

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Kindergarten		Field Trip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (D) investigate the life cycle of plants and identify likenesses between parents and offspring.	Refer to Plant Organisms; Workbook	Refer to Plant Organisms; Workbook	Refer to Plant Organisms; Workbook		
(b) Knowledge and skills.	2. (A) ask questions about organisms, objects, and events observed in the natural world;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (B) plan and conduct simple descriptive investigations such as ways objects move;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (C) collect data and make observations using simple equipment such as hand lenses, primary balances, and non-standard measurement tools;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (D) record and organize data and observations using pictures, numbers, and words; and	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (E) communicate observations with others about simple descriptive investigations.	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	9. (A) differentiate between living and nonliving things based upon whether they have basic needs and produce offspring; and			Build-A-Desert		
	9. (B) examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.		Dependency Web screens	Build-A-Desert screens		
	10. (A) sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape;	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens		
	10. (B) identify parts of plants such as roots, stem, and leaves and parts of animals such as head, eyes, and limbs;	Organism screens	Plant/Botany Organism screens	Adaptations, Organism screens		
	10. (D) observe changes that are part of a simple life cycle of a plant: seed, seedling, plant, flower, and fruit.		Plant/Botany Organism screens			

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Grade One		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (D) In life science, students recognize the interdependence of organisms in the natural world. They understand that all organisms have basic needs that can be satisfied through interactions with living and nonliving things. Students will investigate life cycles of animals and identify likenesses between parents and offspring.	Food Web; refer to animal Organism screens	Dependency Web; refer to animal Organism screens	Build-A-Desert; refer to animal Organism screens	Ecology section: Life Cycle	
(b) Knowledge and skills.	2. (A) ask questions about organisms, objects, and events observed in the natural world;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (B) plan and conduct simple descriptive investigations such as ways objects move;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (C) collect data and make observations using simple equipment such as hand lenses, primary balances, and non-standard measurement tools;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	9. (A) sort and classify living and nonliving things based upon whether or not they have basic needs and produce offspring;			Build-A-Desert		
	9. (B) analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver; and	Web Game	Dependency Web	Build-A-Desert		
	9. (C) gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter.	Web Game; Adaptations	Study section: Dependency Web	Build-A-Desert		
	10. (A) investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats;	Adaptations	Study: Plants, Dependency Web, Animals	Study: Build-A-Desert, Adaptations	Ecology section; Anatomy	
	10. (B) identify and compare the parts of plants;	Adaptations: Plants; refer to Organism screens	Study: Plant screens; refer to Organism screens	Adaptations / Plants; refer to Organism screens		
	10. (C) compare ways that young animals resemble their parents; and	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens	Ecology: Life Cycle	
10. (D) observe and record life cycles of animals such as a chicken, frog, or fish.				Ecology: Life Cycle		

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Grade Two		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (C) Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment.	Study section; Wetlands Mechanisms	Study section; Mechanisms	Desert Study; Mechanisms	Ecology section	
(b) Knowledge and skills.	2. (A) ask questions about organisms, objects, and events during observations and investigations;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (B) plan and conduct descriptive investigations such as how organisms grow;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (C) collect data from observations using simple equipment such as hand lenses, primary balances, thermometers, and non-standard measurement tools;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	9. (A) identify the basic needs of plants and animals;	Study section	Study section	Study section	Ecology section	
	9. (B) identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things; and	Study section: Adaptations; Endangered Wetlands	Study section; Endangered section; Mechanisms	Study section; Human Impact; Mechanisms	Ecology section	
	9. (C) compare and give examples of the ways living organisms depend on each other and on their environments ...	Web Game	Dependency Web	Build-A- Desert	Ecology section	
	10. (A) observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs such as fins help fish move and balance in the water;	Adaptations; refer to Organism screens	Study Section: Dependency Web, Plants, Animals	Desert Study: Build-A- Desert, Adaptations	Ecology section	
	10. (B) observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant; and	Plant Adaptations	Study Section: Plants; Botany	Plant Adaptations; Organism screens		
	10. (C) investigate and record some of the unique stages that insects undergo during their life cycle.	Refer to Organism screens; Workbook: Animal Observations: Insects				

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Grade Three		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (C) Students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.	Study section; Mechanisms; Endangered Wetlands	Study section; Mechanisms; Endangered screens	Desert Study; Mechanisms; Human Impact	Ecology section; Life Cycle	
(b) Knowledge and skills.	2. (A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	2. (C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;	CD and Workbook	CD and Workbook	CD and Workbook	CD and Workbook	
	7. (A) explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains	Decomposers	Soils & Decomposition	Landscape Formation		
	9. (A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem;	Mechanisms; Types; Bog Study	Types; Dependency Web	Mechanisms; Types; Desert Study		
	9. (B) identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem such as removal of frogs from a pond or bees from a field; and	Bog Study; Food Web; Endangered Wetlands	Dependency Web; Endangered screens	Desert Study; Build-A-Desert; Human Impact		
	9. (C) describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations.	Endangered Wetlands	Endangered screens	Human Impact	Ecology section	
	10. (A) explore how structures and functions of plants and animals allow them to survive in a particular environment;	Adaptations: Animal, Plant	Plants, Animals, Dependency Web	Study Organisms Adaptations	Ecology section	
	10. (B) explore that some characteristics of organisms are inherited such as the number of limbs on an animal or flower color and recognize that some behaviors are learned in response to living in a certain] environment		Biodiversity screens; Study section	Desert Study: Adaptations	Ecology: Biodiversity, Niches	
	10. (C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs , [mealworms,] and lady bugs.	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens	Ecology: Life Cycle	

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Grade Four		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	(A) Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. The students will recognize that our major source of energy is the Sun.	Bog Study: Web Energy, Photosynthesis	Human Impact screens	Human Impact screens		
	(B) Within the living environment, students know and understand that living organisms within an ecosystem interact with one another and with their environment. The students will recognize that plants and animals have basic needs, and they are met through a flow of energy known as food webs. Students will explore how all living organisms go through a life cycle and that adaptations enable organisms to survive in their ecosystem.	Bog Study: Food Web screens, Adaptation, Organism screens	Study: Dependency Web screens, Organism screens, Animal screens, Plant screens	Desert Study: Build-A-Desert, Adaptations, Organism screens	Ecology: Life Cycle	
(b) Knowledge and skills.	7. (A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants;		Soils and Decomposition			
	7. (B) observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice; and			Landscape Formation screens		
	8. (A) measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key			Refer to Climate screens		
	8. (B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process; and	Water Cycle	Mechanisms: Water Cycle; Endangered: Climate			
	9. (A) investigate that most producers [plants] need sunlight, water, and carbon dioxide to make their own food, while consumers [animals] are dependent on other organisms for food [producers, and consumers]; and	Food Web screens	Refer to Dependency Web screens	Build-A-Desert		
	9. (B) describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web such as a fire in a forest.	Food Web screens	Refer to Dependency Web screens	Build-A-Desert		
	10. (A) explore how adaptations enable organisms to survive in their environment such as comparing birds' beaks and leaves on plants;	Adaptations: Animal, Plant; refer to Organism screens	Biodiversity; Study screens: refer to Organism screens	Study screens: Adaptations; Organism screens		
	10. (B) demonstrate that some likenesses between parents and offspring are inherited, passed from generation to generation such as eye color in humans or shapes of leaves in plants. Other likenesses are learned such as table manners or reading a book and seals balancing balls on their noses; and	Refer to Organism screens	Biodiversity screens; Study section; refer to Organism screens	Adaptations screens; refer to Organism screens		
	10. (C) explore, illustrate, and compare life cycles in living organisms such as butterflies, beetles, radishes, or lima beans.	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens	Ecology: Life Cycle	

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter A. Elementary

Texas Curriculum: Grade Five		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (B) Within the natural environment, students learn how changes occur on Earth's surface...	Bog Formation; Mechanisms	Mechanisms	Mechanisms: Landscape Formation		
	(C) 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.	Adaptations; Organism screens; Photosynthesis screens; Carbon Cycle	Study section; Biodiversity section, Organism screens	Adaptations screens; Organism screens:	Niches; Anatomy screens; Life Cycle	
(b) Knowledge and skills.	7. (A) explore the processes that led to the formation of sedimentary rocks ...			Rocks and Minerals		
	7. (B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice:			Refer to Landscape Formation screens		
	8. (A) differentiate between weather and climate			Ref Climate screens		
	8. (B) explain how the Sun and the ocean interact in the water cycle	Water Cycle	RefWater Cycle			
	9. (A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;	Food Web screens	Dependency Web screens	Build-a-Desert screens		
	9. (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 Web screens	Refer to Dependency Web			
	9. (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	Endangered Wetlands screens	Endangered Rainforest screens	Human Impact screens	Ecology: Environmental Concerns	
	9. (D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals.	Refer to Carbon Cycle	Refer to Productivity			
	10. (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;	Adaptations; Organism screens;	Study screens; Organism screens	Adaptations screens; Organisms		
	10. (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	Refer to Organism screens	Refer to Biodiversity & Organism screens	Refer to Adaptations & Organism screens		

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter B. Middle School

Texas Curriculum: Grade Six		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (E) 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.	Refer to Organism screens; Food Web screens	Refer to Organism screens; Dependency Web screens	Refer to Organism screens; Desert Study screens; Build-A-Desert		
(b) Knowledge and skills.	10. (B) classify rocks as metamorphic, igneous, sedimentary by the process of their formation			Rocks and Minerals		
	12. (A) understand that all organisms are composed of one or more cells;					Cell Structure & Function
	12. (B) recognize that the presence of a nucleus determines whether a cell is prokaryotic or eukaryotic;					Cell Structure & Function
	12. (C) recognize that the broadest taxonomic classification of living organisms is divided into currently recognized Domains;	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens		
	12. (D) identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms;	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens		Cell Structure & Function
	12. (E) describe biotic and abiotic parts of an ecosystem in which organisms interact; and	Refer to Food Web	Refer to Dependency Web	Build-A-Desert		
	12. (F) diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem.	Refer to Food Web	Refer to Dependency Web	Refer to Build-A-Desert		

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter B. Middle School

Texas Curriculum: Grade Seven		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (B) 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...	Food Web screens	Refer to Dependency Web screens	Refer to Build-A- Desert screens		
	4. (C)... Weathering, erosion, and deposition occur in environments due to the forces of gravity, wind, ice, and water.			Landscape Formation screens		
	4 (E) (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.	Study section; Endangered Wetlands section	Study section; Endangered Rainforests section	Desert Study section; Human Impact section	Ecology section; Anatomy section	
	4. (E) (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.				Anatomy section	Refer to Cellular level
	4.(E) (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 ...				Refer to Anatomy section– see human links	Cell Structure and Function
(b) Knowledge and skills.	5. (A) recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis;	Food screens: Photosynthesis screens				

	5. (B) demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and	Nutrient Cycle screens: Carbon, Water, Nitrogen, Phosphorus	Mechanisms: Soils and Decomposition, Water Cycle, Productivity			
	5. (C) diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.	Food Web screens: Web Energy	Refer to Web Game	Refer to Build-A- Desert		
	6. A) identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur;	Refer to nutrient cycles				
	6. (B) distinguish between physical and chemical changes in matter in the digestive system; and				Refer to: Anatomy: Digestive System	
	8. (B) analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas			Mechanisms (Chihuahuan Desert)		
	10. (A) observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms;	Refer to Web Game	Refer to Web Game	Refer to Build-A- Desert Game		
	10. (B) describe how biodiversity contributes to the sustainability of an ecosystem; and		Biodiversity screens			
	10. (C) observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.		Mechanisms: Succession			
	11. (A) examine organisms or their structures such as insects or leaves and use dichotomous keys for identification	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens		
	11. (B) explain variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their survival such as migration, hibernation, or storage of food in a bulb; and		Biodiversity screens	Adaptations		
	11. (C) identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding...		Biodiversity screens	Refer to Adaptations		
	12. (A) investigate and explain how internal structures of organisms have adaptations that allow [are adapted to perform] specific functions such as gills in fish, hollow bones in birds, or xylem in plants;	Adaptations; Refer to Organism screens	Study screens: Refer to Organism screens	Study screens: Adaptations, Refer to Organism screens		
	12. (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;				Refer to Anatomy section – see human links	
	12. (C) recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;				Refer to Anatomy	Cell Structure and Function
	12. (D) differentiate between structure and function in plant and animal					Cell Structure and Function

	cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;					
	12. (E) compare the functions of a cell to the functions of organisms such as waste removal; and				Refer to Anatomy	Cell Structure and Function
	12. (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.					Refer to Cell Structure and Function
	13. (A) investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and	Refer to Organism screens	Study screens: Refer to Organism screens	Study screens: Refer to Organism screens		
	13. (B) describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.	Adaptations	Study section	Homeostasis screens, Adaptations screens		
	14. (A) define heredity as the passage of genetic instructions from one generation to the next generation;		Biodiversity	What is an adaptation		Refer to genetic material
	14. (C) recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus .					Refer to genetic material

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter B. Middle School

Texas Curriculum: Grade Eight		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	4. (E) 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.	Study section; Endangered Wetlands section	Study section; Endangered Rainforests section	Desert Study section; Human Impact section	Ecology section; Anatomy section	
(b) Knowledge and skills.	11. (A) describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems;	Food Web screens	Dependency Web screens	Refer to Build-A- Desert		
	11. (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;	Refer to Food Web	Refer to Dependency Web	Refer to Build-A- Desert		
	11. (C) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and	Refer to Adaptations	Biodiversity screens	What is an adaptation		

Chapter 112. Texas Essential Knowledge and Skills for Science

N

Texas Curriculum: Aquatic Science		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	1. Aquatic Science. In Aquatic Science, students study the interactions of biotic and abiotic components in aquatic environments, including impacts on aquatic systems. Investigations and field work in this course may emphasize fresh water or marine aspects of aquatic science depending primarily upon the natural resources available for study near the school. Students who successfully complete Aquatic Science will acquire knowledge about a variety of aquatic systems, conduct investigations and observations of aquatic environments, work collaboratively with peers, and develop critical-thinking and problem-solving skills.	CD and Workbook			Refer to Ecology section	
	5. Scientific systems. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.	Food Web screens; Mechanism screens	Dependency Web screens; Mechanisms screens	Build-A-Desert screens, Mechanisms screens		
(b) Knowledge and skills.	5. (A) evaluate data over a period of time from an established aquatic environment documenting seasonal changes and the behavior of organisms;	Refer to Wetland Types and workbook				
	5. (B) collect baseline quantitative data, including pH, salinity, temperature, mineral content, nitrogen compounds, and turbidity from an aquatic environment;	Refer to Mechanisms & Types sections				
	5. (C) analyze interrelationships among producers, consumers, and decomposers in a local aquatic ecosystem; and	Food Web screens				
	5. (D) identify the interdependence of organisms in an aquatic environment ...	Food Web screens				
	6. (A) identify the role of carbon, nitrogen, water, and nutrient cycles in an aquatic environment, including upwellings and turnovers; and	Mechanisms section				
	11. (A) identify how energy flows and matter cycles through both fresh water and salt water aquatic systems, including food webs, chains, and pyramids; and	Food Web screens (fresh water)				

Chapter 112. Texas Essential Knowledge and Skills for Science

Subchapter C. High School

Texas Curriculum: Biology		Fieldtrip Series			Digital Frog	Science Matrix: Cell
Section:	The student is expected to:	Wetlands	Rainforest	Desert		
(a) Introduction.	1. In Biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; and ecosystems and the environment.	Food Web screens, Endangered Wetlands	Biodiversity screens; Endangered Rainforest	Homeostasis; Human Impact	Anatomy screens	Cell Structure & Function
	5. Science, systems, and models. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.	Wetlands Mechanisms: Nutrient Cycles; Food Web screens	Rainforest Mechanisms; Endangered: Climate; Web Game	Desert Study: Homeostasis; Mechanisms: Climate screens,		
(b) Knowledge and skills.	4. (A) compare and contrast prokaryotic and eukaryotic cells;					Cell Structure & Function
	4. (B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules; and					Refer to Cell Structure & Function
	5. (A) describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms;				Urogenital System: Cell Division	Refer to Cell Structure & Function
	5. (B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium;					Refer to Cell Structure & Function
	10. (A) describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals;				Anatomy section: Interacting Systems	
	10. (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.				Anatomy section: Interacting Systems	
	12. (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition among organisms;		Dependency Web screens			
	12. (B) compare variations and adaptations of organisms in different ecosystems;	Adaptations; refer to Organism screens	Study section; refer to Organism screens	Study section; Adaptations, refer to Organism		

				screens		
	12. (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids;	Food Web screens	Refer to Dependency Web	Refer to Build-A- Desert		
	12. (D) recognize that long-term survival of species is dependent on changing resource bases that are limited;	Refer to Food Web	Refer to Dependency Web	Refer to Build-A- Desert		
	12. (E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles; and	Mechanisms: Nutrient Cycles				
	12. (F) describe how environmental change can impact ecosystem stability.	Food Web; Endangered Wetlands section	Dependency Web; Endangered Rainforests section	Build-A- Desert; Human Impact section		