Texas Science

Grade 5

Adopted 2021

The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to: 5.1

- **A.** ask questions and define problems based on observations or information from text, phenomena, models, or investigations; 5.1.A
- **B.** use scientific practices to plan and conduct descriptive and simple experimental investigations and use engineering practices to design solutions to problems; 5.1.B
- **C.** demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards; 5.1.C
- **D.** use tools, including calculators, microscopes, hand lenses, metric rulers, Celsius thermometers, prisms, concave and convex lenses, laser pointers, mirrors, digital scales, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, notebooks, timing devices, materials for building circuits, materials to support observations of habitats or organisms such as terrariums and aquariums, and materials to support digital data collection such as computers, tablets, and cameras to observe, measure, test, and analyze information; 5.1.D
- **E.** collect observations and measurements as evidence; 5.1.E
- **F.** construct appropriate graphic organizers used to collect data, including tables, bar graphs, line graphs, tree maps, concept maps, Venn diagrams, flow charts or sequence maps, and input-output tables that show cause and effect; and 5.1.F
- **G.** develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem. 5.1.G

The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based ar[illegible] de[illegible] expected to: 5.2

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- **A.** identify advantages and limitations of models such as their size, scale, properties, and materials; 5.2.A
- **B.** analyze data by identifying any significant features, patterns, or sources of error; 5.2.B
- **C.** use mathematical calculations to compare patterns and relationships; and 5.2.C
- evaluate experimental and engineering designs. 5.2.D

The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to: 5.3	**A. develop explanations and propose solutions supported by data and models;** 5.3.A **B. communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and** 5.3.B **C. listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific discussion.** 5.3.C
The student knows the contributions of scientists and recognizes the importance of scientific research and innovation for society. The student is expected to: 5.4	**A. explain how scientific discoveries and innovative solutions to problems impact science and society; and** 5.4.A **B. research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.** 5.4.B
The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to: 5.5	**A. identify and use patterns to explain scientific phenomena or to design solutions;** 5.5.A **B. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;** 5.5.B **C. use scale, proportion, and quantity to describe, compare, or model different systems;** 5.5.C **D. examine and model the parts of a system and their interdependence in the function of the system;** 5.5.D **E. investigate how energy flows and matter cycles through systems and how matter is conserved;** 5.5.E **F. explain the relationship between the structure and function of objects, organisms, and systems; and** 5.5.F **G. explain how factors or conditions impact stability and change in objects, organisms, and systems.** 5.5.G
The student knows that matter has measurable physical properties that determine how matter is identified, classified, changed, and used. The student is expected to:	**A. compare and contrast matter based on measurable, testable, or observable physical properties, including mass, magnetism, relative density (sinking and floating using water as a reference point), physical state (solid, liquid, gas), volume, solubility in water, and the ability to conduct or insulate thermal energy and electric energy;** 5.6.A **B. demonstrate and explain that some mixtures maintain physical properties of their substances such as iron filings and sand or sand and water;** 5.6.B

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	C. compare the properties of substances before and after they are combined into a solution and demonstrate that matter is conserved in solutions; and 5.6.C
	D. illustrate how matter is made up of particles that are too small to be seen such as air in a balloon. 5.6.D
The student knows the nature of forces and the patterns of their interactions. The student is expected to: 5.7	**A.** investigate and explain how equal and unequal forces acting on an object cause patterns of motion and transfer of energy; and 5.7.A
	B. design a simple experimental investigation that tests the effect of force on an object in a system such as a car on a ramp or a balloon rocket on a string. 5.7.B
The student knows that energy is everywhere and can be observed in cycles, patterns, and systems. The student is expected to: 5.8	**A.** investigate and describe the transformation of energy in systems such as energy in a flashlight battery that changes from chemical energy to electrical energy to light energy; 5.8.A
	B. demonstrate that electrical energy in complete circuits can be transformed into motion, light, sound, or thermal energy and identify the requirements for a functioning electrical circuit; and 5.8.B
	C. demonstrate and explain how light travels in a straight line and can be reflected, refracted, or absorbed. 5.8.C
The student recognizes patterns among the Sun, Earth, and Moon system and their effects. The student is expected to demonstrate that Earth rotates on its axis once approximately every 24 hours and explain how that causes the day/night cycle and the appearance of the Sun moving across the sky, resulting in changes in shadow positions and shapes. 5.9	**9.** The student recognizes patterns among the Sun, Earth, and Moon system and their effects. The student is expected to demonstrate that Earth rotates on its axis once approximately every 24 hours and explain how that causes the day/night cycle and the appearance of the Sun moving across the sky, resulting in changes in shadow positions and shapes. 5.9
The student knows that there are recognizable patterns and processes on Earth. The student is expected to: 5.10	**A.** explain how the Sun and the ocean interact in the water cycle and affect weather; 5.10.A
	B. model and describe the processes that led to the formation of sedimentary rocks and fossil fuels; and 5.10.B

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	C. model and identify how changes to Earth's surface by wind, water, or ice result in the formation of landforms, including deltas, canyons, and sand dunes. 5.10.C
The student understands how natural resources are important and can be managed. The student is expected to design and explain solutions such as conservation, recycling, or proper disposal to minimize environmental impact of the use of natural resources. 5.11	**11.** The student understands how natural resources are important and can be managed. The student is expected to design and explain solutions such as conservation, recycling, or proper disposal to minimize environmental impact of the use of natural resources. 5.11
The student describes patterns, cycles, systems, and relationships within environments. The student is expected to: 5.12	**A.** observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem; 5.12.A
	B. predict how changes in the ecosystem affect the cycling of matter and flow of energy in a food web; and 5.12.B
	C. describe a healthy ecosystem and how human activities can be beneficial or harmful to an ecosystem. 5.12.C
The student knows that organisms undergo similar life processes and have structures and behaviors that help them survive within their environments. The student is expected to: 5.13	**A.** analyze the structures and functions of different species to identify how organisms survive in the same environment; and 5.13.A
	B. explain how instinctual behavioral traits such as turtle hatchlings returning to the sea and learned behavioral traits such as orcas hunting in packs increase chances of survival. 5.13.B