Grade Level(s)	11-12	Course	Chemistry A	Date Last Revised	January 17, 2011

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	Standard C1: Scientific Inquiry Scientific research may begin by generating new scientific questions that can be answered through replicable scientific investigations that are logically developed and conducted systematically. Scientific conclusions and explanations result from careful analysis of empirical evidence and the use of logical reasoning.						
	C1.1:A Generate new questions that can be investigated in the laboratory or field.						
	C1.1:B Evaluate the uncertainties or validity of scientific conclusions .						
	C1.1C Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume)						
	C1.1D Identify patterns in data and relate them to						

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Weeks 1-3	**C4.8** Electrons, protons, and neutrons are parts of the atom and have measurable properties, including mass and, in the case of protons and electrons, charge. The nuclei of atoms are composed of protons and neutrons. A kind of force that is only evident at nuclear distances holds the particles of the nucleus together against the electrical repulsion between the protons.	**Atomic Structure**			Power-Points Foldable Active Reading Worksheets Videos Reading Labs	Text book Internet News Articles Discovery Education	Labs Quizzes Tests
	C4.8B Describe the atom as mostly empty space with an extremely small, dense nucleus consisting of the protons and neutrons and an electron cloud surrounding the nucleus	.	I will describe that an atom has a dense center called a nucleus containing the protons and the neutrons. I will describe that electrons surround the nucleus in an electron cloud, which is mostly empty space.	Atomic nucleus Electron cloud Atom Empty space Dense Nucleus Protons Neutrons Electron cloud Dalton's Atomic Theory Cathode Ray			
	C4.8C Recognize that protons repel each other and that a strong force needs to be present to keep the nucleus intact	.	I will recognize that protons repel each other and that strong nuclear forces keep the nucleus together.	Protons Repel Strong force Nucleus Repulsion			

	C4.8D Give the number of electrons and protons present if the fluoride ion has a -1 charge.		I will give the number of electrons and protons that give the fluoride ion a -1 charge.	Number Electrons Protons Fluoride Charge Atomic number Mass number			
	C4.10A List the number of protons, neutrons, and electrons for any given ion or isotope.		I will list the number of protons, neutrons, and electrons for any given ion or isotope. For the first 20 elements as well as Fe, Au, Ag, Hg, I, Cr, Cu	Protons Neutrons Electrons Ion isotope	Subatomic Table Creation Activity		
	C4.10d Predict which isotope will have the greatest abundance given the possible isotopes for an element and the average atomic mass in the periodic table.		I will predict which isotope there is more of when given the atomic mass of each isotope and the average atomic mass of the element.	Isotope Abundance Element Average atomic mass Periodic table			
	C4.10e Write the symbol for an isotope, X Z A , where Z is the atomic number, A is the mass number, and X is the symbol for the element.		I will write the symbol for an isotope, X^{Z}_{A} , where Z is the atomic number, A is the mass number, and X is the atomic symbol. I will recognize that A and Z always represent the same numbers even though their location may be different	Symbol Isotope Atomic number Mass number symbol			

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Weeks 3-6		**Atomic Model**			Power-Points Foldable Active Reading Worksheets Videos Reading Labs	Text book Internet News Articles Discovery Education	Labs Quizzes Tests
	C4.9A: Identify elements with similar chemical and physical properties using the periodic table.		I will identify elements with similar chemical and physical properties using the periodic table.	Chemical properties Physical properties			
	C2.4a: Describe energy changes in flame tests of common elements in terms of the (characteristic) electron transitions.		I will describe the changes in energy that occur in flame tests as electrons move from an excited state to a lower state.	Emission spectra Energy level Excited state Ground state Orbitals Sublevel Valence electrons Photon Electromagnetic radiation Wavelength Frequency Photoelectric effect	Fireworks Lab		

	C4.9b: Identify metals, non-metals, and metalloids using the periodic table.		I will use the periodic table to identify the location of metals, non-metals and metalloids.	Metals Nonmetals Metalloids Transition metals Periodic Law Periodic Table Blocks Semiconductors Group number Family number Group Period			
	C4.9c Predict general trends in atomic radius, first ionization energy, and electonegativity of the elements using the periodic table.		I will use the periodic table to predict the arrangement of elements 1-20 based on their atomic radius, first ionization energy and electronegativity	General Trends Atomic radius Ionization energy Electronegativity Elements Periodic table	WebQuest		
	C4.8e: Write the complete electron configuration of elements in the first four rows of the periodic table.		I will write the arrangement of electrons for the elements in the first four rows of the periodic table.	Electron configuration Valence electrons Orbitals Hund's Rule Pauli exclusion principle Aufbau principle	Red Devil Villa's Activity		
	C4.8f: Write kernel structures for main group elements.		I will write an abbreviated form of electron configurations for the elements in groups 1, 2, 13-18.	Kernel structures Noble gas configuration			
	C4.8i: Describe the fact that the electron location cannot be exactly determined at any given time.		I will explain why the location of an electron location cannot be exactly determined.	Heisenberg uncertainty principle			

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Weeks 6-9		**Chemical Bonding**			Power-Points Foldable Active Reading Worksheets Videos Reading Labs	Text book Internet News Articles Discovery Education	Labs Quizzes Tests
	C5.5: Chemical Bonds — Trends An atom's electron configuration, particularly of the outermost electrons, determines how the atom can interact with other atoms. The interactions between atoms that hold them together in molecules or between oppositely charged ions are called chemical bonds.						
	C5.5A: Predict if the bonding between two atoms of different elements will be primarily ionic or covalent.		I will identify that a covalent bond occurs between two nonmetals or a nonmetal and a metalloid. I will identify that ionic bonds occur between a metal and nonmetal.	Ionic Bond Covalent Bond Chemical bond Metallic bond Periodic table Chemical bond Electronegativity Chemical properties of elements Electron sharing Electron transfer	Electron Tug-of-War Activity Covalent Bond Lab		

	C5.5c Draw Lewis structures for simple compounds.		I will draw Lewis (electron dot) structures.	Atomic bonding principles Covalent bond Electron sharing Binary compound Outer electron (valence) Electron Dot structures Group number	I'm Too Sexy for this Lab: Super Molecular Style (GVSU Target Inquiry Lab)		
	C5.5d: Compare the relative melting point, electrical and thermal conductivity, and hardness for ionic, metallic, and covalent compounds		I will understand periodic trends based on physical chemical properties of compounds.	Thermal conductivity Electrical Conductivity Melting point Boiling point	Periodic Trends Lab		
	C5.5e: Relate the melting point, hardness ,electrical and thermal conductivity of a substance to its structure.		I will relate the physical and chemical properties including conductivity to the bond structure of a compound.	Crystal Lattice Lattice Energy Chemical bond Crystalline solid Electrostatic attractions	Periodic Trends Lab		
	C4.3i: Explain why ionic solids have higher melting points than covalent solids. (For example, NaF has a melting point of 995°C while water has a melting point of 0° C.)		I will explain why ionic solids have higher melting points than covalent solids.	Covalent solids Melting point Ionic solids (crystals)	Periodic Trends Lab		
	C4.8g: Predict oxidation states and bonding capacity for main group elements using their electron structure.		I will predict how many bonds an element in groups 1, 2, 13-18 will make. I will predict the oxidation state of an element in groups 1, 2, 13-18.	Oxidation states Bonding capacity Main group elements Electron structure			

	C4.4b Identify if a molecule is polar or nonpolar given a structural formula		I will identify if a molecule is polar or nonpolar.	Polar Covalent Bond Non-polar Covalent Bond Electronegativity differences			

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Weeks 9-12							
	C5.5B: Predict the formula for binary compounds of main group elements		I will predict the formula for binary compounds of main group elements. Main group elements include groups 1, 2, and 13-17.	Main group elements Binary ionic compounds cation anion			
	C4.2A: Nomenclature All compounds have unique names that are determined systematically. Name simple binary compounds using their formulae.		I will name simple binary compounds using their formulas.	Nonmenclature Systematically Anion Cation Binary ionic compounds			
	C4.2B:Given the name, write the formula of simple binary compounds.		I will write the formula of simple binary compounds when given its name.	Binary formula Cation Anion Binary compounds			

	C4.2c Given a formula, name the compound. Clarification: Use the first 20 elements from the periodic table plus copper, iron, lead and mercury. Problems should include molecular compounds (two nonmetals) three element compounds with common ions. Common ions should be limited to: acetate, hydroxide, sulfate, sulfite, nitrate, nitrite, carbonate and ammonium.		I will name a compound when I am given its formula.	Formula compound Molecular formula			
	C4.2d Given the name, write the formula of ionic and molecular compounds.		I will write the formula of ionic and molecular compounds when given their names.	Ionic Formula Molecular compound			
	C4.1a Calculate the percent by weight of each element in a compound based on the compound formula. Clarification: Compounds should include hydrates and compounds containing two or three different elements. A modern periodic table must be made available.		I will calculate the percent by weight of each compound using only the chemical formula and a periodic table.	Percent Weight Element Compound Compound formula			

	C4.1b Calculate the empirical formula of a compound based on the percent by weight of each element in the compound. Clarification: Compounds should include hydrates and compounds containing two or three different elements. A modern periodic table must be made available.		I will calculate the empirical formula of a compound using the percent by weight of each element in the compound.	Empirical formula Compound Percent by weight Element			
	C4.1c Use the empirical formula and molecular weight of a compound to determine the molecular formula. Clarification: Compounds should include hydrates and compounds containing two or three different elements. A modern periodic table must be made available.		I will determine the molecular formula of a compound using the empirical formula and molecular weight of a formula.	Empirical formula Molecular weight Compound Molecular formula			