypotheses and scientific theories.