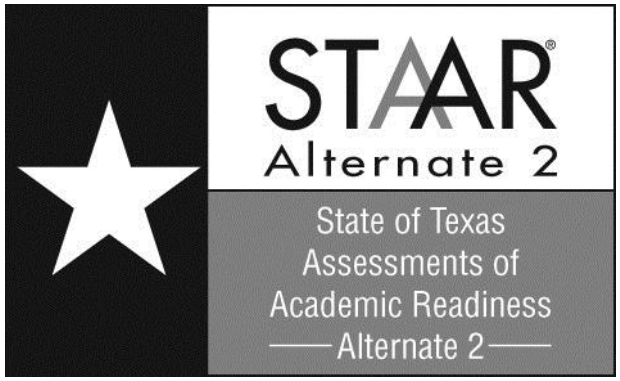

TEKS Curriculum Framework for STAAR Alternate 2

Biology

Updated September 2018

Copyright © September 2018. Texas Education Agency. All rights reserved. Reproduction of all or portions of this work is prohibited without express written permission from the Texas Education Agency.

STAAR Reporting Category 1 – Cell Structure and Function: The student will demonstrate an understanding of biomolecules as building blocks of cells, and that cells are the basic unit of structure and function of living things.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to (A) compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity; Supporting Standard (B) investigate and explain cellular processes, including homeostasis and transport of molecules; Readiness Standard (C) compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza. Readiness Standard	Knows that all living things are composed of cells that perform specific functions and that viruses are different from cells.

Bio 4 Prerequisite Skills/Links to TEKS Vertical Alignment

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Environment: Organisms' Response to Their Environment

- 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 (7)
- investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight (7)

Environment: Identify How Organisms Meet Their Basic Needs

- observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2)

Continued

Bio 4	Prerequisite Skills/Links to TEKS Vertical Alignment
	• observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2) • identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2) • identify the basic needs of plants and animals (2) • identify and compare the parts of plants (1) • sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1) • identify basic parts of plants and animals (K) • sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K) • 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 (K) • differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K) *Environment: Adaptations and Biological Evolution* • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7) • compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5) • explore how structures and functions enable organisms to survive in their environment (4) • explore how structures and functions of plants and animals allow them to survive in a particular environment (3) • investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K) • observe, investigate, describe and discuss the relationship of organisms to their environments (Pre-K)

STAAR Reporting Category 1 – Cell Structure and Function: The student will demonstrate an understanding of biomolecules as building blocks of cells, and that cells are the basic unit of structure and function of living things.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (5) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to (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; Readiness Standard (B) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation; Supporting Standard (C) recognize that disruptions of the cell cycle lead to diseases such as cancer. Supporting Standard	Recognizes the importance of the cell cycle and cell differentiation to the growth of organisms.

Bio 5 Prerequisite Skills/Links to TEKS Vertical Alignment

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Organisms: Inherited Traits and Learned Behaviors

- 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 (5)
- explore and describe examples of traits that are inherited from parents to offspring such as eye color and shapes of leaves and behaviors that are learned such as reading a book and a wolf pack teaching their pups to hunt effectively (4)
- compare ways that young animals resemble their parents (1)
- identify ways that young plants resemble the parent plant (K)

Continued

Bio 5	Prerequisite Skills/Links to TEKS Vertical Alignment
	Organisms: Genetic Material and Its Role in Inheritance • recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus (7) • compare the results of uniform or diverse offspring from asexual or sexual reproduction (7) • define heredity as the passage of genetic instructions from one generation to the next generation (7) *Environment: Identify How Organisms Meet Their Basic Needs* • observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2) • observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2) • identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2) • identify the basic needs of plants and animals (2) • identify and compare the parts of plants (1) • sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1) • identify basic parts of plants and animals (K) • sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K) • 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 (K) • differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K) • observe, investigate, describe and discuss the relationship of organisms to their environments (Pre-K)

STAAR Reporting Category 2 – Mechanisms of Genetics: The student will demonstrate an understanding of the mechanisms of genetics.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (6) Science concepts. The student knows the mechanisms of genetics such as the role of nucleic acids and the principles of Mendelian and non-Mendelian genetics. The student is expected to (A) identify components of DNA, identify how information for specifying the traits of an organism is carried in the DNA, and examine scientific explanations for the origin of DNA; Readiness Standard (B) recognize that components that make up the genetic code are common to all organisms; Supporting Standard (C) explain the purpose and process of transcription and translation using models of DNA and RNA; Supporting Standard (D) recognize that gene expression is a regulated process; Supporting Standard (E) identify and illustrate changes in DNA and evaluate the significance of these changes; Readiness Standard (F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses, and non-Mendelian inheritance; Readiness Standard (G) recognize the significance of meiosis to sexual reproduction. Supporting Standard	Recognizes that the structure of DNA determines the inherited traits in organisms.

Bio 6	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Organisms: Genetic Material and Its Role in Inheritance • recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus (7) • compare the results of uniform or diverse offspring from asexual or sexual reproduction (7) • define heredity as the passage of genetic instructions from one generation to the next generation (7)

Continued

Bio 6	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Organisms: Life Cycles • explore, illustrate, and compare life cycles in living organisms such as beetles, crickets, radishes, or lima beans (4) • investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles (3) • investigate and record some of the unique stages that insects such as grasshoppers and butterflies undergo during their life cycle (2) • observe and record life cycles of animals such as a chicken, frog, or fish (1) • observe changes that are part of a simple life cycle of a plant: seed, seedling, plant, flower, and fruit (K) *Environment: Adaptations and Biological Evolution* • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7) • compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5) • explore how structures and functions enable organisms to survive in their environment (4) • explore how structures and functions of plants and animals allow them to survive in a particular environment (3) • investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1) *Organisms: Inherited Traits and Learned Behaviors* • 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 (5) • explore and describe examples of traits that are inherited from parents to offspring such as eye color and shapes of leaves and behaviors that are learned such as reading a book and a wolf pack teaching their pups to hunt effectively (4) • compare ways that young animals resemble their parents (1) • identify ways that young plants resemble the parent plant (K) **Life sciences skills** • observe, investigate, describe and discuss the relationship of organisms to their environments (Pre-K) • describe life cycles of organisms (Pre-K)

STAAR Reporting Category 3 – Biological Evolution and Classification: The student will demonstrate an understanding of the theory of biological evolution and the hierarchical classification of organisms.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental; Readiness Standard (B) examine scientific explanations of abrupt appearance and stasis in the fossil record; Supporting Standard (C) analyze and evaluate how natural selection produces change in populations, not individuals; Supporting Standard (D) analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success; Supporting Standard (E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species; Readiness Standard (F) analyze other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination. Supporting Standard	Knows evolutionary theory is a scientific explanation for the unity and diversity of life.

Bio 7	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Environment: Adaptations and Biological Evolution • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7)

Continued

Bio 7	Prerequisite Skills/Links to TEKS Vertical Alignment

- compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5)
- explore how structures and functions enable organisms to survive in their environment (4)
- explore how structures and functions of plants and animals allow them to survive in a particular environment (3)
- investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1)

Organisms: Life Cycles

- explore, illustrate, and compare life cycles in living organisms such as beetles, crickets, radishes, or lima beans (4)
- investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles (3)
- investigate and record some of the unique stages that insects such as grasshoppers and butterflies undergo during their life cycle (2)
- observe and record life cycles of animals such as a chicken, frog, or fish (1)
- observe changes that are part of a simple life cycle of a plant: seed, seedling, plant, flower, and fruit (K)

Environment: Identify How Organisms Meet Their Basic Needs

- observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2)
- observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2)
- identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2)
- identify the basic needs of plants and animals (2)
- identify and compare the parts of plants (1)
- sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1)
- identify basic parts of plants and animals (K)
- sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K)
- 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 (K)
- differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K)

Environment: How Organisms Depend on Each Other and Their Environment

- recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems (8)
- investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition (8)
- observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds (7)
- describe how biodiversity contributes to the sustainability of an ecosystem (7)

Continued

Bio 7	Prerequisite Skills/Links to TEKS Vertical Alignment
	• observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms (7) • diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem (6) • describe biotic and abiotic parts of an ecosystem in which organisms interact (6) • identify fossils as evidence of past living organisms and the nature of the environments at the time using models (5) • predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways (5) • describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers (5) • observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components (5) • describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web (4) • investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food (4) • describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations (3) • 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 (3) • observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem (3) • compare the ways living organisms depend on each other and on their environments such as through food chains (2) • gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter (1) • analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver (1) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the relationship of organisms to their environments (Pre-K) • describe life cycles of organisms (Pre-K) • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K)

STAAR Reporting Category 3 – Biological Evolution and Classification: The student will demonstrate an understanding of the theory of biological evolution and the hierarchical classification of organisms.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to (A) define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community; Supporting Standard (B) categorize organisms using a hierarchical classification system based on similarities and differences shared among groups; Readiness Standard (C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals. Supporting Standard	Knows that taxonomy is used to classify organisms based on shared characteristics.

Bio 8	**Prerequisite Skills/Links to TEKS Vertical Alignment**

Organisms: Classification of Organisms

- examine organisms or their structures such as insects or leaves and use dichotomous keys for identification (7)
- 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 (6)
- recognize that the broadest taxonomic classification of living organisms is divided into currently recognized domains (6)

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Continued

Bio 8	Prerequisite Skills/Links to TEKS Vertical Alignment
	Environment: Identify How Organisms Meet Their Basic Needs • observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2) • observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2) • identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2) • identify the basic needs of plants and animals (2) • identify and compare the parts of plants (1) • sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1) • identify basic parts of plants and animals (K) • sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K) • 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 (K) • differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K) *Environment: Adaptations and Biological Evolution* • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7) • compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5) • explore how structures and functions enable organisms to survive in their environment (4) • explore how structures and functions of plants and animals allow them to survive in a particular environment (3) • investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K) • observe, investigate, describe and discuss the relationship of organisms to their environments (Pre-K)

STAAR Reporting Category 4 – Biological Processes and Systems: The student will demonstrate an understanding of metabolic processes, energy conversions, and interactions and functions of systems in organisms.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to (A) compare the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids. Readiness Standard (B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy, energy conversions, and matter; Supporting Standard (C) identify and investigate the role of enzymes. Supporting Standard	Recognizes energy conversions in living organisms and the functions of various biomolecules.

Bio 9	**Prerequisite Skills/Links to TEKS Vertical Alignment**

Environment: How Organisms Depend on Each Other and Their Environment

- recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems (8)
- investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition (8)
- observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds (7)
- describe how biodiversity contributes to the sustainability of an ecosystem (7)
- observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms (7)
- diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem (6)
- describe biotic and abiotic parts of an ecosystem in which organisms interact (6)
- identify fossils as evidence of past living organisms and the nature of the environments at the time using models (5)
- predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways (5)
- describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers (5)
- observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components (5)

Continued

Bio 9	Prerequisite Skills/Links to TEKS Vertical Alignment

- describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web (4)
- investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food (4)
- describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations (3)
- 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 (3)
- observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem (3)
- compare the ways living organisms depend on each other and on their environments such as through food chains (2)
- gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter (1)
- analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver (1)

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Environment: Identify How Organisms Meet Their Basic Needs

- observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2)
- observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2)
- identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2)
- identify the basic needs of plants and animals (2)
- identify and compare the parts of plants (1)

Continued

Bio 9	Prerequisite Skills/Links to TEKS Vertical Alignment
	• sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1) • identify basic parts of plants and animals (K) • sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K) • 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 (K) • differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K) *Environment: Organisms' Response to Their Environment* • 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 (7) • investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight (7) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the relationship of organisms to their environments (Pre-K) • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K)

STAAR Reporting Category 4 – Biological Processes and Systems: The student will demonstrate an understanding of metabolic processes, energy conversions, and interactions and functions of systems in organisms.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to (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; Readiness Standard (B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants; Readiness Standard (C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system. Supporting Standard	Knows that biological systems have functions and interact.

Bio 10 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Environment: Organisms' Response to Their Environment

- 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 (7)
- investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight (7)

Continued

Bio 10	Prerequisite Skills/Links to TEKS Vertical Alignment

Environment: Identify How Organisms Meet Their Basic Needs

- observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2)
- observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2)
- identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2)
- identify the basic needs of plants and animals (2)
- identify and compare the parts of plants (1)
- sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1)
- identify basic parts of plants and animals (K)
- sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K)
- 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 (K)
- differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K)

Environment: How Organisms Depend on Each Other and Their Environment

- recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems (8)
- investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition (8)
- observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds (7)
- describe how biodiversity contributes to the sustainability of an ecosystem (7)
- observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms (7)
- diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem (6)
- describe biotic and abiotic parts of an ecosystem in which organisms interact (6)
- identify fossils as evidence of past living organisms and the nature of the environments at the time using models (5)
- predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways (5)
- describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers (5)
- observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components (5)
- describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web (4)

Continued

Bio 10	Prerequisite Skills/Links to TEKS Vertical Alignment
	• investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food (4) • describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations (3) • 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 (3) • observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem (3) • compare the ways living organisms depend on each other and on their environments such as through food chains (2) • gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter (1) • analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver (1) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the relationship of organisms to their environments (Pre-K) • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K)

STAAR Reporting Category 5 – Interdependence within Environmental Systems: The student will demonstrate an understanding of the interdependence and interactions that occur within an environmental system and their significance.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to (A) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems; Supporting Standard (B) describe how events and processes that occur during ecological succession can change populations and species diversity. Readiness Standard	Knows that biological systems work to achieve and maintain balance.

Bio 11 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Environment: Organisms' Response to Their Environment

- 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 (7)
- investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight (7)

Organisms: Structure and Function of Living Systems

- recognize the components of cell theory (7)
- compare the functions of cell organelles to the functions of an organ system (7)
- differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole (7)
- recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms (7)
- 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 (7)
- recognize that the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic (6)
- understand that all organisms are composed of one or more cells (6)

Environment: How Organisms Depend on Each Other and Their Environment

- recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems (8)
- investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition (8)
- observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds (7)

Continued

Bio 11	Prerequisite Skills/Links to TEKS Vertical Alignment
	• describe how biodiversity contributes to the sustainability of an ecosystem (7) • observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms (7) • diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem (6) • describe biotic and abiotic parts of an ecosystem in which organisms interact (6) • identify fossils as evidence of past living organisms and the nature of the environments at the time using models (5) • predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways (5) • describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers (5) • observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components (5) • describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web (4) • investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food (4) • describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations (3) • 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 (3) • observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem (3) • compare the ways living organisms depend on each other and on their environments such as through food chains (2) • gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter (1) • analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver (1) *Environment: Adaptations and Biological Evolution* • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7)

Continued

Bio 11	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	• compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5) • explore how structures and functions enable organisms to survive in their environment (4) • explore how structures and functions of plants and animals allow them to survive in a particular environment (3) • investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1) **Life sciences skills** • observe, investigate, describe, and discuss the relationship of organisms to their environments (Pre-K) • observe, investigate and describe and discuss the characteristics of organisms (Pre-K)

STAAR Reporting Category 5 – Interdependence within Environmental Systems: The student will demonstrate an understanding of the interdependence and interactions that occur within an environmental system and their significance.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**Essence of TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations**
Biology (12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to (A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms; Readiness Standard (B) compare variations and adaptations of organisms in different ecosystems; Supporting Standard (C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids; Readiness Standard (D) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles; Supporting Standard (E) describe how environmental change can impact ecosystem stability. Readiness Standard	Knows that interdependence and interactions occur within an environmental system.

Bio 12 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Environment: How Organisms Depend on Each Other and Their Environment

- recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems (8)
- investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition (8)
- observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds (7)
- describe how biodiversity contributes to the sustainability of an ecosystem (7)
- observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms (7)
- diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem (6)
- describe biotic and abiotic parts of an ecosystem in which organisms interact (6)
- identify fossils as evidence of past living organisms and the nature of the environments at the time using models (5)

Continued

Bio 12	Prerequisite Skills/Links to TEKS Vertical Alignment

- predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways (5)
- describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers (5)
- observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components (5)
- describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web (4)
- investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food (4)
- describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations (3)
- 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 (3)
- observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem (3)
- compare the ways living organisms depend on each other and on their environments such as through food chains (2)
- gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter (1)
- analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver (1)

Environment: Organisms' Response to Their Environment

- 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 (7)
- investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight (7)

Environment: Identify How Organisms Meet Their Basic Needs

- observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant (2)
- observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs (2)
- identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things (2)
- identify the basic needs of plants and animals (2)
- identify and compare the parts of plants (1)
- sort and classify living and nonliving things based upon whether they have basic needs and produce offspring (1)
- identify basic parts of plants and animals (K)

Continued

Bio 12	Prerequisite Skills/Links to TEKS Vertical Alignment
	• sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape (K) • 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 (K) • differentiate between living and nonliving things based upon whether they have basic needs and produce offspring (K) *Environment: Adaptations and Biological Evolution* • explore how short- and long-term environmental changes affect organisms and traits in subsequent populations (8) • 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 (7) • 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 and hybrid plants (7) • 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 (7) • compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals (5) • explore how structures and functions enable organisms to survive in their environment (4) • explore how structures and functions of plants and animals allow them to survive in a particular environment (3) • investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats (1) **Personal safety and health skills** • identify good habits of nutrition and exercise (Pre-K) • practice good habits of personal health and hygiene (Pre-K) **Life sciences skills** • observe, investigate, describe, and discuss the relationship of organisms to their environments (Pre-K) • observe, investigate, describe, and discuss the characteristics of organisms (Pre-K)

Scientific processes: Scientific process standards will not be listed under a separate reporting category. These standards will be incorporated into assessment tasks in reporting categories 1–5 and identified along with content standards.

TEKS Knowledge and Skills Statement/STAAR-Tested Student Expectations

Biology (1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to

(A) demonstrate safe practices during laboratory and field investigations;

(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.

Bio 1 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Demonstrate Home and School Safety Practices

- 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 (6–8)
- demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards (6–8)
- demonstrate safe practices and the use of safety equipment as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate (5)
- demonstrate safe practices and the use of safety equipment as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate (4)
- demonstrate safe practices as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment as appropriate, including safety goggles or chemical splash goggles, as appropriate, and gloves (3)
- identify, describe, and demonstrate safe practices as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations, including wearing safety goggles or chemical splash goggles, as appropriate, washing hands, and using materials appropriately (2)
- identify, discuss, and demonstrate safe and healthy practices as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations, including wearing safety goggles or chemical splash goggles, as appropriate, washing hands, and using materials appropriately (K-1)

Use and Conservation of School Resources and Laboratory Materials

- practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials (6–8)
- make informed choices in the conservation, disposal, and recycling of materials (5)

Continued

Bio 1	Prerequisite Skills/Links to TEKS Vertical Alignment
	• make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic (4) • make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics (3) • identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal (2) • identify and learn how to use natural resources and materials, including conservation and reuse or recycling of paper, plastic, and metals (1) • demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reusing or recycling paper, plastic, and metal (K) **Personal safety and health skills** • practice good habits of personal safety (Pre-K)

Scientific processes: Scientific process standards will not be listed under a separate reporting category. These standards will be incorporated into assessment tasks in reporting categories 1–5 and identified along with content standards.

TEKS Knowledge and Skills Statement/STAAR-Tested Student Expectations

Biology (2) Scientific processes. The student uses scientific practices and equipment during laboratory and field investigations. The student is expected to

(A) know the definition of science and understand that it has limitations, as specified in Chapter 112.34, subsection (b)(2) of 19 TAC;*
(B) know that 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 are incorporated into theories;
(C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well established and highly reliable explanations, but they may be subject to change as new areas of science and new technologies are developed;
(D) distinguish between scientific hypotheses and scientific theories;
(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as data-collecting probes, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, balances, gel electrophoresis apparatuses, micropipettes, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, , Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures;
(G) analyze, evaluate, make inferences, and predict trends from data;
(H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.

Bio 2 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Plan and Conduct Investigations

- design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology (8)
- plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology (6–8)

Continued

*Chapter 112.34, Subsection (b)(2) of 19 TAC; Nature of Science. 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 currently scientifically testable.

Bio 2	Prerequisite Skills/Links to TEKS Vertical Alignment
	• design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology (6–7) • ask well defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology (5) • describe, plan, and implement simple experimental investigations testing one variable (5) • plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions (4) • 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 (3) • plan and conduct descriptive investigations (2) • ask questions about organisms, objects, and events during observations and investigations (2) • plan and conduct simple descriptive investigations (K–1) • ask questions about organisms, objects, and events observed in the natural world (K–1) *Gather Information* • use appropriate tools, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectroscopes, timing devices, and other necessary equipment to collect, record, and analyze information (8) • use appropriate tools, including life science models, hand lenses, 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 necessary equipment to collect, record, and analyze information (7) • collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers (6–8) • use appropriate tools, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, balances, microscopes, thermometers, calculators, computers, timing devices, and other necessary equipment to collect, record, and analyze information (6) • collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices; and materials to support observations of habitats of organisms such as terrariums and aquariums (5) • collect and record information by detailed observations and accurate measuring (5) • collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring scales, balances, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums (4)

Continued

Bio 2	Prerequisite Skills/Links to TEKS Vertical Alignment
	• collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps (4) • collect, record, and analyze information using tools, including cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, magnets, collecting nets, notebooks, and Sun, Earth, and Moon system models; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums (3) • collect and record data by observing and measuring using the metric system and recognize differences between observed and measured data (3) • measure and compare organisms and objects (2) • collect, record, and compare information using tools, including computers, hand lenses, rulers, plastic beakers, magnets, collecting nets, notebooks, and safety goggles or chemical splash goggles, as appropriate; timing devices; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums (2) • collect data from observations using scientific tools (2) • record and organize data using pictures, numbers, and words (1–2) • measure and compare organisms and objects using non-standard units (1) • collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles or chemical splash goggles, as appropriate; timing devices; non-standard measuring items; weather instruments such as demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums (1) • collect data and make observations using simple tools (K–1) • use senses as a tool of observation to identify properties and patterns of organisms, objects, and events in the environment (K) • collect information using tools, including computing devices, hand lenses, primary balances, cups, bowls, magnets, collecting nets, and notebooks; timing devices; non-standard measuring items; weather instruments such as demonstration thermometers; and materials to support observations of habitats of organisms such as terrariums and aquariums (K) • record and organize data and observations using pictures, numbers, and words (K) *Organize Information* • construct tables and graphs, using repeated trials and means, to organize data and identify patterns (6–8) • construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information (5) • construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data (4) • construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data (3) • compare results of investigations with what students and scientists know about the world (2)

Continued

Bio 2	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Analyze Evidence and Communicate Conclusions • analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student (6-8) • analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends (6–8) • communicate valid conclusions in both written and verbal forms (5) • analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence (5) • communicate valid oral and written results supported by data (4) • perform repeated investigations to increase the reliability of results (4) • analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing (3–5) • analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured (4) • demonstrate that repeated investigations may increase the reliability of results (3, 5) • communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion (3) • analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations (3) • communicate observations and justify explanations using student-generated data from simple descriptive investigations (2) • communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations (1) • communicate observations about simple descriptive investigations (K) **Physical science skills** • use simple measuring devices to learn about objects (Pre-K)

Scientific processes: Scientific process standards will not be listed under a separate reporting category. These standards will be incorporated into assessment tasks in reporting categories 1–5 and identified along with content standards.

TEKS Knowledge and Skills Statement/STAAR-Tested Student Expectations

Biology (3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to

(A) analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student;
(B) communicate and apply scientific information extracted from various sources such as current events, published journal articles, and marketing materials;
(C) draw inferences based on data related to promotional materials for products and services;
(D) evaluate the impact of scientific research on society and the environment;
(E) evaluate models according to their limitations in representing biological objects or events;
(F) research and describe the history of biology and contributions of scientists.

Bio 3 **Prerequisite Skills/Links to TEKS Vertical Alignment**

Organize Information

- construct tables and graphs, using repeated trials and means, to organize data and identify patterns (6–8)
- construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information (5)
- construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data (4)
- construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data (3)
- compare results of investigations with what students and scientists know about the world (2)

Analyze Evidence and Communicate Conclusions

- analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student (6-8)
- analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends (6–8)
- communicate valid conclusions in both written and verbal forms (5)
- analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence (5)
- communicate valid oral and written results supported by data (4)
- perform repeated investigations to increase the reliability of results (4)
- analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing (3–5)
- analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured (4)
- demonstrate that repeated investigations may increase the reliability of results (3, 5)

Continued

Bio 3	Prerequisite Skills/Links to TEKS Vertical Alignment
	• communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion (3) • analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations (3) • communicate observations and justify explanations using student-generated data from simple descriptive investigations (2) • communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations (1) • communicate observations about simple descriptive investigations (K) *Application of Science* • identify and explain a problem and propose a task and solution for the problem (2) • make predictions based on observable patterns (1–2) • identify and explain a problem and propose a solution (1) • make predictions based on observable patterns in nature (K) • identify and explain a problem such as the impact of littering and propose a solution (K) *Use Models* • use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature (8) • use models to represent aspects of the natural world such as human body systems and plant and animal cells (7) • identify advantages and limitations of models such as size, scale, properties, and materials (6–8) • use models to represent aspects of the natural world such as a model of Earth's layers (6) • draw or develop a model that represents how something that cannot be seen such as the Sun, Earth, and Moon system and formation of sedimentary rock works or looks (5) • represent the natural world using models such as the water cycle and stream tables and identify their limitations, including accuracy and size (4) • represent the natural world using models such as volcanoes or the Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials (3) *History and Impact of Scientific Research* • relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content (6–8) • connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists (3–5) • identify what a scientist is and explore what different scientists do (2) • describe what scientists do (1) • explore that scientists investigate different things in the natural world and use tools to help in their investigations (K)