Standard ID	Standard Text	Edgenuity Lesson Name
TX.112.35.	Chemistry (One Credit).	
(10-12.1)	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:	
10-12.1 (A)	Demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers.	Safety in Science
10-12.1 (B)	Know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Safety Data Sheets (SDS).	Safety in Science
10-12.1 (C)	Demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.	Safety in Science
(10-12.2)	Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	
10-12.2 (A)	Know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section.	The Nature of Chemistry
10-12.2 (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.	Hypotheses, Laws, and Theories
10-12.2 (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.	Hypotheses, Laws, and Theories
10-12.2 (D)	Distinguish between scientific hypotheses and scientific theories.	Hypotheses, Laws, and Theories
10-12.2 (E)	Plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, electronic balances, an adequate supply of consumable chemicals, and sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, and burettes.	Hypotheses, Laws, and Theories Safety in Science Scientific Methods Tools, Technology, and Measurement

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10-12.2 (F)	Collect data and make measurements with accuracy and precision.	Tools, Technology, and Measurement
10-12.2 (G)	Express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures.	Using Math to Analyze Data
10-12.2 (H)	Organize, analyze, evaluate, make inferences, and predict trends from data.	Tools, Technology, and Measurement Using Math to Analyze Data
10-12.2 (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.	Using Math to Analyze Data
(10-12.3)	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:	
10-12.3 (A)	Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing.	Evaluating Scientific Explanations
10-12.3 (B)	Communicate and apply scientific information extracted from various sources such as current events, published journal articles, and marketing materials.	Liquids
10-12.3 (C)	Draw inferences based on data related to promotional materials for products and services.	Evaluating Scientific Explanations
10-12.3 (D)	Evaluate the impact of research on scientific thought, society, and the environment.	The Historical Development of Atomic Theory The Modern Atomic Theory
10-12.3 (E)	Describe the connection between chemistry and future careers.	The Nature of Chemistry
10-12.3 (F)	Describe the history of chemistry and contributions of scientists.	The Historical Development of Atomic Theory The History and Arrangement of the Periodic Table The Modern Atomic Theory
(10-12.4)	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:	
10-12.4 (A)	Differentiate between physical and chemical changes and properties.	Changes in Matter Lab: Physical and Chemical Changes

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10-12.4 (B)	Identify extensive properties such as mass and volume and intensive properties such as density and melting point.	
		Changes in Matter
10-12.4 (C)	Compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume.	
		Gases
		Liquids
		Phase Changes
		Solids and Plasmas
10-12.4 (D)	Classify matter as pure substances or mixtures through investigation of their properties.	
		Elements, Compounds, and Mixtures
(10-12.5)	Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	
10-12.5 (A)	Explain the use of chemical and physical properties in the historical development of the Periodic Table.	
		The History and Arrangement of the Periodic Table
10-12.5 (B)	Identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals using the Periodic Table.	
		The History and Arrangement of the Periodic Table
10-12.5 (C)	Interpret periodic trends, including atomic radius, electronegativity, and ionization energy using the Periodic Table.	
		Periodic Trends
(10-12.6)	Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	
10-12.6 (A)	Describe 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.	
		The Historical Development of Atomic Theory
		The Modern Atomic Theory
10-12.6 (B)	Describe the mathematical relationships between energy, frequency, and wavelength of light using the electromagnetic spectrum.	
		Electromagnetic Waves
10-12.6 (C)	Calculate average atomic mass of an element using isotopic composition.	
		The Structure of the Atom

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10-12.6 (D)	Express the arrangement of electrons in atoms of representative elements using electron configurations and Lewis valence electron dot structures.	
		Atomic Numbers and Electron Configurations Covalent Bonding Electrons and the Periodic Table Ionic Bonding
(10-12.7)	Science concepts. The student knows how atoms form ionic, covalent, and metallic bonds. The student is expected to:	
10-12.7 (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.	
		Nomenclature of Covalent Compounds Nomenclature of Ionic Compounds
10-12.7 (B)	Write the chemical formulas of ionic compounds containing representative elements, transition metals and common polyatomic ions, covalent compounds, and acids and bases.	
		Percent Composition and Molecular Formula
10-12.7 (C)	Construct electron dot formulas to illustrate ionic and covalent bonds.	
		Covalent Bonding Ionic Bonding Lab: Ionic and Covalent Bonds
10-12.7 (D)	Describe metallic bonding and explain metallic properties such as thermal and electrical conductivity, malleability, and ductility.	
		Metallic Bonding
10-12.7 (E)	Classify molecular structure for molecules with linear, trigonal planar, and tetrahedral electron pair geometries as explained by Valence Shell Electron Pair Repulsion (VSEPR) theory.	
		Molecular Geometry
(10-12.8)	Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	
10-12.8 (A)	Define and use the concept of a mole.	
		Molar Masses
10-12.8 (B)	Calculate the number of atoms or molecules in a sample of material using Avogadro's number.	
		Molar Masses
10-12.8 (C)	Calculate percent composition of compounds.	
		Percent Composition and Molecular Formula
10-12.8 (D)	Differentiate between empirical and molecular formulas.	
		Percent Composition and Molecular Formula

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10-12.8 (E)	Write and balance chemical equations using the law of conservation of mass.	
		Writing and Balancing Chemical Equations
10-12.8 (F)	Differentiate among double replacement (ion-swap) reactions, including acid-base reactions, and precipitation reactions and oxidation-reduction reactions such as synthesis, decomposition, single replacement, and combustion reactions.	
		Lab: Types of Reactions Neutralization Reactions Oxidation-Reduction Types of Reactions
10-12.8 (G)	Perform stoichiometric calculations, including determination of mass and gas volume relationships between reactants and products and percent yield.	
		Gas Stoichiometry Introduction to Stoichiometry Lab: Limiting Reactant and Percent Yield Limiting Reactant and Percent Yield Stoichiometric Calculations
10-12.8 (H)	Describe the concept of limiting reactants in a balanced chemical equation.	
		Lab: Limiting Reactant and Percent Yield Limiting Reactant and Percent Yield
(10-12.9)	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:	
10-12.9 (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.	
		Gas Laws Lab: Boyle’s Law Lab: Charles's Law The Ideal Gas Law
10-12.9 (B)	Describe the postulates of kinetic molecular theory.	
		Gases Liquids Solids and Plasmas
(10-12.10)	Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	
10-12.10 (A)	Describe the unique role of water in solutions in terms of polarity.	
		Properties of Water

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10-12.10 (B)	Apply the general rules regarding solubility through investigations with aqueous solutions.	Lab: Solubility Solutions and Solubility
10-12.10 (C)	Calculate the concentration of solutions in units of molarity.	Measures of Concentration: Molarity
10-12.10 (D)	Calculate the dilutions of solutions using molarity.	Measures of Concentration: Molarity
10-12.10 (E)	Distinguish among types of solutions such as electrolytes and nonelectrolytes; unsaturated, saturated, and supersaturated solutions; and strong and weak acids and bases.	Equilibria of Acids and Bases Reactions in Aqueous Solutions Solutions and Solubility
10-12.10 (F)	Investigate factors that influence solid and gas solubilities and rates of dissolution such as temperature, agitation, and surface area.	Lab: Solubility Solutions and Solubility
10-12.10 (G)	Define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid-base reactions that form water.	Arrhenius, Bronsted-Lowry, and Lewis Acids and Bases Properties of Acids and Bases
10-12.10 (H)	Define pH and calculate the pH of a solution using the hydrogen ion concentration.	Lab: Measuring pH pH
(10-12.11)	Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	
10-12.11 (A)	Describe energy and its forms, including kinetic, potential, chemical, and thermal energies.	Energy
10-12.11 (B)	Describe the law of conservation of energy and the processes of heat transfer in terms of calorimetry.	Calorimetry Energy Heat Lab: Calorimetry and Specific Heat

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10-12.11 (C)	Classify reactions as exothermic or endothermic and represent energy changes that occur in chemical reactions using thermochemical equations or graphical analysis.	
		Heat
		Thermochemical Equations
10-12.11 (D)	Perform calculations involving heat, mass, temperature change, and specific heat.	
		Calorimetry
		Lab: Calorimetry and Specific Heat
(10-12.12)	Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	
10-12.12 (A)	Describe the characteristics of alpha, beta, and gamma radioactive decay processes in terms of balanced nuclear equations.	
		Balancing Nuclear Reactions
		The Nucleus
		Types of Radioactive Decay
10-12.12 (B)	Compare fission and fusion reactions.	
		Nuclear Fission and Nuclear Fusion