

## TTUISD - TEKS Tracker

Author <u>Ronnie Dunaway</u> Submission Date <u>    </u> / <u>    </u> / <u>    </u>					
Evaluator <u>    </u> Evaluation Date <u>    </u> / <u>    </u> / <u>    </u>					
<b>TTUISD: Chemistry 1B (CHEM 1B) Course v.2.0</b> <b>TEKS: §112.35. Grade 10, 11, or 12, Adopted 2010.</b> <b>Text: <i>Chemistry: Concepts and Applications</i> (2000) ISBN: 0-02-828209-4</b>					
<b>TEKS Requirement (Secondary)</b>	<b>Sem. B</b>	<b>Lesson &amp; Assignment Number</b>	<b>Textbook Chapter/Page #</b>	<b>Bloom's Taxonomy</b>	
<b>§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).</b>					
(a) General requirements. Students shall be awarded one credit for successful completion of this course. Required prerequisites: one unit of high school science and Algebra I. Suggested prerequisite: completion of or concurrent enrollment in a second year of math. This course is recommended for students in Grade 10, 11, or 12.					
(b) Introduction.					
(1) Chemistry. In Chemistry, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include characteristics of matter, use of the Periodic Table, development of atomic theory and chemical bonding, chemical stoichiometry, gas laws, solution chemistry, thermochemistry, and nuclear chemistry. Students will investigate how chemistry is an integral part of our daily lives.					
(2) Nature of Science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.					
(3) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation can be experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.					
(4) Science and social ethics. Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods and ethical and social decisions that involve the application of scientific information.					
(5) Scientific systems. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.					
(c) Knowledge and skills.					
<b>(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:</b>					
(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers;					
(B) know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Material Safety Data Sheets (MSDS); and					
(C) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.					
<b>(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:</b>					
(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;					
(B) know that scientific hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories;					

TEKS Requirement (Secondary)		Sem. B	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but may be subject to change as new areas of science and new technologies are developed;					Understand
(D) distinguish between scientific hypotheses and scientific theories;					Understand
(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals;					Create
(F) collect data and make measurements with accuracy and precision;					Understand
(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures;					Apply
(H) organize, analyze, evaluate, make inferences, and predict trends from data; and					Analyze
(I) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports.					Analyze
<b>(3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:</b>					
(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;					Evaluate
(B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;					Apply
(C) draw inferences based on data related to promotional materials for products and services;					Analyze
(D) evaluate the impact of research on scientific thought, society, and the environment;			p. 12, 212, 316, 448, 490, 596, 678, careers		Evaluate
(E) describe the connection between chemistry and future careers; and			p. 12, 212, 316, 448, 490, 596, 678, careers, Refining of Ores, p. 727		Remember
(F) research and describe the history of chemistry and contributions of scientists.			Madame Curie Essay		Remember
<b>(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:</b>					
(A) differentiate between physical and chemical changes and properties;					Remember
(B) identify extensive and intensive properties;					Remember
(C) compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume; and					Remember
(D) classify matter as pure substances or mixtures through investigation of their properties.					Remember
<b>(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:</b>					
(A) explain the use of chemical and physical properties in the historical development of the Periodic Table;					Remember
(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals; and					Remember
(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy.					Remember

TEKS Requirement (Secondary)		Sem. B	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
<b>(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:</b>					
(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom;					Understand
(B) understand the electromagnetic spectrum and the mathematical relationships between energy, frequency, and wavelength of light;					Understand
(C) calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light;					Understand
(D) use isotopic composition to calculate average atomic mass of an element; and					Apply
(E) express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures.			Lesson 8.2 Modeling Molecules		Apply
<b>(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:</b>					
(A) name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules;					Remember
(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases;					Apply
(C) construct electron dot formulas to illustrate ionic and covalent bonds;					Create
(D) describe the nature of metallic bonding and apply the theory to explain metallic properties such as thermal and electrical conductivity, malleability, and ductility; and					Apply
(E) predict molecular structure for molecules with linear, trigonal planar, or tetrahedral electron pair geometries using Valence Shell Electron Pair Repulsion (VSEPR) theory.					Apply
<b>(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:</b>					
(A) define and use the concept of a mole;		<b>B</b>	P. 405 Text; p. 412		Apply
(B) use the mole concept to calculate the number of atoms, ions, or molecules in a sample of material;		<b>B</b>	p. 405		Apply
(C) calculate percent composition and empirical and molecular formulas;		<b>B</b>	p. 420		Apply
(D) use the law of conservation of mass to write and balance chemical equations; and					Apply
(E) perform stoichiometric calculations, including determination of mass relationships between reactants and products, calculation of limiting reagents, and percent yield.		<b>B</b>	Ch. 12.2 Using Moles p. 414-430, Lesson 6 pg. 218		Apply
<b>(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:</b>					
(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law;					Apply
(B) perform stoichiometric calculations, including determination of mass and volume relationships between reactants and products for reactions involving gases; and		<b>B</b>	p. 412-413, 416, 418, 420		Apply
(C) describe the postulates of kinetic molecular theory.					Remember
<b>(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:</b>					
(A) describe the unique role of water in chemical and biological systems;		<b>B</b>	Lesson 2B, Ch. 13 text Sect. 13.1		Understand
(B) develop and use general rules regarding solubility through investigations with aqueous solutions;		<b>B</b>	P. 443 MiniLab 1, Lab 2.1 Lesson 2B		Apply
(C) calculate the concentration of solutions in units of molarity;		<b>B</b>	p. 464, text Sect. 13.2		Apply
(D) use molarity to calculate the dilutions of solutions;		<b>B</b>	p. 462, text Sect. 13.2		Apply

TEKS Requirement (Secondary)		Sem. B	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
(E) distinguish between types of solutions such as electrolytes and nonelectrolytes and unsaturated, saturated, and supersaturated solutions;		B	p. 144 Electrolytes, p. 488 acid, p. 492 base		Understand
(F) investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area;		B	p. 452-460 text		Analyze
(G) define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water;		B	p. 486, p. 526, Lesson 3B Discussion, Ch. 14-15 text		Apply
(H) understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions;		B	p. 562, p. 581 Assessments, Lessons 3B and 4B		Understand
(I) define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution; and		B	P. 502, Ch. 14 Text		Apply
(J) distinguish between degrees of dissociation for strong and weak acids and bases.		B	P. 521, 530, 498-499, 497, Strengths of Acids and Bases		Understand
<b>(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:</b>					
(A) understand energy and its forms, including kinetic, potential, chemical, and thermal energies;		B	Lesson 1		Understand
(B) understand the law of conservation of energy and the processes of heat transfer;		B	Conservation, 711-712, Heat Transfer		Understand
(C) use thermochemical equations to calculate energy changes that occur in chemical reactions and classify reactions as exothermic or endothermic;		B	p. 712 MiniLab, P. 711		Apply
(D) perform calculations involving heat, mass, temperature change, and specific heat; and		B	p. 724 Practice problems, Sect. 20.2 Text, p. 719		Understand
(E) use calorimetry to calculate the heat of a chemical process.		B	p. 724		Apply
<b>(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:</b>					
(A) describe the characteristics of alpha, beta, and gamma radiation;		B	p. 748, 758, Lesson 9, Section 21.1, p. 746		Understand
(B) describe radioactive decay process in terms of balanced nuclear equations; and		B	p. 752, Pennium Lab		Apply
(C) compare fission and fusion reactions.		B	p. 762-767 text		Understand
<i>Source: The provisions of this §112.35 adopted to be effective August 4, 2009, 34 TexReg 5063.</i>					