

Science TEKS Review Work Group C Draft Recommendations Vertical Alignment

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| 5. Matter and energy. The student knows that matter is made of atoms, can be classified according to its properties, and can undergo changes. The student is expected to: | 5. Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. The student is expected to: | 5. Matter and energy. The student understands that matter can be classified according to its properties and is conserved in chemical changes. The student is expected to: |
| 6.5.A compare solids, liquids, and gases in terms of, structure, shape, volume, and energy of atoms and molecules; | 7.5.A compare and contrast elements and compounds in terms of atoms and molecules, structure, chemical symbols, and chemical formulas; | 8.5.A characterize and classify matter as elements, compounds, homogeneous mixtures, or heterogeneous mixtures; |
| 6.5.B investigate the properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures; | 7.5.B distinguish between physical and chemical changes in matter; | 8.5.B describe the properties of cohesion, adhesion, and surface tension in water and relate to observable phenomena, such as the formation of droplets, transport in plants, and insects walking on water; |
| 6.5.C classify elements on the periodic table as metals, nonmetals, and metalloids using their physical properties; | 7.5.C describe aqueous solutions in terms of solute and solvent, concentration, and dilution; and | 8.5.C compare and contrast the properties of acids and bases including pH relative to water, sour or bitter taste, and how they feel to the touch; and |
| 6.5.D compare the density of substances relative to various fluids; and | 7.5.D investigate and model how temperature, surface area, and agitation affect the rate of dissolution of solid solutes in aqueous solutions. | 8.5.D investigate how mass is conserved in chemical reactions and relate conservation of mass to the rearrangement of atoms using chemical equations, including photosynthesis. |
| 6.5.E identify the formation of a new substance by using the evidence of a possible chemical change including production of a gas, change in thermal energy, production of a precipitate, and color change. | | |
| 6.6. Force, motion, and energy. The student knows the nature of forces and their interactions. The student is expected to: | 7.6 Force, motion, and energy. The student can describe motion and how forces can impact the motion of an object. The student is expected to: | 8.6. Force, motion, and energy. The student understands the relationship between force and motion. The student is expected to: |
| 6.6.A identify and describe forces that act on objects, including gravity, friction, magnetism, applied forces, and normal forces; | 7.6.A calculate average speed using distance and time measurements; | 8.6.A calculate and analyze how the acceleration of an object is dependent upon the net force acting on the object and the mass of the object using Newton's Second Law of motion; and |
| 6.6.B calculate the net force on an object in a horizontal or vertical direction using diagrams and determine if the forces are balanced or unbalanced; and | 7.6.B distinguish between speed and velocity in linear motion in terms of distance, displacement, and direction; | 8.6.B investigate and describe how Newton's three laws of motion act simultaneously within systems such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches. |
| 6.6.C identify simultaneous force pairs that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of motion. | 7.6.C measure, record, and interpret an object's motion using distance-time graphs; and | |
| | 7.6.D analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of motion. | |
| 6.7 Force, motion, and energy. The student knows that energy is conserved when transformed from one type to another. The student is expected to: | 7.7 Force, motion, and energy. The student understands the behavior of thermal energy. The student is expected to: | 8.7 Force, motion, and energy. The student knows how energy is transferred through waves. The student is expected to: |
| 6.7.A compare and contrast kinetic energy with gravitational, elastic, and chemical potential energies; and | 7.7.A investigate methods of thermal energy transfer, including conduction, convection, and radiation; | 8.7.A explain how energy is transferred through transverse and longitudinal waves; |
| 6.7.B describe how energy is conserved through transformations in systems such as electrical circuits, food webs, amusement park rides, and photosynthesis. | 7.7.B. investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium; and | 8.7.B compare the characteristics of amplitude, frequency, and wavelength in transverse waves, including the electromagnetic spectrum; and |
| | 7.7.C explain the relationship between temperature and the kinetic energy of the molecules within a substance. | 8.7.C explain the use of electromagnetic waves in applications such as radiation therapy, wireless technologies, fiber optics, microwaves, ultraviolet sterilization, astronomical observations, and X-rays. |
| 6.8 Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to: | 7.8 Earth and space. The student understands the organization and characteristics of objects in our solar system. The student is expected to: | 8.8. Earth and space. The student knows characteristics of the universe. The student is expected to: |
| 6.8.A model and illustrate how the tilted Earth revolves around the Sun, causing changes in seasons; | 7.8.A describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, comets, Kuiper belt, and Oort cloud; | 8.8.A describe the life cycle of stars and compare and classify stars using the Hertzsprung-Russell diagram; |

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| 6.8.B describe and predict how the positions of the sun and moon and their gravitational forces affect daily, spring, and neap cycles of ocean tides; and | 7.8.B describe how gravity governs the motion of our solar system; and | 8.8.B categorize galaxies as spiral, elliptical, and irregular and locate the solar system within the Milky Way galaxy; and |
| | 7.8.C analyze the characteristics of Earth that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere; | 8.8.C research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe. |
| 6.9 Earth and space. The student understands the structure of Earth, and the rock cycle. The student is expected to: | 7.9 Earth and space. The student understands the causes and effects of plate tectonics. The student is expected to: | 8.9 Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to: |
| 6.9.A differentiate among the biosphere, hydrosphere, atmosphere, and geosphere and identify their components; | 7.9.A describe the historical development of evidence that supports plate tectonic theory; and | 8.9.A describe how weather and climate are influenced by interactions involving sunlight, the hydrosphere, and atmosphere; |
| 6.9.B model and describe the layers of Earth, including the inner core, outer core, mantle, and crust; and | 7.9.B describe how plate tectonics causes ocean basin formation, earthquakes, mountain building, and volcanic eruptions, including supervolcanoes and hot spots. | 8.9.B identify global patterns of atmospheric movement and how they influence local weather; and |
| 6.9.C describe how rocks change through geologic processes in the rock cycle and classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation. | | 8.9.C describe the interactions among ocean currents and air masses that produce el Niño, la Niña, and tropical cyclones. |
| 6.10 Earth and space. The student understands how resources are managed. The student is expected to: | 7.10 Earth and space. The student understands how human activity can impact the hydrosphere. The student is expected to: | 8.10 Earth and space. The student knows that natural events and human activity can impact global climate. The student is expected to: |
| 6.10.A research and describe how conservation, increased efficiency, and technology can help manage air, water, soil, and energy resources. | 7.10.A analyze positive and negative influences of human activity on groundwater and surface water in a watershed; and | 8.10.A describe how volcanic eruptions, meteor impacts, abrupt changes in ocean currents and the release and absorption of greenhouse gases influence climate; and |
| | 7.10.B describe human dependence and influence on ocean systems and explain how human activities have modified these systems. | 8.10.B research and describe how human actions can affect climate change. |
| 6.11 Organisms and environments. The student knows that cells are the fundamental units of organisms. The student is expected to: | 7.11 Organisms and environments. The student knows how the systems of an organism function. The student is expected to: | 8.11 Organisms and environments. The student knows how cells support the health of organisms and their environments. The student is expected to: |
| 6.11.A identify that organisms are composed of cells, which come from pre-existing cells and are the basic unit of structure and function as explained by cell theory; | 7.11.A identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, and endocrine systems; and | 8.11.A identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells; and |
| 6.11.B describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals; and | 7.11.B compare the results of uniform or diverse offspring from asexual or sexual reproduction in plants and animals. | 8.11.B describe the function of genes within chromosomes in determining inherited traits of offspring. |
| 6.11.C identify the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, autotrophic and heterotrophic. | | |
| 6.12 Organisms and environments. The student knows the impact of variation on the survival of populations. The student is expected to: | 7.12 Organisms and environments. The student knows that populations and species inherit many of their unique traits through gradual processes over many generations. The student is expected to: | 8.12 Organisms and environments. The student knows the relationship between adaptation, variation, and survival. The student is expected to: |
| 6.12.A describe how advantages and disadvantages for the survival of a population can result from variations within the population as environments change. | 7.12.A describe how natural and artificial selection change genetic traits in a population over generations. | 8.12.A describe how variations within a population lead to adaptations that influence the probability of survival and reproductive success of a species over generations. |
| 6.13 Organisms and environments. The student knows that interdependence occurs among living systems and the environment. The student is expected to: | 7.13 Organisms and environments. The student understands that energy flows between organisms and the environment. The student is expected to: | 8.13 Organisms and environments. The student understands how ecosystems and populations change. The student is expected to: |
| 6.13.A describe predatory, competitive, and symbiotic relationships between organisms including mutualism, parasitism, and commensalism; | 7.13.A diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids; | 8.13.A analyze the effects on food webs when new species are introduced, existing species are eliminated, and existing populations fluctuate; and |
| 6.13.B 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; and | 7.13.B describe how ecosystems are sustained by biodiversity, the continuous flow of energy, and the recycling of matter and nutrients within the biosphere; and | 8.13.B describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. |

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| 6.13.C describe the hierarchical organization of organism, population, and community within an ecosystem. | 7.13.C describe how biodiversity contributes to the sustainability of an ecosystem. | |
| | 7.14 Organisms and environments. The student knows all organisms are classified into taxonomic groups. The student is expected to: | |
| | 7.14.A describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups; and | |
| | 7.14.B describe the characteristics of the recognized kingdoms in ecosystems and their functions such as bacteria aiding digestion or fungi decomposing organic matter. | |

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