

Haddon Township High School
Course Overview Template

Subject Area: Science
Course Name: Applied Chemistry

Summary: This chemistry course centers around a qualitative approach to chemistry. Laboratory work and student projects provide practical applications of course concepts. Topics include chemical models, chemical elements and their compounds, chemical behavior and properties, and the use and application of the periodic table. Applied Chemistry is designed to accommodate the entrance requirements of college-bound students entering non-science fields.

Unit Title	Student Learning Target	Standards	Resources	Assessment
Matter	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> Identify elements, compounds and heterogeneous or homogeneous mixtures. Give examples of each and define each. Identify physical and chemical changes and properties. Give examples of each and define each. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> and <i>Chemistry: Matter and Change</i>.</p> <p>Six kits of ten different substances in small containers for students to view with labels. Magnesium and zinc metal, sand paper, Bunsen burners, evaporating dishes, crucible tongs, striker, 3M hydrochloric acid, water, spatula, sodium chloride, silver chloride, vinegar, baking soda, wood splint, test tubes, test tube rack, test tube holder, cupric sulfate pentahydrate, mortar and pestle.</p>	<p>Complete an activity called <i>Elements, Compounds and Mixtures</i>. Students record data like symbol/formula, description and category(s). Students are graded based on whether they identified the substance correctly and answered three conclusion questions about the data collected.</p> <p>Complete the lab <i>Physical and Chemical Changes</i>. Students perform 7 different steps with several different metals and other compounds and determine whether the changes were physical or chemical changes. They complete a lab report to submit the results.</p>

Measurements	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Relate metrics to English units. • Complete metric to English conversions. • Use the rules for significant figures when measuring or calculating. • Determine the number of moles in a sample of matter. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science. 9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> and <i>Chemistry: Matter and Change</i>.</p> <p>Diet and non-diet sodas, balances, metric rulers, graduated cylinders, element samples – Cu, Al, Zn and S</p>	<p>Determine the sugar content of certain beverages and compare to the amount given on the label. Determine the density, a physical property, of certain elements.</p>
Matter is Made Up of Atoms	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Determine the number of protons, neutrons and electrons in neutral, charged and isotopic elements given information concerning each atom. • Relate the electromagnetic spectrum of light to the energy of electrons. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to</p>	<p><i>Chemistry: Concepts and Applications</i> and <i>Chemistry: Matter and Change</i></p> <p>aluminum foil of various-sized rectangles and squares, metric rulers, balances, calculators, density table</p>	<p>Determine the number of atoms in a thickness of aluminum foil. Relate to atomic radii and periodic table while answering synthesis-level questions. This activity also uses density, metric system and dimensional analysis.</p>

	<ul style="list-style-type: none"> Determine the relative strength, frequency and wavelength of each part of the spectrum. 	<p>be proficient in science.</p> <p>5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
Periodic Table	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> Describe the development of the modern periodic table. Relate the chemical and physical properties of the elements to the location of those elements on the periodic table. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.</p> <p>5.2 Physical Science:</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> and <i>Chemistry: Matter and Change</i></p> <p>Computers with internet, periodic table of elements application on iPad</p>	<p>Students describe the family properties for each of the designated groups of elements on the periodic table and present information to the class in a Power Point format.</p>

		<p>Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
<p>Writing Formulas and Naming Compounds</p>	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Describe how different atoms will form different ions and how the ions combined to form compounds. • Describe how different atoms will share electrons to form molecules. • Distinguish between the different systems used to represent and name covalent compounds and ionic compounds. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.</p> <p>5.2 Physical Science: Physical science principles, including</p>	<p>Game sheets, polyatomic ion sheets and periodic tables</p>	<p>Compete in the formula writing/naming compound game with students in two teams.</p>

		<p>fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
<p>Writing Chemical Equations and Describing Chemical Reactions</p>	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Calculate the molar mass of any compound by adding the atomic masses of all atoms in a chemical compound represented by chemical formulas. • Write balanced chemical equations. • Use chemical equations to predict the products produced based on the type of reaction. • Apply stoichiometry to calculate amounts of 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.</p> <p>5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and</p>	<p>Chemicals, beakers, balances, filter paper, funnel, desiccators (optional), calculators; Textbooks <i>Chemistry: Concepts and Applications</i> and <i>Chemistry: Matter and Change</i></p>	<p>Given a word equation to describe a chemical reaction, students determine the balanced equation. The balanced equation is used to determine mass of precipitate formed from given amount of reactant. The chemical reaction is carried out; students collect precipitate and verify the amount. Percent yield is determined.</p>

	<p>reactants or products in reactions.</p>	<p>motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science. 9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
<p>Electrons in the Atom</p>	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Write electron configurations, orbital notations and electron dot notations using knowledge of the Aufbau principle, Hund's rule, and valence electrons. • Determine the number of valence electrons in an atom. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science. 5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> or <i>Chemistry: Matter and Change</i>, periodic table</p>	<p>Play electron configuration game: (1) Given the name of an element, write its electron configuration, and (2) Given the block, period and group of an element write its electron configuration.</p>

		<p>making sense of phenomena in physical, living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
The Kinetic Theory of Gases	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Describe what pressure is and what temperature is, and explain what units are used to represent both. • Distinguish between how temperature and pressure measurements are made. • Use the gas laws to calculate the pressure, temperature or volume of gases. 	<p>5.1 Science Practices: Science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.</p> <p>5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical,</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> or <i>Chemistry: Matter and Change</i>, Safari Montage video, calculator, chemicals, balance, graduated cylinders</p>	<p>Explain how an airbag works and what gas fills the airbag. Model the filling of the bag by a chemical reaction.</p> <p>Determine amount of reactant to produce CO₂ to fill baggie.</p>

		<p>living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>		
<p>Concentration of Solutions</p>	<p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Calculate concentration of solutions using molarity, molality and percent by mass. • Relate pH to the strengths of acids and bases. • Neutralize an acid with a base of known concentration to determine the concentration of the acid. 	<p>5.2 Physical Science: Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.</p> <p>9.1 21st Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.</p>	<p>Textbooks <i>Chemistry: Concepts and Applications</i> or <i>Chemistry: Matter and Change</i>, computers with Internet access</p>	<p>Write a report explaining how energy is involved in each step of a solution process and how the heat of solution can be determined. Relate to temperature changes – both exothermic and endothermic values. Diagram the process and label the energy changes.</p>