

<p>TEKS * = TAKS objective (tested for) √ = TEKS that are tested on AP* exams Bold = high emphasis on AP exam(s) <i>Italics</i> = medium emphasis on AP exam(s) Plain = low emphasis on AP exam(s) “such as...” indicates a likely test item</p>	AP BIOLOGY	AP CHEMISTRY	AP PHYSICS	AP ENVIRONMENTAL SCIENCE	Examples/ Activities	Commentary
Science, Grade 6						
<p>(6.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:</p>					<ul style="list-style-type: none"> • 2000 APES question #1 (Energy conversions and calculations) 	
<p>(A) demonstrate safe practices during field and laboratory investigations; and</p>	√	√	√	√	<ul style="list-style-type: none"> • Lab safety* 	
<p>(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.</p>				√		
<p>(6.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:</p>					<ul style="list-style-type: none"> • Science Fair* • Mystery Box Activity* • Project Wild – "Turkey Trouble"* • Project Wild – "Water's Going On?!"* • Data Table* • 2000 APES question #2 (Recycling, environmental decision making, document based) • 2000 APES question #4 (Human population, graph interpretation) • 2001 APES question #2 (Experimental design, document based) • 1999 APBIO question #4 (Characteristics of DNA and classic experiment that proved DNA is the molecule heredity) • 2000 APPHYC Mech question #1 (Pendulum lab question) • 2001 AP Phy C EM question #2 (Potential vs time experiment) • 2002 APPHY-C Mech question # 3 	<p>Frequent laboratory experiences (40% minimum); inquiry labs encouraged once skills are mastered.</p> <p>This is the basis for understanding all sciences. Students will be successful if they understand the scientific method.</p>

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					(Potential energy, force, and displacement) • 2002 AP CHEM question #5 (Molar heat of neutralization lab question)	
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;	√	√	√	√		
(B) collect data by observing and measuring;	√	√	√	√		
(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;	√	√	√	√		
(D) communicate valid conclusions; and	√	√	√	√		
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.	√	√	√	√		
(6.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:					• 2002 APES question #4 (Global change, climate, document based)	Higher level thinking leads to higher level learning.
<i>(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;</i>	√			√		
<i>(B) draw inferences based on data related to promotional materials for products and services;</i>				√		
<i>(C) represent the natural world using models and identify their limitations;</i>	√			√		
<i>(D) evaluate the impact of research on scientific thought, society, and the environment; and</i>				√		
(E) connect Grade 6 science concepts with the history of science and contributions of scientists.					• Scientist Biography* • Project Wild Case Studies/activities – ex. "What You Wear is What They Were," "Polar Bears in Phoenix," "Checks and Balances"*	
(6.4) Scientific processes. The student knows how to use a variety						As in any work-related

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of tools and methods to conduct science inquiry. The student is expected to:						situation, the ability to use tools properly and efficiently helps students to gain skills and confidence to be successful in science.
(A) collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes; and	√	√	√	√		
(B) identify patterns in collected information using percent, average, range, and frequency.	√	√	√	√	<ul style="list-style-type: none"> Maintain a daily/weekly/monthly weather log (temperature, humidity, pressure, wind speed & direction)* 	Stressing connections and patterns helps students to learn to look for them in all of their analyses.
(6.5) Scientific concepts. The student knows that systems may combine with other systems to form a larger system. The student is expected to:						
(A) identify and describe a system that results from the combination of two or more systems such as in the solar system; and						
(B) describe how the properties of a system are different from the properties of its parts.	√					In APBIO, this is fundamental to body systems, cells, and biomes.
(6.6) Scientific concepts. The student knows that there is a relationship between force and motion. The student is expected to:						
(A) identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force;			√		<ul style="list-style-type: none"> Physics of Sports* Coasters #1* 	

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					<ul style="list-style-type: none"> • 1999 APPHY-B question #1 (Force and motion of a Mars rover) • 1999 APPHY-C Mech question #2 (Object falling through a planet) • 2002 APPHY-B question #1 (Rocket thrusting upwards) 	
<p>(B) demonstrate that changes in motion can be measured and graphically represented; and</p>			√		<ul style="list-style-type: none"> • Coasters #2* • 2000 APPHY-B question #1 (Velocity vs. time graph) • 2001 APPHY-C Mech question #1 (Cart colliding with a force probe) • 2002 APPHY-C Mech question #3 (Cart colliding with a spring) 	
<p>(C) identify forces that shape features of the Earth including uplifting, movement of water, and volcanic activity.</p>				√		
<p>(6.7) Science concepts. The student knows that substances have physical and chemical properties. The student is expected to:</p>						
<p><i>(A) demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances; and</i></p>		√				
<p><i>(B) classify substances by their physical and chemical properties.</i></p>		√			<ul style="list-style-type: none"> • 2001 APCHEM question #5 (Practical applications incl. conductivity, boiling pt., reactivity, and pH) 	
<p>(6.8) Science concepts. The student knows that complex interactions occur between matter and energy. The student is expected to:</p>						
<p>(A) define matter and energy;</p>		√	√			
<p>(B) explain and illustrate the interactions between matter and energy in the water cycle and in the decay of biomass such as in a compost bin; and</p>	√			√	<ul style="list-style-type: none"> • Evaporation and Condensation* • Draw and illustrate the water cycle • Field trip to sanitary landfill or recycling 	

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					center	
(C) describe energy flow in living systems including food chains and food webs.	√			√	<ul style="list-style-type: none"> Project Wild –“Deadly Links”* Using color to survive in nature* Human Food Web Game (each person is an organism, start with producer, throw ball of yarn throughout the web; show what happens if a species disappears); Food Web Bulletin Boards (use local organisms, draw pictures or use names and then arrows to make a bulletin board illustrating the food web).* 	
(6.9) Science concepts. The student knows that obtaining, transforming, and distributing energy affects the environment. The student is expected to:					<ul style="list-style-type: none"> 1999 APES question #2 (Resources, environmental law) 	This often involves mathematical computations in APES.
(A) identify energy transformations occurring during the production of energy for human use such as electrical energy to heat energy or heat energy to electrical energy;		√	√	√	<ul style="list-style-type: none"> 2001 APPHY-B question #5 (Resistor used as a thermometer) 2002 APPHY-C EM question #2 (Cart transferring energy to a spring) 	Grade 6 TEKS only—important topic for APES
(B) <i>compare methods used for transforming energy in devices such as water heaters, cooling systems, or hydroelectric and wind power plants; and</i>				√	<ul style="list-style-type: none"> Guest speaker from local energy supplier LCRA Energy Efficiency Program (household energy efficiency— geared to middle school grades) http://www.lcra.org/energy/powerhouse.html 	Grade 6 TEKS only—important topic for APES
(C) <i>research and describe energy types from their source to their use and determine if the type is renewable, non-renewable, or inexhaustible.</i>				√	<ul style="list-style-type: none"> Coal Investigations from the American Coal Society* 	
(6.10) Science concepts. The student knows the relationship between structure and function in living systems. The student is expected to:					<ul style="list-style-type: none"> 2002 APBIO question #3 (Physiology and the evolution of systems in various phyla) 	Major theme in APBIO
(A) differentiate between structure and function.	√					

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(B) determine that all organisms are composed of cells that carry on functions to sustain life; and	√					
(C) identify how structure complements function at different levels of organization including organs, organ systems, organisms, and populations.	√					
(6.11) Science concepts. The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:					<ul style="list-style-type: none"> • 1999 APBIO question #4 (Characteristics of DNA and classic experiment that proved DNA is the molecule heredity) • 2001 APBIO question #2 (Evolution and natural selection) 	Heredity and evolution are major themes in APBIO.
(A) identify some changes in traits that can occur over several generations through natural occurrence and selective breeding;	√					
(B) identify cells as structures containing genetic material; and	√				<ul style="list-style-type: none"> • Edible cell * 	
(C) interpret the role of genes in inheritance.	√ √					
(6.12) Science concepts. The student knows that the responses of organisms are caused by internal or external stimuli. The student is expected to:					<ul style="list-style-type: none"> • 2000 APBIO question #4 (Adaptation and defense mechanisms) 	
(A) identify responses in organisms to internal stimuli such as hunger or thirst;	√					
(B) identify responses in organisms to external stimuli such as the presence or absence of heat or light; and	√					
(C) identify components of an ecosystem to which organisms may respond.	√			√	<ul style="list-style-type: none"> • Habitat Selection Lab (modeled after AP Biology Habitat Selection lab)* 	
(6.13) Science concepts. The student knows components of our solar system. The student is expected to:						
(A) identify characteristics of objects in our solar system including the Sun, planets, meteorites, comets, asteroids, and moons; and						
(B) describe types of equipment and transportation needed for space						

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travel.						
(6.14) Science concepts. The student knows the structures and functions of Earth systems. The student is expected to:						
<i>(A) summarize the rock cycle;</i>				√	• Make posters showing the rock cycle	
(B) identify relationships between groundwater and surface water in a watershed; and				√		
<i>(C) describe components of the atmosphere, including oxygen, nitrogen, and water vapor, and identify the role of atmospheric movement in weather change.</i>				√		Knowing these cycles helps the students understand the interdependence of life with abiotic forces.
Science, Grade 7						
(7.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate and ethical practices. The student is expected to:						
(A) demonstrate safe practices during field and laboratory investigations; and	√	√	√	√		
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.				√		
(7.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:					<ul style="list-style-type: none"> • “Do Mosquitos Transmit HIV?” Roleplay (Designing an experiment to test a very complex scientific problem)* • Scuds on Drugs Lab (Effect of aspirin on heart rate invertebrates)* • Population Growth Lab (Modeling Exponential Growth Lab)* • Thumb Variation Lab* (Measuring diversity of human thumb length) • Emission Impossible* 	Frequent laboratory experiences (40% minimum); inquiry labs encouraged once skills are mastered.

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					<ul style="list-style-type: none"> • 2000 APES question #4 (Human population, graph interpretation) • 2002 APES question #3 (Environmental quality (toxicity levels), graphing) • 1999 APBIO question #1 (Design an experiment for photosynthesis) • 1999 APBIO question #3 (Kingdom taxonomy) • 1999 APBIO question #4 (Characteristics of DNA and classic experiment that proved DNA is the molecule heredity) • 2002 APPHY-C Mech question #3 (Potential energy, force, and displacement) • 2001 APCHEM question #6 (Kinetics lab question) 	
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;	√	√	√	√		
(B) collect data by observing and measuring;	√	√	√	√		
(C) organize, analyze, make inferences, and predict trends from direct and indirect evidence;	√	√	√	√	<ul style="list-style-type: none"> • Project Wild – "Turkey Trouble," "Water's Going On?!" (for TEKS 7.2C–E) These activities are part of the Project WILD K–12 Education Curriculum and Activity Guide, copyright 2002 by the Council for Environmental Education. The complete Activity Guide can be obtained by attending a Project WILD workshop. For more information, visit 	

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					www.projectwild.org.	
(D) communicate valid conclusions; and	√	√	√	√		
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.	√	√	√	√		
(7.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:					<ul style="list-style-type: none"> • 1999 APES question #4 (Pesticides, environmental decision making, document based) • 2002 APBIO question #2 (Interpretation of data associated with physiology) • 2002 APBIO question #4 (Osmosis based data provided. Predict the effect of osmosis on plants) 	
(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;	√					
(B) draw inferences based on data related to promotional materials for products and services;						
(C) represent the natural world using models and identify their limitations;	√			√		
(D) evaluate the impact of research on scientific thought, society, and the environment; and				√		Environmental laws are tested on the APES exam.
(E) connect Grade 7 science concepts with the history of science and contributions of scientists.	√					Darwin and Mendel are the most frequently mentioned scientists in APBIO and should be emphasized in 7.10.
(7.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:						

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<p>(A) collect, analyze, and record information to explain a phenomenon using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, and computer probes, timing devices, magnets, and compasses; and</p>	√	√	√	√	<ul style="list-style-type: none"> DNA Extraction Lab* Dissection Labs (Comparing different phyla) Computer Probes with Logger Pro or Lab Pro Software-Have Multiple Labs Population Growth Lab (Modeling exponential growth)* Snail Pull Lab (Calculate and compare the relative pulling strength of humans and snails)* Adopt a body of water (creek, pond, etc.) and do standard water tests on the water 	
<p>(B) collect and analyze information to recognize patterns such as rates of change.</p>	√	√	√	√	<ul style="list-style-type: none"> Population Growth Lab (Modeling exponential growth)* 2001 AP CHEM question #6 (Kinetics lab question) 	
<p>(7.5) Science concepts. The student knows that an equilibrium of a system may change. The student is expected to:</p>						
<p>(A) describe how systems may reach an equilibrium such as when a volcano erupts; and</p>		√		√		
<p>(B) observe and describe the role of ecological succession in maintaining an equilibrium in an ecosystem.</p>	√			√	<ul style="list-style-type: none"> Biome PowerPoint Presentation* Aquatic Succession – Place pond water in variety of containers; add different amounts of fertilizer to each container; observe change in amount of algae over time* 	
<p>(7.6) Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:</p>						
<p>(A) <i>demonstrate basic relationships between force and motion using simple machines including pulleys and levers;</i></p>			√		<ul style="list-style-type: none"> 1999 APPHY-C Mech question #3 (Force, torque, lever) 	This is emphasized on TAKS and is not

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					<ul style="list-style-type: none"> • 2000 APPHY-B question #2 (Blocks and pulley) • 2000 APPHY-C Mech question #3 (Pulleys and Atwood machine) • 2001 APPHY-C Mech question #3 (Block, pulley, and rotation) 	addressed in grade 8. For students that skip IPC, this may their final exposure before TAKS.
(B) demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force; and			√		<ul style="list-style-type: none"> • 1999 APPHY-C Mech question #3 (Static equilibrium) • 2000 APPHY-B question #1 (Velocity vs time graph) • 2000 APPHY-C Mech question #3 (Static equilibrium) 	
(C) relate forces to basic processes in living organisms including the flow of blood and the emergence of seedlings.	√					
(7.7) Science concepts. The student knows that substances have physical and chemical properties. The student is expected to:						This is fundamental knowledge for APPHYS and APCHEM.
(A) identify and demonstrate everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood;		√				
(B) describe physical properties of elements and identify how they are used to position an element on the periodic table; and		√	√			
(C) recognize that compounds are composed of elements.		√				
(7.8) Science concepts. The student knows that complex interactions occur between matter and energy. The student is expected to:					<ul style="list-style-type: none"> • 2002 APES question #2 (Resource supply (water), environmental decision making) 	
(A) illustrate examples of potential and kinetic energy in everyday life such as objects at rest, movement of geologic faults, and falling water; and		√	√	√	<ul style="list-style-type: none"> • 1999 APPHY-B question #3 (Energy of a cart rolling down a hill) • 1999 APPHY-C Mech question #1 	

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					<p>(Energy of a pendulum)</p> <ul style="list-style-type: none"> 2002 APPHY-B question #2 (Potential energy graph) 	
<p><i>(B) identify that radiant energy from the Sun is transferred into chemical energy through the process of photosynthesis.</i></p>	√			√	<ul style="list-style-type: none"> Photosynthesis Lab using <i>Elodea</i> 1999 APBIO question #1 (Design an experiment for photosynthesis) 	<p>Students should be able to explain <u>how</u> this energy transformation occurs.</p>
<p>(7.9) Science concepts. The student knows the relationship between structure and function in living systems. The student is expected to:</p>					<ul style="list-style-type: none"> 2001 APBIO question #1 (Relationship between structure and function in some human systems) 2002 APBIO question #3 (Physiology and the evolution of systems in various phyla) 	<p>This is a major theme in APBIO.</p>
<p>(A) identify the systems of the human organism and describe their functions; and</p>	√				<ul style="list-style-type: none"> “Gross and Cool Body” Web site (Researching a body system on Web site and presenting to the rest of class as oral presentation)* 2000 APBIO question #4 (Adaptation and defense mechanisms) 	
<p><i>(B) describe how organisms maintain stable internal conditions while living in changing external environments.</i></p>	√				<ul style="list-style-type: none"> 2000 APBIO question #2 (Feedback mechanisms for factors in the body) 	
<p>(7.10) Science concepts. The student knows that species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:</p>					<ul style="list-style-type: none"> 2001 APBIO question #2 (Evolution and natural selection) 2001 APBIO question #4 (Proteins and their relationship to DNA, RNA, and the cell membrane) 2000 APBIO question #3 (DNA question asking students to relate DNA to mitosis) 	<p>Heredity and evolution are major themes in APBIO.</p>
<p>(A) identify that sexual reproduction results in more diverse</p>	√					

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offspring and asexual reproduction results in more uniform offspring;						
(B) compare traits of organisms of different species that enhance their survival and reproduction; and	√				<ul style="list-style-type: none"> • “Evolve a Bird Activity” (Changing characteristics on a bird diagram to demonstrate how it would be adapted to other environments)* • “Create a New Species” (Creating a new species and describing it as a scientific paper)* 	
(C) distinguish between dominant and recessive traits and recognize that inherited traits of an individual are contained in genetic material.	√					
(7.11) Science concepts. The student knows that the responses of organisms are caused by internal or external stimuli. The student is expected to:					<ul style="list-style-type: none"> • 2002 APES question #3 (Environmental quality (toxicity levels), graphing) • 2002 APBIO question #1 (Human genome and biochemistry) 	
(A) analyze changes in organisms such as a fever or vomiting that may result from internal stimuli; and	√					
(B) identify responses in organisms to external stimuli found in the environment such as the presence of absence of light.	√			√	<ul style="list-style-type: none"> • Earthworm Behavioral Reactions and External Anatomy lab* 	
(7.12) Science concepts. The student knows that there is a relationship between organisms and the environment. The student is expected to:					<ul style="list-style-type: none"> • 2000 APES question #3 (Endangered species, environmental law) 	This concept is very important on TAKS and a major theme in APBIO.
(A) identify components of an ecosystem;	√			√	<ul style="list-style-type: none"> • “Create a New Species” (Creating a new species and describing it as a scientific paper. Part of this includes making a diagram of a food web that includes the organism)* 	
(B) observe and describe how organisms including producers,	√			√	<ul style="list-style-type: none"> • Trophic Pyramids 	

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consumers, and decomposers live together in an environment and use existing resources;					<ul style="list-style-type: none"> Ecosystem Observations – students go outdoors, observe and area and record EVERYTHING found in that ecosystem; make posters/power point, etc.* 	
(C) describe how different environments support different varieties of organisms; and	√			√		
(D) observe and describe the role of ecological succession in ecosystems.	√			√	<ul style="list-style-type: none"> Aquatic Succession – Place pond water in variety of containers; add different amounts of fertilizer to each container; observe change in amount of algae over time* 	
(7.13) Science concepts. The student knows components of our solar system. The student is expected to:						
(A) identify and illustrate how the tilt of the Earth on its axis as it rotates and revolves around the Sun causes changes in seasons and the length of a day; and						
(B) relate the Earth’s movement and the moon’s orbit to the observed cyclical phases of the moon.						
(7.14) Science concepts. The student knows that natural events and human activity can alter Earth systems. The student is expected to:					<ul style="list-style-type: none"> 1999 APES question #2 (Resources, environmental law) 2000 APES question #2 (Recycling, environmental decision making, document based) 2000 APES question #3 (Endangered species, environmental law) 2002 APES question #2 (Resource supply (water), environmental decision making) 2002 APES question #4 (Global change, climate, document based) 	
(A) describe and predict the impact of different catastrophic events				√		

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on the Earth;						
(B) analyze effects of regional erosional deposition and weathering; and				√		
(C) make inferences and draw conclusions about effects of human activity on Earth’s renewable, non-renewable, and inexhaustible resources.				√		“Tragedies of the Commons” is a major theme in APES and can be covered in grade 7 by the biome project (also covered in 7.12).
Science, Grade 8						
(8.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate and ethical practices. The student is expected to:					<ul style="list-style-type: none"> • 2001 APES question #1 (Energy conversions and calculations) • 2002 APES question #1 (Energy conversions and calculations) 	
(A) demonstrate safe practices during field and laboratory investigations; and	√	√	√	√		
(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.				√		
(8.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:					<ul style="list-style-type: none"> • Water Use Project* • 1999 APES question #1 (Environmental quality (water), experimental design) • 2001 APES question #4 (Environmental quality (water), environmental law, data interpretation) • 2000 APBIO question #1 (Lab based question on factors effecting enzymes) • 2001 APBIO question #3 (Lab based question on dissolved oxygen) 	Frequent laboratory experiences (40% minimum); inquiry labs encouraged once skills are mastered.

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					and productivity) • 2000 APPHY-B question #6 (Specific heat lab question) • 2000 APCHEM question #5 (Freezing point depression lab question)	
(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;	√	√	√	√	• Project Wild – "Turkey Trouble," "Water's Going On?!" (Applies to all of 8.2) These activities are part of the Project WILD K-12 Education Curriculum and Activity Guide, copyright 2002 by the Council for Environmental Education. For more information, visit www.projectwild.org .	
(B) collect data by observing and measuring;	√	√	√	√		
(C) organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence;	√	√	√	√		
(D) communicate valid conclusions; and	√	√	√	√		
(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.	√	√	√	√		
(8.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:					• 1999 APES question #4 (Pesticides, environmental decision making, document based) • 2002 APES question #2 (Resource supply (water), environmental decision making) • 2002 APES question #4 (Global change, climate, document based)	
<i>(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;</i>	√					
<i>(B) draw inferences based on data related to promotional materials</i>						

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<i>for products and services;</i>						
<i>(C) represent the natural world using models and identify their limitations;</i>	√			√		
<i>(D) evaluate the impact of research on scientific thought, society, and the environment; and</i>				√	<ul style="list-style-type: none"> Project Wild – "Enviro-Ethics," "Ethi-Reasoning," "Ethi-Thinking" These activities are part of the Project WILD K-12 Education Curriculum and Activity Guide, copyright 2002 by the Council for Environmental Education. For more information, visit the Texas Project WILD Coordinator at www.projectwild.org. 	
(E) connect Grade 8 science concepts with the history of science and contributions of scientists.	√					
(8.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:					<ul style="list-style-type: none"> 1999 APES question #1 (Environmental quality (water), experimental design) 	Experimental design and making predictions from collected data is a skill required on all AP science exams.
(A) collect, record and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices; and	√	√	√	√	<ul style="list-style-type: none"> Adopt a body of water (creek, pond, etc.) and do standard water tests on the water 	
(B) extrapolate from collected information to make predictions.	√	√	√	√	<ul style="list-style-type: none"> Population Growth Lab (Predicting the Earth's population in the future by extrapolating data to 2010)* 	
(8.5) Scientific processes. The student knows that relationships exist between science and technology. The student is expected to:					<ul style="list-style-type: none"> Invention Convention, Science Fair, Robotics Competition, Odyssey of the 	

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					Mind <ul style="list-style-type: none"> Cooperative Groups research and design – pollution control devices, turtle exclusion devices, erosion control devices/methods, etc. 	
<i>(A) identify a design problem and propose a solution;</i>	√		√	√		Emphasis on control and variables
<i>(B) design and test a model to solve the problem; and</i>	√		√	√		
<i>(C) evaluate the model and make recommendations for improving the model.</i>	√		√	√		
(8.6) Science concepts. The student knows that interdependence occurs among living systems. The student is expected to:					<ul style="list-style-type: none"> 1999 APBIO question #2 (Communication among different cells) 2002 APBIO question #3 (Physiology and the evolution of systems in various phyla) 2002 APCHEM question #1 (Acid equilibria and titration) 	Covered in grade 6.
<i>(A) describe interactions among systems in the human organism;</i>	√					
<i>(B) identify feedback mechanisms that maintain equilibrium of systems such as body temperature, turgor pressure, and chemical reactions; and</i>	√	√			<ul style="list-style-type: none"> 2000 APBIO question #2 (Feedback mechanisms for factors in the body) 	
<i>(C) describe interactions within ecosystems.</i>	√			√		
(8.7) Science concepts. The student knows that there is a relationship between force and motion. The student is expected to:						
<i>(A) demonstrate how unbalanced forces cause changes in the speed or direction of an object’s motion; and</i>			√		<ul style="list-style-type: none"> 1999 APPHY-B question #5 (Coin on a rotating turntable) 2000 APPHY-C Mech question #2 (Falling object) 2001 APPHY-B question #1 (Ball moving in a vertical circle) 	If IPC is skipped, this is the only time this topic will be taught before TAKS.

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					<ul style="list-style-type: none"> • 2001 APPHY-C Mech question #1 (Force acting on a cart on a track) • 2002 APPHY-B question #1 (Rocket thrusting upward) • 2002 APPHY-C Mech question #1 (Car crashing into another object) 	
(B) recognize that waves are generated and can travel through different media.			√		<ul style="list-style-type: none"> • 1999 APCHEM question #2 (atomic structure w/ bond energy and line spectra) • 1999 APPHY-B question #6 (Optics lab question) • 2000 APPHY-B question #4 (Light passing through glass) • 2001 APPHY-B question #4 (Refraction of light) • 2002 APPHY-B question #4 (Light passing through a lens) 	
(8.8) Science concepts. The student knows that matter is composed of atoms. The student is expected to:					<ul style="list-style-type: none"> • 2000 APCHEM question #7 (Atomic structure w/isotopes, electron configuration, electron dot structures, and ionization energy) • 2002 APCHEM question #6 (atomic structure and bonding) • 2001 APPHY-B question #7 (Nuclear fusion) 	
<i>(A) describe the structure and parts of an atom; and</i>		√	√			
(B) identify the properties of an atom including mass and electrical charge.		√	√			
(8.9) Science concepts. The student knows that substances have chemical and physical properties. The student is expected to:					<ul style="list-style-type: none"> • 1999-2002 APCHEM question #4 (Chemical reaction prediction) 	

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					<ul style="list-style-type: none"> 2000 APCHEM question #7 (Atomic structure w/isotopes, electron configuration, electron dot structures and ionization energy) 	
<i>(A) demonstrate that substances may react chemically to form new substances;</i>		√				Students should learn types of bonding, simple formula writing, simple equation writing.
<i>(B) interpret information on the periodic table to understand that physical properties are used to group elements;</i>		√				
<i>(C) recognize the importance of formulas and equations to express what happens in a chemical reaction; and</i>		√				
<i>(D) identify that physical and chemical properties influence the development and application of everyday materials such as cooking surfaces, insulation, adhesives, and plastics.</i>		√				
(8.10) Science concepts. The student knows that complex interactions occur between matter and energy. The student is expected to:					<ul style="list-style-type: none"> 1999 APCHEM question #6 (Entropy, enthalpy, and free energy) 2001 APCHEM question #2 (Entropy, enthalpy, free energy, and bond energy) 	
(A) illustrate interactions between matter and energy including specific heat;		√	√		<ul style="list-style-type: none"> 2000 APPHY-B question #6 (Specific heat lab question) 	Students skipping IPC should calculate specific heat.
(B) describe interactions among solar, weather, and ocean systems; and				√	<ul style="list-style-type: none"> Modeling A Thermocline* 	
(C) identify and demonstrate that loss or gain of heat energy occurs during exothermic and endothermic chemical reactions.	√	√				
(8.11) Science concepts. The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:					<ul style="list-style-type: none"> 2000 APES question #3 (Endangered species, environmental law) 1999 APBIO question #4 (Characteristics of DNA and classic 	

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					experiment that proved DNA is the molecule heredity) <ul style="list-style-type: none"> • 2001 APBIO question #2 (Evolution and natural selection) • 2001 APBIO question #4 (Proteins and their relationship to DNA, RNA, and the cell membrane) • 2002 APBIO question #1 (Human genome and biochemistry) 	
<i>(A) identify that change in environmental conditions can affect the survival of individuals and of species;</i>	√			√	<ul style="list-style-type: none"> • Research and report on (use variety of methods) an endangered species. 	If this concept is not taught in grade 7, greater emphasis must be placed on it now.
<i>(B) distinguish between inherited traits and other characteristics that result from interactions with the environment; and</i>	√					
<i>(C) make predictions about possible outcomes of various genetic combinations of inherited characteristics.</i>	√					
(8.12) Science concepts. The student knows that cycles exist in Earth systems. The student is expected to:					<ul style="list-style-type: none"> • 2002 APES question #2 (Resource supply (water), environmental decision making) • 2002 APES question #4 (Global change, climate, document based) 	Emphasized here, not taught again except in APES.
<i>(A) analyze and predict the sequence of events in the lunar and rock cycles;</i>				√		
<i>(B) relate the role of oceans to climatic changes; and</i>				√		
<i>(C) predict the results of modifying the Earth’s nitrogen, water, and carbon cycles.</i>				√		
(8.13) Science concepts. The student knows characteristics of the universe. The student is expected to:						
<i>(A) describe characteristics of the universe such as stars and</i>						

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galaxies;						
(B) explain the use of light years to describe distances in the universe; and						
(C) research and describe historical scientific theories of the origin of the universe.						
(8.14) Science concepts. The student knows that natural events and human activities can alter Earth systems. The student is expected to:					<ul style="list-style-type: none"> • 1999 APES question #3 (Environmental quality (air), graph interpretation) • 1999 APES question #4 (Pesticides, environmental decision making, document based) • 2000 APES question #3 (Endangered species, environmental law) • 2002 APES question #4 (Global change, climate, document based) 	Emphasized here, not taught again except in APES.
<i>(A) predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, and continental drift;</i>				√		
(B) analyze how natural or human events may have contributed to the extinction of some species; and				√		
(C) describe how human activities have modified soil, water, and air quality.				√	<ul style="list-style-type: none"> • “Emission Impossible”* • Use test kits to test a variety of soils for texture/N/P/K and compare the results to where the soil was found (make connection between what was happening to soil and soil properties); do particulate test (index card with 1 square cm hole covered with sticky tape – place in different areas and check for particulates). 	

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