

Science - Biology (TEKS - Aligned Course Objectives)

Scientific Processes

OBJ	BIO	1	The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices
SE	BIO	1A	Demonstrate safe practices during field and laboratory investigations
SE	BIO	1B	Make wise choices in the use and conservation of resources and the disposal or recycling of materials
OBJ	BIO	2	The student uses scientific methods during field and laboratory investigations
SE	BIO	2A	Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology
SE	BIO	2B	Collect data and make measurements with precision
SE	BIO	2C	Organize, analyze, evaluate, make inferences, and predict trends from data
SE	BIO	2D	Communicate valid conclusions
OBJ	BIO	3	The student uses critical thinking and scientific problem solving to make informed decisions
SE	BIO	3A	Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information
SE	BIO	3B	Evaluate promotional claims that relate to biological issues such as product labeling and advertisements
SE	BIO	3C	Evaluate the impact of research on scientific thought, society, and the environment
SE	BIO	3D	Describe the connection between biology and future careers
SE	BIO	3E	Evaluate models according to their adequacy in representing biological objects or events
SE	BIO	3F	Research and describe the history of biology and contributions of scientists

Science Concepts

OBJ	BIO	4	The student knows that cells are the basic structures of all living things and have specialized parts that perform specific functions, and that viruses are different from cells and have different properties and functions
SE	BIO	4A	Identify the parts of prokaryotic and eukaryotic cells
SE	BIO	4B	Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules
SE	BIO	4C	Compare the structures and functions of viruses to cells and describe the role of viruses in causing diseases and conditions such as acquired immune deficiency syndrome, common colds, smallpox, influenza, and warts
SE	BIO	4D	Identify and describe the role of bacteria in maintaining health such as in digestion and in causing diseases such as in streptococcus infections and diphtheria
OBJ	BIO	5	The student knows how an organism grows and how specialized cells, tissues, and organs develop
SE	BIO	5A	Compare cells from different parts of plants and animals including roots, stems, leaves, epithelia, muscles, and bones to show specialization of structure and function
SE	BIO	5B	Identify cell differentiation in the development of organisms
SE	BIO	5C	Sequence the levels of organization in multicellular organisms to relate the parts to each other and to the whole
OBJ	BIO	6	The student knows the structures and functions of nucleic acids in the mechanisms of genetics
SE	BIO	6A	Describe components of deoxyribonucleic acid (DNA), and illustrate how information for specifying the traits of an organism is carried in the DNA

SE	BIO	6B	Explain replication, transcription, and translation using models of DNA and ribonucleic acid (RNA)
SE	BIO	6C	Identify and illustrate how changes in DNA cause mutations and evaluate the significance of these changes
SE	BIO	6D	Compare genetic variations observed in plants and animals
SE	BIO	6E	Compare the processes of mitosis and meiosis and their significance to sexual and asexual reproduction
SE	BIO	6F	Identify and analyze karyotypes
OBJ	BIO	7	The student knows the theory of biological evolution
SE	BIO	7A	Identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology
SE	BIO	7B	Illustrate the results of natural selection in speciation, diversity, phylogeny, adaptation, behavior, and extinction
OBJ	BIO	8	The student knows applications of taxonomy and can identify its limitations
SE	BIO	8A	Collect and classify organisms at several taxonomic levels such as species, phylum, and kingdom using dichotomous keys
SE	BIO	8B	Analyze relationships among organisms and develop a model of a hierarchical classification system based on similarities and differences using taxonomic nomenclature
SE	BIO	8C	Identify characteristics of kingdoms including monerans, protists, fungi, plants, and animals
OBJ	BIO	9	The student knows metabolic processes and energy transfers that occur in living organisms
SE	BIO	9A	Compare the structures and functions of different types of biomolecules such as carbohydrates, lipids, proteins, and nucleic acids
SE	BIO	9B	Compare the energy flow in photosynthesis to the energy flow in cellular respiration
Se	BIO	9C	Investigate and identify the effects of enzymes on food molecules
SE	BIO	9D	Analyze the flow of matter and energy through different trophic levels and between organisms and the physical environment
OBJ	BIO	10	The student knows that, at all levels of nature, living systems are found within other living systems, each with its own boundary and limits
SE	BIO	10A	Interpret the functions of systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune
SE	BIO	10B	Compare the interrelationships of organ systems to each other and to the body as a whole
SE	BIO	10C	Analyze and identify characteristics of plant systems and subsystems
OBJ	BIO	11	The student knows that organisms maintain homeostasis
SE	BIO	11A	Identify and describe the relationships between internal feedback mechanisms in the maintenance of homeostasis
SE	BIO	11B	Investigate and identify how organisms, including humans, respond to external stimuli
SE	BIO	11C	Analyze the importance of nutrition, environmental conditions, and physical exercise on health
SE	BIO	11D	Summarize the role of microorganisms in maintaining and disrupting equilibrium including diseases in plants and animals and decay in an ecosystem
OBJ	BIO	12	The student knows that interdependence and interactions occur within an ecosystem
SE	BIO	12A	Analyze the flow of energy through various cycles including the carbon, oxygen, nitrogen, and water cycles
SE	BIO	12B	Interpret interactions among organisms exhibiting predation, parasitism, commensalism, and mutualism
SE	BIO	12C	Compare variations, tolerances, and adaptations of plants and animals in different biomes
SE	BIO	12D	Identify and illustrate that long-term survival of species is dependent on a resource base that may be limited
SE	BIO	12E	Investigate and explain the interactions in an ecosystem including food chains, food webs, and food pyramids

OBJ	BIO	13	The student knows the significance of plants in the environment
SE	BIO	13A	Evaluate the significance of structural and physiological adaptations of plants to their environments
SE	BIO	13B	Survey and identify methods of reproduction, growth, and development of various types of plants