Correlation to the Texas End-of-Course Biology Essential Knowledge and Skills

This worktext is customized to the Eligible Texas Essential Knowledge and Skills and will help your students prepare for the Texas End-of-Course Biology test.

Texas Essential Knowledge and Skills	Measuring Up® Lessons
Reporting Category 1: Cell Structure and Function	
The student will demonstrate an understanding of biomolecules as building blocks of cells, and that cells are the basic unit of structure and function of living things.	
(B.4) **Science concepts.** The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to:	
(A) compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity; **Supporting Standard**	2–4, 12, 22
(B) investigate and explain cellular processes, including homeostasis and transport of molecules; and **Readiness Standard**	5–7, 10–11, Inv 1, 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. **Readiness Standard**	13
(B.5) **Science concepts.** The student knows how an organism grows and the importance of cell differentiation. The student is expected to:	
(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; **Readiness Standard**	8–10
(B) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation; and **Supporting Standard**	10–12, 14
(C) recognize that disruptions of the cell cycle lead to diseases such as cancer. **Supporting Standard**	14
(B.9) **Science concepts.** The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to:	
(A) compare the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids. **Readiness Standard**	1–2, 10
Reporting Category 2: Mechanisms of Genetics	
The student will demonstrate an understanding of the mechanisms of genetics.	
(B.6) **Science concepts.** The student knows the mechanisms of genetics such as the role of nucleic acids and the principles of Mendelian and non-Mendelian genetics. The student is expected to:	
(A) identify components of DNA, identify how information for specifying the traits of an organism is carried in the DNA, and examine scientific explanations for the origin of DNA; **Readiness Standard**	9, 14
(B) recognize that components that make up the genetic code are common to all organisms; **Supporting Standard**	9, 14
(C) explain the purpose and process of transcription and translation using models of DNA and RNA; **Supporting Standard**	10–11
(D) recognize that gene expression is a regulated process; **Supporting Standard**	11, 14
(E) identify and illustrate changes in DNA and evaluate the significance of these changes; **Readiness Standard**	15
(F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses, and non-Mendelian inheritance; and **Readiness Standard**	16
(G) recognize the significance of meiosis to sexual reproduction. **Supporting Standard**	17

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Reporting Category 3: Biological Evolution and Classification	
The student will demonstrate an understanding of the theory of biological evolution and the hierarchical classification of organisms.	
(B.7) **Science concepts.** The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. 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; **Readiness Standard**	18
(B) examine scientific explanations of abrupt appearance and stasis in the fossil record; **Supporting Standard**	19
(C) analyze and evaluate how natural selection produces change in populations, not individuals; **Supporting Standard**	20
(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; **Supporting Standard**	20
(E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species; and **Readiness Standard**	20–21
(F) analyze other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination. **Supporting Standard**	21
(B.8) **Science concepts.** The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to:	
(A) define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community; **Supporting Standard**	22
(B) categorize organisms using a hierarchical classification system based on similarities and differences shared among groups; and **Readiness Standard**	23, Inv 3
(C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals. **Supporting Standard**	22
Reporting Category 4: Biological Processes and Systems	
The student will demonstrate an understanding of metabolic processes, energy conversions, and interactions and functions of systems in organisms.	
(B.9) **Science concepts.** The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to:	
(B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy, energy conversions, and matter; and **Supporting Standard**	6–7
(C) identify and investigate the role of enzymes. **Supporting Standard**	1
(B.10) **Science concepts.** The student knows that biological systems are composed of multiple levels. The student is expected to:	
(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; **Readiness Standard**	25–28
(B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants; and **Readiness Standard**	29–31
(C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system. **Supporting Standard**	24

Texas Essential Knowledge and Skills	Measuring Up® Lessons
Reporting Category 5: Interdependence within Environmental Systems	
The student will demonstrate an understanding of the interdependence and interactions that occur within an environmental system and their significance.	
(B.11) **Science concepts.** The student knows that biological systems work to achieve and maintain balance. The student is expected to:	
(A) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems; and **Supporting Standard**	26, 28, 33, 35–37
(B) describe how events and processes that occur during ecological succession can change populations and species diversity. **Readiness Standard**	34
(B.12) **Science concepts.** The student knows that interdependence and interactions occur within an environmental system. The student is expected to:	
(A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition, among organisms; **Readiness Standard**	35
(B) compare variations and adaptations of organisms in different ecosystems; **Supporting Standard**	32
(C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids; **Readiness Standard**	36
(D) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles; and **Supporting Standard**	37
(E) describe how environmental change can impact ecosystem stability. **Readiness Standard**	33, Inv 5

Texas Essential Knowledge and Skills	Measuring Up® Lessons
Scientific Process Skills	
(B.1) **Scientific processes.** The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	
(A) demonstrate safe practices during laboratory and field investigations; and	Inv 1–2, 4–5, 38
(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.	38
(B.2) **Scientific processes.** The student uses scientific practices and equipment during laboratory and field investigations. The student is expected to:	
(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;	39, 41
(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 that have been tested over a wide variety of conditions are incorporated into theories;	39, Inv 6
(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;	39
(D) distinguish between scientific hypotheses and scientific theories;	39
(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;	Inv 4–6
(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as data-collecting probes, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, balances, gel electrophoresis apparatuses, micropipettes, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures;	Inv 1–2, 4, 40
(G) analyze, evaluate, make inferences, and predict trends from data; and	Inv 5, 39, Inv 6
(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.	Inv 1–6
(B.3) **Scientific processes.** The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to	
(A) analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student;	Inv 1–2, 4, 41
(B) communicate and apply scientific information extracted from various sources such as current events, published journal articles, and marketing materials;	41
(C) draw inferences based on data related to promotional materials for products and services;	41
(D) evaluate the impact of scientific research on society and the environment;	Inv 2, 41
(E) evaluate models according to their limitations in representing biological objects or events; and	41
(F) research and describe the history of biology and contributions of scientists.	41