TTUISD - TEKS Tracker

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Evaluator_____ Evaluation Date _____/_____/_____

TTUISD: Biology 1B (BIO 1B) Course v.4.0
TEKS: §112.34, Beginning with School Year 2010-2011

TEXTBOOK: Miller, Kenneth R., and Joseph S. Levine. Biology (2015). Texas Edition. Hoboken, NJ: Pearson Education, Inc. Digital edition ISBN-10: 0-13-324517-9.
(This title may also be known as Miller & Levine Biology, Texas Biology Student Edition.)

TEKS Requirement (Secondary)		Sem. B	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
§112.34. Biology, Beginning with School Year 2010-2011 (One Credit).					
(a) General requirements. Students shall be awarded one credit for successful completion of this course. Prerequisites: none. This course is recommended for students in Grade 9, 10, or 11.					
(b) Introduction.					
(1) Biology. In Biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; and ecosystems and the environment.					
(2) Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.					
(3) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.					
(4) Science and social ethics. Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).					
(5) Science, systems, and models. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.					
(c) Knowledge and skills.					
(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		**B**	Lessons 16-30	Lab Skills/928-929; Lab Handbook 930, 833-934	Remember
(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.		**B**	Lessons 16-30	Lab Skills/928; Lab Handbook 939, 949	Understand
(2) Scientific processes. The student uses scientific methods 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;		**B**	Lessons 16-30	Lab Handbook/935	Understand
(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**	Lessons 16-30	16/456; Science Skills/909-910; Lab Handbook/942	Understand
(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**	Lessons 16-30	16/450, 471-473; Science Skills/909-911	Understand

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(D) distinguish between scientific hypotheses and scientific theories;		B	Lessons 16-30	Lab Handbook/938-939	Understand
(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;		B	Lessons 16-30	16/451, 457; 18/513, 520; 19/541	Create
(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	Lessons 16-30	Science Skills/910, 916-918; Lab Handbook/938-942, 944-951	Apply
(G) analyze, evaluate, make inferences, and predict trends from data; and		B	Lessons 16-30	16/470; 17/491, 500; 18/524	Evaluate
(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	Lessons 16-30	24/719; Lab Skills/921-924	Understand
(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) 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	Lessons 16-30	17/493; 20/593; 22/656	Evaluate
(B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;		B	Lessons 16-30	22/654; 26/773; 27/799	Apply
(C) draw inferences based on data related to promotional materials for products and services;		B	Lessons 16-30	Science Skills/912-915; Lab Handbook/946-947, 974-975	Analyze
(D) evaluate the impact of scientific research on society and the environment;		B	Lessons 16-30	17/493; 18/529; 20/593	Evaluate
(E) evaluate models according to their limitations in representing biological objects or events; and		B	Lessons 16-30	22/655; Science Skills/919-920; Lab Handbook/936-937	Evaluate
(F) research and describe the history of biology and contributions of scientists.		B	Lessons 16-30	16/450-456, 459, 470-473; 19/510-515	Remember
(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;		B	Lesson 18	18/525-526	Remember
(B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules; and		B	Lesson 23	23/671-673; 25/732-735	Understand
(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	Lesson 20, 30	17/502; 20/574-579, 588-589, 592	Understand
(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;		B	SEMESTER A	-	Remember
(B) examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium;		B	Lesson 23, 24	23/665-667, 669-683; 24/698	Remember
(C) describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation; and		B	SEMESTER A	-	Remember
(D) recognize that disruptions of the cell cycle lead to diseases such as cancer.		B	SEMESTER A	-	Remember
(6) Science concepts. The student knows the mechanisms of genetics, including the role of nucleic acids and the principles of Mendelian Genetics. The student is expected to:					
(A) identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DNA;		B	SEMESTER A	-	Remember
(B) recognize that components that make up the genetic code are common to all organisms;		B	SEMESTER A	-	Understand

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(C) explain the purpose and process of transcription and translation using models of DNA and RNA;		B	SEMESTER A	-	Apply
(D) recognize that gene expression is a regulated process;		B	SEMESTER A	-	Understand
(E) identify and illustrate changes in DNA and evaluate the significance of these changes;		B	SEMESTER A	-	Evaluate
(F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance;		B	SEMESTER A	-	Apply
(G) recognize the significance of meiosis to sexual reproduction; and		B	SEMESTER A	-	Understand
(H) describe how techniques such as DNA fingerprinting, genetic modifications, and chromosomal analysis are used to study the genomes of organisms.		B	SEMESTER A	-	Understand
(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;		B	Lesson 16, 17, 19, 26	16/465-471, 473; 17/499-501; 19/538-539, 551	Evaluate
(B) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record;		B	Lesson 19, 26	19/538-541, 546-551; 26/752-754, 757-764	Evaluate
(C) analyze and evaluate how natural selection produces change in populations, not individuals;		B	Lesson 17, 19	17/482-483, 487-489, 491-492; 19/544-545	Evaluate
(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	Lesson 16, 17, 29	16/457, 460-464, 471-473; 17/482-483, 487-489	Evaluate
(E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species;		B	Lesson 16, 17	16/460-465, 474; 17/484-489, 494-497	Evaluate
(F) analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination; and		B	Lesson 17	17/484-486, 490-492, 498-501	Evaluate
(G) analyze and evaluate scientific explanations concerning the complexity of the cell.		B	Lesson 19	19/555-558; 21/600-607	Evaluate
(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;		B	Lesson 18	18/510-515	Remember
(B) categorize organisms using a hierarchical classification system based on similarities and differences shared among groups; and		B	Lesson 18, 25	18/510-515, 523-528; 21/618-621, 626; 25/730, 744	Analyze
(C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals.		B	Lesson 18, 20, 21, 22, 25	18/523-528; 20/580-585; 21/602-605, 618-621, 625	Understand
(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 structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids;		B	SEMESTER A	-	Analyze
(B) compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter;		B	SEMESTER A	-	Analyze
(C) identify and investigate the role of enzymes; and		B	Lesson 27	27/784-785	Analyze
(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.		B	Lesson 19	19/552-555, 558	Analyze
(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;		B	Lesson 25, 27, 28, 30	25/732-735; 27/784-786, 788-790, 794-795	Analyze
(B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants; and		B	Lesson 22, 23, 24	22/637-652; 23/664-668, 671-673	Analyze
(C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.		B	Lesson 25, 30	25/737-741; 30/860-862, 865	Analyze
(11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to:					

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(A) describe the role of internal feedback mechanisms in the maintenance of homeostasis;		**B**	Lesson 25, 28, 30	23/682-684, 687; 25/732-735; 28/827-830	Analyze
(B) investigate and analyze how organisms, populations, and communities respond to external factors;		**B**	Lesson 19, 28, 29	19/544-545; 28/808-809, 829-830	Analyze
(C) summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems; and		**B**	Lesson 20, 21	20/584-592; 21/610-616, 622-625	Understand
(D) describe how events and processes that occur during ecological succession can change populations and species diversity.		**B**	SEMESTER A	-	Analyze
(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;		**B**	Lesson 21, 27	21/614-616, 622-625; 27/782-783, 786	Analyze
(B) compare variations and adaptations of organisms in different ecosystems;		**B**	Lesson 22, 24, 26, 27, 28	22/636-638, 646-647, 649-654	Understand
(C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids;		**B**	SEMESTER A	-	Analyze
(D) recognize that long-term survival of species is dependent on changing resource bases that are limited;		**B**	Lesson 29	29/847-849	Understand
(E) describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles; and		**B**	SEMESTER A	-	Evaluate
(F) describe how environmental change can impact ecosystem stability.		**B**	SEMESTER A	-	Understand
Source: The provisions of this §112.34 adopted to be effective August 4, 2009, 34 TexReg 5063.					