2021 Introduction	*2017 Introduction*
(1) In Kindergarten through Grade 5 Science, content is organized into recurring strands. The concepts within each grade level build on prior knowledge, prepare students for the next grade level, and establish a foundation in science. In Grade 1, the following concepts will be addressed in each strand. (A) Scientific and engineering practices. Scientific inquiry is the planned and deliberate investigation of the natural world using scientific and engineering practices. Scientific methods of investigation are descriptive, comparative, or experimental. The method chosen should be appropriate to the grade level and question being asked. Student learning for different types of investigations include descriptive investigations, which involve collecting data and recording observations without making comparisons; comparative investigations, which involve collecting data with variables that are manipulated to compare results; and experimental investigations, which involve processes similar to comparative investigations but in which a control is identified. (i) Scientific practices. Students ask questions, plan and conduct investigations to answer questions, and explain phenomena using appropriate tools and models. (ii) Engineering practices. Students identify problems and design solutions using appropriate tools and models. (iii) To support instruction in the science content standards, it is recommended that districts integrate scientific and engineering practices through classroom and outdoor investigations for at least 80% of instructional time. (B) Matter and its properties. Students build their knowledge of the natural world using their senses. Students focus on observable properties and patterns of objects, including larger and smaller, heavier and lighter, shape, color, and texture. The students understand changes in materials caused by heating and cooling. (C) Force, motion, and energy. Students know that force and motion are related and that energy exists in many forms as a part of everyday life. Magnetism interacts with various materials and can be used as a push and pull. The students investigate the importance of heat and focus on changes caused by heating and cooling. (D) Earth and space. Patterns, cycles, and systems are recognizable in the natural world and among objects in the sky. Students make informed choices by understanding weather and seasonal patterns. Students understand that natural resources on Earth, including rocks, soil, and water, are used by humans and can be conserved.	***(1)*** *In Grade 1, students observe and describe the natural world using their senses. Students do science as inquiry in order to develop and enrich their abilities to understand the world around them in the context of scientific concepts and processes. Students develop vocabulary through their experiences investigating properties of common objects, earth materials, and organisms.* *(A) A central theme in first grade science is active engagement in asking questions, creating a method to answer those questions, answering those questions, communicating ideas, and exploring with scientific tools in order to explain scientific concepts and processes like scientific investigation and reasoning; matter and energy; force, motion, and energy; Earth and space; and organisms and environment. Scientific investigation and reasoning involves practicing safe procedures, asking questions about the natural world, and seeking answers to those questions through simple observations used in descriptive investigations.* *(B) Matter is described in terms of its physical properties, including relative size, weight, shape, color, and texture. The importance of light, thermal, and sound energy is identified as it relates to the students' everyday life. The location and motion of objects are explored.* *(C) Weather is recorded and discussed on a daily basis so students may begin to recognize patterns in the weather. In addition, patterns are observed in the appearance of objects in the sky.* *(D) In life science, students recognize the interdependence of organisms in the natural world. They understand that all organisms have basic needs that can be satisfied through interactions with living and nonliving things. Students will investigate life cycles of animals and identify likenesses between parents and offspring.* ***(2)*** *Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process."* ***(3)*** *Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.* ***(4)*** *The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 80% of instructional time.*

2021 Introduction *(continued)*	*2017 Introduction (continued)*
(E) Organisms and environments. All living organisms interact with living and nonliving things within their environments and use structures to meet their basic needs. Students know that organisms are interdependent and part of a food chain. The students investigate the life cycle of animals and identify likenesses between parents and young. **(2)** Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not currently scientifically testable. **(3)** Scientific hypotheses and theories. Students are expected to know that: (A) hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories; and (B) scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well established and highly reliable explanations, but they may be subject to change as new areas of science and new technologies are developed. **(4)** Science and social ethics. Scientific decision making is a way of answering questions about the natural world involving its own set of ethical standards about how the process of science should be carried out. Students distinguish between scientific decision-making practices and ethical and social decisions that involve science. **(5)** Recurring themes and concepts. Science consists of recurring themes and making connections between overarching concepts. Recurring themes include structure and function, systems, models, and patterns. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. Models have limitations but provide a tool for understanding the ideas presented. Students analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment. **(6)** Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.	***(5)*** *Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.*

2021	*2017*
Scientific and Engineering Practices	
(1) 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:	
(A) ask questions and define problems based on observations or information from text, phenomena, models, or investigations;	*(2)(A) ask questions about organisms, objects, and events observed in the natural world*
(B) use scientific practices to plan and conduct simple descriptive investigations and use engineering practices to design solutions to problems;	*(2)(B) plan and conduct simple descriptive investigations*
(C) identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency-approved safety standards;	*(1)(A) identify, discuss, and demonstrate safe and healthy practices as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations, including wearing safety goggles or chemical splash goggles, as appropriate, washing hands, and using materials appropriately*
(D) use tools, including hand lenses, goggles, heat-resistant gloves, trays, cups, bowls, beakers, sieves/sifters, tweezers, primary balance, notebooks, terrariums, aquariums, stream tables, soil samples (loam, sand, gravel, rocks, and clay), seeds, plants, windsock, pinwheel, student thermometer, demonstration thermometer, rain gauge, straws, ribbons, non-standard measuring items, flashlights, sandpaper, wax paper, items that are magnetic, non-magnetic items, a variety of magnets, hot plate, aluminum foil, Sun-Moon-Earth model, and plant and animal life cycle models to observe, measure, test, and compare;	*(4)(A) collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles or chemical splash goggles, as appropriate; timing devices; non-standard measuring items; weather instruments such as demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums* *(4)(B) measure and compare organisms and objects using non-standard units*
(E) collect observations and measurements as evidence;	*(2)(C) collect data and make observations using simple tools*
(F) record and organize data using pictures, numbers, words, symbols, and simple graphs; and	*(2)(D) record and organize data using pictures, numbers, and words*
(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.	*(3)(A) identify and explain a problem and propose a solution*

2021	*2017*
(2) The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:	
(A) identify basic advantages and limitations of models such as their size, properties, and materials;	**NEW (referenced in Intro (5))**
(B) analyze data by identifying significant features and patterns	*(3)(B) make predictions based on observable patterns*
(C) use mathematical concepts to compare two objects with common attributes; and	**NEW**
(D) evaluate a design or object using criteria to determine if it works as intended.	**NEW**
(3) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	
(A) develop explanations and propose solutions supported by data and models;	**NEW**
(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and	*(2)(E) communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations*
(C) listen actively to others' explanations to identify important evidence and engage respectfully in scientific discussion.	**NEW**
(4) The student knows the contributions of scientists and recognizes the importance of scientific research and innovation for society. The student is expected to:	
(A) explain how science or an innovation can help others; and	**NEW**
(B) identify scientists and engineers such as Katherine Johnson, Sally Ride, and Ernest Just and explore what different scientists and engineers do.	*(3)(C) describe what scientists do*

2021	*2017*
Recurring Themes and Concepts	
(5) The student uses recurring themes and concepts to make connections across disciplines. The student is expected to:	
(A) identify and use patterns to describe phenomena or design solutions;	**NEW**
(B) investigate and predict cause-and-effect relationships in science;	**NEW**
(C) describe the properties of objects in terms of relative size (scale) and relative quantity;	**NEW**
(D) examine the parts of a whole to define or model a system;	**NEW**
(E) identify forms of energy and properties of matter;	**NEW**
(F) describe the relationship between the structure and function of objects, organisms, and systems; and	**NEW**
(G) describe how factors or conditions can cause objects, organisms, and systems to either change or stay the same.	**NEW**

2021	*2017*
Matter and Its Properties	
(6) The student knows that objects have physical properties that determine how they are described and classified. The student is expected to:	
(A) classify objects by observable physical properties, including, shape, color, and texture, and attributes such as larger and smaller and heavier and lighter;	*(5)(A) classify objects by observable properties such as larger and smaller, heavier and lighter, shape, color, and texture*
(B) explain and predict changes in materials caused by heating and cooling; and	*(5)(B) predict and identify changes in materials caused by heating and cooling*
(C) demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together.	**NEW**
	REMOVED *(5)(C) classify objects by the materials from which they are made*

2021	*2017*
Force, Motion, and Energy	
(7) The student knows that forces cause changes in motion and position in everyday life. The student is expected:	
(A) explain how pushes and pulls can start, stop, or change the speed or direction of an object's motion; and	*(6)(C) demonstrate and record the ways that objects can move such as in a straight line, zig zag, up and down, back and forth, round and round, and fast and slow*
(B) plan and conduct a descriptive investigation that predicts how pushes and pulls can start, stop, or change the speed or direction of an object's motion.	*(6)(C) demonstrate and record the ways that objects can move such as in a straight line, zig zag, up and down, back and forth, round and round, and fast and slow*
(8) The student knows that energy is everywhere and can be observed in everyday life. The student is expected to:	
(A) investigate and describe applications of heat in everyday life such as cooking food or using a clothes dryer; and	*(6)(A) identify and discuss how different forms of energy such as ~~light~~, thermal, and ~~sound~~ are important to everyday life*
(B) describe how some changes caused by heat may be reversed such as melting butter and other changes cannot be reversed such as cooking an egg or baking a cake.	**NEW**
	MOVED TO KINDER *(6)(B) predict and describe how a magnet can be used to push or pull an object*

2021	2017
Earth and Space	
(9) The student knows that the natural world has recognizable patterns. The student is expected to describe and predict the patterns of seasons of the year such as order of occurrence and changes in nature.	*(8)(C) identify characteristics of the seasons of the year and day and night*
(10) The student knows that the natural world includes earth materials that can be observed in systems and processes. The student is expected to:	
(A) investigate and document the properties of particle size, shape, texture, and color and the components of different types of soils such as topsoil, clay, and sand;	*(7)(A) observe, compare, describe, and sort components of soil by size, texture, and color*
(B) investigate and describe how water can move rock and soil particles from one place to another;	**NEW**
(C) compare the properties of puddles, ponds, streams, rivers, lakes, and oceans, including color, clarity, size, shape, and whether it is freshwater or saltwater; and	*(K)(7)(B) observe and describe physical properties of natural sources of water, including color and clarity (MOVED FROM KINDER)* *(7)(B) identify and describe a variety of natural sources of water, including streams, lakes, and oceans* *(2)(7)(B) identify and compare the properties of natural sources of freshwater and saltwater (MOVED FROM SECOND GRADE)*
(D) describe and record observable characteristics of weather, including hot or cold, clear or cloudy, calm or windy, and rainy or icy, and explain the impact of weather on daily choices.	*(8)(A) record weather information, including relative temperature such as hot or cold, clear or cloudy, calm or windy, and rainy or icy* *(2)(8)(B) identify the importance of weather and seasonal information to make choices in clothing, activities, and transportation (MOVED FROM SECOND GRADE)*

2021	*2017*
Earth and Space	
(11) The student knows that earth materials and products made from these materials are important to everyday life. The student is expected to:	
(A) identify and describe how plants, animals, and humans use rocks, soil, and water;	*(7)(C) identify how rocks, soil, and water are used to make products*
(B) explain why water conservation is important; and	*(1)(B) identify and learn how to use natural resources and materials, including conservation and reuse or recycling of paper, plastic, and metals* *(2)(1)(B) identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as **conserving water** and reuse or recycling of paper, plastic, and metal (MOVED FROM SECOND GRADE)*
(C) describe ways to conserve water such as turning off the faucet when brushing teeth and protect natural sources of water such as keeping trash out of bodies of water.	*(1)(B) identify and learn how to use natural resources and materials, including conservation and reuse or recycling of paper, plastic, and metals* *(2)(1)(B) identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as **conserving water** and reuse or recycling of paper, plastic, and metal (MOVED FROM SECOND GRADE)*
	REMOVED *(8)(B) observe and record changes in the appearance of objects in the sky such as the Moon and stars, including the Sun* ***MOVED to KINDER*** *(8)(D) demonstrate that air is all around us and observe that wind is moving air*

2021	2017
Organisms and Environments	
(12) The student knows that the environment is composed of relationships between living organisms and nonliving components. The student is expected to:	
(A) classify living and nonliving things based upon whether they have basic needs and produce young;	*(9)(A) sort and classify living and nonliving things based upon whether they have basic needs and produce offspring*
(B) describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums; and	*(9)(B) analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver*
(C) identify and illustrate how living organisms depend on each other through food chains.	*(9)(C) gather evidence of interdependence among living organisms such as energy transfer through food chains or animals using plants for shelter*
(13) The student knows that organisms resemble their parents and have structures and undergo processes that help them interact and survive within their environments. The student is expected to:	
(A) identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival;	*(10)(A) investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats*
(B) record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish; and	*(10)(D) observe and record life cycles of animals such as a chicken, frog, or fish*
(C) compare ways that young animals resemble their parents.	*(10)(C) compare ways that young animals resemble their parents*
	REMOVED *(10)(B) identify and compare the parts of plants*