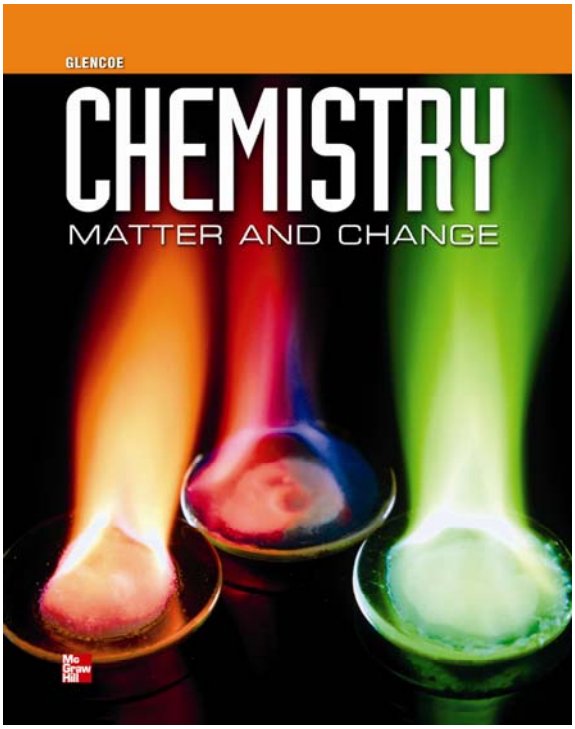
Glencoe

High School Science Content Expectations/Chemistry Essential Skills



GLENCOE
CHEMISTRY
MATTER AND CHANGE

STANDARDS	PAGE REFERENCES
CHEMISTRY	
STANDARD C1: INQUIRY, REFLECTION, AND SOCIAL IMPLICATIONS *Students will understand the nature of science and demonstrate an ability to practice scientific reasoning by applying it to the design, execution, and evaluation of scientific investigations. Students will demonstrate their understanding that scientific knowledge is gathered through various forms of direct and indirect observations and the testing of this information by methods including, but not limited to, experimentation. They will be able to distinguish between types of scientific knowledge (e.g., hypotheses, laws, theories) and become aware of areas of active research in contrast to conclusions that are part of established scientific consensus. They will use their scientific knowledge to assess the costs, risks, and benefits of technological systems as they make personal choices and participate in public policy decisions. These insights will help them analyze the role science plays in society, technology, and potential career opportunities.*	
C1.1 Scientific Inquiry Science is a way of understanding nature. 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. Some questions in science are addressed through indirect rather than direct observation, evaluating the consistency of new evidence with results predicted by models of natural processes. Results from investigations are communicated in reports that are scrutinized through a peer review process.	

Codes used for Teacher Wraparound Edition pages are the initial caps of headings on that page.

STANDARDS		PAGE REFERENCES
C1.1A	Generate new questions that can be investigated in the laboratory or field.	**Student Edition:** 9-10, 76-79, 156-161, 182-185 *CHEMLAB* 24, 92 *Inquiry Extension* 92, 230, 432, 776 *LAUNCH Lab* 69, 205
C1.1B	Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions.	**Student Edition:** 12-16, 47-53, 136-143, 320-332 *CHEMLAB* 60, 390, 550 *MiniLab* 39, 378, 526 *Problem-Solving Strategy* 51, 52
C1.1C	Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision).	**Student Edition:** 36-38, 107-114 *CHEMLAB* 60, 230, 310, 390, 550, 734, 892 *How It Works* 125 *LAUNCH Lab* 3, 205, 707 *MiniLab* 39
C1.1D	Identify patterns in data and relate them to theoretical models.	**Student Edition:** 5-8, 55-58, 111-113, 146-155, 156-157, 174-181, 187-194, 442-451, 712-716 *Chemistry & Health* 59 *CHEMLAB* 60 *DATA ANALYSIS LAB* 21 *MiniLab* 120, 193 *Problem-Solving Strategy* 160, 717
C1.1E	Describe a reason for a given conclusion using evidence from an investigation.	**Student Edition:** 111-114, 146-152, 182-194, 560-567 *Chemistry & Health* 389 *CHEMLAB* 24, 506, 698 *DATA ANALYSIS LAB* 216, 408 *Everyday Chemistry* 355 *MiniLab* 82

STANDARDS		PAGE REFERENCES
C1.2 Scientific Reflection and Social Implications The integrity of the scientific process depends on scientists and citizens understanding and respecting the "Nature of Science." Openness to new ideas, skepticism, and honesty are attributes required for good scientific practice. Scientists must use logical reasoning during investigation design, analysis, conclusion, and communication. Science can produce critical insights on societal problems from a personal and local scale to a global scale. Science both aids in the development of technology and provides tools for assessing the costs, risks, and benefits of technological systems. Scientific conclusions and arguments play a role in personal choice and public policy decisions. New technology and scientific discoveries have had a major influence in shaping human history. Science and technology continue to offer diverse and significant career opportunities.		
C1.2A	Critique whether or not specific questions can be answered through scientific investigations.	**Student Edition:** 12-15, 341-350, 442-451, 542-548 *CHEMLAB* 24, 60 *DATA ANALYSIS LAB* 216, 387, 805 *PROBLEM-SOLVING LAB* 326, 622, 842
C1.2B	Identify and critique arguments about personal or societal issues based on scientific evidence.	**Student Edition:** 5-8, 20-21, 880-884 *Chemistry & Health* 59, 389, 623 *CHEMLAB* 698, 892 *DATA ANALYSIS LAB* 21 *Everyday Chemistry* 229, 431, 815
C1.2C	Develop an understanding of a scientific concept by accessing information from multiple sources. Evaluate the scientific accuracy and significance of the information.	**Student Edition:** 9-10, 47-54, 174-181, 325-340, 385-388, 402-410, 542-548 *Chemistry & Health* 59, 389 *Everyday Chemistry* 229, 355 *How It Works* 125, 309, 733
C1.2D	Evaluate scientific explanations in a peer review process or discussion format.	**Student Edition:** 20-21 *CHEMLAB* 60, 698 *Everyday Chemistry* 355, 815 *In the Field* 91, 697, 891 *MiniLab* 726 *PROBLEM-SOLVING LAB* 50
C1.2E	Evaluate the future career and occupational prospects of science fields.	**Student Edition:** *CAREERS IN CHEMISTRY* 7, 81, 123, 185, 308, 342, 447, 813 *In the Field* 91, 505, 697, 891

STANDARDS		PAGE REFERENCES
STANDARD C2: FORMS OF ENERGY *Students recognize the many forms of energy and understand that energy is central to predicting and explaining how and why chemical reactions occur. The chemical topics of bonding, gas behavior, kinetics, enthalpy, entropy, free energy, and nuclear stability are addressed in this standard.* *Chemistry students relate temperature to the average kinetic energy of the molecules and use the kinetic molecular theory to describe and explain the behavior of gases and the rates of chemical reactions. They understand nuclear stability in terms of reaching a state of minimum potential energy.*		
P2.p1 Potential Energy *(prerequisite)* Three forms of potential energy are gravitational, elastic, and chemical. Objects can have elastic potential energy due to their compression or chemical potential energy due to the arrangement of the atoms. *(prerequisite)*		
P2.p1A	Describe energy changes associated with changes of state in terms of the arrangement and order of the atoms (molecules) in each state. *(prerequisite)*	**Student Edition:** 70-72, 76-77, 216-217, 226, 425-430, 530-531 *MiniLab* 242 *PROBLEM-SOLVING LAB* 531
P2.p1B	Use the positions and arrangements of atoms and molecules in solid, liquid, and gas state to explain the need for an input of energy for melting and boiling and a release of energy in condensation and freezing. *(prerequisite)*	**Student Edition:** 70-72, 76-77, 214-215, 216-217, 226, 425-430, 530-531
C2.1x Chemical Potential Energy Potential energy is stored whenever work must be done to change the distance between two objects. The attraction between the two objects may be gravitational, electrostatic, magnetic, or strong force. Chemical potential energy is the result of electrostatic attractions between atoms.		
C2.2 Molecules in Motion Molecules that compose matter are in constant motion (translational, rotational, vibrational). Energy may be transferred from one object to another during collisions between molecules.		
C2.2A	Describe conduction in terms of molecules bumping into each other to transfer energy. Explain why there is better conduction in solids and liquids than gases.	**Student Edition:** 177-181, 214-215, 226-227, 498-499
C2.2B	Describe the various states of matter in terms of the motion and arrangement of the molecules (atoms) making up the substance.	**Student Edition:** 70-72, 225-226, 402-405, 411-414, 415-424, 425-430, 530-531

STANDARDS	PAGE REFERENCES
C2.2x Molecular Entropy As temperature increases, the average kinetic energy and the entropy of the molecules in a sample increases.	
C2.3x Breaking Chemical Bonds *For molecules to react, they must collide with enough energy (activation energy) to break old chemical bonds before their atoms can be rearranged to form new substances.*	
C2.4x Electron Movement *For each element, the arrangement of electrons surrounding the nucleus is unique. These electrons are found in different energy levels and can only move from a lower energy level (closer to nucleus) to a higher energy level (farther from nucleus) by absorbing energy in discrete packets. The energy content of the packets is directly proportional to the frequency of the radiation. These electron transitions will produce unique absorption spectra for each element. When the electron returns from an excited (high energy state) to a lower energy state, energy is emitted in only certain wavelengths of light, producing an emission spectra.*	
C2.5x Nuclear Stability *Nuclear stability is related to a decrease in potential energy when the nucleus forms from protons and neutrons. If the neutron/proton ratio is unstable, the element will undergo radioactive decay. The rate of decay is characteristic of each isotope; the time for half the parent nuclei to decay is called the half-life. Comparison of the parent/daughter nuclei can be used to determine the age of a sample. Heavier elements are formed from the fusion of lighter elements in the stars.*	
STANDARD C3: ENERGY TRANSFER AND CONSERVATION *Students apply the First and Second Laws of Thermodynamics to explain and predict most chemical phenomena.* *Chemistry students use the term enthalpy to describe the transfer of energy between reactants and products in simple calorimetry experiments performed in class and will recognize Hess's Law as an application of the conservation of energy.* *Students understand the tremendous energy released in nuclear reactions is a result of small amounts of matter being converted to energy.*	
P3.p1 Conservation of Energy *(prerequisite)* *When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer.* (prerequisite)	
P3.p1A Explain that the amount of energy necessary to heat a substance will be the same as the amount of energy released when the substance is cooled to the original temperature. *(prerequisite)*	**Student Edition:** 519-521, 523-524
C3.1x Hess's Law *For chemical reactions where the state and amounts of reactants and products are known, the amount of energy transferred will be the same regardless of the chemical pathway. This relationship is called Hess's law.*	

STANDARDS		PAGE REFERENCES
	P3.p2 Energy Transfer *(prerequisite)* *Nuclear reactions take place in the sun. In plants, light from the sun is transferred to oxygen and carbon compounds, which, in combination, have chemical potential energy (photosynthesis).* (prerequisite)	
P3.p2A	Trace (or diagram) energy transfers involving various types of energy including nuclear, chemical, electrical, sound, and light. *(prerequisite)*	**Student Edition:** 136-145, 516-520, 522-528, 530-533, 710-711, 718-723, 728-732, 877-884 *CHEMLAB* 550 *DATA ANALYSIS LAB* 724 *How It Works* 309 *Real-World Chemistry* 521
	C3.2x Enthalpy *Chemical reactions involve breaking bonds in reactants (endothermic) and forming new bonds in the products (exothermic). The enthalpy change for a chemical reaction will depend on the relative strengths of the bonds in the reactants and products.*	
	C3.3 Heating Impacts *Heating increases the kinetic (translational, rotational, and vibrational) energy of the atoms composing elements and the molecules or ions composing compounds. As the kinetic (translational) energy of the atoms, molecules, or ions increases, the temperature of the matter increases. Heating a sample of a crystalline solid increases the kinetic (vibrational) energy of the atoms, molecules, or ions. When the kinetic (vibrational) energy becomes great enough, the crystalline structure breaks down, and the solid melts.*	
C3.3A	Describe how heat is conducted in a solid.	**Student Edition:** 516-518, 525-528
C3.3B	Describe melting on a molecular level.	**Student Edition:** 420, 425-426, 530-531 *Everyday Chemistry* 431
	C3.3x Bond Energy *Chemical bonds possess potential (vibrational and rotational) energy.*	
	C3.4 Endothermic and Exothermic Reactions *Chemical interactions either release energy to the environment (exothermic) or absorb energy from the environment (endothermic).*	
C3.4A	Use the terms endothermic and exothermic correctly to describe chemical reactions in the laboratory.	**Student Edition:** 216, 247, 525-528, 564-565
C3.4B	Explain why chemical reactions will either release or absorb energy.	**Student Edition:** 247, 525-528, 529, 564-565
	C3.4x Enthalpy and Entropy *All chemical reactions involve rearrangement of the atoms. In an exothermic reaction, the products have less energy than the reactants. There are two natural driving forces: (1) toward minimum energy (enthalpy) and (2) toward maximum disorder (entropy).*	

STANDARDS	PAGE REFERENCES
C3.5x Mass Defect *Nuclear reactions involve energy changes many times the magnitude of chemical changes. In chemical reactions matter is conserved, but in nuclear reactions a small loss in mass (mass defect) will account for the tremendous release of energy. The energy released in nuclear reactions can be calculated from the mass defect using* ***E*** *=* mc^2.	
STANDARD C4: PROPERTIES OF MATTER Compounds, elements, and mixtures are categories used to organize matter. Students organize materials into these categories based on their chemical and physical behavior. Students understand the structure of the atom to make predictions about the physical and chemical properties of various elements and the types of compounds those elements will form. An understanding of the organization the Periodic Table in terms of the outer electron configuration is one of the most important tools for the chemist and student to use in prediction and explanation of the structure and behavior of atoms.	
P4.p1 Kinetic Molecular Theory *(prerequisite)* *Properties of solids, liquids, and gases are explained by a model of matter that is composed of tiny particles in motion. (prerequisite)*	
P4.p1A For a substance that can exist in all three phases, describe the relative motion of the particles in each of the phases. *(prerequisite)*	**Student Edition:** 71-72, 402-405, 425-429
P4.p1B For a substance that can exist in all three phases, make a drawing that shows the arrangement and relative spacing of the particles in each of the phases. *(prerequisite)*	**Student Edition:** 76-77, 402-405, 415-421, 425
P4.p1C For a simple compound, present a drawing that shows the number of particles in the system does not change as a result of a phase change. *(prerequisite)*	**Student Edition:** 76-77, 425
P4.p2 Elements, Compounds, and Mixtures *(prerequisite)* *Elements are a class of substances composed of a single kind of atom. Compounds are composed of two or more different elements chemically combined. Mixtures are composed of two or more different elements and/or compounds physically combined. Each element and compound has physical and chemical properties, such as boiling point, density, color, and conductivity, which are independent of the amount of the sample. (prerequisite)*	
P4.p2A Distinguish between an element, compound, or mixture based on drawings or formulae. *(prerequisite)*	**Student Edition:** 80-83, 84-87, 177-181, 210-217, 240-247, 476-479 *CHEMLAB* 230 *Elements Handbook* 904-944 *Problem-Solving Strategies* 224

STANDARDS		PAGE REFERENCES
P4.p2B	Identify a pure substance (element or compound) based on unique chemical and physical properties. *(prerequisite)*	**Student Edition:** 5-7, 36-38, 84-90, 212-215 *CHEMLAB* 92, 196, 230 *Elements Handbook* 904-944 *How It Works* 125 *MiniLab* 242
P4.p2C	Separate mixtures based on the differences in physical properties of the individual components. *(prerequisite)*	**Student Edition:** 82-83, 730-732, 747-749 *DATA ANALYSIS LAB* 269 *How It Works* 125 *In the Field* 91 *MiniLab* 82
P4.p2D	Recognize that the properties of a compound differ from those of its individual elements. *(prerequisite)*	**Student Edition:** 212-217, 240-241, 269-270, 680-683, 729-732, 770-774 *CHEMLAB* 230, 356, 816 *Real-World Chemistry* 685
	C4.1x Molecular and Empirical Formulae *Compounds have a fixed percent elemental composition. For a compound, the empirical formula can be calculated from the percent composition or the mass of each element. To determine the molecular formula from the empirical formula, the molar mass of the substance must also be known.*	
	C4.2 Nomenclature *All compounds have unique names that are determined systematically.*	
C4.2A	Name simple binary compounds using their formulae.	**Student Edition:** 222-224, 248-250
C4.2B	Given the name, write the formula of simple binary compounds.	**Student Edition:** 218-220, 251-252
	C4.2x Nomenclature *All molecular and ionic compounds have unique names that are determined systematically.*	
	C4.3 Properties of Substances *Differences in the physical and chemical properties of substances are explained by the arrangement of the atoms, ions, or molecules of the substances and by the strength of the forces of attraction between the atoms, ions, or molecules.*	
C4.3A	Recognize that substances that are solid at room temperature have stronger attractive forces than liquids at room temperature, which have stronger attractive forces than gases at room temperature.	**Student Edition:** 71-72, 411-414, 415-424, 425-430

STANDARDS		PAGE REFERENCES
C4.3B	Recognize that solids have a more ordered, regular arrangement of their particles than liquids and that liquids are more ordered than gases.	**Student Edition:** 71-72, 415-424 *PROBLEM-SOLVING LAB* 180
	C4.3x Solids *Solids can be classified as metallic, ionic, covalent, or network covalent. These different types of solids have different properties that depend on the particles and forces found in the solid.*	
	C4.4x Molecular Polarity *The forces between molecules depend on the net polarity of the molecule as determined by shape of the molecule and the polarity of the bonds.*	
	C4.5x Ideal Gas Law *The forces in gases are explained by the ideal gas law.*	
	C4.6x Moles *The mole is the standard unit for counting atomic and molecular particles in terms of common mass units.*	
	C4.7x Solutions *The physical properties of a solution are determined by the concentration of solute.*	
	C4.8 Atomic Structure 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.	
C4.8A	Identify the location, relative mass, and charge for electrons, protons, and neutrons.	**Student Edition:** 107-114, 146-155, 156-161, 861-863, 865-869 *CHEMLAB* 126 *Problem-Solving Strategy* 160, 878
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.	**Student Edition:** 111-113 *DATA ANALYSIS LAB* 113
C4.8C	Recognize that protons repel each other and that a strong force needs to be present to keep the nucleus intact.	**Student Edition:** 865
C4.8D	Give the number of electrons and protons present if the fluoride ion has a -1 charge.	**Student Edition:** 158, 209

STANDARDS		PAGE REFERENCES
	C4.8x Electron Configuration *Electrons are arranged in main energy levels with sublevels that specify particular shapes and geometry. Orbitals represent a region of space in which an electron may be found with a high level of probability. Each defined orbital can hold two electrons, each with a specific spin orientation. The specific assignment of an electron to an orbital is determined by a set of 4 quantum numbers. Each element and, therefore, each position in the periodic table is defined by a unique set of quantum numbers.*	
	C4.9 Periodic Table *In the periodic table, elements are arranged in order of increasing number of protons (called the atomic number). Vertical groups in the periodic table (families) have similar physical and chemical properties due to the same outer electron structures.*	
C4.9A	Identify elements with similar chemical and physical properties using the periodic table.	**Student Edition:** 177-181, 182-185, 187-194 *CHEMLAB* 196
	C4.9x Electron Energy Levels *The rows in the periodic table represent the main electron energy levels of the atom. Within each main energy level are sublevels that represent an orbital shape and orientation.*	
	C4.10 Neutral Atoms, Ions, and Isotopes *A neutral atom of any element will contain the same number of protons and electrons. Ions are charged particles with an unequal number of protons and electrons. Isotopes are atoms of the same element with different numbers of neutrons and essentially the same chemical and physical properties.*	
C4.10A	List the number of protons, neutrons, and electrons for any given ion or isotope.	**Student Edition:** 115-121, 177 *Periodic Table of the Elements* 178-179
C4.10B	Recognize that an element always contains the same number of protons.	**Student Edition:** 115
	C4.10x Average Atomic Mass *The atomic mass listed on the periodic table is an average mass for all the different isotopes that exist, taking into account the percent and mass of each different isotope.*	
	STANDARD C5: CHANGES IN MATTER Students will analyze a chemical change phenomenon from the point of view of what is the same and what is not the same.	
	P5.p1 Conservation of Matter *(prerequisite)* *Changes of state are explained by a model of matter composed of tiny particles that are in motion. When substances undergo changes of state, neither atoms nor molecules themselves are changed in structure. Mass is conserved when substances undergo changes of state. (prerequisite)*	
P5.p1A	Draw a picture of the particles of an element or compound as a solid, liquid, and gas. *(prerequisite)*	**Student Edition:** 70-72, 402-405, 415-424, 425-430

STANDARDS		PAGE REFERENCES
	C5.r1x Rates of Reactions *(recommended)* *The rate of a chemical reaction will depend upon (1) concentration of reacting species, (2) temperature of reaction, (3) pressure if reactants are gases, and (4) nature of the reactants. A model of matter composed of tiny particles that are in constant motion is used to explain rates of chemical reactions. (recommended)*	
	C5.2 Chemical Changes *Chemical changes can occur when two substances, elements, or compounds interact and produce one or more different substances whose physical and chemical properties are different from the interacting substances. When substances undergo chemical change, the number of atoms in the reactants is the same as the number of atoms in the products. This can be shown through simple balancing of chemical equations. Mass is conserved when substances undergo chemical change. The total mass of the interacting substances (reactants) is the same as the total mass of the substances produced (products).*	
C5.2A	Balance simple chemical equations applying the conservation of matter.	**Student Edition:** 285-288, 689-695 *Problem-Solving Strategy* 696
C5.2B	Distinguish between chemical and physical changes in terms of the properties of the reactants and products.	**Student Edition:** 76-77, 300-306, 425-427 *LAUNCH Lab* 281
C5.2C	Draw pictures to distinguish the relationships between atoms in physical and chemical changes.	**Student Edition:** 71-72, 76-77, 105, 289-291
	C5.2x Balancing Equations *A balanced chemical equation will allow one to predict the amount of product formed.*	
	C5.3x Equilibrium *Most chemical reactions reach a state of dynamic equilibrium where the rates of the forward and reverse reactions are equal.*	
	C5.4 Phase Change/Diagrams *Changes of state require a transfer of energy. Water has unusually high-energy changes associated with its changes of state.*	
C5.4A	Compare the energy required to raise the temperature of one gram of aluminum and one gram of water the same number of degrees.	**Student Edition:** 519-520 *MiniLab* 526
C5.4B	Measure, plot, and interpret the graph of the temperature versus time of an ice-water mixture, under slow heating, through melting and boiling.	**Student Edition:** 530-531 *PROBLEM-SOLVING LAB* 531

STANDARDS		PAGE REFERENCES
	C5.4x Changes of State *All changes of state require energy. Changes in state that require energy involve breaking forces holding the particles together. The amount of energy will depend on the type of forces.*	
	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.	**Student Edition:** 206-209, 210-217, 265-266
C5.4B	Predict the formula for binary compounds of main group elements.	**Student Edition:** 218-220, 240-242
	C5.5x Chemical Bonds *Chemical bonds can be classified as ionic, covalent, and metallic. The properties of a compound depend on the types of bonds holding the atoms together.*	
	C5.6x Reduction/Oxidation Reactions *Chemical reactions are classified according to the fundamental molecular or submolecular changes that occur. Reactions that involve electron transfer are known as oxidation/reduction (or "redox").*	
	C5.7 Acids and Bases *Acids and bases are important classes of chemicals that are recognized by easily observed properties in the laboratory. Acids and bases will neutralize each other. Acid formulas usually begin with hydrogen, and base formulas are a metal with a hydroxide ion. As the pH decreases, a solution becomes more acidic. A difference of one pH unit is a factor of 10 in hydrogen ion concentration.*	
C5.7A	Recognize formulas for common inorganic acids, carboxylic acids, and bases formed from families I and II.	**Student Edition:** 637-641, 645-649, 798 *Everyday Chemistry* 669
C5.7B	Predict products of an acid-base neutralization.	**Student Edition:** 638-639, 646-649, 659-660 *Everyday Chemistry* 669
C5.7C	Describe tests that can be used to distinguish an acid from a base.	**Student Edition:** 658, 662 *LAUNCH Lab* 633
C5.7D	Classify various solutions as acidic or basic, given their pH.	**Student Edition:** 636, 652-653, 658, 662 *Problem-Solving Lab* 668
C5.7E	Explain why lakes with limestone or calcium carbonate experience less adverse effects from acid rain than lakes with granite beds.	**Student Edition:** 635, 637, 659 *Connection to Earth Science* 643

STANDARDS		PAGE REFERENCES
	C5.7x Brønsted-Lowry *Chemical reactions are classified according to the fundamental molecular or submolecular changes that occur. Reactions that involve proton transfer are known as acid/base reactions.*	
	C5.8 Carbon Chemistry *The chemistry of carbon is important. Carbon atoms can bond to one another in chains, rings, and branching networks to form a variety of structures, including synthetic polymers, oils, and the large molecules essential to life.*	
C5.8A	Draw structural formulas for up to ten carbon chains of simple hydrocarbons.	**Student Edition:** 750-755, 759-764
C5.8B	Draw isomers for simple hydrocarbons.	**Student Edition:** 765-769
C5.8C	Recognize that proteins, starches, and other large biological molecules are polymers.	**Student Edition:** 826-831, 834, 840-843