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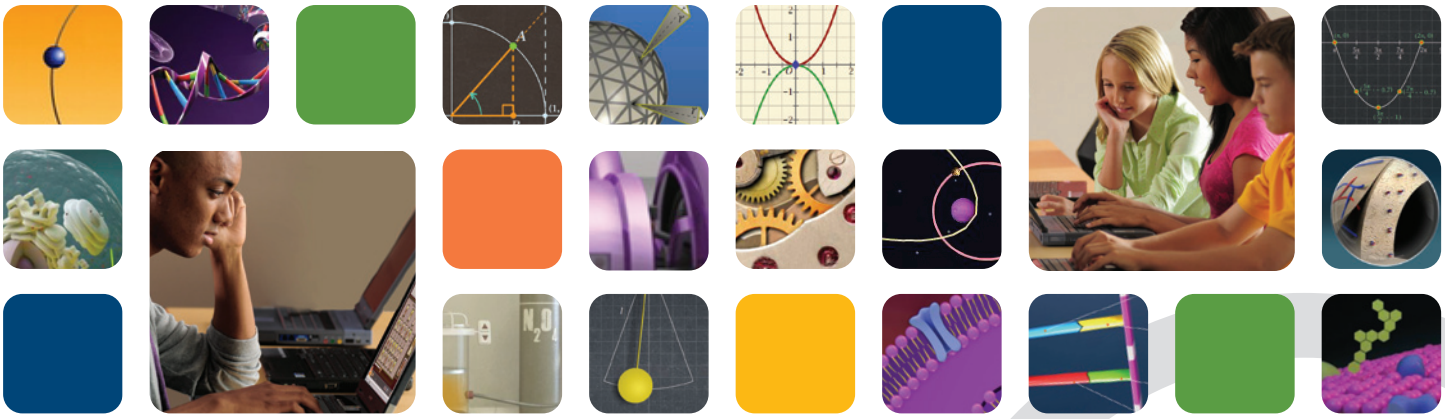
ac / TEKS Alignment

Dynamic, Interactive Learning for Grade 5-8



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STAARS Readiness and Supporting Standards

Readiness Standards

These standards are considered essential for success in the current grade or course. They support college and career readiness as well as address broad, deep ideas with in-depth instruction.

Supporting Standards

These standards play a role in preparing students for the next grade though not a central role. They address more narrowly defined ideas and may be emphasized in a subsequent or previous year.

AC Science Activity Objects consist of five different types:

1. Concept Development

These activities introduce concepts through engaging, real-world scenarios and develop these concepts using an inquiry-based approach.

2. Experiment

These activities engage learners in a virtual lab environment to develop inquiry skills.

3. Skills Application

These activities help learners apply rules and procedures to strengthen computational skills.

4. Problem Solving

These activities engage learners with a guided problem-solving process to apply and enhance their science understanding.

5. Dynamic Modeling

These activities provide learners the opportunity to manipulate variables and observe dynamic changes with interactive 3D objects.

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ac / TEKS 5th Grade Alignment

Introduction

(1) 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.

(2) Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.

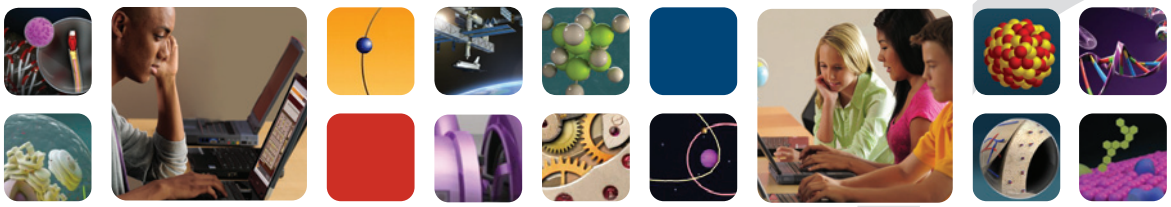
(3) The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 50% of instructional time.

(4) In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(4A) Within the physical environment, students learn about the physical properties of matter, including magnetism, physical states of matter, relative density, solubility in water, and the ability to conduct or insulate electrical and heat energy. Students explore the uses of light, thermal, electrical, and sound energies.

(4B) Within the natural environment, students learn how changes occur on Earth's surface and that predictable patterns occur in the sky. Students learn that the natural world consists of resources, including nonrenewable, renewable, and alternative energy sources.

(4C) Within the living environment, students learn that structure and function of organisms can improve the survival of members of a species. Students learn to differentiate between inherited traits and learned behaviors. Students learn that life cycles occur in animals and plants and that the carbon dioxide-oxygen cycle occurs naturally to support the living environment.



GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
1.A	(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:	(A) demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations; and	The Safety of Classroom Investigations		●
			Laboratory Safety	●	
			The Safety of Outdoor Investigations		●
1.B	(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:	(B) make informed choices in the conservation, disposal, and recycling of materials.	Laboratory Safety	●	
2.A	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(A) describe, plan, and implement simple experimental investigations testing one variable;	The Density of Marbles	●	
2.B	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(B) ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology;	Phototropism in Plants	●	
			Environmental Factors that Affect the Growth of Molds	●	
			Separation of Mixtures	●	
			Solar Energy: Designing a Solar Car	●	
			Hurricane Formation	●	
			Cell Theory and Cell Types	●	
2.C	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(C) collect information by detailed observations and accurate measuring;	The Rock Cycle	●	
			Newton's Third Law of Motion	●	
2.D	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(D) analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence;	The Rock Cycle	●	
			Properties of Solids, Liquids, and Gases	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
2.E	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(E) demonstrate that repeated investigations may increase the reliability of results;	Building Circuits	●	
			Newton's Second Law of Motion	●	
2.F	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(F) communicate valid conclusions in both written and verbal forms; and	Newton's Second Law of Motion	●	
			The Rock Cycle	●	
2.G	(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:	(G) construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.	Motion Graph of Constant Velocity		●
			Truck On: Position - Time and Velocity - Time Graphs	●	
			Plotting Landforms on Topographic Maps	●	
			Using Topographic Maps		●
			Conservation of Mechanical Energy	●	
3.A	(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. 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;	Plants' Needs for Photosythesis	●	
			Newton's Second Law of Motion	●	
			Life From Nonliving Things? Redi's Experiment	●	
			Star Types: In Search of Habitability	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
			Applying and Communicating Scientific Information		●
3.B	(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:	(B) evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels;	Evaluating Products and Services		●
3.C	(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:	(C) draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works; and	Modeling and Mathematics in Physics		●

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
3.D	(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:	(D) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.	The History of Biology		●
			The Impact of Scientific Advances on Science and Society		●
4.A	(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:	(A) collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, pan balances, triple beam balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observations of habitats or organisms such as terrariums and aquariums; and	Physical Properties	●	
			Exploring Cells with a Microscope	●	
			Digital Cameras		●
			Calculating Atomic Mass	●	
			The Rock Cycle	●	
			Lab Equipment: Optics		●
			Lab Equipment: Mechanics		●
			Heat Conduction	●	
			Melting and Boiling Points: Heating Curves	●	
			How Liquid Thermometers Measure Temperature		●
			Measuring Mass and Weight	●	
			The Differences between Mass and Weight		●
			Separation of Mixtures	●	
			Melting and Boiling Points: Different Materials, Different Amounts	●	
			Lab Equipment: Electronics		●
			Collecting Nets		●
			Homeostasis	●	
			Calculating Average Speed		●
			Habitat Designer: Panda	●	
			Habitat Designer: Sea Turtle	●	
			Classification of Animals	●	
4.B	(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:	(B) use safety equipment, including safety goggles and gloves.	Laboratory Safety	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
5.A	(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:A626:A626	(A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy;	Physical Properties	●	
			Magnetic Properties of Matter		●
			Properties of Solids, Liquids, and Gases	●	
			States of Matter: Solid, Liquid, and Gas		●
			Differences in Density: Floating and Sinking		●
			Identifying Substances Using Solubility		●
			Heat Conduction of Different Materials	●	
5.B	(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:	(B) identify the boiling and freezing/melting points of water on the Celsius scale;	Boiling, Condensation, Freezing, and Melting Points		▼
			Let's Decrease the Freezing Point of Water		▼
5.C	(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:	(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand; and	Properties of Mixtures		▼
5.D	(5) Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:	(D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.	Properties of Mixtures		▼
6.A	(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:	(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy;	Defining Energy		●
			Energy Conversions in Flashlights		●
			Sound Energy		●
6.B	(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:	(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound;	Building Circuits	●	
			Electric Circuits		●

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
6.C	(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:	(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water; and	The Path of a Reflected Light Beam		●
			Light Reflection: Solving Puzzles	●	
			Examples of Refraction of Light		●
6.D	(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:	(D) design an experiment that tests the effect of force on an object.	Newton's Second Law of Motion	▼	
			Balanced and Unbalanced Forces	▼	
			Newton's Third Law of Motion	▼	
7.A	(7) Earth and space. The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to:	(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels	The Rock Cycle	●	
			Sedimentary Rocks		●
			The Impact of Energy Resources: Part I		●
			Fossil Fuels and Renewable Energy Sources		●
			Fossil Fuels		●
			The Rock Cycle		●
7.C	(7) Earth and space. The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to:	(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels	Renewable Energy Sources	●	
			The Impact of Energy Resources: Part I		●
			Fossil Fuels and Renewable Energy Sources		●
			Solar Energy: Designing a Solar Car	●	
			The Impact of Energy Resources: Part II		●
7.D	(7) Earth and space. The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to:	(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models	Sorting and Identifying Animal Fossils	▼	
			Analysis of Fossil Evidence	▼	
			Ages of Rocks and Fossils		▼
			Pangaea: Image of Earth 250 Million Years Ago	▼	
			The Rock Cycle	▼	

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
8.A	(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:	(A) differentiate between weather and climate;	Weather vs. Climate		▼
8.B	(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:	(B) explain how the Sun and the ocean interact in the water cycle;	The Water Cycle		▼
			Surface Water		▼
8.C	(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:	(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky; and	The Effects of Earth's Daily Rotation		●
8.D	(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:	(D) identify and compare the physical characteristics of the Sun, Earth, and Moon.	Star Types: In Search of Habitability	▼	
			The Solar System	▼	
			The Shape of the Earth		▼
			The Moon		▼
			Comparison of the Sun, Earth, and the Moon		▼
9.A	(9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:	(A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;	Biotic and Abiotic Factors in Ecosystems		●
			Food Chains and Food Webs		●
9.B	(9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:	(B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers;	Food Chains and Food Webs		●
9.C	(9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:	(C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways; and	Environmental Problems		▼
			Acid Rain		▼
			Global Warming		▼

Readiness Standard ●
Supporting Standard ▼

GRADE 5
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
9.D	(9) Organisms and environments. The student knows that there are relationships, systems, and cycles within environments. The student is expected to:	(D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals.	The Significance of the Carbon Dioxide-Oxygen Cycle		▼
10.A	(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to:	(A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals;	Comparing the Adaptations of Organisms in Different Ecosystems		●
10.B	(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to:	(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle; and	Inherited Traits and Learned Behaviors of Plants and Animals		●
10.C	(10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to:	(C) describe the differences between complete and incomplete metamorphosis of insects.	Life Cycle of Animals	▼	

● Readiness Standard
▼ Supporting Standard

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ac / TEKS 6th Grade Alignment

Introduction

(1) Science, as defined by the National Academy of Science, 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 scientifically testable.

(2) Scientific 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 become theories. Scientific theories are based on natural and physical phenomena and are capable of being tested by multiple, independent researchers. Students should know that scientific theories, unlike hypotheses, are well-established and highly reliable, but they may still be subject to change as new information and technologies are developed. Students should be able to distinguish between scientific decision-making methods and ethical/social decisions that involve the application of scientific information.

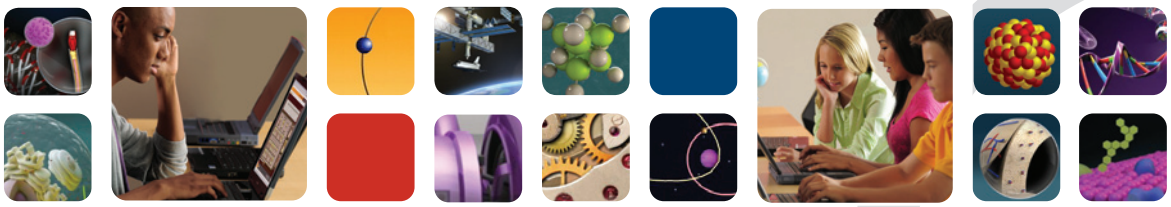
(3) Grade 6 science is interdisciplinary in nature; however, much of the content focus is on physical science. National standards in science are organized as multi-grade blocks such as Grades 5-8 rather than individual grade levels. In order to follow the grade level format used in Texas, the various national standards are found among Grades 6, 7, and 8. Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include change and constancy, patterns, cycles, systems, models, and scale.

(4) The strands for Grade 6 include:

(4A) Scientific investigations and reasoning.

(i) To develop a rich knowledge of science and the natural world, students must become familiar with different modes of scientific inquiry, rules of evidence, ways of formulating questions, ways of proposing explanations, and the diverse ways scientists study the natural world and propose explanations based on evidence derived from their work.

(ii) Scientific investigations are conducted for different reasons. All investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings. Continue to Next Page >>



ac / TEKS 6th Grade Alignment

Introduction Continued

(ii) (cont) Descriptive investigations are used to explore new phenomena such as conducting surveys of organisms or measuring the abiotic components in a given habitat. Descriptive statistics include frequency, range, mean, median, and mode. A hypothesis is not required in a descriptive investigation. On the other hand, when conditions can be controlled in order to focus on a single variable, experimental research design is used to determine causation.

Students should experience both types of investigations and understand that different scientific research questions require different research designs.

(iii) Scientific investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and the methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. Models have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(4B) Matter and energy.

(i) Matter can be classified as elements, compounds, or mixtures. Students have already had experience with mixtures in Grade 5, so Grade 6 will concentrate on developing an understanding of elements and compounds. It is important that students learn the differences between elements and compounds based on observations, description of physical properties, and chemical reactions. Elements are represented by chemical symbols, while compounds are represented by chemical formulas. Subsequent grades will learn about the differences at the molecular and atomic level.

(ii) Elements are classified as metals, nonmetals, and metalloids based on their physical properties. The elements are divided into three groups on the Periodic Table. Each different substance usually has a different density, so density can be used as an identifying property. Therefore, calculating density aids classification of substances.

(iii) Energy resources are available on a renewable, nonrenewable, or indefinite basis. Understanding the origins and uses of these resources enables informed decision making. Students should consider the ethical/social issues surrounding Earth's natural energy resources, while looking at the advantages and disadvantages of their long-term uses.

(4C) Force, motion, and energy. Energy occurs in two types, potential and kinetic, and can take several forms. Thermal energy can be transferred by conduction, convection, or radiation. It can also be changed from one form to another. Students will investigate the relationship between force and motion using a variety of means, including calculations and measurements.

(4D) Earth and space. The focus of this strand is on introducing Earth's processes. Students should develop an understanding of Earth as part of our solar system. The topics include organization of our solar system, the role of gravity, and space exploration.

(4E) Organisms and environments. Students will gain an understanding of the broadest taxonomic classifications of organisms and how characteristics determine their classification. The other major topics developed in this strand include the interdependence between organisms and their environments and the levels of organization within an ecosystem.

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
1.A	(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 the Texas Safety Standards	Laboratory Safety	●	
			The Safety of Outdoor Investigations		●
1.B	(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:	(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials	Laboratory Safety	●	
2.A	(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;	Hurricane Formation	●	
			Introduction to Classification	●	
			Comparing Plant and Animal Cells	●	
			Classification of Animals	●	
			Sorting and Identifying Animal Fossils	●	
			Water Test Kits		●
			Evaluating Products and Services		●
2.B	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;	Phototropism in Plants	●	
			Osmosis	●	
			Conservation of Mass in Chemical Reactions	●	
			Plants' Needs for Photosythesis	●	
			Homeostasis	●	
			Tools for Scientific Analysis: Tape Measures		●

Readiness Standard ●
Supporting Standard ▼

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
2.C	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;	Heat Conduction	●	
			Physical Properties	●	
			SI Units and Dimensional Analysis	●	
			Balanced and Unbalanced Forces	●	
			Cell Theory and Cell Types	●	
			Drilling into Groundwater	●	
			Phototropism in Plants	●	
			Water Test Kits		●
			Evaluating Products and Services		●
			Tools for Scientific Analysis: Tape Measures		●
2.D	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and	Homeostasis	●	
			Graphical Visualization of Air Pollution	●	
2.E	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Cell Theory and Cell Types	●	
			Investigating Photosynthesis with Van Helmont	●	
			Investigating Photosynthesis with Priestley and Ingenhousz	●	
3.A	(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;	Homeostasis	●	
			Plants' Needs for Photosythesis	●	
			Newton's Second Law of Motion	●	
			Life From Nonliving Things? Redi's Experiment	●	
			Star Types: In Search of Habitability	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
			Applying and Communicating Scientific Information		●

Readiness Standard ●
Supporting Standard ▼

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
3.B	(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:	(B) use models to represent aspects of the natural world such as a model of Earth's layers;	Agent Organelles	●	
			Muscles and Pinocchio's Arm	●	
3.C	(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:	(C) identify advantages and limitations of models such as size, scale, properties, and materials; and	Life Science Models		●
			Modeling and Mathematics in Physics		●
3.D	(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:	(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.	The Impact of Scientific Advances on Science and Society		●
			The History of Biology		●
			History of Taxonomy		●

Readiness Standard ●
Supporting Standard ▼

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
4.A	(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 to collect, record, and analyze information, including journals/ notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum; and	The Rock Cycle	●	
			Diffusion	●	
			Physical Properties	●	
			Separation of Mixtures	●	
			Cell Theory and Cell Types	●	
			Lab Equipment: Mechanics		●
			Melting and Boiling Points: Different Materials, Different Amounts	●	
			The Effect of Temperature on Enzyme Activity	●	
			Boiling, Condensation, Freezing, and Melting Points		●
			Measuring Mass and Weight	●	
			Exploring Cells with a Microscope	●	
			Heat Conduction	●	
			Melting and Boiling Points: Heating Curves	●	
			How Liquid Thermometers Measure Temperature		●
			Calculating Atomic Mass	●	
			Color Absorption and Reflection: Light Energy into Heat	●	
			Light Intensity and Distance from the Source	●	
4.B	(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:	(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.	Laboratory Safety	●	
			The Properties of Acids	●	
			The Properties of Bases	●	
5.A	(5) Matter and energy. The student knows the differences between elements and compounds. The student is expected to:	(A) know that an element is a pure substance represented by chemical symbols;	Symbols of Elements		●
			A Musical Introduction to Chemical Formulas	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
5.B	(5) Matter and energy. The student knows the differences between elements and compounds. The student is expected to:	(B) recognize that a limited number of the many known elements comprise the largest portion of solid Earth, living matter, oceans, and the atmosphere	Elements Forming Earth's Land and Seas		●
			Elements Forming the Human Body		●
			The Structure of the Atmosphere		●
5.C	(5) Matter and energy. The student knows the differences between elements and compounds. The student is expected to:	(C) differentiate between elements and compounds on the most basic level; and	The Differences Between Elements and Compounds		▼
			A Musical Introduction to Chemical Formulas	▼	
			Representation of Elements and Compounds		▼
5.D	(5) Matter and energy. The student knows the differences between elements and compounds. The student is expected to:	(D) identify the formation of a new substance by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change	Physical and Chemical Changes	●	
			Elements and Compounds		●
6.A	(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	Physical Properties and the Periodic Table	▼	
6.B	(6) Matter and energy. The student knows matter has physical properties that can be used for classification. The student is expected to:	(B) calculate density to identify an unknown substance	The Density of Marbles	▼	
			Physical Properties	▼	
			Physical Properties of Substances	▼	
7.A	(7) Matter and energy. The student knows that some of Earth's energy resources are available on a nearly perpetual basis, while others can be renewed over a relatively short period of time. Some energy resources, once depleted, are essentially nonrenewable. The student is expected to:	(A) research and debate the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources	Nonrenewable Energy Sources	●	
			The Impact of Energy Resources: Part I		●
			The Impact of Energy Resources: Part II		●
			Renewable Energy Sources	●	
			Energy Sources: The Sun		●
			Solar Energy: Designing a Solar Car	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
7.B	(7) Matter and energy. The student knows that some of Earth's energy resources are available on a nearly perpetual basis, while others can be renewed over a relatively short period of time. Some energy resources, once depleted, are essentially nonrenewable. The student is expected to:	(B) design a logical plan to manage energy resources in the home, school, or community	Nonrenewable Energy Sources	●	
			Renewable Energy Sources	●	
8.A	(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	Roller Coaster Design: Gravitational Potential and Kinetic Energy	▼	
			Why Does Kinetic Energy Change?		▼
8.B	(8) Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:	(B) identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces	Balanced and Unbalanced Forces	●	
			Friction	●	
8.C	(8) Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:	(C) calculate average speed using distance and time measurements	Motion Graph of Constant Velocity		▼
			Calculation of Speed		▼
			Calculating Average Speed		▼
8.D	(8) Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:	(D) measure and graph changes in motion	Truck On: Position - Time and Velocity - Time Graphs	▼	
			Motion Graph of Constant Velocity		▼
			Calculation of Speed		▼
			Calculating Average Speed		▼
8.E	(8) Force, motion, and energy. The student knows force and motion are related to potential and kinetic energy. The student is expected to:	(E) investigate how inclined planes and pulleys can be used to change the amount of force to move an object	Inclined Planes	●	
			Fixed Pulleys		●
			Movable Pulleys		●
			Input and Output Forces on Pulleys		●

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GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
9.A	(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:	(A) investigate methods of thermal energy transfer, including conduction, convection, and radiation	Heat Conduction	●	
			Heat Conduction of Different Materials	●	
			Heat Transfer in a Truck Engine	●	
			Conduction, Convection, and Radiation		●
			Radiation		●
9.B	(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:	(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; and	Heat Conduction	●	
			Heat Conduction of Different Materials	●	
			Heat Transfer in a Truck Engine	●	
			Conduction, Convection, and Radiation		●
			The Transfer of Heat, and Equilibrium Temperature		●
9.C	(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	Conservation of Mechanical Energy	▼	
			Roller Coaster Design: Gravitational Potential and Kinetic Energy	▼	
			Why Does Kinetic Energy Change?		▼
10.A	(10) Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:	(A) build a model to illustrate the structural layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere	The Structural Layers of Earth	●	
10.B	(10) Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:	(B) classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation	The Rock Cycle	●	
10.C	(10) Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:	(C) identify the major tectonic plates, including Eurasian, African, Indo-Australian, Pacific, North American, and South American	Plate Tectonics: The Atlantic Ocean	●	
			Plate Tectonics: The Hawaiian Islands	●	
			Plate Tectonics: The Himalayas	●	
			Pangaea: Image of Earth 250 Million Years Ago	●	
			Tectonic Plates		●

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GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
10.D	(10) Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:	(D) describe how plate tectonics causes major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building	Plate Tectonics: The Atlantic Ocean	●	
			Plate Tectonics: The Hawaiian Islands	●	
			Plate Tectonics: The Himalayas	●	
			Pangaea: Image of Earth 250 Million Years Ago	●	
			Tectonic Plates		●
11.A	(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:	(A) describe the physical properties, locations, and movements of the Sun, planets, Galilean moons, meteors, asteroids, and comets;	The Sun: Structure of our Star		●
			The Solar System	●	
			The Position of the Planets		●
			Size of the Planets		●
			Motion of the Planets		●
			Galilean Moons		●
			Meteoroids		●
			Asteroids		●
			The Structure of the Planets		●
			Comets	●	
11.B	(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	Newton's Law of Universal Gravitation		▼
			Space Objects: Gravity and Motion	▼	
			Space Objects: Interactions Due to Gravitational Forces	▼	
11.C	(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:	(C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel	Space Technology		●
			First Man on the Moon		●
			Space Shuttles		●
			Rockets		●
			Technologies Used in Space Exploration	●	
12.A	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	(A) understand that all organisms are composed of one or more cells	Cell Theory and Cell Types	●	

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GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
12.B	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	(B) recognize that the presence of a nucleus determines whether a cell is prokaryotic or eukaryotic;	Cell Theory and Cell Types	●	
			The Structure of Bacteria		●
12.C	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	(C) recognize that the broadest taxonomic classification of living organisms is divided into currently recognized Domains;	Domains and Kingdoms	●	
12.D	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which 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;	Domains and Kingdoms		▼
12.E	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	(E) describe biotic and abiotic parts of an ecosystem in which organisms interact; and	Biotic and Abiotic Factors in Ecosystems	●	

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GRADE 6
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
12.F	(12) Organisms and environments. The student knows all organisms are classified into Domains and Kingdoms. Organisms within these taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem. The student is expected to:	(F) diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem.	Habitat Designer: Panda	●	
			Habitat Designer: Sea Turtle	●	

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Introduction

(1) Science, as defined by the National Academy of Science, 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 scientifically testable.

(2) Scientific 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 become theories. Scientific theories are based on natural and physical phenomena and are capable of being tested by multiple, independent researchers. Students should know that scientific theories, unlike hypotheses, are well-established and highly reliable, but they may still be subject to change as new information and technologies are developed. Students should be able to distinguish between scientific decision-making methods and ethical/social decisions that involve the application of scientific information.

(3) Grade 7 science is interdisciplinary in nature; however, much of the content focus is on organisms and the environment. National standards in science are organized as a multi-grade blocks such as Grades 5-8 rather than individual grade levels. In order to follow the grade level format used in Texas, the various national standards are found among Grades 6, 7, and 8. Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include change and constancy, patterns, cycles, systems, models, and scale.

(4) The strands for Grade 7 include:

(4A) Scientific investigation and reasoning.

(i) To develop a rich knowledge of science and the natural world, students must become familiar with different modes of scientific inquiry, rules of evidence, ways of formulating questions, ways of proposing explanations, and the diverse ways scientists study the natural world and propose explanations based on evidence derived from their work.

(ii) Scientific investigations are conducted for different reasons. All investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings. Descriptive

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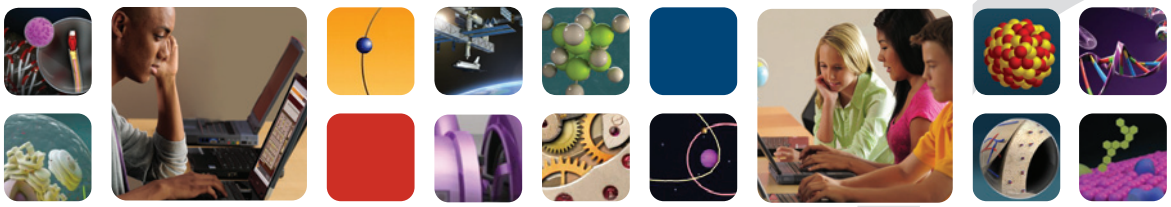

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Introduction Continued

investigations are used to explore new phenomena such as conducting surveys of organisms or measuring the abiotic components in a given habitat. Descriptive statistics include frequency, range, mean, median, and mode. A hypothesis is not required in a descriptive investigation. On the other hand, when conditions can be controlled in order to focus on a single variable, experimental research design is used to determine causation. Students should experience both types of investigations and understand that different scientific research questions require different research designs.

(iii) Scientific investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and the methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. Models have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(4B) Matter and energy. Matter and energy are conserved throughout living systems. Radiant energy from the Sun drives much of the flow of energy throughout living systems due to the process of photosynthesis in organisms described as producers. Most consumers then depend on producers to meet their energy needs. Decomposers play an important role in recycling matter. Organic compounds are composed of carbon and other elements that are recycled due to chemical changes that rearrange the elements for the particular needs of that living system. Large molecules such as carbohydrates are composed of chains of smaller units such as sugars, similar to a train being composed of multiple box cars. Subsequent grade levels will learn about the differences at the molecular and atomic level.

(4C) Force, motion, and energy. Force, motion, and energy are observed in living systems and the environment in several ways. Interactions between muscular and skeletal systems allow the body to apply forces and transform energy both internally and externally. Force and motion can also describe the direction and growth of seedlings, turgor pressure, and geotropism. Catastrophic events of weather systems such as hurricanes, floods, and tornadoes can shape and restructure the environment through the force and motion evident in them. Weathering, erosion, and deposition occur in environments due to the forces of gravity, wind, ice, and water.

(4D) Earth and space. Earth and space phenomena can be observed in a variety of settings. Both natural events and human activities can impact Earth systems. There are characteristics of Earth and relationships to objects in our solar system that allow life to exist.

(4E) Organisms and environments.

(i) Students will understand the relationship between living organisms and their environment. Different environments support different living organisms that are adapted to that region of Earth. Organisms are living systems that maintain a steady state with that environment and whose balance may be disrupted by internal and external stimuli. External stimuli include human activity or the environment. Successful organisms can reestablish a balance through different processes such as a feedback mechanism. Ecological succession can be seen on a broad or small scale.

(ii) Students learn that all organisms obtain energy, get rid of wastes, grow, and reproduce. During both sexual and asexual reproduction, traits are passed onto the next generation. These traits are contained in genetic material that is found on genes within a chromosome from the parent. Changes in traits sometimes occur in a population over many generations. One of the ways a change can occur is through the process of natural selection. Students extend their understanding of structures in living systems from a previous focus on external structures to an understanding of internal structures and functions within living things.

(iii) All living organisms are made up of smaller units called cells. All cells use energy, get rid of wastes, and contain genetic material. Students will compare plant and animal cells and understand the internal structures within them that allow them to obtain energy, get rid of wastes, grow, and reproduce in different ways. Cells can organize into tissues, tissues into organs, and organs into organ systems. Students will learn the major functions of human body systems such as the ability of the integumentary system to protect against infection, injury, and ultraviolet (UV) radiation; regulate body temperature; and remove waste.

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
1.A	(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; and	Laboratory Safety	●	
		(A) demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards	The Safety of Outdoor Investigations		●
1.B	(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:	(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.	Laboratory Safety	●	
2.A.	(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;	Hurricane Formation	●	
			Introduction to Classification	●	
			Comparing Plant and Animal Cells	●	
			Classification of Animals	●	
			Cell Theory and Cell Types	●	
			Sorting and Identifying Animal Fossils	●	
			Separation of Mixtures	●	
2.B	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(B) design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;	Phototropism in Plants	●	
			Osmosis	●	
			Conservation of Mass in Chemical Reactions	●	
			Plants' Needs for Photosynthesis	●	
			Homeostasis	●	
2.C	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;	Heat Conduction	●	
			Physical Properties	●	
			SI Units and Dimensional Analysis	●	
			Balanced and Unbalanced Forces	●	
			Cell Theory and Cell Types	●	
			Drilling into Groundwater	●	
			Phototropism in Plants	●	

Readiness Standard ●
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GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
2.D	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and	Homeostasis	●	
			Conservation of Mass in Chemical Reactions	●	
			Graphical Visualization of Air Pollution	●	
2.E	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Cell Theory and Cell Types	●	
			Investigating Photosynthesis with Van Helmont	●	
			Investigating Photosynthesis with Priestley and Ingenhousz	●	
3.A	(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;	Homeostasis	●	
			Plants' Needs for Photosynthesis	●	
			Newton's Second Law of Motion	●	
			Life From Nonliving Things? Redi's Experiment	●	
			Star Types: In Search of Habitability	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
			Applying and Communicating Scientific Information		●
3.B	(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:	(B) use models to represent aspects of the natural world such as human body systems and plant and animal cells;	Agent Organelles	●	
			Muscles and Pinocchio's Arm	●	
3.C	(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:	(C) identify advantages and limitations of models such as size, scale, properties, and materials; and	Modeling and Mathematics in Physics		●
			Life Science Models		●

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GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
3.D	(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:	(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.	The Impact of Scientific Advances on Science and Society		●
			The History of Biology		●
			History of Taxonomy		●
4.A	(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	How Liquid Thermometers Measure Temperature		●
			Acid-Base Indicators		●
			Waster Test Kits		●
			Digital Cameras		●
			Stereoscopes		●
			Calculating Atomic Mass	●	
			Exploring Cells with a Microscope	●	
			Cell Theory and Cell Types	●	
			Homeostasis	●	
			Surface Area-to-Volume Ratio in Organisms	●	
			Identifying pH of Substances	●	
			Color Absorption and Reflection: Light into Heat Energy	●	
			Diffusion	●	
			Lab Equipment: Mechanics		●
			Physical Properties	●	
			The Effect of Temperature on Enzyme Activity	●	
			Muscles and Pinocchio's Arm	●	
			Lab Equipment: Optics		●
			The Rock Cylcle	●	
			Phototropism in Plants	●	
			Boiling, Condensation, Freezing, and Melting Points		●
			Measuring Mass and Weight	●	
			Collecting Nets		●
			Globes		●
			Insect Traps		●

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GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
4.A Cont.	(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	Life Science Models		●
			Tools for Scientific Analysis: Tape Measures		●
			Separation of Mixtures	●	
			Conservation on Mass in Chemical Reactions	●	
			Melting and Boiling Points: Different Materials, Different Amounts	●	
			Melting and Boiling Points: Heating Curves	●	
			Heat Conduction	●	
			Light Intensity and Distance from the Source	●	
4.B	(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:	(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.	Laboratory Safety	●	
			The Properties of Acids	●	
			The Properties of Bases	●	
			Heat Conduction	●	
			Acid-Base Indicators		●
5.A	(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;	Plants' Needs for Photosynthesis	●	
			Factors Influencing Photosynthesis: Carbon Dioxide	●	
			Factors Influencing Photosynthesis: Intensity and the Color of Light	●	
			Factors Influencing Photosynthesis: Temperature	●	
			Aerobic Respiration and Photosynthesis		●
5.B	(5) Matter and energy. The student knows that interactions occur between matter and energy. The student is expected to:	(B) demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and	Carbon Cycle		●
			The Water Cycle		●
			Nitrogen Cycle		●

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GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
5.C	(5) Matter and energy. The student knows that interactions occur between matter and energy. The student is expected to:	(C) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.	The Energy Flow from Producer to Consumer	▼	
			Food Chains and Food Webs		▼
			Importance of Protista		▼
			Ecological Pyramids		▼
6.A	(6) Matter and energy. The student knows that matter has physical and chemical properties andcan undergo physical and chemical changes. The student is expected to:A689	(A) identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur;	Carbon and Carbohydrates		▼
			Hydrolysis		▼
			Proteins		▼
			Lipids		▼
6.B	(6) Matter and energy. The student knows that matter has physical and chemical properties andcan undergo physical and chemical changes. The student is expected to:	(B) distinguish between physical and chemical changes in matter in the digestive system; and	Digestive System	▼	
6.C	(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:	(C) recognize how large molecules are broken down into smaller molecules such as carbohydrates can be broken down into sugars.	Hydrolysis		●
			Digestive System	●	
7.A	(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	Work		
7.B	(7) Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. The student is expected to:	(B) illustrate the transformation of energy within an organism such as the transfer from chemical energy to heat and thermal energy in digestion	Transformation of Energy in Organisms		●
7.C	(7) Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. The student is expected to:	(C) demonstrate and illustrate forces that affect motion in everyday life such as emergence of seedlings, turgor pressure, and geotropism.	Phototropism in Plants	●	
			Nastic Movement		●
			Thigmotropism in Plants		●
			Water Transport in Plants		●

Readiness Standard ●
Supporting Standard ▼

▼ SCIENCE ACTIVITY OBJECTS

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
8.A	(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;	The Effects of Natural Disasters on Ecosystems		●
8.B	(8) Earth and space. The student knows that natural events and human activity can impact Earth systems. The student is expected to:	(B) analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and	Comparing the Adaptations of Organisms in Different Ecosystems		●
			Erosion and Deposition of the Environment in Texas		●
8.C	(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.	Groundwater and Surface Water		▼
9.A	(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	Star Types: In Search of Habitability	●	
9.B	(9) Earth and space. The student knows components of our solar system. The student is expected to:	(B) identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.	Star Types: In Search of Habitability	●	
			The Solar Syslem	●	
10.A	(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;	Comparing the Adaptations of Organisms in Different Ecosystems		●
10.B	(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	The Importance of Biodiversity		▼
10.C	(10) Organisms and environments. The student knows that there is a relationship between organisms and the environment. The student is expected to:	(C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds	Ecological Succession		▼

Readiness Standard ●
Supporting Standard ▼

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
11.A	(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;	Introduction to Classification	▼	
			Classification of Animals	▼	
11.B	(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:	(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	Introduction to Classification	●	
			Comparing the Adaptations of Organisms in Different Ecosystems		●
			Biological Adaptations: Bird Beaks	●	
			Behavioral and Physiological Adaptations of Organisms		●
11.C	(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:	(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.	Natural Selection	▼	
12.A	(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;	General Characteristics of Birds		●
			General Characteristics of Amphibians		●
			Water Transport in Plants		●

Readiness Standard ●
Supporting Standard ▼

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
12.B	(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;	Technology's Effects on the Respiratory System		●
			Breathing		●
			Respiratory System		●
			An Organ of the Excretory System: Kidneys		●
			The Excretory System		●
			Urinary Diseases and Disorders		●
			Pituitary Gland		●
			Reflexes		●
			Thyroid Gland		●
			Endocrine System		●
			Integumentary System		●
			Muscles and Pinocchio's Arm	●	
			Joints	●	
			The Structure of Bones	●	
			Digestive System	●	
			The Nervous System	●	
			Female Reproductive System		●
			Menstruation		●
			Menstrual Cycle		●
			Male Reproductive System		●
			Technology's Effects on the Skeletal System		●
			Joints		●
			Blood Vessels		●
			Blood Circulation		●
			The Human Body Atlas	●	
			The Respiratory System	●	
			The Urinary System	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
12.C	(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:	(C) recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;	Levels of Organization in Plants		●
			Comparing Plant and Animal Cells	●	
			Cell Theory and Cell Types	●	
			Bees, Flowers, and Pollination	●	
			Plant Survival: The Xeroscape Garden	●	
			Cell Organization		●
			Muscles and Pinocchio's Arm	●	
			The Structure of Bones	●	
			Hear with the Ear	●	
			An Organ of the Excretory System: Kidneys		●
			Vision and the Eye	●	
			The Nervous System	●	
			Immune System		●
			Digestive System	●	
			Classification of Animals	●	
			The Animal Kingdom		●
12.D	(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:	(D) differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;	The Structure and Function of Cell Membrane	▼	
			Comparing Plant and Animal Cells	▼	
			Agent Organelles	▼	
12.E	(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:	(E) compare the functions of a cell to the functions of organisms such as waste removal; and	Comparing the Functions of Cells with the Functions of Organisms		●
12.F	(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:	(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.	Cell Theory and Cell Types	▼	
			Comparing the Functions of Cells with the Functions of Organisms		▼

Readiness Standard ●
Supporting Standard ▼

GRADE 7
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
13.A	(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	Homeostasis	●	
			Nastic Movement		●
			Phototropism in Plants	●	
			Thigmotropism in Plants		●
13.B	(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:	(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.	Homeostasis	●	
			Immune System		●
14.A	(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	Find the Heir: Genetics Applied	●	
14.B	(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 sexual reproduction or asexual reproduction	Reproduction in Bacteria		▼
14.C	(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:	(C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.	Find the Heir: Genetics Applied	▼	

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Introduction

1) 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 scientifically testable.

(2) Scientific 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 become theories. Scientific theories are based on natural and physical phenomena and are capable of being tested by multiple, independent researchers. Students should know that scientific theories, unlike hypotheses, are well-established and highly reliable, but they may still be subject to change as new information and technologies are developed. Students should be able to distinguish between scientific decision-making methods and ethical/social decisions that involve the application of scientific information.

(3) Grade 8 science is interdisciplinary in nature; however, much of the content focus is on earth and space science. National standards in science are organized as multi-grade blocks such as Grades 5-8 rather than individual grade levels. In order to follow the grade level format used in Texas, the various national standards are found among Grades 6, 7, and 8. Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include change and constancy, patterns, cycles, systems, models, and scale.

(4) The strands for Grade 8 include:

(4A) Scientific investigation and reasoning.

(i) To develop a rich knowledge of science and the natural world, students must become familiar with different modes of scientific inquiry, rules of evidence, ways of formulating questions, ways of proposing explanations, and the diverse ways scientists study the natural world and propose explanations based on evidence derived from their work.

(ii) Scientific investigations are conducted for different reasons. All investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings. Descriptive investigations are used to explore new phenomena such as conducting surveys

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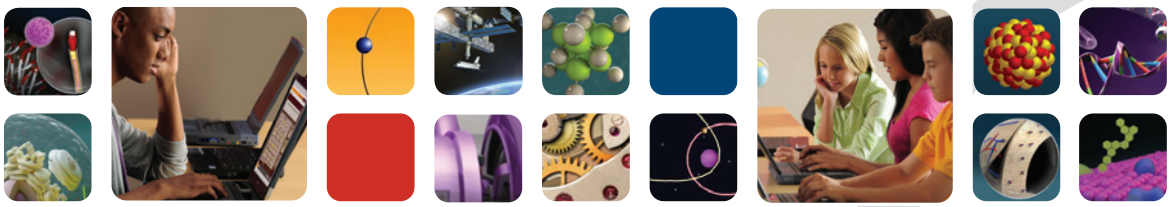

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Introduction Continued

of organisms or measuring the abiotic components in a given habitat.

Descriptive statistics include frequency, range, mean, median, and mode. A hypothesis is not required in a descriptive investigation. On the other hand, when conditions can be controlled in order to focus on a single variable, experimental research design is used to determine causation. Students should experience both types of investigations and understand that different scientific research questions require different research designs.

(iii) Scientific investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and the methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. Models have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(4B) Matter and energy. Students recognize that matter is composed of atoms. Students examine information on the Periodic Table to recognize that elements are grouped into families. In addition, students understand the basic concept of conservation of mass. Lab activities will allow students to demonstrate evidence of chemical reactions. They will use chemical formulas and balanced equations to show chemical reactions and the formation of new substances.

(4C) Force, motion, and energy. Students experiment with the relationship between forces and motion through the study of Newton's three laws. Students learn how these forces relate to geologic processes and astronomical phenomena. In addition, students recognize that these laws are evident in everyday objects and activities. Mathematics is used to calculate speed using distance and time measurements.

(4D) Earth and space. Students identify the role of natural events in altering Earth systems. Cycles within Sun, Earth, and Moon systems are studied as students learn about seasons, tides, and lunar phases. Students learn that stars and galaxies are part of the universe and that distances in space are measured by using light waves. In addition, students use data to research scientific theories of the origin of the universe. Students will illustrate how Earth features change over time by plate tectonics. They will interpret land and erosional features on topographic maps. Students learn how interactions in solar, weather, and ocean systems create changes in weather patterns and climate.

(4E) Organisms and environments. In studies of living systems, students explore the interdependence between these systems. Interactions between organisms in ecosystems, including producer/consumer, predator/prey, and parasite/host relationships, are investigated in aquatic and terrestrial systems. Students describe how biotic and abiotic factors affect the number of organisms and populations present in an ecosystem. In addition, students explore how organisms and their populations respond to short- and long-term environmental changes, including those caused by human activities.

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
1.A	(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 the Texas Safety Standards; and	Laboratory Safety		●
			The Safety of Outdoor Investigations	●	
1.B	(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:	(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.	Laboratory Safety	●	
2.A	(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;	Hurricane Formation	●	
			Introduction to Classification	●	
			Comparing Plant and Animal Cells	●	
			Classification of Animals	●	
			Cell Theory and Cell Types	●	
			Calculating Atomic Mass	●	
			Exploring Cells with a Microscope	●	
			Parasitism	●	
			The Concept of Inertia	●	
2.B	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;	Phototropism in Plants	●	
			Osmosis	●	
			Conservation of Mass in Chemical Reactions	●	
			Balanced and Unbalanced Forces	●	
			Homeostasis	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
2.C	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;	Heat Conduction	●	
			Physical Properties	●	
			SI Units and Dimensional Analysis	●	
			Balanced and Unbalanced Forces	●	
			Exploring Cells with a Microscope	●	
			Environmental Factors that Affect the Growth of Molds	●	
			Conservation of Mass in Chemical Reactions	●	
2.D	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and	Homeostasis	●	
			Conservation of Mass in Chemical Reactions	●	
			Graphical Visualization of Air Pollution	●	
2.E	(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:	(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	Cell Theory and Cell Types	●	
			Investigating Photosynthesis with Van Helmont	●	
3.A	(3) Scientific processes. 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;	Homeostasis	●	
			Plants' Needs for Photosynthesis	●	
			Newton's Second Law of Motion	●	
			Life From Nonliving Things? Redi's Experiment	●	
			Star Types: In Search of Habitability	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
			Applying and Communicating Scientific Information		●
			Balanced and Unbalanced Forces	●	
			Environmental Factors that Affect the Growth of Molds	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
3.B	(3) Scientific processes. 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:	(B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;	Agent Organelles	●	
			Muscles and Pinocchio's Arm	●	
			Atomic Model History: From Ancient Greece to Thomson	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
3.C	(3) Scientific processes. 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:	(C) identify advantages and limitations of models such as size, scale, properties, and materials; and	Modeling and Mathematics in Physics		●
			Life Science Models		●
3.D	(3) Scientific processes. 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:	(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.	The Impact of Scientific Advances on Science and Society		●
			The History of Biology		●
			History of Taxonomy		●

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
4.A	(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 to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectroscopes, timing devices, and other equipment as needed to teach the curriculum; and	The Rock Cycle	●	
			Diffusion	●	
			Physical Properties	●	
			Separation of Mixtures	●	
			Lab Equipment: Mechanics		●
			Psychrometers		●
			Melting and Boiling Points: Different Materials, Different Amounts	●	
			The Effect of Temperature on Enzyme Activity	●	
			Boiling, Condensation, Freezing, and Melting Points		●
			Measuring Mass and Weight	●	
			The Differences between Mass and Weight		●
			Conservation of Mass in Chemical Reactions	●	
			Exploring Cells with a Microscope	●	
			Cell Theory and Cell Types	●	
			Heat Conduction	●	
			Melting and Boiling Points: Heating Curves	●	
			How Liquid Thermometers Measure Temperature		●
			Surface Area-to-Volume Ratio in Organisms	●	
			Sea and Land Breezes	●	
			Color Absorption and Reflection: Light Energy into Heat	●	
			Light Intensity and Distance from the Source	●	
			Lab Equipment: Optics		●
4.B	(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:	(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.	Laboratory Safety	●	
			The Properties of Acids	●	
			The Properties of Bases	●	

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
5.A	(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;	Atomic Model History: From Ancient Greece to Thomson	●	
			History of the Atomic Model: From Rutherford to Bohr	●	
			Subatomic Particles		●
5.B	(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;	Subatomic Particles		●
			Calculating Atomic Mass	●	
			Electron Configuration and the Tendency to Gain or Lose Electrons	●	
			The Concept of Bonding		●
			Bonding and the Periodic Table		●
5.C	(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements;	General Structure of the Periodic Table		●
			Properties of s-Block Elements		●
			Properties of Group 8A Elements		●
			Properties of Group 7A Elements		●
			Properties of Group 6A Elements		●
			Properties of Group 5A Elements		●
			Properties of Group 4A Elements		●
			Properties of Group 3A Elements		●
			Physical Properties and the Periodic Table	●	
5.D	(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts;	A Musical Introduction to Chemical Formulas	●	
5.E	(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	(E) investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and	Physical and Chemical Changes	●	
			Elements and Compounds		●
5.F	(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:	(F) recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass.	Writing and Balancing Chemical Equations	▼	
			Conservation of Mass in Chemical Reactions	▼	

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
6.A	(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;	Balanced and Unbalanced Forces	●	
			Newton's Second Law of Motion	●	
			Friction	●	
			Solving Problems with Newton's Second Law	●	
6.B	(6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:	(B) differentiate between speed, velocity, and acceleration; and	Speed, Velocity, and Acceleration		▼
6.C	(6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:	(C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.	The Concept of Inertia	●	
			Solving Problems With Newton's Second Law	●	
			Newton's Third Law of Motion: The Physics of Rockets	●	
			The Application of Newton's Laws of Motion		●
			Newton's Second Law of Motion	●	
			Newton's Third Law of Motion	●	
7.A	(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;	The Effects of Earth's Rotation		●
			Formation of Seasons	●	
			The Effects of Earth's Revolution Around the Sun		●
7.B	(7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:	(B) demonstrate and predict the sequence of events in the lunar cycle; and	The Phases of Earth's Moon		●
7.C	(7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:	(C) relate the position of the Moon and Sun to their effect on ocean tides.	Newton's Law of Universal Gravitation		▼
			Tides		▼

Readiness Standard ●
Supporting Standard ▼

GRADE 8
Texas Knowledge and Skills (TEKS)

State ID	TEKS	Student Expectation	Content	Activity Object	Animation
8.A	(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 Herztsprung-Russell diagram for classification;	Stars		●
			The Lifecycle of Stars		●
			Constellations		●
			Galaxies		●
			The Milky Way Galaxy		●
			Classifying the Components of the Universe Using Models		●
			The Solar System	●	
8.B	(8) Earth and space. The student knows characteristics of the universe. The student is expected to:	(B) recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star;	The Sun: Our Closest Star		▼
8.C	(8) Earth and space. The student knows characteristics of the universe. The student is expected to:	(C) explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe;	Observing Space		▼
8.D	(8) Earth and space. The student knows characteristics of the universe. The student is expected to:	(D) model and describe how light years are used to measure distances and sizes in the universe; and	Stars		▼
8.E	(8) Earth and space. The student knows characteristics of the universe. The student is expected to:	(E) research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.	The Formation of the Universe	●	
9.A	(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.	Plate Tectonics: The Atlantic Ocean	▼	
			Pangaea: Image of Earth 250 Million Years Ago	▼	
9.B	(9) Earth and space. The student knows that natural events can impact Earth systems. The student is expected to:	(B) relate plate tectonics to the formation of crustal features; and	Plate Tectonics: The Atlantic Ocean	●	
			Plate Tectonics: The Hawaiian Islands	●	
			Plate Tectonics: The Himalayas	●	
			Pangaea: Image of Earth 250 Million Years Ago	●	

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State ID	TEKS	Student Expectation	Content	Activity Object	Animation
9.C	(9) Earth and space. The student knows that natural events can impact Earth systems. The student is expected to:	(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering;	Plotting Landforms on Topographic Maps	●	
			Using Topographic Maps		●
			Using Satellite Images		●
10.A	(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 and ocean currents;	Sea and Land Breezes	▼	
			Ocean Currents		▼
			Effect of Sun on Ocean Current		▼
10.B	(10) Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to:	(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and	Weather Prediction	▼	
			Atmospheric Movement and Pressure		▼
			Atmospheric Movement and Fronts		▼
10.C	(10) Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to:	(C) identify the role of the oceans in the formation of weather systems such as hurricanes.	Sea and Land Breezes	▼	
			Hurricane Formation	▼	
11.A	(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) describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems;	Producer and Consumer Relationships in Ecosystems		●
			Predation in Ecosystems		●
			Parasitism	●	
			Parasitism in Ecosystems		●
			Food Chains and Food Webs		●
			The Energy Flow from Producers to Consumers	●	

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State ID	TEKS	Student Expectation	Content	Activity Object	Animation
11.B	(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:	(B) investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;	The Energy Flow from Producer to Consumer	●	
			Photoperiodism in Plants		●
			Biotic and Abiotic Factors in Ecosystems		●
			Interactions among Organisms--Competition	●	
			Competition in Ecosystems		●
			Biological Adaptations: Bird Beaks	●	
			The Effects of Natural Disasters on Ecosystems		●
			Factors Affecting Population Growth		●
			Thigmotropism in Plants		●
11.C	(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:	(C) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and	Environmental Factors that Affect the Growth of Molds	●	
			The Energy Flow from Producer to Consumer	●	
			Mass Extinction		●
			Ecological Succession		●
			The Effects of Natural Disasters on Ecosystems		●
11.D	(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:	(D) recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.	The Importance of Oceans		▼
			How Humans Affect the Ocean		▼

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For more information, contact us:

www.adaptivecurriculum.com/us/texas
txadoption@adaptivecurriculum.com
888.999.9319 (Toll Free)

adaptive curriculum™ | Texas

1475 North Scottsdale Road, Suite 120
Arizona State University SkySong
Scottsdale, AZ 85257-3538