ELIGIBLE SCIENCE TEKS FOR TAKS

The remaining Texas Assessment of Knowledge and Skills (TAKS) science tests will assess eligible skills and concepts from the 2009 revised science Texas Essential Knowledge and Skills (TEKS). These eligible skills and concepts are those that are contained in the revised version of the TEKS and were previously tested. TAKS test items addressing skills or concepts from the 1997 science TEKS that have not been included in the 2009 revised science TEKS have been deleted from the TAKS science item banks. No new science skills or concepts will be added to the TEKS that are eligible for assessment for the remaining administrations of TAKS.

This document identifies the TEKS student expectations that are eligible to be assessed on the remaining TAKS science tests. Because of the reorganization of the skills and concepts in the revised science TEKS, there is not always a one-to-one correspondence between the previous student expectations and the revised student expectations. For that reason, this document lists the student expectations in their entirety that are eligible for TAKS, even though some parts of the student expectations are new and are not eligible for assessment.

Texas Education Agency
Student Assessment Division
August 2011

TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS
EXIT LEVEL SCIENCE

Objective 1: The student will demonstrate an understanding of the nature of science.

Biology (1) and Integrated Physics and Chemistry (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.

Biology (2) Scientific Processes.* The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to

(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;

(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;

(G) analyze, evaluate, make inferences, and predict trends from data; and

(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.

Integrated Physics and Chemistry (3) Scientific Processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions. 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; and

(C) draw inferences based on data related to promotional materials for products and services.

*Although the student expectations for Integrated Physics and Chemistry (2) B, C, D, and E are not listed in this document, they are almost identical to the student expectations for Biology (2) E, F, G, and H, respectively, and are therefore eligible for assessment.

Objective 2: The student will demonstrate an understanding of the organization of living systems.

Biology (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

(B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules.

Biology (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.

Biology (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;

(C) explain the purpose and process of transcription and translation using models of DNA and RNA; and

(E) identify and illustrate changes in DNA and evaluate the significance of these changes.

Biology (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

(C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals.

Biology (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) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants; and

(C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.

Objective 3: The student will demonstrate an understanding of the interdependence of organisms and the environment.

Biology (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

(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.

Biology (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) analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record;

(C) analyze and evaluate how natural selection produces change in populations, not individuals;

(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; and

(E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species.

Biology (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) compare variations and adaptations of organisms in different ecosystems; and

(C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids.

Objective 4: The student will demonstrate an understanding of the structures and properties of matter.

Integrated Physics and Chemistry (6) Science Concepts. The student knows that relationships exist between the structure and properties of matter. The student is expected to

(C) analyze physical and chemical properties of elements and compounds such as color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity;

(D) relate the physical and chemical behavior of an element, including bonding and classification, to its placement on the Periodic Table; and

(E) relate the structure of water to its function as a solvent and investigate the properties of solutions and factors affecting gas and solid solubility, including nature of solute, temperature, pressure, pH, and concentration.

Integrated Physics and Chemistry (7) Science Concepts. The student knows that changes in matter affect everyday life. The student is expected to

(A) investigate changes of state as it relates to the arrangement of particles of matter and energy transfer;

(B) recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons; and

(C) demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.

Objective 5: The student will demonstrate an understanding of motion, forces, and energy.

Integrated Physics and Chemistry (4) Science Concepts. The student knows concepts of force and motion evident in everyday life. The student is expected to

(A) describe and calculate an object's motion in terms of position, displacement, speed, and acceleration;

(B) measure and graph distance and speed as a function of time using moving toys;

(C) investigate how an object's motion changes only when a net force is applied, including activities and equipment such as toy cars, vehicle restraints, sports activities, and classroom objects;

(D) assess the relationship between force, mass, and acceleration, noting the relationship is independent of the nature of the force, using equipment such as dynamic carts, moving toys, vehicles, and falling objects; and

(E) apply the concept of conservation of momentum using action and reaction forces such as students on skateboards.

Integrated Physics and Chemistry (5) Science Concepts. The student recognizes multiple forms of energy and knows the impact of energy transfer and energy conservation in everyday life. The student is expected to

(D) investigate the law of conservation of energy;

(E) investigate and demonstrate the movement of thermal energy through solids, liquids, and gases by convection, conduction, and radiation such as in weather, living, and mechanical systems;

(G) explore the characteristics and behaviors of energy transferred by waves, including acoustic, seismic, light, and waves on water as they superpose on one another, bend around corners, reflect off surfaces, are absorbed by materials, and change direction when entering new materials; and

(I) critique the advantages and disadvantages of various energy sources and their impact on society and the environment.

TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS
GRADE 10 SCIENCE

Objective 1: The student will demonstrate an understanding of the nature of science.

Biology (1) and Integrated Physics and Chemistry (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.

Biology (2) Scientific Processes.* The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to

(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology;

(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;

(G) analyze, evaluate, make inferences, and predict trends from data; and

(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.

Integrated Physics and Chemistry (3) Scientific Processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions. 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; and

(C) draw inferences based on data related to promotional materials for products and services.

*Although the student expectations for Integrated Physics and Chemistry (2) B, C, D, and E are not listed in this document, they are almost identical to the student expectations for Biology (2) E, F, G, and H, respectively, and are therefore eligible for assessment.

Objective 2: The student will demonstrate an understanding of the organization of living systems.

Biology (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

(B) investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules.

Biology (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;

(E) identify and illustrate changes in DNA and evaluate the significance of these changes; and

(F) predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance.

Biology (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

(C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals.

Biology (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; and

(B) describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants.

Objective 3: The student will demonstrate an understanding of the interdependence of organisms and the environment.

Biology (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

(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.

Biology (7) Science Concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to

(C) analyze and evaluate how natural selection produces change in populations, not individuals;

(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; and

(E) analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species.

Biology (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) compare variations and adaptations of organisms in different ecosystems; and

(C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids.

Objective 4: The student will demonstrate an understanding of the structures and properties of matter.

Integrated Physics and Chemistry (6) Science Concepts. The student knows that relationships exist between the structure and properties of matter. The student is expected to

(C) analyze physical and chemical properties of elements and compounds such as color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity; and

(E) relate the structure of water to its function as a solvent and investigate the properties of solutions and factors affecting gas and solid solubility, including nature of solute, temperature, pressure, pH, and concentration.

Integrated Physics and Chemistry (7) Science Concepts. The student knows that changes in matter affect everyday life. The student is expected to

(A) investigate changes of state as it relates to the arrangement of particles of matter and energy transfer;

(B) recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons; and

(C) demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.

Objective 5: The student will demonstrate an understanding of motion, forces, and energy.

Integrated Physics and Chemistry (4) Science Concepts. The student knows concepts of force and motion evident in everyday life. The student is expected to

(A) describe and calculate an object's motion in terms of position, displacement, speed, and acceleration;

(B) measure and graph distance and speed as a function of time using moving toys;

(C) investigate how an object's motion changes only when a net force is applied, including activities and equipment such as toy cars, vehicle restraints, sports activities, and classroom objects;

(D) assess the relationship between force, mass, and acceleration, noting the relationship is independent of the nature of the force, using equipment such as dynamic carts, moving toys, vehicles, and falling objects; and

(E) apply the concept of conservation of momentum using action and reaction forces such as students on skateboards.

Integrated Physics and Chemistry (5) Science Concepts. The student recognizes multiple forms of energy and knows the impact of energy transfer and energy conservation in everyday life. The student is expected to

(D) investigate the law of conservation of energy;

(E) investigate and demonstrate the movement of thermal energy through solids, liquids, and gases by convection, conduction, and radiation such as in weather, living, and mechanical systems;

(F) evaluate the transfer of electrical energy in series and parallel circuits and conductive materials; and

(G) explore the characteristics and behaviors of energy transferred by waves, including acoustic, seismic, light, and waves on water as they superpose on one another, bend around corners, reflect off surfaces, are absorbed by materials, and change direction when entering new materials.