



Alignment Document

State of Louisiana And Aventa Learning Chemistry

Chemistry

2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
0	Chemistry		
SI	Science as Inquiry		
0	The Abilities Necessary to Do Scientific Inquiry		
SI.1	Write a testable question or hypothesis when given a topic	Measurement	Scientific Method
SI.2	Describe how investigations can be observation, description, literature survey, classification, or experimentation	Organic Chemistry	Lab: Make Slime (polymers)
SI.3	Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls		
SI.4	Conduct an investigation that includes multiple trials and record, organize, and display data appropriately		
SI.5	Utilize mathematics, organizational tools, and graphing skills to solve problems	Gases	Temperature
SI.6	Use technology when appropriate to enhance laboratory investigations and presentations of findings		
SI.7	Choose appropriate models to explain scientific knowledge or experimental results (e.g., objects, mathematical relationships, plans, schemes, examples, role-playing, computer simulations)	Solutions	Lab: make solution of kool-aid
		Nuclear Chemistry	Lab: Construct a Bohr Model of C-13 atom

SI.8	Give an example of how new scientific data can cause an existing scientific explanation to be supported, revised, or rejected		
SI.9	Write and defend a conclusion based on logical analysis of experimental data	Solutions	Lab: make solution of kool-aid
SI.10	Given a description of an experiment, identify appropriate safety measures	Organic Chemistry	Lab: Make Slime (polymers)
0	Understanding Scientific Inquiry		
SI.11	Evaluate selected theories based on supporting scientific evidence		
SI.12	Cite evidence that scientific investigations are conducted for many different reasons		
SI.13	Identify scientific evidence that has caused modifications in previously accepted theories		
SI.14	Cite examples of scientific advances and emerging technologies and how they affect society (e.g., MRI, DNA in forensics)		
SI.15	Analyze the conclusion from an investigation by using data to determine its validity		
SI.16	Use the following rules of evidence to examine experimental results:		
SI.16.a	Can an expert's technique or theory be tested, has it been tested, or is it simply a subjective, conclusive approach that cannot be reasonably assessed for reliability?		
SI.16.b	Has the technique or theory been subjected to peer review and publication?		
SI.16.c	What is the known or potential rate of error of the technique or theory when applied?		
SI.16.d	Were standards and controls applied and maintained?		
SI.16.e	Has the technique or theory been generally accepted in the scientific community?		
PS	Physical Science		
0	Measurement and Symbolic Representation		
PS.1	Convert metric system units involving length, mass, volume, and time using dimensional analysis (i.e., factor-label method)	Measurement	SI Units
PS.2	Differentiate between accuracy and precision and evaluate percent error	Measurement	Lab: Accuracy and Uncertainty in measurements
		Measurement	Uncertainty



PS.3	Determine the significant figures based on precision of measurement for stated quantities	Measurement	Significant Figures
		Measurement	Uncertainty
PS.4	Use scientific notation to express large and small numbers	Measurement	Scientific Notation
		Measurement	Scientific Notation
PS.5	Write and name formulas for ionic and covalent compounds	Bonding	Ionic Bonding
		Bonding	Covalent Bonding
PS.6	Write and name the chemical formula for the products that form from the reaction of selected reactants	Matter	Equation Balancing
PS.7	Write a balanced symbolic equation from a word equation	Matter	Equation Balancing
0	Atomic Structure		
PS.8	Analyze the development of the modern atomic theory from a historical perspective	Atoms	The Atom
PS.9	Draw accurate valence electron configurations and Lewis dot structures for selected molecules, ionic and covalent compounds, and chemical equations	Bonding	Lewis Dot Structures
		Bonding	Lab: Bonding (P/P only)
		Matter	Equation Balancing
		Bonding	Covalent Bonding
PS.10	Differentiate among alpha, beta, and gamma emissions	Nuclear Chemistry	Radioactive Decay
PS.11	Calculate the amount of radioactive substance remaining after a given number of half-lives has passed	Nuclear Chemistry	Radioactive Decay
PS.12	Describe the uses of radioactive isotopes and radiation in such areas as plant and animal research, health care, and food preservation	Nuclear Chemistry	Radioactive Decay
PS.13	Identify the number of bonds an atom can form given the number of valence electrons	Bonding	Lab: Bonding (P/P only)
0	The Structure and Properties of Matter		
PS.14	Identify unknowns as elements, compounds, or mixtures based on physical properties (e.g., density, melting point, boiling point, solubility)		



PS.15	Predict the physical and chemical properties of an element based only on its location in the periodic table	Atoms	Regions of the Periodic Table
		Atoms	Lab: Periodic Table (P/P only)
		Atoms	Trends in the Periodic Table
		Atoms	The Elements
		Atoms	The Periodic Table
		Atoms	Valence Electrons
		Solutions	Lab: make solution of kool-aid
PS.16	Predict the stable ion(s) an element is likely to form when it reacts with other specified elements		
PS.17	Use the periodic table to compare electronegativities and ionization energies of elements to explain periodic properties, such as atomic size	Atoms	Trends in the Periodic Table
PS.18	Given the concentration of a solution, calculate the predicted change in its boiling and freezing points		
PS.19	Predict the conductivity of a solution		
PS.20	Express concentration in terms of molarity, molality, and normality	Solutions	Concentration
		Solutions	Lab: make solution of kool-aid
		Equilibrium	Concentration
PS.21	Design and conduct a laboratory investigation in which physical properties are used to separate the substances in a mixture	Solutions	Lab: make solution of kool-aid
PS.22	Predict the kind of bond that will form between two elements based on electronic structure and electronegativity of the elements (e.g., ionic, polar, nonpolar)	Bonding	Lab: Bonding (P/P only)
PS.23	Model chemical bond formation by using Lewis dot diagrams for ionic, polar, and nonpolar compounds	Nuclear Chemistry	Lab: Construct a Bohr Model of C-13 atom
		Bonding	Ionic Bonding
		Bonding	Lewis Dot Structures
		Bonding	Lab: Bonding (P/P only)
PS.24	Describe the influence of intermolecular forces on the physical and chemical properties of covalent compounds	Bonding	States of Matter
		Bonding	Covalent Bonding
		Solutions	Lab: make solution of kool-aid



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PS.25	Name selected structural formulas of organic compounds	Bonding	Covalent Bonding
PS.26	Differentiate common biological molecules, such as carbohydrates, lipids, proteins, and nucleic acids by using structural formulas	Organic Chemistry	Amino Acids
PS.27	Investigate and model hybridization in carbon compounds		
PS.28	Name, classify, and diagram alkanes, alkenes, and alkynes		
PS.29	Predict the properties of a gas based on gas laws (e.g., temperature, pressure, volume)	Gases	Lab: Observe gas laws by changing P, V, T
		Gases	Gas Laws
PS.30	Solve problems involving heat flow and temperature changes by using known values of specific heat and latent heat of phase change	Thermodynamics	Heat Flow
		Thermodynamics	Solving Problems Involving Heat Flow
		Rates	Temperature
0	Chemical Reactions		
PS.31	Describe chemical changes and reactions using diagrams and descriptions of the reactants, products, and energy changes	Matter	Classifying Chemical Reactions
		Organic Chemistry	Lab: Make Slime (polymers)
PS.32	Determine the concentration of an unknown acid or base by using data from a titration with a standard solution and an indicator	Acids & Bases	Properties of Acids and Bases
		Acids & Bases	Lab: Test household acids/bases
		Acids & Bases	Definition of Acids and Bases
		Acids & Bases	Acid and Base Strength
		Acids & Bases	The pH Scale
		Solutions	Lab: make solution of kool-aid
		Equilibrium	Concentration
PS.33	Calculate pH of acids, bases, and salt solutions based on the concentration of hydronium and hydroxide ions	Acids & Bases	The pH Scale
		Acids & Bases	Lab: Test household acids/bases
		Solutions	Lab: make solution of kool-aid
		Equilibrium	Concentration



PS.34	Describe chemical changes by developing word equations, balanced formula equations, and net ionic equations	Organic Chemistry	Lab: Make Slime (polymers)
		Bonding	Ionic Bonding
		Matter	Equation Balancing
PS.35	Predict products (with phase notations) of simple reactions, including acid/base, oxidation/reduction, and formation of precipitates	Acids & Bases	The pH Scale
		Acids & Bases	Properties of Acids and Bases
		Acids & Bases	Lab: Test household acids/bases
		Acids & Bases	Definition of Acids and Bases
		Acids & Bases	Acid and Base Strength
PS.36	Identify the substances gaining and losing electrons in simple oxidation-reduction reactions		
PS.37	Predict the direction of a shift in equilibrium in a system as a result of stress by using LeChatalier's principle	Equilibrium	Pressure
		Equilibrium	Lab: Le Chatelier's Principle (P/P only)
		Equilibrium	Le Chatelier's Principle
		Equilibrium	Temperature
PS.38	Relate the law of conservation of matter to the rearrangement of atoms in a balanced chemical equation	Matter	Lab: Conservation of mass (P/P only)
		Matter	Equation Balancing
		Nuclear Chemistry	Inside the Atom
PS.39	Conduct an investigation in which the masses of the reactants and products from a chemical reaction are calculated		
PS.40	Compute percent composition, empirical formulas, and molecular formulas of selected compounds in chemical reactions	Bonding	Covalent Bonding
		Solutions	Concentration



PS.41	Apply knowledge of stoichiometry to solve mass/mass, mass/volume, volume/volume, and mole/mole problems	Matter	The Mole
		Matter	Lab: Conservation of mass (P/P only)
		Matter	Molar Mass
		Matter	Atoms, Molecules, and Moles
		Matter	Stoichiometry
PS.42	Differentiate between activation energy in endothermic reactions and exothermic reactions	Thermodynamics	Chemical Processes
		Equilibrium	Temperature
PS.43	Graph and compute the energy changes that occur when a substance, such as water, goes from a solid to a liquid state, and then to a gaseous state		
PS.44	Measure and graph energy changes during chemical reactions observed in the laboratory	Organic Chemistry	Lab: Make Slime (polymers)
		Gases	Temperature
PS.45	Give examples of common chemical reactions, including those found in biological systems	Matter	Classifying Chemical Reactions
0	Forces and Motion		
PS.46	Identify and compare intermolecular forces and their effects on physical and chemical properties	Solutions	Lab: make solution of kool-aid
		Bonding	States of Matter
0	Interactions of Energy and Matter		
PS.47	Assess environmental issues related to the storage, containment, and disposal of wastes associated with energy production and use		