



State of Texas Assessments of Academic Readiness

# **Biology Assessment**

## **Eligible Texas Essential Knowledge and Skills**

Texas Education Agency

Effective as of the 2025-2026 school year

# STAAR Biology Assessment

## Biological Structures, Functions, and Processes

- B.5 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
  - (B) compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity
  - (D) compare the structures of viruses to cells and explain how viruses spread and cause disease
- B.6 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 cycle to the growth of organisms, including an overview of the stages of the cell cycle and deoxyribonucleic acid (DNA) replication models
  - (B) explain the process of cell specialization through cell differentiation, including the role of environmental factors
  - (C) relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer
- B.11 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
  - (B) investigate and explain the role of enzymes in facilitating cellular processes
- B.12 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
  - (B) explain how the interactions that occur among systems that perform functions of transport, reproduction, and response in plants are facilitated by their structures

## Mechanisms of Genetics

- B.7 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
  - (B) describe the significance of gene expression and explain the process of protein synthesis using models of DNA and ribonucleic acid (RNA)
  - (C) identify and illustrate changes in DNA and evaluate the significance of these changes
- B.8 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
  - (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

## Biological Evolution

- B.9 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
  - (B) examine scientific explanations for varying rates of change such as gradualism, abrupt appearance, and stasis in the fossil record
- B.10 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 in individuals
  - (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
  - (C) analyze and evaluate how natural selection may lead to speciation
  - (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

## Interdependence within Environmental Systems

- B.13 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
  - (B) analyze how ecosystem stability is affected by disruptions to the cycling of matter and flow of energy through trophic levels using models
  - (C) explain the significance of the carbon and nitrogen cycles to ecosystem stability and analyze the consequences of disrupting these cycles
  - (D) explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact ecosystem stability

DRAFT