lead4ward

STAAR Standards Snapshot – Biology

Process Standards (Scientific Process Skills)		
STAAR	B.1(A)	demonstrate safe practices during laboratory and field investigations
	B.1(B)	demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials
	B.2(A)	know the definition of science and understand that it has limitations, as specified in chapter 112.34, subsection (b)(2) of 19 TAC
	B.2(B)	know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories
	B.2(C)	know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed;
	B.2(D)	distinguish between scientific hypotheses and scientific theories
	B.2(E)	plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology
≥ 40% of items will be dual coded	B.2(F)	collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures
	B.2(G)	analyze, evaluate, make inferences, and predict trends from data
	B.2(H)	communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports
	B.3(A)	in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student
	B.3(B)	communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials
	B.3(C)	draw inferences based on data related to promotional materials for products and services
	B.3(D)	evaluate the impact of scientific research on society and the environment
	B.3(E)	evaluate models according to their limitations in representing biological objects or events
	B.3(F)	research and describe the history of biology and contributions of scientists

Rptg Cat	STAAR	Readiness Standards		Supporting Standards	
1 Cell Structure and Function	11	B.4(B)	investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules	B.4(A)	compare and contrast prokaryotic and eukaryotic cells
		B.4(C)	compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza	B.5(B)	examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium
		B.5(A)	describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms	B.5(C)	describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation
		B.9(A)	compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids	B.5(D)	recognize that disruptions of the cell cycle lead to diseases such as cancer
				B.9(D)	analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life
2 Mechanisms of Genetics	11	B.6(A)	identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DNA	B.6(B)	recognize that components that make up the genetic code are common to all organisms
		B.6(E)	identify and illustrate changes in DNA and evaluate the significance of these changes	B.6(C)	explain the purpose and process of transcription and translation using models of DNA and RNA
		B.6(F)	predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance	B.6(D)	recognize that gene expression is a regulated process
				B.6(G)	recognize the significance of meiosis to sexual reproduction
				B.6(H)	describe how techniques such as DNA fingerprinting, genetic modifications, and chromosomal analysis are used to study the genomes of organisms
3 Biological Evolution and Classification	10	B.7(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.7(B)	analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record
		B.7(E)	analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species	B.7(C)	analyze and evaluate how natural selection produces change in populations, not individuals
		B.8(B)	categorize organisms using a hierarchical classification system based on similarities and differences shared among groups	B.7(D)	analyze and evaluate how the elements of natural selection, including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources, result in differential reproductive success
				B.7(F)	analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination
				B.7(G)	analyze and evaluate scientific explanations concerning the complexity of the cell
				B.8(A)	define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community
				B.8(C)	compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals

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4 Biological Processes and Systems	**11**	B.10(A)	describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals	B.9(B)	compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter
		B.10(B)	describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants	B.9(C)	identify and investigate the role of enzymes
				B.10(C)	analyze the levels of organization in biological systems and relate the levels to each other and to the whole system
				B.11(A)	describe the role of internal feedback mechanisms in the maintenance of homeostasis
5 Interdependence within Environmental Systems	**11**	B.11(D)	describe how events and processes that occur during ecological succession can change populations and species diversity	B.11(B)	investigate and analyze how organisms, populations, and communities respond to external factors
		B.12(A)	interpret relationships, including predation, parasitism, commensalism, mutualism, and competition among organisms	B.11(C)	summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems
		B.12(C)	analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids	B.12(B)	compare variations and adaptations of organisms in different ecosystems
		B.12(F)	describe how environmental change can impact ecosystem stability	B.12(D)	recognize that long-term survival of species is dependent on changing resource bases that are limited
				B.12(E)	describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles
# Items	**54**	**32-25 questions from Readiness Standards**		**19-22 questions from Supporting Standards**	