



Alignment Document

State of Texas And Aventa Learning Physical Science

Physical Science 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
112.42	Integrated Physics and Chemistry		
0	Scientific processes.		
112.42.1	The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.	Doing Science	Physical Science Labs
112.42.1.A	demonstrate safe practices during field and laboratory investigations;	Doing Science	Experimental Set Up
112.42.1.B	make wise choices in the use and conservation of resources and the disposal or recycling of materials.		
112.42.2	The student uses scientific methods during field and laboratory investigations.	Doing Science	Experimental Set Up
112.42.2.A	plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;	Doing Science	Experimental Set Up
112.42.2.B	collect data and make measurements with precision;	Doing Science	SI Units and Symbols
112.42.2.C	organize, analyze, evaluate, make inferences, and predict trends from data;	Doing Science	Experimental Set Up
112.42.2.D	communicate valid conclusions.	Doing Science	Experimental Set Up
112.42.3	The student uses critical thinking and scientific problem solving to make informed decisions.	Doing Science	Experimental Set Up
112.42.3.A	analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;	Doing Science	Experimental Set Up



112.42.3.B	draw inferences based on data related to promotional materials for products and services;		
112.42.3.C	evaluate the impact of research on scientific thought, society, and the environment;	Doing Science	Introduction
112.42.3.D	describe connections between physics and chemistry, and future careers;	Doing Science	Introduction
112.42.3.E	research and describe the history of physics, chemistry, and contributions of scientists.	Doing Science	Scientific Laws
		Atomic Structure	The Discovery of the Atom
0	Science concepts.		
112.42.4	The student knows concepts of force and motion evident in everyday life.	Motion	Motion
		Forces	Newton's Second Law of Motion
		Forces	Newton's Third Law
112.42.4.A	calculate speed, momentum, acceleration, work, and power in systems such as in the human body, moving toys, and machines;	Motion	Calculating Speed
		Motion	Acceleration
112.42.4.B	investigate and describe applications of Newton's laws such as in vehicle restraints, sports activities, geological processes, and satellite orbits;	Motion	Newton's First Law of Motion
		Motion	Sir Isaac and Seat Belts
112.42.4.C	analyze the effects caused by changing force or distance in simple machines as demonstrated in household devices, the human body, and vehicles;	Simple Machines	Overcoming Gravity and Friction
112.42.4.D	investigate and demonstrate mechanical advantage and efficiency of various machines such as levers, motors, wheels and axles, pulleys, and ramps.	Simple Machines	The Six Types of Simple Machines
112.42.5	The student knows the effects of waves on everyday life.	Waves	Introduction
		Waves	Waves
112.42.5.A	demonstrate wave types and their characteristics through a variety of activities such as modeling with ropes and coils, activating tuning forks, and interpreting data on seismic waves;		
112.42.5.B	demonstrate wave interactions including interference, polarization, reflection, refraction, and resonance within various materials;	Waves	Electromagnetic Radiation



112.42.5.C	identify uses of electromagnetic waves in various technological applications such as fiber optics, optical scanners, and microwaves;	Waves	Electromagnetic Radiation
112.42.5.D	demonstrate the application of acoustic principles such as in echolocation, musical instruments, noise pollution, and sonograms.	Waves	Sound Waves
112.42.6	The student knows the impact of energy transformations in everyday life.	Energy	Introduction
112.42.6.A	describe the law of conservation of energy;	Energy	Conservation of Energy
112.42.6.B	investigate and demonstrate the movement of heat through solids, liquids, and gases by convection, conduction, and radiation;	Energy	Heat and Temperature
112.42.6.C	analyze the efficiency of energy conversions that are responsible for the production of electricity such as from radiant, nuclear, and geothermal sources, fossil fuels such as coal, gas, oil, and the movement of water or wind;	Energy	Conservation of Energy
112.42.6.D	investigate and compare economic and environmental impacts of using various energy sources such as rechargeable or disposable batteries and solar cells;		
112.42.6.E	measure the thermal and electrical conductivity of various materials and explain results;	Energy	Heat and Temperature
112.42.6.F	investigate and compare series and parallel circuits;	Electricity & Magnetism	Electrical Current
112.42.6.G	analyze the relationship between an electric current and the strength of its magnetic field using simple electromagnets;	Electricity & Magnetism	Electrical Current
112.42.6.H	analyze the effects of heating and cooling processes in systems such as weather, living, and mechanical.	Energy	Heat and Temperature
112.42.7	The student knows relationships exist between properties of matter and its components.	Matter	Properties of Matter
112.42.7.A	investigate and identify properties of fluids including density, viscosity, and buoyancy;	Matter	Properties of Matter
112.42.7.B	research and describe the historical development of the atomic theory;	Atomic Structure	The Discovery of the Atom
112.42.7.C	identify constituents of various materials or objects such as metal salts, light sources, fireworks displays, and stars using spectral-analysis techniques;		
112.42.7.D	relate the chemical behavior of an element including bonding, to its placement on the periodic table;	Atomic Structure	The Structure of the Periodic Table
112.42.7.E	classify samples of matter from everyday life as being elements, compounds, or mixtures.	Matter	Classification of Matter



112.42.8	The student knows that changes in matter affect everyday life.	Matter	Properties of Matter
112.42.8.A	distinguish between physical and chemical changes in matter such as oxidation, digestion, changes in states, and stages in the rock cycle;	Chemical Reactions	Types of Reactions
112.42.8.B	analyze energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks to classify them as endergonic or exergonic reactions;	Chemical Reactions	Energy and Chemical Reactions
112.42.8.C	investigate and identify the law of conservation of mass;	Atomic Structure	The Discovery of the Atom
		Atomic Structure	Chemical Reactions and Equations
112.42.8.D	describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production;	Atomic Structure	Atomic Model
112.42.8.E	research and describe the environmental and economic impact of the end-products of chemical reactions.	Chemical Reactions	Types of Reactions
112.42.9	The student knows how solution chemistry is a part of everyday life.	Matter	What is Chemistry?
112.42.9.A	relate the structure of water to its function as the universal solvent;		
112.42.9.B	relate the concentration of ions in a solution to physical and chemical properties such as pH, electrolytic behavior, and reactivity;		
112.42.9.C	simulate the effects of acid rain on soil, buildings, statues, or microorganisms;		
112.42.9.D	demonstrate how various factors influence solubility including temperature, pressure, and nature of the solute and solvent;		
112.42.9.E	demonstrate how factors such as particle size, influence the rate of dissolving.		