

Grade 7 Side-by-Side



2021 Knowledge and Skill Statement/Student Expectation	2021 Text	2017 Knowledge and Skill Statement/Student Expectation	2017 Text	Notes from TEA Staff
SCIENCE.7.1	Scientific and engineering practices . The student, for at least 40% of instructional time, 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:	7.1	Scientific investigation and reasoning . The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices . The student is expected to:	
		7.2	Scientific investigation and reasoning . The student uses scientific practices during laboratory and field investigations. The student is expected to:	
SCIENCE.7.1.A	ask questions and define problems based on observations or information from text, phenomena, models , or investigations;	7.2.A	plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;	
SCIENCE.7.1.B	use scientific practices to plan and conduct descriptive, comparative , and experimental investigations and use engineering practices to design solutions to problems ;	7.2.B	design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;	
SCIENCE.7.1.C	use appropriate safety equipment and practices during laboratory, classroom , and field investigations as outlined in Texas Education Agency-approved safety standards;	7.1.A	demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards; and	
		7.4	Science investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:	
		7.4.B	use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.	
SCIENCE.7.1.D	use appropriate tools such as graduated cylinders, metric rulers, periodic tables , balances, scales , thermometers, temperature probes , laboratory ware, timing devices, pH indicators , hot plates, models , microscopes, slides , life science models , petri dishes, dissecting kits , magnets , spring scales or force sensors , tools that model wave behavior , satellite images , hand lenses , and lab notebooks or journals;	7.4	Science investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:	
		7.4.A	use appropriate tools, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, balances, microscopes, thermometers, calculators, computers, timing devices, and other necessary equipment to collect, record, and analyze information; and	
SCIENCE.7.1.E	collect quantitative data using the International System of Units (SI) and qualitative data as evidence ;	7.2.C	collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;	
SCIENCE.7.1.F	construct appropriate tables, graphs, maps , and charts using repeated trials and means to organize data;	7.2.D	construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and	
SCIENCE.7.1.G	develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and	7.3.B	use models to represent aspects of the natural world such as a model of Earth's layers;	
SCIENCE.7.1.H	distinguish between scientific hypotheses, theories, and laws.			
		7.1.B	practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.	Conservation is covered in elementary and Grade 6.

SCIENCE.7.2	Scientific and engineering practices. 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:			
SCIENCE.7.2.A	identify advantages and limitations of models such as their size, scale, properties, and materials;	7.3.C	identify advantages and limitations of models such as size, scale, properties, and materials; and	
SCIENCE.7.2.B	analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations;	7.2.E	analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Data analysis, explanations, and conclusions were split into Student Expectations, 7.2.B, 7.3.A, and 7.3.B.
SCIENCE.7.2.C	use mathematical calculations to assess quantitative relationships in data; and			
SCIENCE.7.2.D	evaluate experimental and engineering designs.			
SCIENCE.7.3	Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:			
SCIENCE.7.3.A	develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;	7.3.A	analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student;	
SCIENCE.7.3.B	communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and	7.2.E	analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Data analysis, explanations, and conclusions were split into Student Expectations, 7.2.B, 7.3.A, and 7.3.B.
SCIENCE.7.3.C	engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.			
SCIENCE.7.4	Scientific and engineering practices . The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society . The student is expected to:	7.3	Scientific investigation and reasoning . The student uses critical thinking, scientific reasoning, and problem-solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:	Critical thinking and the contributions of scientists were split into separate Knowledge and Skill statements, 7.3 and 7.4.
SCIENCE.7.4.A	relate the impact of past and current research on scientific thought and society, including the process of science , cost-benefit analysis , and contributions of diverse scientists as related to the content;	7.3.D	relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.	
SCIENCE.7.4.B	make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, cost-effectiveness, and methods used; and			
SCIENCE.7.4.C	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.			

SCIENCE.7.5	<u>Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to:</u>			
SCIENCE.7.5.A	<u>identify and apply patterns to understand and connect scientific phenomena or to design solutions;</u>			
SCIENCE.7.5.B	<u>identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;</u>			
SCIENCE.7.5.C	<u>analyze how differences in scale, proportion, or quantity affect a system's structure or performance;</u>			
SCIENCE.7.5.D	<u>examine and model the parts of a system and their interdependence in the function of the system;</u>			
SCIENCE.7.5.E	<u>analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems;</u>			
SCIENCE.7.5.F	<u>analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems; and</u>			
SCIENCE.7.5.G	<u>analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.</u>			
SCIENCE.7.6	Matter and energy. The student <u>distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions.</u> The student is expected to:	7.6	Matter and energy. The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. The student is expected to:	
SCIENCE.7.6.A	<u>compare and contrast</u> elements and compounds <u>in terms of atoms and molecules,</u> chemical symbols, and chemical formulas;	6.5.A	know that an element is a pure substance represented by a chemical symbol and that a compound is a pure substance represented by a chemical formula;	The concept of elements and compounds was moved from Grade 6.
SCIENCE.7.6.B	<u>use the periodic table to identify the atoms and the number of each kind within a</u> chemical formula;			
SCIENCE.7.6.C	distinguish between physical and chemical changes in matter;	7.6.A	distinguish between physical and chemical changes in matter;	
SCIENCE.7.6.D	<u>describe aqueous solutions in terms of solute and solvent, concentration, and dilution; and</u>			
SCIENCE.7.6.E	<u>investigate and model how temperature, surface area, and agitation affect the rate of dissolution of solid solutes in aqueous solutions.</u>			

		7.5	Matter and energy. The student knows that interactions occur between matter and energy. The student is expected to:	
		7.5.A	recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis; and	The concepts of energy transformations and chemical energy have moved to Grade 5.
SCIENCE.7.7	Force, motion, and energy. The student <u>describes the cause-and-effect relationship between</u> force and motion. The student is expected to:	7.7	Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy . The student is expected to:	Force, motion, and energy were split between Knowledge and Skill statements, 7.7 and 7.8.
SCIENCE.7.7.A	calculate average speed using distance and time measurements <u>from investigations</u> ;	6.8.C	calculate average speed using distance and time measurements;	The concept of average speed was moved from Grade 6.
SCIENCE.7.7.B	<u>distinguish</u> between speed and velocity <u>in linear motion in terms of distance, displacement, and direction</u> ;	8.6.B	differentiate between speed, velocity, and acceleration ;	The concept of velocity was moved from Grade 8.
SCIENCE.7.7.C	measure, <u>record, and interpret an object's</u> motion <u>using distance-time</u> graphs; and	6.8.D	measure and graph changes in motion;	The concept of graphing motion was moved from Grade 6.
SCIENCE.7.7.D	<u>analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.</u>			
SCIENCE.7.8	<u>Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. The student is expected to:</u>			Force, motion, and energy were split between two Knowledge and Skill statements, 7.7 and 7.8.
SCIENCE.7.8.A	investigate methods of thermal energy transfer <u>into and out of systems</u> , including conduction, convection, and radiation;	6.9.A	investigate methods of thermal energy transfer, including conduction, convection, and radiation;	The concept of thermal energy transfer was moved from Grade 6.
SCIENCE.7.8.B	investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances <u>within the system reach thermal equilibrium</u> ; and	6.9.B	verify through investigations that thermal energy moves in a predictable pattern from warmer to cooler until all the substances attain the same temperature such as an ice cube melting ;	The concept of thermal equilibrium was moved from Grade 6.
SCIENCE.7.8.C	<u>explain the relationship between temperature and the kinetic energy of the particles within a substance.</u>			
		7.7.A	illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and	The concept of energy transformations was moved to Grade 5.
		7.7.B	demonstrate and illustrate forces that affect motion in organisms such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.	The concept of forces within organisms was deleted from middle school.
SCIENCE.7.9	Earth and space. The student <u>understands the patterns of movement, organization, and characteristics of</u> components of our solar system. The student is expected to:	7.9	Earth and space. The student knows components of our solar system. The student is expected to:	
SCIENCE.7.9.A	describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, comets, <u>Kuiper belt, and Oort cloud</u> ;	6.11.A	describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, and comets;	Objects in our solar system was moved from Grade 6.
SCIENCE.7.9.B	<u>describe how</u> gravity governs motion <u>within Earth's</u> solar system; and	6.11.B	understand that gravity is the force that governs the motion of our solar system; and	The concept of gravity was moved from Grade 6.

SCIENCE.7.9.C	analyze the characteristics of <u>Earth</u> that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere.	7.9.A	analyze the characteristics of objects in our solar system that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere; and	
		7.9.B	identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.	The concept of space exploration was deleted from middle school.
SCIENCE.7.10	Earth and space. The student understands the <u>causes and effects of plate tectonics</u> . The student is expected to:	6.10	Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:	The concept of plate tectonics was moved from Grade 6.
SCIENCE.7.10.A	describe the evidence that supports <u>that Earth has changed over time, including fossil evidence, plate tectonics, and superposition; and</u>	8.9.A	describe the historical development of evidence that supports plate tectonic theory;	The development of plate tectonic theory was moved from Grade 8.
SCIENCE.7.10.B	describe how plate tectonics causes ocean basin formation, earthquakes, mountain building, and volcanic eruptions, <u>including supervolcanoes and hot spots.</u>	6.10.D	describe how plate tectonics causes major geological events such as ocean basin formation, earthquakes, volcanic eruptions, and mountain building.	How plate tectonics causes geologic events was moved from Grade 6.
SCIENCE.7.11	Earth and space. The student <u>understands how</u> human activity can impact the <u>hydrosphere</u> . The student is expected to:	7.8	Earth and space. The student knows that natural events and human activity can impact Earth systems . The student is expected to:	
SCIENCE.7.11.A	<u>analyze the beneficial and harmful influences</u> of human activity on groundwater and surface water in a watershed; and	7.8.C	model the effects of human activity on groundwater and surface water in a watershed.	
SCIENCE.7.11.B	<u>describe human dependence and influence on ocean systems and explain how human activities impact these systems.</u>			
		7.9.A	predict and describe how catastrophic events such as floods, hurricanes, or tornadoes impact ecosystems;	The concept of catastrophic weather events was deleted from middle school.
		7.8.B	analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and	The concepts of weathering, erosion, and deposition were moved to elementary school.
SCIENCE.7.12	<u>Organisms and environments. The student understands that ecosystems are dependent upon the cycling of matter and the flow of energy. The student is expected to:</u>	7.10	Organisms and environments. The student knows that there is a relationship between organisms and the environment.	
SCIENCE.7.12.A	diagram the flow of energy <u>within</u> trophic levels <u>and describe how the available energy decreases in successive trophic levels</u> in energy pyramids; and	7.5.B	diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.	Food chains and webs are covered in elementary school.
		Bio.12.C	analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids;	The concept of trophic levels was moved from Biology.
SCIENCE.7.12.B	describe <u>how ecosystems are sustained by the continuous</u> flow of energy <u>and the recycling of</u> matter <u>and nutrients within the biosphere.</u>	Bio.12.C	analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids;	The concept of the flow of matter and energy was moved from Biology.
		Bio.12.D	describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles; and	
		7.10.A	observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms;	The concept of environments supporting different varieties of organisms was deleted from middle school.

		7.10.B	describe how biodiversity contributes to the sustainability of an ecosystem; and	The concepts of biodiversity and sustainability were moved to Grade 8.
		7.10.C	observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.	The concept of ecological succession was moved to Grade 8.
SCIENCE.7.13	Organisms and environments. The student knows <u>how</u> systems <u>are</u> organized <u>and</u> function <u>to support the health of an organism and how</u> traits are <u>inherited</u> . The student is expected to:	7.12	Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. The student is expected to:	Knowledge and Skill statements 12 and 14 were combined.
		7.14	Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. The student is expected to:	
SCIENCE.7.13.A	identify <u>and model</u> the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, <u>urinary</u> , reproductive, integumentary, nervous, <u>immune</u> , and endocrine systems;	7.12.B	identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, <u>excretory</u> , reproductive, integumentary, nervous, and endocrine systems;	
SCIENCE.7.13.B	<u>describe the hierarchical</u> organization of cells, tissues, organs, and organ systems within plants and animals;	7.12.C	recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;	
		8.10	Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to:	
SCIENCE.7.13.C	compare the results <u>of</u> asexual and sexual reproduction <u>of plants and animals in relation to the</u> diversity of offspring <u>and the changes in the population over time; and</u>	7.14.B	compare the results of <u>uniform or</u> diverse offspring from asexual or sexual reproduction;	
SCIENCE.7.13.D	<u>describe and give examples of how</u> natural and <u>artificial</u> selection change <u>the occurrence of</u> traits <u>in a population</u> over generations.	7.11.C	identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (Geospiza fortis) or domestic animals and hybrid plants.	
		7.11	Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. The student is expected to:	The concept of gradualism was deleted from middle school.
		7.11.A	examine organisms or their structures such as insects or leaves and use dichotomous keys for identification;	Dichotomous keys have been deleted from middle school.
		7.11.B	explain variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their survival such as migration, hibernation, or storage of food in a bulb; and	The concept of variations in traits was split between Grades 6 and 8.
		7.12.A	investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants;	The concept of internal adaptations was moved to Grade 8.
		7.12.D	differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;	The functions of cell organelles were moved to Grade 8.

		7.12.E	compare the functions of cell organelles to the functions of an organ system; and	Concept deleted
		7.12.F	recognize the components of cell theory.	The concept of cell theory was moved to Grade 6.
		7.13	Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. The student is expected to:	Responses to stimuli was deleted from middle school.
		7.13.A	investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and	Responses to stimuli was deleted from middle school.
		7.13.B	describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.	Responses to stimuli were deleted from middle school.
		7.14.A	define heredity as the passage of genetic instructions from one generation to the next generation;	Heredity was moved to Grade 8.
		7.14.C	recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.	The concept moved to Grade 8.
SCIENCE.7.14	Organisms and environments. The student knows <u>how the taxonomic system is used to describe relationships between</u> organisms. The student is expected to:	Bio.8	Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to:	Taxonomy was moved from Biology.
SCIENCE.7.14.A	<u>describe the taxonomic system that</u> categorizes organisms based on similarities and differences shared among groups; and	6.12.D	identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized kingdoms;	Classification of organisms into groups was moved from Grade 6 and from Biology.
		Bio.8.B	categorize organisms using a hierarchical classification system based on similarities and differences shared among groups; and	
SCIENCE.7.14.B	<u>describe the</u> characteristics of the <u>recognized kingdoms and their importance in ecosystems such as bacteria aiding digestion or fungi decomposing organic matter.</u>	Bio.8.C	compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals.	Characteristics of the taxonomic kingdoms were moved from Biology.
KEY	<u>Blue double underline: indicates content new to the grade level</u>	Orange strike through: indicates content was deleted.		
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