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 for high school courses. In Grade 3, 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 60% of instructional time. (B) Matter and energy. Students build upon the knowledge learned in Kindergarten-Grade 2 by investigating the physical properties of matter. Students explore states of matter and observe that changes can occur to matter through heating and cooling. The students explore using substances by combining them to create or modify objects based on their physical properties. (C) Force, motion, and energy. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position. Students also identify forces such as magnetism and gravity. Students understand energy exists in many forms, including mechanical, thermal, light, and sound. The students identify forms of energy in everyday life.	*(1) In Grade 3, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and using models to support scientific inquiry about the natural world.* *(A) Within the physical environment, students recognize that patterns, relationships, and cycles exist in matter. Students will investigate the physical properties of matter and will learn that changes occur. They explore mixtures and investigate light, sound, and thermal energy in everyday life. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position.* *(B) Within the natural environment, students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships.* *(C) Within the living environment, students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.* *(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 practices, analyzing information, making informed decisions, and using tools to collect and record information while addressing the content and vocabulary in physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 60% of instructional time.* *(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 Introduction *(continued)*	*2017 Introduction*
(D) Earth and space. Students learn that there are recognizable processes that change the Earth over time. Students compare day-to-day changes in weather. They also investigate how soil is formed through the processes of weathering and decomposition. Students model rapid changes to Earth's surface as well as explore ways to conserve Earth's resources. Students recognize that there are identifiable objects and patterns in Earth's solar system. Students model the orbits of the Sun, Earth, and Moon as well as describe their relationship to each other. This will set the foundation for Grade 4 when they look at changes in the appearance of the Moon. Students also identify the sequence of the planets in Earth's solar system. (E) Organisms and environments. Students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how environment and the structures and functions of animals play a key role in survival. Students know that when changes in the environment occur, organisms may thrive, become ill, or perish. Students also examine fossils as evidence of past living organisms. (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.	

2021 Introduction *(continued)*	*2017 Introduction*
(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.	

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;	**NEW**
(B) use scientific practices to plan and conduct descriptive investigations and use engineering practices to design solutions to problems;	*(2)(A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world*
(C) demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards;	*(1)(A) demonstrate safe practices as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment as appropriate, including goggles or chemical splash goggles, as appropriate, and gloves*
(D) use tools, including hand lenses; metric rulers; Celsius thermometers; wind vanes; rain gauges; graduated cylinders; beakers; digital scales; hot plates; meter sticks; magnets; notebooks; Sun, Earth, Moon system models; timing devices; materials to support observation of habitats of organisms such as terrariums, aquariums, and collecting nets; and materials to support digital data collection such as computers, tablets, and cameras, to observe, measure, test, and analyze information;	*(4)(A) collect, record, and analyze information using tools, including cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, magnets, collecting nets, notebooks, and Sun, Earth, and Moon system models; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums*
(E) collect observations and measurements as evidence;	*(2)(B) collect and record data by observing and measuring using the metric system and recognize differences between observed and measured data*
(F) construct appropriate graphic organizers 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	*(2)(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data*
(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.	**NEW**

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;	*(3)(B) represent the natural world using models such as volcanoes or the Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials*
(B) analyze data by identifying significant features, patterns, or sources of error;	*(2)(D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations*
(C) use mathematical concepts to compare patterns and relationships; and	**NEW**
(D) evaluate a design or object using criteria.	**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;	*(3)(A) analyze, evaluate, and critique explanations by using evidence, logical reasoning, and experimental and observational testing*
(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and	*(2)(F) communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations*
(C) listen actively to others' explanations to identify relevant 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 scientific discoveries and innovative solutions to problems impact science and society; and	**NEW**
(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.	*(3)(C) identify what a scientist is and explore what different scientists do*
	REMOVE *(2)(E) demonstrate that repeated investigations may increase the reliability of results*

2021	*2017*
Recurring Themes and Concepts	
(5) The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to:	
(A) identify and use patterns to explain scientific phenomena or to design solutions;	**NEW**
(B) identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;	**NEW**
(C) use scale, proportion, and quantity to describe, compare, or model different systems;	**NEW**
(D) examine and model the parts of a system and their interdependence in the function of the system;	**NEW**
(E) investigate the flow of energy and cycling of matter through systems;	**NEW**
(F) explain the relationship between the structure and function of objects, organisms, and systems; and	**NEW**
(G) explain how factors or conditions impact stability and change in objects, organisms, and systems.	**NEW**

2021	*2017*
Matter and Energy	
(6) 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) measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float in water;	*(5)(A) measure, test, record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float*
(B) describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container;	*(5)(B) describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container*
(C) predict, observe, and record changes in the state of matter caused by heating or cooling in a variety of substances such as ice becoming liquid water, condensation forming on the outside of a glass, or liquid water being heated to the point of becoming water vapor (gas); and	*(5)(C) predict, observe, and record changes in the state of matter caused by heating or cooling such as ice becoming liquid water, condensation forming on the outside of a glass of ice water, or liquid water being heated to the point of becoming water vapor*
(D) demonstrate that materials can be combined based on their physical properties to create or modify objects such as building a tower or adding clay to sand to make a stronger brick and justify the selection of materials based on their physical properties.	**NEW**
	REMOVED *(5)(D) explore and recognize that a mixture is created when two materials are combined such as gravel and sand or metal and plastic paper clips*

2021	*2017*
Force, Motion, and Energy	
(7) The student knows the nature of forces and the patterns of their interactions. The student is expected:	
(A) demonstrate and describe forces acting on an object in contact or at a distance, including magnetism, gravity, and pushes and pulls; and	*(6)(C) observe forces such as magnetism and gravity acting on objects*
(B) plan and conduct a descriptive investigation to demonstrate and explain how position and motion can be changed by pushing and pulling objects such as swings, balls, and wagons.	*(6)(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects such as swings, balls, and wagons*
(8) The student knows that energy is everywhere and can be observed in cycles, patterns, and systems. The student is expected to:	
(A) identify everyday examples of energy, including light, sound, thermal, and mechanical; and	*(6)(A) explore different energy forms of energy, including mechanical, light, sound, and thermal in everyday life*
(B) plan and conduct investigations that demonstrate how the speed of an object is related to its mechanical energy.	**NEW**

2021	2017
Earth and Space	
(9) The student knows there are recognizable objects and patterns in Earth's solar system. The student is expected to:	
(A) construct models and explain the orbits of the Sun, Earth, and Moon in relation to each other; and	*(8)(C) construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions*
(B) identify the order of the planets in Earth's solar system in relation to the Sun.	*(8)(D) identify the planets in Earth's solar system and their position in relation to the Sun*
(10) The student knows that there are recognizable processes that change Earth over time. The student is expected to:	
(A) compare and describe day-to-day weather in different locations at the same time, including air temperature, wind direction, and precipitation;	*(8)(A) observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation*
(B) investigate and explain how soils such as sand and clay are formed by weathering of rock and by decomposition of plant and animal remains; and	*(7)(A) explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains*
(C) model and describe rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides.	*(7)(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides*
(11) The student understands how natural resources are important and can be managed. The student is expected to:	
(A) explore and explain how humans use natural resources such as in construction, in agriculture, in transportation, and to make products;	*(7)(C) explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved*
(B) explain why the conservation of natural resources is important; and	*(1)(B) make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics*
(C) identify ways to conserve natural resources through reducing, reusing, or recycling.	*(1)(B) make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics*
	MOVED to SECOND GRADE *(8)(B) describe and illustrate the Sun as a star composed of gases that provides light and thermal energy*

2021	2017
Organisms and Environments	
(12) The student describes patterns, cycles, systems, and relationships within environments. The student is expected to:	
(A) explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy;	*(2)(9)(B) identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (MOVED FROM 2nd GRADE)*
(B) identify and describe the flow of energy in a food chain and predict how changes in a food chain such as removal of frogs from a pond or bees from a field affect the ecosystem;	*(9)(B) identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field*
(C) describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations; and	*(9)(C) describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations*
(D) identify fossils as evidence of past living organisms and environments, including common Texas fossils.	*(5)(9)(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models (MOVED FROM FIFTH GRADE)*
(13) The student knows that organisms undergo similar life processes and have structures that function to help them survive within their environments. The student is expected to:	
(A) explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment; and	*(10)(A) explore how structures and functions of ~~plants~~ and animals allow them to survive in a particular environment*
(B) explore, illustrate, and compare life cycles in organisms such as beetles, crickets, radishes, or lima beans.	*(4)(10)(C) explore, illustrate, and compare life cycles in living organisms such as beetles, crickets, radishes, or lima beans (MOVED FROM FOURTH GRADE)*
	REMOVED *(9)(A) observe and describe the physical characteristics of environments and how they support populations and communities of plants and animals within an ecosystem* *(10)(B) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles*