

Biology is specifically aligned with the Texas Essential Knowledge and Skills (TEKS) Biology Standards and Benchmarks. The course focuses on mastery of basic biological concepts and models while building scientific inquiry skills and exploring the connections between living things and their environment.

The course begins with an introduction to the nature of science and biology, including the major themes of structure and function, matter and energy, and the interconnectedness of life. Students then apply those themes to the structure and function of the cell, cellular metabolism, and biogeochemical cycles. Building on this foundation, students explore the connections and interactions between living things by studying genetics, ecosystems and natural selection, and evolution. The course ends with an applied look at human biology.

Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts.

Lab activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science.

This course is built to the TEKS Biology Standards and Benchmarks.

Length: Two Semesters

UNIT 1: INTRODUCTION TO BIOLOGY

LESSON 1: BIOLOGICAL SCIENCE

Study: What Is Science?

Learn about the nature of science.

Duration: 1 hr Scoring: 0 points

Quiz: What Is Science?

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Biology, Technology, and Society

Learn how science, technology, and society affect one another.

Duration: 1 hr Scoring: 0 points

Quiz: Biology, Technology, and Society

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Biology Basics

Learn about the main characteristics of life.

Duration: 1 hr Scoring: 0 points

Quiz: Biology Basics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: TOOLS OF INQUIRY

Study: Scientific Investigations

Learn how to design a scientific investigation.

Duration: 1 hr Scoring: 0 points

Quiz: Scientific Investigations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Modeling

Learn about different types of scientific models.

Duration: 1 hr Scoring: 0 points

Quiz: Modeling

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Data Analysis

Learn how to use common data analysis techniques.

Duration: 1 hr Scoring: 0 points

Quiz: Data Analysis

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Patterns in Data

Answer open-response questions to assess your understanding of the material.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: INTRODUCTION TO BIOLOGY WRAP-UP**Review: Introduction to Biology**

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Introduction to Biology

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Introduction to Biology

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 2: ENERGY AND MATTER IN LIVING SYSTEMS**LESSON 1: THE BUILDING BLOCKS OF LIFE****Study: From Atoms to Biosphere**

Learn about the hierarchical organization of biological systems.

Duration: 1 hr Scoring: 0 points

Quiz: From Atoms to Biosphere

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Biomolecules

Learn about the four main types of biomolecules.

Duration: 1 hr Scoring: 0 points

Quiz: Biomolecules

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Energy and Matter in the Biosphere

Learn how energy flows and matter cycles through living systems.

Duration: 1 hr Scoring: 0 points

Quiz: Energy and Matter in the Biosphere

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Modeling the Carbon Cycle

Use a simulation to model the carbon cycle.

Duration: 3 hrs Scoring: 50 points

LESSON 2: PHOTOSYNTHESIS AND CELLULAR RESPIRATION**Study: Photosynthesis**

Learn how autotrophs use photosynthesis to make food.

Duration: 1 hr Scoring: 0 points

Quiz: Photosynthesis

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Cellular Respiration

Learn how cells use cellular respiration to meet their energy needs.

Duration: 1 hr Scoring: 0 points

Quiz: Cellular Respiration

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Modeling Photosynthesis and Cellular Respiration

Use models to investigate photosynthesis and cellular respiration.

Duration: 3 hrs Scoring: 50 points

LESSON 3: INVESTIGATING ENERGY AND MATTER IN LIVING SYSTEMS**Lab: Investigating the Flow of Energy and Cycling of Matter**

Investigate how energy flows and matter cycles through living systems.

Duration: 3 hrs Scoring: 50 points

Discuss: Investigating the Flow of Energy and Cycling of Matter

Discuss your lab results.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: ENERGY AND MATTER IN LIVING SYSTEMS WRAP-UP**Review: Energy and Matter in Living Systems**

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Energy and Matter in Living Systems

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Energy and Matter in Living Systems

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 3: ECOSYSTEMS**LESSON 1: RELATIONSHIPS IN ECOSYSTEMS****Study: Food Chains and Energy Pyramids**

Learn how energy and matter enter, move through, and exit ecosystems.

Duration: 1 hr Scoring: 0 points

Quiz: Food Chains and Energy Pyramids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Changes in Populations

Learn how changes in biotic and abiotic factors can increase or decrease the size of a population.

Duration: 1 hr Scoring: 0 points

Quiz: Changes in Populations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Relationships in Ecosystems

Answer open-response questions to assess your understanding of the material.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 2: ECOSYSTEM STABILITY AND CHANGE

Study: Ecological Succession

Learn how ecosystems recover from disturbances and change over time.

Duration: 1 hr Scoring: 0 points

Quiz: Ecological Succession

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Explore: Changes in Ecosystems

Research how changing environmental conditions can result in a new ecosystem.

Duration: 1 hr 30 mins Scoring: 35 points

Study: Impact of Humans on Ecosystems

Learn how human activities can impact ecosystems.

Duration: 1 hr Scoring: 0 points

Quiz: Impact of Humans on Ecosystems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Engineering a Solution to Reduce Human Impact

Identify one way human activities have impacted an ecosystem, and design a solution to mitigate the impact.

Duration: 3 hrs Scoring: 50 points

LESSON 3: ECOSYSTEMS WRAP-UP

Review: Ecosystems

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Ecosystems

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Ecosystems

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 4: MULTICELLULAR ORGANISMS

LESSON 1: GROWTH AND DEVELOPMENT

Study: Mitotic Cell Division

Learn how eukaryotic cells reproduce.

Duration: 1 hr Scoring: 0 points

Quiz: Mitotic Cell Division

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Cell Differentiation

Learn how eukaryotic cells differentiate in order to become specialized.

Duration: 1 hr Scoring: 0 points

Quiz: Cell Differentiation

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Modeling Cell Division and Differentiation

Use models to investigate cell division and differentiation.

Duration: 3 hrs Scoring: 50 points

LESSON 2: TISSUES, ORGANS, AND BODY SYSTEMS**Study: Tissues and Organs**

Learn how cells in most multicellular organisms are organized into tissues and organs.

Duration: 1 hr Scoring: 0 points

Quiz: Tissues and Organs

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Animal Systems

Learn about common animal organ systems and how they interact with one another.

Duration: 1 hr Scoring: 0 points

Quiz: Animal Systems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Plant Systems

Learn about common plant organ systems and how they interact with one another.

Duration: 1 hr Scoring: 0 points

Quiz: Plant Systems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Modeling Organ System Interactions

Use models to investigate organ system interactions.

Duration: 3 hrs Scoring: 50 points

LESSON 3: HOMEOSTASIS**Study: Homeostasis**

Learn how multicellular organisms maintain homeostasis.

Duration: 1 hr Scoring: 0 points

Quiz: Homeostasis

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Investigating Homeostasis

Plan and conduct an investigation to discover how an organism maintains homeostasis.

Duration: 3 hrs Scoring: 50 points

Discuss: Investigating Homeostasis

Discuss your lab results.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: MULTICELLULAR ORGANISMS WRAP-UP

Review: Multicellular Organisms

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Multicellular Organisms

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Multicellular Organisms

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 5: SEMESTER 1 REVIEW AND EXAM

LESSON 1: SEMESTER 1 REVIEW AND EXAM

Review: Semester 1 Review

Review what you have learned in this semester.

Duration: 0 hrs 30 mins Scoring: 0 points

Exam: Semester 1 Computer-Scored Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points

Final Exam: Semester 1 Teacher-Scored Exam

Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points

UNIT 6: HEREDITY

LESSON 1: GENETIC INHERITANCE

Study: Introduction to Heredity

Learn about discoveries that led to an understanding of how traits are inherited.

Duration: 1 hr Scoring: 0 points

Quiz: Introduction to Heredity

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Chromosomes and DNA

Learn about the structures of DNA and chromosomes.

Duration: 1 hr Scoring: 0 points

Quiz: Chromosomes and DNA

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: DNA REPLICATION AND MEIOSIS

Study: DNA Replication

Learn about the process of DNA replication.

Duration: 1 hr Scoring: 0 points

Quiz: DNA Replication

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Meiotic Cell Division

Learn how gametes are produced by the process of meiosis.

Duration: 1 hr Scoring: 0 points

Quiz: Meiotic Cell Division

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: DNA Replication and Meiosis

Answer open-response questions to assess your understanding of the material.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: PATTERNS OF INHERITANCE

Study: Types of Inheritance

Learn about patterns of inheritance.

Duration: 1 hr Scoring: 0 points

Quiz: Types of Inheritance

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Predicting Genetic Outcomes

Learn how to use Punnett squares and pedigree charts to make predictions.

Duration: 1 hr Scoring: 0 points

Quiz: Predicting Genetic Outcomes

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Explore: Explaining Heredity

Research the roles of DNA and chromosomes in a disease that can be passed from parents to offspring.

Duration: 1 hr 30 mins Scoring: 35 points

LESSON 4: HEREDITY WRAP-UP

Review: Heredity

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Heredity

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Heredity

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 7: GENES AND TRAITS

LESSON 1: GENE EXPRESSION

Study: Protein Synthesis

Learn how proteins are made using the codes in genes.

Duration: 1 hr Scoring: 0 points

Quiz: Protein Synthesis

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Modeling Protein Synthesis

Use models to investigate the process of protein synthesis.

Duration: 3 hrs Scoring: 50 points

Study: Regulation of Gene Expression

Learn how gene expression is regulated.

Duration: 1 hr Scoring: 0 points

Quiz: Regulation of Gene Expression

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: GENETIC VARIATION**Study: Origins of Genetic Variation**

Learn about the sources of genetic variation.

Duration: 1 hr Scoring: 0 points

Quiz: Origins of Genetic Variation

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Population Genetics

Learn about allele frequencies in a population and how they can change.

Duration: 1 hr Scoring: 0 points

Quiz: Population Genetics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Genetic Variation

Answer open-response questions to assess your understanding of the material.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: GENES AND TRAITS WRAP-UP**Review: Genes and Traits**

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Genes and Traits

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Genes and Traits

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 8: NATURAL SELECTION**LESSON 1: ADAPTATIONS****Study: Adaptations in Populations**

Learn how adaptations help organisms survive and reproduce.

Duration: 1 hr Scoring: 0 points

Quiz: Adaptations in Populations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Explore: Group Behavior and Survival

Research how group behavior affects the survival of a species.

Duration: 1 hr 30 mins Scoring: 35 points

Study: Natural Selection and Population Change

Learn how natural selection can cause the traits of populations to change.

Duration: 1 hr Scoring: 0 points

Quiz: Natural Selection and Population Change

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: NATURAL SELECTION IN ACTION

Lab: Investigating Natural Selection

Use a simulation to investigate natural selection.

Duration: 3 hrs Scoring: 50 points

Discuss: Investigating Natural Selection

Discuss your lab results.

Duration: 0 hrs 20 mins Scoring: 15 points

Lab: Analyzing Natural Selection

Analyze data gathered from a simulation to draw conclusions about natural selection.

Duration: 3 hrs Scoring: 50 points

LESSON 3: OTHER MECHANISMS OF POPULATION CHANGE

Lab: Modeling Genetic Drift and Gene Flow

Use models to investigate genetic drift and gene flow.

Duration: 3 hrs Scoring: 50 points

Discuss: Modeling Genetic Drift and Gene Flow

Discuss your lab results.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: NATURAL SELECTION WRAP-UP

Review: Natural Selection

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Natural Selection

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Natural Selection

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 9: EVOLUTION

LESSON 1: CHANGES TO EARTH'S SPECIES

Study: Darwin's Theory of Evolution

Learn how evidence was used to develop the scientific theory of evolution.

Duration: 1 hr Scoring: 0 points

Quiz: Darwin's Theory of Evolution

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Modern Research on Evolution

Learn about modern evidence that supports the theory of evolution.

Duration: 1 hr Scoring: 0 points

Quiz: Modern Research on Evolution

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Speciation and Extinction

Learn how new species form and why species go extinct.

Duration: 1 hr Scoring: 0 points

Quiz: Speciation and Extinction

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Evolution

Answer open-response questions to assess your understanding of the material.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 2: THE TREE OF LIFE

Study: History of Life on Earth

Learn how life has changed throughout Earth's history.

Duration: 1 hr Scoring: 0 points

Quiz: History of Life on Earth

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Phylogenetic Systematics

Learn how evolutionary relationships are used to classify organisms.

Duration: 1 hr Scoring: 0 points

Quiz: Phylogenetic Systematics

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: PREVENTING EXTINCTIONS

Explore: Environmental Change and Evolution

Research how changes in the environment can cause a species to change.

Duration: 1 hr 30 mins Scoring: 35 points

Lab: Engineering a Solution to Protect Species

Use a simulation to design solutions to protect species.

Duration: 3 hrs Scoring: 50 points

Discuss: Engineering a Solution to Protect Species

Discuss your lab results.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: EVOLUTION WRAP-UP

Review: Evolution

Review what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Evolution

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Evolution

Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 10: SEMESTER 2 REVIEW AND EXAM

LESSON 1: SEMESTER 2 REVIEW AND EXAM

Review: Semester 2 Review

Review what you have learned in this semester.

Duration: 0 hrs 30 mins Scoring: 0 points

Exam: Semester 2 Computer-Scored Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points

Final Exam: Semester 2 Teacher-Scored Exam

Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points