STAAR® ALTERNATE 2

State of Texas Assessments of Academic Readiness

TEKS Curriculum Framework for STAAR Alternate 2

Biology Assessment

Note: This curriculum framework document includes the Science TEKS implemented in the 2024-2025 school year.

Strand 1 - Biological Structures, Functions, and Processes	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (5) Science concepts. The student knows that biological structures at multiple levels of organization perform specific functions and processes that affect life. The student is expected to: (A) relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure and function of a cell; **Supporting Standard** (B) compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity; **Readiness Standard** (C) compare the structures of viruses to cells and explain how viruses spread and cause disease. **Supporting Standard**	Knows that all living things are composed of cells that perform specific functions and that viruses are different from cells.

Bio 5	Prerequisite Skills Linked to Assessed Curriculum

- 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells.
- 8.13.B: Describe the function of genes within chromosomes in determining inherited traits of offspring.
- 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations.
- 7.14.A: Describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups.
- 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems.
- 7.13.B: Describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals.
- 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time.
- 7.13.D: Describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations.
- 7.6.A: Compare and contrast elements and compounds in terms of atoms and molecules, chemical symbols, and chemical formulas.

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Bio 5	Prerequisite Skills Linked to Assessed Curriculum
	• 7.6.B: Use the periodic table to identify the atoms and the number of each kind within a chemical formula. • 6.13.A: Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function. • 6.13.B: Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic. • 6.13.C: Describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. • 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K.13.B: Identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K13.D: Identify ways that young plants resemble the parent plant. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • PK4.VI.B.3: Observe, investigate, describe, and discuss the relationship of organisms in their environments.

Strand 1 - Biological Structures, Functions, and Processes	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (6) Science concepts. The student knows how an organism grows and the importance of cell differentiation. The student is expected to: (A) explain the importance of the cell cycles to the growth of organisms, including an overview of the stages of the cell cycle and deoxyribonucleic acid (DNA) replication models; **Supporting Standard** (B) explain the process of cell specialization through cell differentiation, including the role of environmental factors; **Supporting Standard** (C) relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer. **Readiness Standard**	Recognizes the importance of the cell cycle and cell differentiation to the growth of organisms.

Bio 6	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells. • 8.13.B: Describe the function of genes within chromosomes in determining inherited traits of offspring. • 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations. • 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems. • 7.13.B: Describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals. • 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time. • 7.13.D: Describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations. • 7.6.A: Compare and contrast elements and compounds in terms of atoms and molecules, chemical symbols, and chemical formulas.

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Bio 6	Prerequisite Skills Linked to Assessed Curriculum
	• 7.6.B: Use the periodic table to identify the atoms and the number of each kind within a chemical formula. • 6.13.A: Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function. • 6.13.B: Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic. • 6.13.C: Describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 4.13.B: Differentiate between inherited and acquired physical traits of organisms. • 4.12.A: Investigate and explain how most producers can make their own food using sunlight, water, and carbon dioxide through the cycling of matter. • 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment. • 3.13.B: Explore, illustrate, and compare life cycles in organisms such as beetles, crickets, radishes, or lima beans. • 3.12.A: Explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy. • 3.6.D: Demonstrate that materials can be combined based on their physical properties to create or modify objects such as building a tower or adding clay to sand to make a stronger brick and justify the selection of materials based on their physical properties. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. • 2.13.C: Record and compare how being part of a group helps animals obtain food, defend themselves, and cope with changes. • 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. *Continued*

Bio 6	**Prerequisite Skills Linked to Assessed Curriculum**
	• 2.6.B: Conduct a descriptive investigation to explain how physical properties can be changed through processes such as cutting, folding, sanding, melting, or freezing. • 2.6.C: Demonstrate that small units such as building blocks can be combined or reassembled to form new objects for different purposes and explain the materials chosen based on their physical properties. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.13.C: Compare ways that young animals resemble their parents. • 1.12.B: Describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums. • 1.6.A: Classify objects by observable physical properties, including, shape, color, and texture, and attributes such as larger and smaller and heavier and lighter. • 1.6.B: Explain and predict changes in materials caused by heating and cooling. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K.13.B: Identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K13.D: Identify ways that young plants resemble the parent plant. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • PK4.VI.B.3: Observe, investigate, describe, and discuss the relationship of organisms in their environments.

Strand 1 - Biological Structures, Functions, and Processes	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (11) Science concepts. The student knows the significance of matter cycling, energy flow, and enzymes in living organisms. The student is expected to: (A) explain how matter is conserved, and energy is transferred during photosynthesis and cellular respiration using models, including the chemical equations for these processes; **Supporting Standard** (B) investigate and explain the role of enzymes in facilitating cellular processes. **Readiness Standard**	Recognizes energy conversions in living organisms and the functions of various biomolecules.

Bio 11	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells. • 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. • 8.6.C: Describe the properties of cohesion, adhesion, and surface tension in water and relate to observable phenomena such as the formation of droplets, transport in plants, and insects walking on water. • 8.6.D: Compare and contrast the properties of acids and bases, including pH relative to water. • 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems. • 7.12.A: Diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids. • 7.12.B: Describe how ecosystems are sustained by the continuous flow of energy and the recycling of matter and nutrients within the biosphere. • 7.8.A: Investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation. • 7.8.B: Investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium. • 7.6.D: Describe aqueous solutions in terms of solute and solvent, concentration, and dilution.

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Bio 11	Prerequisite Skills Linked to Assessed Curriculum
	• 6.13.A: Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function. • 6.12.A: Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition. • 6.12.C: Describe the hierarchical organization of organism, population, and community within an ecosystem. • 6.8.B: Describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 5.12.A: Observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem. • 5.12.B: Predict how changes in the ecosystem affect the cycling of matter and flow of energy in a food web. • 5.8.C: Demonstrate and explain how light travels in a straight line and can be reflected, refracted, or absorbed. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 4.12.A: Investigate and explain how most producers can make their own food using sunlight water, and carbon dioxide through the cycling of matter. • 4.12.B: Describe the cycling of matter and flow of energy through food webs, including the roles of the Sun, producers, consumers, and decomposers. • 4.10.A: 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. • 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment. • 3.13.B: Explore, illustrate, and compare life cycles in organisms such as beetles, crickets, radishes, or lima beans. • 3.12.A: Explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy. • 3.12.B: Identify and describe the flow of energy in a food chain and predict how changes in a food chain such as removal of frogs from a pond or bees from a field affect the ecosystem. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. *Continued*

Bio 11	Prerequisite Skills Linked to Assessed Curriculum
	• 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 2.12.A: Describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem. • 2.12.B: Create and describe food chains identifying producers and consumers to demonstrate how animals depend on other living things. • 2.12.C: Explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around. • 2.6.C: Demonstrate that small units such as building blocks can be combined or reassembled to form new objects for different purposes and explain the materials chosen based on their physical properties. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.12.B: Describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums. • 1.12.C: Identify and illustrate how living organisms depend on each other through food chains. • 1.11.A: identify and describe how plants, animals, and humans use rocks, soil, and water. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K.13.D: Identify ways that young plants resemble the parent plant. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • PK4.VI.B.2: Observe, describe, and discuss the life cycles of organisms.

Strand 1 - Biological Structures, Functions, and Processes	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (12) Science concepts. The student knows that multicellular organisms are composed of multiple systems that interact to perform complex functions. The student is expected to: (A) analyze the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals; **Supporting Standard** (B) explain how the interactions that occur among systems that perform functions of transport, reproduction, and response in plants are facilitated by their structures. **Readiness Standard**	Knows that biological systems have functions and interact.

Bio 12	**Prerequisite Skills Linked to Assessed Curriculum**

- 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells.
- 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations.
- 8.12.A: Explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems.
- 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity.
- 8.12.C: Describe how biodiversity contributes to the stability and sustainability of an ecosystem and the health of the organisms within the ecosystem.
- 8.6.C: Describe the properties of cohesion, adhesion, and surface tension in water and relate to observable phenomena such as the formation of droplets, transport in plants, and insects walking on water.
- 8.6.D: Compare and contrast the properties of acids and bases, including pH relative to water.
- 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems.
- 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time.

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Bio 12	Prerequisite Skills Linked to Assessed Curriculum
	• 7.8.A: Investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation. • 7.8.B: Investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium. • 7.6.D: Describe aqueous solutions in terms of solute and solvent, concentration, and dilution. • 6.12.A: Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition. • 6.12.B: Describe and give examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 5.12.A: Observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem. • 5.8.C: Demonstrate and explain how light travels in a straight line and can be reflected, refracted, or absorbed. • 5.6.D: Illustrate how matter is made up of particles that are too small to be seen such as air in a balloon. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 4.12.A: Investigate and explain how most producers can make their own food using sunlight water, and carbon dioxide through the cycling of matter. • 4.10.A: 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. • 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment. • 3.13.B: Explore, illustrate, and compare life cycles in organisms such as beetles, crickets, radishes, or lima beans. • 3.12.C: Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. *Continued*

Bio 12	Prerequisite Skills Linked to Assessed Curriculum
	• 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 2.12.A: Describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem. • 2.12.C: Explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around. • 2.6.C: Demonstrate that small units such as building blocks can be combined or reassembled to form new objects for different purposes and explain the materials chosen based on their physical properties. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.13.C: Compare ways that young animals resemble their parents. • 1.12.A: Classify living and nonliving things based upon whether they have basic needs and produce young. • 1.12.B: Describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums. • 1.11.A: Identify and describe how plants, animals, and humans use rocks, soil, and water. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K.13.B: Identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K.13.D: Identify ways that young plants resemble the parent plant. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • K.10.B: Observe and describe weather changes from day to day and over seasons. • K.8.A: Communicate the idea that objects can only be seen when a light source is present and compare the effects of different amounts of light on the appearance of objects. • PK4.VI.B.2: Observe, describe, and discuss the life cycles of organisms.

Strand 2 - Mechanisms of Genetics	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (7) Science concepts. The student knows the role of nucleic acids in gene expression. The student is expected to: (A) identify components of DNA, explain how the nucleotide sequence specifies some traits of an organism, and examine scientific explanations for the origin of DNA; **Supporting Standard** (B) describe the significance of gene expression and explain the process of protein synthesis using models of DNA and ribonucleic acid (RNA); **Supporting Standard** (C) identify and illustrate changes in DNA and evaluate the significance of these changes. **Readiness Standard**	Recognizes the structure of DNA.

Bio 7	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells. • 8.13.B: Describe the function of genes within chromosomes in determining inherited traits of offspring. • 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations. • 7.14.A: Describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups. • 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems. • 7.13.B: Describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals. • 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time. • 7.13.D: Describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations. • 6.13.A: Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function.

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Bio 7	Prerequisite Skills Linked to Assessed Curriculum
	• 6.13.B: Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 5.13.B: Explain how instinctual behavioral traits such as turtle hatchlings returning to the sea and learned behavioral traits such as orcas hunting in packs increase chances of survival. • 5.6.D: Illustrate how matter is made up of particles that are too small to be seen such as air in a balloon. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 4.13.B: Differentiate between inherited and acquired physical traits of organisms. • 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment. • 3.6.D: Demonstrate that materials can be combined based on their physical properties to create or modify objects such as building a tower or adding clay to sand to make a stronger brick and justify the selection of materials based on their physical properties. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. • 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 2.6.C: Demonstrate that small units such as building blocks can be combined or reassembled to form new objects for different purposes and explain the materials chosen based on their physical properties. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.13.C: Compare ways that young animals resemble their parents. • 1.12.A: Classify living and nonliving things based upon whether they have basic needs and produce young. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits.

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Bio 7	Prerequisite Skills Linked to Assessed Curriculum
	• K.13.B: Identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K13.D: Identify ways that young plants resemble the parent plant.

Strand 2 - Mechanisms of Genetics	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (8) Science concepts. The student knows the role of nucleic acids and the principles of inheritance and variation of traits in Mendelian and non-Mendelian genetics. The student is expected to: (A) analyze the significance of chromosome reduction, independent assortment, and crossing-over during meiosis in increasing diversity in populations of organisms that reproduce sexually; **Supporting Standard** (B) predict possible outcomes of various genetic combinations using monohybrid and dihybrid crosses, including non-Mendelian traits of incomplete dominance, codominance, sex-linked traits, and multiple alleles. **Readiness Standard**	Knows that the structure of DNA determines inherited traits in organisms.

Bio 8	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.13.A: Identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells. • 8.13.B: Describe the function of genes within chromosomes in determining inherited traits of offspring. • 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations. • 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. • 7.14.B: Describe the characteristics of the recognized kingdoms and their importance in ecosystems such as bacteria aiding digestion or fungi decomposing organic matter. • 7.13.A: Identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems. • 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time. • 7.13.D: Describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations.

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Bio 8	Prerequisite Skills Linked to Assessed Curriculum
	• 6.13.A: Describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function. • 6.13.B: Identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic. • 6.13.C: Describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change. • 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 5.6.D: Illustrate how matter is made up of particles that are too small to be seen such as air in a balloon. • 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment. • 4.13.B: Differentiate between inherited and acquired physical traits of organisms. • 3.6.D: Demonstrate that materials can be combined based on their physical properties to create or modify objects such as building a tower or adding clay to sand to make a stronger brick and justify the selection of materials based on their physical properties. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 2.6.C: Demonstrate that small units such as building blocks can be combined or reassembled to form new objects for different purposes and explain the materials chosen based on their physical properties. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.13.C: Compare ways that young animals resemble their parents. • 1.8.B: Describe how some changes caused by heat may be reversed such as melting butter and other changes cannot be reversed such as cooking an egg or baking a cake. • 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together.

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Bio 8	Prerequisite Skills Linked to Assessed Curriculum
	• K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K13.D: Identify ways that young plants resemble the parent plant. • PK4.VI.B.3: Observe, investigate, describe, and discuss the relationship of organisms in their environments.

Strand 3 - Biological Evolution	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (9) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life that has multiple lines of evidence. 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; **Supporting Standard** (B) examine scientific explanations for varying rates of change such as gradualism, abrupt appearance, and stasis in the fossil record. **Readiness Standard**	Knows evolutionary theory is a scientific explanation for the unity and diversity of life.

Bio 9	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. • 8.12.C: Describe how biodiversity contributes to the stability and sustainability of an ecosystem and the health of the organisms within the ecosystem. • 8.11.A: Use scientific evidence to describe how natural events, including volcanic eruptions, meteor impacts, abrupt changes in ocean currents, and the release and absorption of greenhouse gases influence climate. • 8.11.B: Use scientific evidence to describe how human activities, including the release of greenhouse gases, deforestation, and urbanization, can influence climate. • 7.12.B: Describe how ecosystems are sustained by the continuous flow of energy and the recycling of matter and nutrients within the biosphere. • 6.12.A: Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition. • 6.12.B: Describe and give examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism. • 6.12.C: Describe the hierarchical organization of organism, population, and community within an ecosystem. • 6.12.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.

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Bio 9	Prerequisite Skills Linked to Assessed Curriculum
	• 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment. • 5.12.A: Observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem. • 5.12.B: Predict how changes in the ecosystem affect the cycling of matter and flow of energy in a food web. • 5.12.C: Describe a healthy ecosystem and how human activities can be beneficial or harmful to an ecosystem. • 5.10.B: Model and describe the processes that led to the formation of sedimentary rocks and fossil fuels. • 5.10.C: Model and identify how changes to Earth's surface by wind, water, or ice result in the formation of landforms, including deltas, canyons, and sand dunes. • 4.12.A: Investigate and explain how most producers can make their own food using sunlight, water, and carbon dioxide through the cycling of matter. • 4.12.B: Describe the cycling of matter and flow of energy through food webs, including the roles of the Sun, producers, consumers, and decomposers. • 4.12.C: Identify and describe past environments based on fossil evidence, including common Texas fossils. • 3.12.A: Explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy. • 3.12.C: Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations. • 3.12.D: Identify fossils as evidence of past living organisms and environments, including common Texas fossils. • 2.13.D: Investigate and describe some of the unique life cycles of animals where young animals do not resemble their parents, including butterflies and frogs. • 2.12.A: Describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem. • 2.12.C: Explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. *Continued*

Bio 9	Prerequisite Skills Linked to Assessed Curriculum
	• K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • K.10.A: Describe and classify rocks by the observable properties of size, shape, color, and texture. • PK4.VI.B.2: Observe, describe, and discuss the life cycles of organisms.

Strand 3 - Biological Evolution	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (10) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life that has multiple mechanisms. The student is expected to: (A) analyze and evaluate how natural selection produces change in populations and not individuals; **Supporting Standard** (B) 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; **Readiness Standard** (C) analyze and evaluate how natural selection may lead to speciation; **Readiness Standard** (D) analyze evolutionary mechanisms other than natural selection, including genetic drift, gene flow, mutation, and genetic recombination, and their effect on the gene pool of a population. **Supporting Standard**	Knows that the unity and diversity caused by evolution can occur by multiple mechanisms.

Bio 10	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.13.B: Describe the function of genes within chromosomes in determining inherited traits of offspring. • 8.13.C: Describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations. • 8.12.A: Explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems. • 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. • 8.12.C: Describe how biodiversity contributes to the stability and sustainability of an ecosystem and the health of the organisms within the ecosystem. • 8.11.A: Use scientific evidence to describe how natural events, including volcanic eruptions, meteor impacts, abrupt changes in ocean currents, and the release and absorption of greenhouse gases influence climate.

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Bio 10	Prerequisite Skills Linked to Assessed Curriculum

- 8.11.B: Use scientific evidence to describe how human activities, including the release of greenhouse gases, deforestation, and urbanization, can influence climate.
- 7.14.A: Describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups.
- 7.13.C: Compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time.
- 7.13.D: Describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations.
- 7.12.B: Describe how ecosystems are sustained by the continuous flow of energy and the recycling of matter and nutrients within the biosphere.
- 6.13.C: Describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change.
- 6.12.A: Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition.
- 6.12.B: Describe and give examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism.
- 5.13.A: Analyze the structures and functions of different species to identify how organisms survive in the same environment.
- 5.13.B: Explain how instinctual behavioral traits such as turtle hatchlings returning to the sea and learned behavioral traits such as orcas hunting in packs increase chances of survival.
- 5.12.A: Observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem.
- 5.12.B: Predict how changes in the ecosystem affect the cycling of matter and flow of energy in a food web.
- 5.12.C: Describe a healthy ecosystem and how human activities can be beneficial or harmful to an ecosystem.
- 4.13.A: Explore and explain how structures and functions of plants such as waxy leaves and deep roots enable them to survive in their environment.
- 4.13.B: Differentiate between inherited and acquired physical traits of organisms.
- 4.12.C: Identify and describe past environments based on fossil evidence, including common Texas fossils.
- 3.13.A: Explore and explain how external structures and functions of animals such as the neck of a giraffe or webbed feet on a duck enable them to survive in their environment.

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Bio 10	Prerequisite Skills Linked to Assessed Curriculum
	• 3.13.B: Explore, illustrate, and compare life cycles in organisms such as beetles, crickets, radishes, or lima beans. • 3.12.A: Explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy. • 3.12.B: Identify and describe the flow of energy in a food chain and predict how changes in a food chain such as removal of frogs from a pond or bees from a field affect the ecosystem. • 3.12.C: Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations. • 3.12.D: Identify fossils as evidence of past living organisms and environments, including common Texas fossils. • 3.10.A: Compare and describe day-to-day weather in different locations at the same time, including air temperature, wind direction, and precipitation. • 3.10.C: Model and describe rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides. • 2.13.A: Identify the roots, stems, leaves, flowers, fruits, and seeds of plants and compare how those structures help different plants meet their basic needs for survival. • 2.13.B: Record and compare how the structures and behaviors of animals help them find and take in food, water, and air. • 2.12.A: Describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem. • 2.12.B: Create and describe food chains identifying producers and consumers to demonstrate how animals depend on other living things. • 1.13.A: Identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival. • 1.13.B: Record observations of and describe basic life cycles of animals, including a bird, a mammal, and a fish. • 1.13.C: Compare ways that young animals resemble their parents. • 1.12.B: Describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums. • 1.12.C: Identify and illustrate how living organisms depend on each other through food chains. • 1.11.A: Identify and describe how plants, animals, and humans use rocks, soil, and water. • 1.10.C: Compare the properties of puddles, ponds, streams, rivers, lakes, and oceans, including color, clarity, size, shape, and whether it is freshwater or saltwater. *Continued*

Bio 10	**Prerequisite Skills Linked to Assessed Curriculum**
	• 1.6.C: Demonstrate and explain that a whole object is a system made of organized parts such as a toy that can be taken apart and put back together. • K.13.A: Identify the structures of plants, including roots, stems, leaves, flowers, and fruits. • K.13.B: Identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects. • K.13.C: Identify and record the changes from seed, seedling, plant, flower, and fruit in a simple plant life cycle. • K.13.D: Identify ways that young plants resemble the parent plant. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • K.10.B: Observe and describe weather changes from day to day and over seasons.

Strand 4 - Interdependence within Environmental Systems	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
Biology (13) Science concepts. The student knows that interactions at various levels of organization occur within an ecosystem to maintain stability. The student is expected to: (A) investigate and evaluate how ecological relationships, including predation, parasitism, commensalism, mutualism, and competition, influence ecosystem stability; **Supporting Standard** (B) analyze how ecosystem stability is affected by disruptions to the cycling of matter and flow of energy through trophic levels using models; **Supporting Standard** (C) explain the significance of the carbon and nitrogen cycles to ecosystem stability and analyze the consequences of disrupting these cycles; **Supporting Standard** (D) explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact ecosystem stability; **Readiness Standard**	Recognizes the balance and interdependence within biological systems and their interactions within the environment.

Bio 13	**Prerequisite Skills Linked to Assessed Curriculum**
	• 8.12.A: Explain how disruptions such as population changes, natural disasters, and human intervention impact the transfer of energy in food webs in ecosystems. • 8.12.B: Describe how primary and secondary ecological succession affect populations and species diversity after ecosystems are disrupted by natural events or human activity. • 8.12.C: Describe how biodiversity contributes to the stability and sustainability of an ecosystem and the health of the organisms within the ecosystem. • 8.11.C: Describe the carbon cycle. • 8.6.B: Use the periodic table to identify the atoms involved in chemical reactions. • 8.6.E: Investigate how mass is conserved in chemical reactions and relate conservation of mass to the rearrangement of atoms using chemical equations, including photosynthesis.

Continued

Bio 13	Prerequisite Skills Linked to Assessed Curriculum

- 7.12.A: Diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids.
- 7.12.B: Describe how ecosystems are sustained by the continuous flow of energy and the recycling of matter and nutrients within the biosphere.
- 7.8.A: Investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation.
- 7.8.B: Investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium.
- 6.12.A: Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition.
- 6.12.B: Describe and give examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism.
- 6.12.C: Describe the hierarchical organization of organism, population, and community within an ecosystem.
- 6.11.A: Research and describe why resource management is important in reducing global energy, poverty, malnutrition, and air and water pollution.
- 6.10.A: Differentiate between the biosphere, hydrosphere, atmosphere, and geosphere and identify components of each system.
- 6.9.A: Model and illustrate how the tilted Earth revolves around the Sun, causing changes in seasons.
- 6.8.B: Describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis.
- 6.6.E: Identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change.
- 5.12.A: Observe and describe how a variety of organisms survive by interacting with biotic and abiotic factors in a healthy ecosystem.
- 5.12.B: Predict how changes in the ecosystem affect the cycling of matter and flow of energy in a food web.
- 5.12.C: Describe a healthy ecosystem and how human activities can be beneficial or harmful to an ecosystem.
- 5.8.A: Investigate and describe the transformation of energy in systems such as energy in a flashlight battery that changes from chemical energy to electrical energy to light energy.
- 4.12.A: Investigate and explain how most producers can make their own food using sunlight, water, and carbon dioxide through the cycling of matter.

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Bio 13	Prerequisite Skills Linked to Assessed Curriculum
	• 4.12.B: Describe the cycling of matter and flow of energy through food webs, including the roles of the Sun, producers, consumers, and decomposers. • 3.12.A: Explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy. • 3.12.B: Identify and describe the flow of energy in a food chain and predict how changes in a food chain such as removal of frogs from a pond or bees from a field affect the ecosystem. • 3.12.C: Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations. • 3.8.A: Identify everyday examples of energy, including light, sound, thermal, and mechanical. • 3.6.D: Demonstrate that materials can be combined based on their physical properties to create or modify objects such as building a tower or adding clay to sand to make a stronger brick and justify the selection of materials based on their physical properties. • 2.12.A: Describe how the physical characteristics of environments, including the amount of rainfall, support plants and animals within an ecosystem. • 2.12.B: Create and describe food chains identifying producers and consumers to demonstrate how animals depend on other living things. • 2.12.C: Explain and demonstrate how some plants depend on other living things, wind, or water for pollination and to move their seeds around. • 2.9.A: Describe the Sun as a star that provides light and heat and explain that the Moon reflects the Sun's light. • 1.12.B: Describe and record examples of interactions and dependence between living and nonliving components in terrariums or aquariums. • 1.12.C: Identify and illustrate how living organisms depend on each other through food chains. • K.12.A: Observe and identify the dependence of plants on air, sunlight, water, nutrients in the soil, and space to grow. • K.12.B: Observe and identify the dependence of animals on air, water, food, space, and shelter. • K.10.C: Identify evidence that supports the idea that air is all around us and demonstrate that wind is moving air using items such as a windsock, pinwheel, or ribbon. • K.9.A: Identify, describe, and predict the patterns of day and night and their observable characteristics. • PK4.VI.B.2: Observe, describe, and discuss the life cycles of organisms.