

Chemistry –Grades 10-12

Course Goal: The goal of Chemistry is to create student a curiosity about matter and its interactions; to initiate a lifetime of using an organized, evidence-based approach to solving problems; and to recognize the importance of chemistry in the understanding of all other sciences with its application to daily life and real world situations.

Related Links	QUARTER 1	QUARTER 2
	<p><u>Students will:</u> explore atomic theory and the structure of atoms, and demonstrate that atomic structure is the basis for the properties of elements and the molecular bonds that they form.</p> <p>Big Idea / Enduring Understanding Atoms form the building blocks of all matter on Earth.</p> <p>Essential Questions</p> <ul style="list-style-type: none"> ↘ How are instruments used to collect scientific data? ↘ What instruments are available, what are their limitations, and how are these limitations modeled mathematically? ↘ What are the characteristics by which matter can be classified? <p>Content Topics</p> <ul style="list-style-type: none"> ↘ Review: math concepts and skills ↘ Structure of Matter <ol style="list-style-type: none"> 1. Classification of matter, including physical and chemical properties 2. Atomic theory 3. Solubility, molarity 4. Reaction rates 5. Equilibrium ↘ Nature and History of Science <ol style="list-style-type: none"> 1. Scientific World View 2. Scientific Inquiry 3. Scientific Enterprise 4. Historic Perspectives <p>Skills</p> <ul style="list-style-type: none"> ↘ Science process skills, which may include observing, inferring, measuring, performing experiments, etc. ↘ Laboratory skills, which may include use of the balance, bunsen burner, thermometer, etc. ↘ Literacy skills, which may include math computation, writing, reading, scientific literacy, use of technology, etc. ↘ Affective skills, which may include communication, cooperation, media preference, etc. <p>Assessments Periodic Puzzle</p>	<p><u>Students will:</u> study the structure of matter, the properties of matter, and how the structure of matter determines the properties of matter.</p> <p>Big Ideas / Enduring Understandings</p> <ul style="list-style-type: none"> ↘ Matter can be classified by state, properties, and composition. ↘ Atoms interact with one another by transferring or sharing electrons. <p>Essential Questions:</p> <ul style="list-style-type: none"> ↘ How do physical changes differ from chemical changes? ↘ How would you describe the properties of solutions? ↘ How are the several kinds of chemical reactions different from one another? ↘ What is the nature of oxidation/reduction reactions? <p>Content Topics</p> <ul style="list-style-type: none"> ↘ Physical and chemical changes ↘ Law of the conservation of matter, including balancing equations ↘ Periodic Table ↘ Chemical bonding and polarity ↘ IUPAC compound nomenclature , including writing formulas ↘ Organic chemistry including nomenclature of organic compounds ↘ Periodicity ↘ Oxidation/Reduction reactions ↘ Electrochemistry <p>Skills</p> <ul style="list-style-type: none"> ↘ Science process skills, which may include observing, inferring, measuring, performing experiments, etc. ↘ Lab equipment skills, which may include use of the balance, bunsen burner, thermometer, etc. ↘ Literacy skills, which may include math computation, writing, reading, scientific literacy, use of technology, etc. ↘ Affective skills, which may include communication, cooperation, media preference, etc. <p>Assessments</p> <ul style="list-style-type: none"> ↘ Copper sequence lab ↘ Calculating the molar mass of a gas or molar volume of a gas ↘ Finding the mass of an unknown gas

	QUARTER 3	QUARTER 4
	<p><u>Students will:</u> learn how the properties of compounds are related to the arrangement and type of atoms they contain.</p> <p>Big Idea / Enduring Understanding <ul style="list-style-type: none"> ✎ Chemical compounds and solutions are important in the world. </p> <p>Essential Questions <ul style="list-style-type: none"> ✎ Why is water known as the "universal" solvent? ✎ Why are organic compounds so numerous and diverse? ✎ How can reactions be exothermic or endothermic? ✎ What are the characteristics of thermodynamics? ✎ What are the implications of stoichiometry to modern chemistry? ✎ What are the many uses of organic compounds? </p> <p>Content Topics <ul style="list-style-type: none"> ✎ Organic compounds and their nomenclature ✎ Exothermic and endothermic reactions ✎ Avogadro's number ✎ Stoichiometry ✎ Power ✎ Fossil fuel use, including societal implications ✎ Thermodynamics </p> <p>Skills <ul style="list-style-type: none"> ✎ Science process skills, which may include observing, inferring, measuring, performing experiments, etc. ✎ Laboratory skills, which may include use of the balance, bunsen burner, thermometer, etc. ✎ Literacy skills, which may include math computation, writing, reading, scientific literacy, use of technology, etc. ✎ Affective skills, which may include communication, cooperation, media preference, etc. </p> <p>Assessments <ul style="list-style-type: none"> ✎ Designing and performing an original experiment. ✎ Analyzing an iodine clock reaction. ✎ Identifying lab unknowns. </p>	<p><u>Students will:</u> learn that matter undergoes chemical transformations, resulting in products that are different from the reactants.</p> <p>Big Idea / Enduring Understandings <ul style="list-style-type: none"> ✎ Atoms react in many different ways to make the world in which we live. </p> <p>Essential Questions <ul style="list-style-type: none"> ✎ How does the electromagnetic spectrum impact our lives? ✎ How would you differentiate among acids, bases and salts based on their properties? ✎ What are the rules that determine the volume, temperature, and pressure of a gas? </p> <p>Content Topics <ul style="list-style-type: none"> ✎ Electromagnetic spectrum ✎ Nuclear chemistry <ul style="list-style-type: none"> - radioactivity - fission/fusion - half-life ✎ Acid-base reactions ✎ Gas Laws <ul style="list-style-type: none"> - volume, temperature and pressure relationships - gas stoichiometry, including a mole of a gas - reactions, including energy generated or used in a chemical reaction ✎ History and Nature of Science </p> <p>Skills <ul style="list-style-type: none"> ✎ Science process skills, which may include observing, inferring, measuring, performing experiments, etc. ✎ Lab equipment skills, which may include use of the balance, bunsen burner, thermometer, etc. ✎ Literacy skills, which may include math computation, writing, reading, scientific literacy, use of technology, etc. ✎ Affective skills, which may include communication, cooperation, media preference, etc. </p> <p>Assessments <ul style="list-style-type: none"> ✎ Recycling symbols </p>