



Correlation to the Grade 8 Texas Essential Knowledge and Skills

This worktext is customized to the *Texas Essential Knowledge and Skills* and will help you prepare for the *State of Texas Assessments of Academic Readiness (STAAR®)* in Science for Grade 8.

Scientific and reasoning skills are listed under their separate Focus on Process (FOP) sections. In addition, these skills are incorporated into practice items throughout the text.

Texas Essential Knowledge and Skills	Measuring Up Express Lessons
TEKS 8.1 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:	
(A) demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards	FOP Unit 1
(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials	FOP Unit 1
TEKS 8.2 Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. The student is expected to:	
(A) plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology	FOP Unit 4
(B) design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology	FOP Unit 4
(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers	FOP Unit 4
(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns	FOP Unit 2
(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends	FOP Unit 2
TEKS 8.3 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:	
(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	FOP Appendix
(B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature	FOP Unit 3
(C) identify advantages and limitations of models such as size, scale, properties, and materials	FOP Unit 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	FOP Appendix
TEKS 8.4 Scientific 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:	
(A) use appropriate tools, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrometers, timing devices, and other necessary equipment to collect, record, and analyze information	FOP Unit 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	FOP Unit 1

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TEKS 8.5 Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	
(A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud	1
(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity	2
(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements	3
(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts	4
(E) investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass	5
TEKS 8.6 Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:	
(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion	7
(B) differentiate between speed, velocity, and acceleration	6
(C) investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches	8
TEKS 8.7 Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:	
(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun, causing changes in seasons	9
(B) demonstrate and predict the sequence of events in the lunar cycle	10
(C) relate the positions of the Moon and Sun to their effect on ocean tides	11
TEKS 8.8 Earth and space. The student knows characteristics of the universe. The student is expected to:	
(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification	12, 13
(B) recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star	12
(C) identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe	13
TEKS 8.9 Earth and space. The student knows that natural events can impact Earth systems. The student is expected to:	
(A) describe the historical development of evidence that supports plate tectonic theory	14
(B) relate plate tectonics to the formation of crustal features	15
(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering	16



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TEKS 8.10 Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to:	
(A) recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds	17
(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts	18
(C) identify the role of the oceans in the formation of weather systems such as hurricanes	17
TEKS 8.11 Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to:	
(A) investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition	19
(B) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations	19–20
(C) recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems	21

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TEKS 7.5 Matter and energy. The student knows that interactions occur between matter and energy. The student is expected to:	
(B) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids	19
TEKS 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	
distinguish between physical and chemical changes in matter	27
TEKS 7.8 Earth and space. The student knows that natural events and human activity can impact Earth systems. The student is expected to:	
(C) model the effects of human activity on groundwater and surface water in a watershed	28
TEKS 7.10 Organisms and environments. The student knows that there is a relationship between organisms and the environment. The student is expected to:	
(B) describe how biodiversity contributes to the sustainability of an ecosystem	19
(C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds	29
TEKS 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:	
(A) examine organisms or their structures such as insects or leaves and use dichotomous keys for identification	30
(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 (<i>Geospiza fortis</i>) or domestic animals and hybrid plants	20
TEKS 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:	
(B) identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems	31
(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole	32
(F) recognize the components of cell theory	32
TEKS 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:	
(B) compare the results of uniform or diverse offspring from asexual or sexual reproduction	33
(C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus	33



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TEKS 6.6 Matter and energy. The student knows matter has physical properties that can be used for classification. The student is expected to:	
(A) compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability	3
(B) calculate density to identify an unknown substance	22
TEKS 6.8 Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:	
(A) compare and contrast potential and kinetic energy	23
(C) calculate average speed using distance and time measurements	6
(D) measure and graph changes in motion	6
TEKS 6.9 Force, motion, and energy. The student knows that the Law of Conservation of Energy states that energy can neither be created nor destroyed, it just changes form. The student is expected to:	
(C) demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy	24
TEKS 6.11 Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to:	
(B) understand that gravity is the force that governs the motion of our solar system	25
TEKS 6.12 Organisms and environments. The student knows all organisms are classified into domains and kingdoms. Organisms within these taxonomic groups share similar characteristics that allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	
(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	26