

Scope and Sequence: SCIENCE
Chemistry (Grade 11) **DRAFT**
Links: [NHPS Science Overview](#)
[CAPT Science Overview](#)

	QuarterOne		QuarterTwo		Quarter Three	Quarter Four	
Unit Titles	Q1:Chemical Properties (inc phases/heat)	Q1: Atomic Structure	Q2: Nuclear	Q2: Compounds/Bonding	Q3: Reactions/Equations	Q4: Gases and Heat	Q4: Solutions/Organic Chemistry
Learning Outcomes							
INQUIRY STANDARDS ACROSS ALL UNITS D INQ.1 Identify questions that can be answered through scientific investigation. D INQ.2 Read, interpret and examine the credibility and validity of scientific claims in different sources of information. D INQ.3 Formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment. D INQ.4 Design and conduct appropriate types of scientific investigations to answer different questions.	<p>-Use properties to distinguish types of matter.</p> <p>-Determine the density of objects from measurements and grap</p> <p>-Know that matter is composed of particles and how these particles are held together.</p> <p>-Describe the three phases of matter.</p> <p>-Know the properties of metals and non-metals.</p> <p>-Define and contrast physical, chemical, and nuclear changes.</p> <p>-Determine whether a substance is a mixture, element, or compound.</p> <p>-Use properties of matter to separate mixtures.</p>	<p>Develop atomic theory in an historical perspective comparing and contrasting different models.</p> <p>Describe the discovery of the parts of the atom.</p> <p>Know atomic structure in terms of protons, neutrons, and elections.</p> <p>Define and use concepts of atomic number, mass number, and isotopes.</p> <p>- Develop the concept of atomic weight.</p> <p>Describe the general structure of the atom, and explain how the properties of the first 20 elements in the Periodic Table are related to their</p>	<p>Describe the nuclear changes that release energy.</p> <p>Use the concepts of half life to predict the results of nuclear decay.</p> <p>Know natural and man-made occurrences of fission and fusion, including medical, industrial and military applications.</p> <p>Use the scientific concepts involved in nuclear power generation to make decisions about current societal issues.</p>	<p>Describe the historical development of the organization of the Periodic Table and the modern periodic law.</p> <p>Describe atomic properties such as atomic radius, ionization energy, oxidation number, and electron affinity using the periodic table and charts.</p> <p>Develop the concept of chemical activity as it relates to atomic structure.</p> <p>Know the trends in properties of the families and series on the Periodic Table.</p> <p>Describe the uses of some common elements.</p> <p>Write correct formulas for</p>	<p>Explain the chemical composition of acids and bases, and explain the change of pH in neutralization reactions.</p> <p>Develop the concept of conservation of mass.</p> <p>Be able to write and balance common equations.</p> <p>Identify the different types of chemical reactions.</p> <p>Develop the concept of mass relationships in a chemical reaction.</p> <p>Identify endothermic and exothermic reactions.</p> <p>Determine the molecular mass of a compound.</p>	<p>Identify endothermic and exothermic reactions.</p> <p>Identify the three basic assumptions of the kinetic molecular theory.</p> <p>Describe the basic differences between solids, liquids, and gases in terms of the kinetic theory.</p> <p>Be able to apply the concepts of phase change to explain everyday phenomena.</p> <p>Describe energy changes accompanying a change of state.</p> <p>Describe how the intermolecular forces affect the properties of condensed states of matter.</p> <p>Read and interpret</p>	<p>Explain how the chemical structure of polymers affects their physical properties.</p> <p>Explain how the structure of the carbon atom affects the type of bonds it forms in organic and inorganic molecules.</p> <p>Describe combustion reactions of hydrocarbons and their resulting by-products.</p> <p>Explain the general formation and structure of carbon-based polymers, including synthetic polymers, such as polyethylene, and biopolymers, such as carbohydrate.</p> <p>Explain how simple chemical monomers can be combined to create linear, branched and/or</p>

<p>D INQ.5 Identify independent and dependent variables, including those that are kept constant and those used as controls.</p> <p>D INQ.6 Use appropriate tools and techniques to make observations and gather data.</p> <p>D INQ.7 Assess the reliability of the data that was generated in the investigation.</p> <p>D INQ.8 Use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.</p> <p>D INQ.9 Articulate conclusions and explanations based on research data, and assess results based on the design of the investigation.</p> <p>D INQ.10 Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.</p>	<p>identify the three basic assumptions of the kinetic molecular theory.</p> <p>Describe the basic differences between solids, liquids, and gases in terms of the kinetic theory.</p> <p>Be able to apply the concepts of phase change to explain everyday phenomena.</p> <p>Describe energy changes accompanying a change of state.</p> <p>Describe how the intermolecular forces affect the properties of condensed states of matter.</p> <p>Read and interpret phase change graphs.</p> <p>Describe the factors that effect phase changes.</p>	<p>atomic structures.</p>		<p>compounds using ratios and ion charts.</p> <p>Identify names and formulas and uses for common compounds and elements.</p> <p>Determine whether a chemical bond between any two elements is ionic or covalent.</p> <p>Describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding)</p>	<p>Determine empirical and molecular formulas for compounds.</p> <p>Calculate masses and yields of reactants and products in a reaction.</p> <p>Understand the concepts behind limiting reactions</p>	<p>phase change graphs.</p> <p>Describe the factors that affect phase changes.</p> <p>Describe the physical properties of gases.</p> <p>Describe volume, temperature, and pressure of a gas and their units of measurement.</p> <p>Apply the relationships between pressure, temperature, concentration and volume to gas behavior (i.e. Boyle's Law, Charles' Law).</p>	<p>cross-linked polymers.</p> <p>Be able to draw structural formulas and name organic compounds.</p> <p>Describe the existence and uses of some organic compounds.</p>
<p>Significant Task</p>	<p>Phase Change Lab, Density Lab</p>	<p>Element Project</p>	<p>Nuclear Energy Debate</p>	<p>Supermarket Chemistry</p>	<p>Chemistry of A Car</p>	<p>Coffe Cup Project Gas Laws and Hot Air Balloons</p>	<p>Making Plastic Lab</p>

Content Supporting Materials	Textbooks, Labs, NHPS Web Materials	Textbooks, Labs, NHPS Web Materials	Textbooks, Labs, NHPS Web Materials, Teaching Plastics, CRISPY Programs	Textbooks, Labs, NHPS Web Materials	Textbooks, Labs, NHPS Web Materials	Textbooks, Labs, NHPS Web Materials	Textbooks, Labs, NHPS Web Materials
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