(1) Scientific investigation and reasoning. *The student, for at least 40% of the 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 the Texas Safety Standards; and				
(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.				
(2) Scientific investigation and reasoning. *The student uses scientific inquiry methods 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;				
(B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;				
(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;				
(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and				
(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.				
(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) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;				
(B) use models to represent aspects of the natural world such as human body systems and plant and animal cells;				
(C) identify advantages and limitations of models such as size, scale, properties, and materials; and				
(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.				
(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:*				

(A) use appropriate tools to collect, record, and analyze information, including life science models, hand lens, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras, journals/notebooks, and other equipment as needed to teach the curriculum; and				
(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.				
(5) Matter and energy. *The student knows that interactions occur between matter and energy. The student is expected to:*				
(A) recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis;				
(B) demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and				
(C) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids. ***Supporting Standard***				
(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:*				
(A) identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur; ***Supporting Standard***				
(B) distinguish between physical and chemical changes in matter in the digestive system; and ***Supporting Standard***				
(C) recognize how large molecules are broken down into smaller molecules such as carbohydrates can be broken down into sugars.				
(7) Force, motion, and energy. *The student knows that there is a relationship among force, motion, and energy. The student is expected to:*				
(A) contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still; ***Supporting Standard***				
(B) illustrate the transformation of energy within an organism such as the transfer from chemical energy to heat and thermal energy in digestion; and				
(C) demonstrate and illustrate forces that affect motion in everyday life such as emergence of seedlings, turgor pressure, and geotropism.				
(8) Earth and space. *The student knows that natural events and human activity can impact Earth systems. The student is expected to:*				
(A) predict and describe how different types of catastrophic events impact ecosystems such as floods, hurricanes, or tornadoes;				

(B) analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and				
(C) model the effects of human activity on groundwater and surface water in a watershed. ***Supporting Standard***				
(9) Earth and space. *The student knows components of our solar system. The student is expected to:*				
(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				
(B) identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.				
(10) Organisms and environments. *The student knows that there is a relationship between organisms and the environment. The student is expected to:*				
(A) observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms;				
(B) describe how biodiversity contributes to the sustainability of an ecosystem; and ***Supporting Standard***				
(C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds. ***Supporting Standard***				
(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; ***Supporting Standard***				
(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				
(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. ***Supporting Standard***				
(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:*				
(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;				

(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; ***Supporting Standard***				
(C) recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;				
(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole; ***Supporting Standard***				
(E) compare the functions of a cell to the functions of organisms such as waste removal; and				
(F) recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life. ***Supporting Standard***				
(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:*				
(A) investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and				
(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.				
(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:*				
(A) define heredity as the passage of genetic instructions from one generation to the next generation;				
(B) compare the results of uniform or diverse offspring from sexual reproduction or asexual reproduction; and ***Supporting Standard***				
(C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus. ***Supporting Standard***				