

Science
Texas Essential Knowledge and Skills
GRADE 5

(a) Introduction

- (1) In Grade 5, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools such as nets and cameras to collect and record information. Students also use computers and information technology tools to support scientific investigations.
- (2) As students learn science skills, they identify structures and functions of Earth systems including the crust, mantle, and core and the effect of weathering of landforms. Students learn that growth, erosion, and dissolving are examples of how some past events have affected present events. Students learn about magnetism, physical states of matter, and conductivity as properties that are used to classify matter. In addition, students learn that light, heat, and electricity are all forms of energy.
- (3) Students learn that adaptations can improve the survival of members of a species, and they explore an organism's niche within an ecosystem. Students continue the study of organisms by exploring a variety of traits that are inherited by offspring from their parents and study examples of learned characteristics.
- (4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.
- (5) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.
- (6) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(b) Knowledge and skills

- (5.1) **Scientific processes.** *The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:*
 - (A) demonstrate safe practices during field and laboratory investigations; and
 - (B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.
- (5.2) **Scientific processes.** *The student uses scientific methods during field and laboratory investigations. The student is expected to:*
 - (A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;
 - (B) collect information by observing and measuring;
 - (C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
 - (D) communicate valid conclusions; and
 - (E) construct simple graphs, tables, maps and charts using tools including computers to organize, examine, and evaluate information.
- (5.3) **Scientific processes.** *The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:*
 - (A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
 - (B) draw inferences based on information related to promotional materials for products and services;
 - (C) represent the natural world using models and identify their limitations;
 - (D) evaluate the impact of research on scientific thought, society, and the environment; and
 - (E) connect Grade 5 science concepts with the history of science and contributions of scientists.
- (5.4) **Scientific processes.** *The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:*

- (A) collect and analyze information using tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, compasses, balances, hot plates, meter sticks, timing devices, magnets, collecting nets, and safety goggles; and
 - (B) demonstrate that repeated investigations may increase the reliability of results.
- (5.5) **Science concepts.** *The student knows that a system is a collection of cycles, structures, and processes that interact. The student is expected to:*
- (A) describe some cycles, structures, and processes that are found in a simple system; and
 - (B) describe some interactions that occur in a simple system.
- (5.6) **Science concepts.** *The student knows that some change occurs in cycles. The student is expected to:*
- (A) identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles;
 - (B) identify the significance of the water, carbon, and nitrogen cycles; and
 - (C) describe and compare life cycles of plants and animals.
- (5.7) **Science concepts.** *The student knows that matter has physical properties. The student is expected to:*
- (A) classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;
 - (B) demonstrate that some mixtures maintain the physical properties of their ingredients;
 - (C) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving sugar in water; and
 - (D) observe and measure characteristic properties of substances that remain constant such as boiling points and melting points.
- (5.8) **Science concepts.** *The student knows that energy occurs in many forms. The student is expected to:*
- (A) differentiate among forms of energy including light, heat, electrical, and solar energy;
 - (B) identify and demonstrate everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, and eyeglasses;
 - (C) demonstrate that electricity can flow in a circuit and can produce heat, light, sound, and magnetic effects; and
 - (D) verify that vibrating an object can produce sound.
- (5.9) **Science concepts.** *The student knows that adaptations may increase the survival of members of a species. The student is expected to:*
- (A) compare the adaptive characteristics of species that improve their ability to survive and reproduce in an ecosystem;
 - (B) analyze and describe adaptive characteristics that result in an organism's unique niche in an ecosystem; and
 - (C) predict some adaptive characteristics required for survival and reproduction by an organism in an ecosystem.
- (5.10) **Science concepts.** *The student knows that likenesses between offspring and parents can be inherited or learned. The student is expected to:*
- (A) identify traits that are inherited from parent to offspring in plants and animals; and
 - (B) give examples of learned characteristics that result from the influence of the environment.
- (5.11) **Science concepts.** *The student knows that certain past events affect present and future events. The student is expected to:*
- (A) identify and observe actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow;
 - (B) draw conclusions about "what happened before" using data such as from tree-growth rings and sedimentary rock sequences; and
 - (C) identify past events that led to the formation of the Earth's renewable, nonrenewable, and inexhaustible resources.
- (5.12) **Science concepts.** *The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:*
- (A) interpret how land forms are the result of a combination of constructive and destructive forces such as deposition of sediment and weathering;
 - (B) describe processes responsible for the formation of coal, oil, gas, and minerals;
 - (C) identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon; and
 - (D) identify gravity as the force that keeps planets in orbit around the Sun and the moon in orbit around the Earth.