

WV CSO Curriculum Planning Tool

Advanced Chemistry

Standard	Obj.#	Objective	Projected Date	Date Taught	Date Assessed	Date Re-Taught	Date Re-Assessed
Standard 1: History and the Nature of Science	AC.1.1	formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.					
	AC.1.2	Science's practical and theoretical limitations.					
	AC.1.3	science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.					
	AC.1.4	conclude that science is a blend of creativity, logic and math					
	AC.1.5	key historical concepts and principles, impact on modern thought and life by identifying the scientist's contributions.					
	AC.1.6	integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.					
Standard 2: Science as Inquiry	AC.2.1	skills, attitudes and/or values of scientific inquiry					
	AC.2.2	demonstrate ethical practices for science					
	AC.2.3	Scientific for personal and societal issues.					
	AC.2.4	properly and safely manipulate equipment, materials, chemicals, organisms and models.					
	AC.2.5	conduct explorations in a variety of environments					
	AC.2.6	use appropriate technology solutions					
	AC.2.7	science processes within a problem solving setting					
	AC.2.8	design, conduct, evaluate and revise experiments					
Standard 3: Unifying Themes	AC.3.1	analyze systems to understand natural & designed world; systems analysis to make predictions about behaviors in systems; recognize order in matter, objects or events.					
	AC.3.2	apply evidence from models to make predictions about interactions and changes in systems.					
	AC.3.3	measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.					
	AC.3.4	understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased					
Standard 4: Science Subject Matter/Concepts	AC.4.1	classification of matter using the periodic table; kinetic molecular theory to explain physical states of matter; physical & chemical properties; & physical & chemical changes					
	AC.4.2	review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.					
	AC.4.3	Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.					
	AC.4.4	identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.					
	AC.4.5	associate electron configuration of elements with element location on periodic table.					
	AC.4.6	write electron dot structures for representative elements.					
	AC.4.7	predict the formulas of ionic compounds and molecular compounds.					
	AC.4.8	analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.					
	AC.4.9	using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.					
	AC.4.10	construct models to explain the structure and geometry of organic-inorganic molecules & lattice structures of crystals.					
	AC.4.11	recognize simple organic functional groups and name simple organic compounds.					

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	AC.4.12	predict the products and write balanced equations for the general types of chemical reactions.					
	AC.4.13	use dimensional analysis to perform unit conversions and to verify experimental calculations.					
	AC.4.14	Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.					
	AC.4.15	perform calculations using the combined and ideal gas laws.					
	AC.4.16	calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.					
	AC.4.17	experimentally determine the empirical formulas of hydrates.					
	AC.4.18	perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.					
	AC.4.19	factors that influence the rate of reaction.					
	AC.4.20	apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.					
	AC.4.21	review colligative properties.					
	AC.4.22	name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.					
	AC.4.23	predict the products upon adding water to both acidic and basic anhydrides.					
	AC.4.24	write and balance net ionic equations.					
	AC.4.25	solve problems using the solubility product constants.					
	AC.4.26	pH and/or pOH for various solutions & relate to pH scale.					
	AC.4.27	conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.					
	AC.4.28	oxidation & reduction as electron transfer within reactions.					
	AC.4.29	construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.					
	AC.4.30	enthalpy change in reactions using the heat of formation.					
	AC.4.31	evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.					
	AC.4.32	write balanced nuclear equations and make predications using half-life values.					
	AC.4.33	list the biological effects of radiation and the units used to measure radiation.					
	AC.4.34	compare and contrast fusion and fission reactions.					
	AC.4.35	research the application of nuclear technology.					
Standard 5: Scientific Design and Application	AC.5.1	summarize technological advances in chemistry.					
	AC.5.2	interdependence of science and technology.					
	AC.5.3	apply scientific skills and technological tools to design solutions that address personal and societal needs.					
	AC.5.4	scientific concepts underlying technological innovations.					
	AC.5.5	use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.					
Standard 6: Science in Personal and Social Perspectives	AC.6.1	current environmental issues pertaining to chemistry.					
	AC.6.2	impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.					
	AC.6.3	explore occupational opportunities in science and technology including the academic preparation necessary.					
	AC.6.4	decision making activities and actions to resolve science-technology-society issues.					