

# WINTHROP HIGH SCHOOL

## CP Chemistry Syllabus

### Course Overview

This is a first year survey course for students who have successfully completed a year of biology. Students will analyze patterns in laboratory data to develop an understanding of fundamental topics in chemistry including, but not limited to laboratory procedures/safety, atomic theory, periodicity, chemical bonding, phases of matter, chemical reactions, the chemistry of everyday things. Students will be assessed on their ability to apply fundamental chemical principles to broader situations. By the completion of the course, students will develop laboratory techniques and refine their analytical and critical thinking skills.

### Materials

We will predominantly use the online textbook resources from [www.ck12.org](http://www.ck12.org), as well as other online resources that will be posted to Schoology.

### Curriculum Content Map

Unit	Sect	Title	Topics of Study
<b>1 The Structure of Matter</b>	<b>I</b>	<b>An Introduction to Matter</b>	<ul style="list-style-type: none"><li>• Lab Safety</li><li>• Chemical and Physical changes</li><li>• Scientific Method</li><li>• Periodic Table</li><li>• Classification of Matter</li><li>• Drawings of each type of matter</li><li>• Phases of Matter, including phase diagrams</li><li>• Drawings of each phase of matter</li></ul>
	<b>II</b>	<b>An Introduction to the Atom</b>	<ul style="list-style-type: none"><li>• Atomic History</li><li>• Atomic structure</li><li>• Valence and Core electrons</li><li>• Ions and common ionic charge</li><li>• Isotope notation</li><li>• Electron Configurations</li><li>• Light/ Energy</li></ul>
<b>2 The Formation of Matter</b>	<b>I</b>	<b>Periodic Trends, the Periodic Table and Bonding</b>	<ul style="list-style-type: none"><li>• Electronegativity</li><li>• Periodic Trends</li><li>• Bonding, covalent, ionic, metallic and network covalent</li><li>• Types of Solids</li></ul>

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			<ul style="list-style-type: none"> <li>• Drawings of various types of bonding as well as solids.</li> </ul>
	II	<b>Ionic and Molecular Compounds</b>	<ul style="list-style-type: none"> <li>• Lewis Structures</li> <li>• Ionic compound naming and formula writing</li> <li>• Naming covalent compounds</li> <li>• Drawing Lewis Structures for covalent compounds</li> <li>• Covalent compound molecular geometries through <math>AX_4</math></li> <li>• Molecular polarity</li> </ul>
<b>3 Interactions of Matter</b>	I	<b>Interactions between Molecules</b>	<ul style="list-style-type: none"> <li>• Types of Intermolecular Forces.</li> <li>• Predicting intermolecular forces based on molecular structure.</li> <li>• Drawings representing intermolecular forces and molecular structure.</li> <li>• Properties of substances and intermolecular forces; Vapor pressure, freezing and melting points.</li> <li>• Phase changes and IMF's - Heating and Cooling Curves and Phase Diagrams</li> <li>• Organic molecules and functional groups</li> </ul>
	II	<b>Gases</b>	<ul style="list-style-type: none"> <li>• Combined Gas Law, Boyle's Law, Charles's Law, Guy-Lussac's Law, Avogadro's Law and Ideal Gas Law</li> </ul>
<b>4 Transformations of Matter</b>	I	<b>Chemical Reactions</b>	<ul style="list-style-type: none"> <li>• Writing out Chemical Reactions from sentence structures.</li> <li>• Writing out sentence structures from chemical reactions.</li> <li>• Naturally occurring diatomics.</li> <li>• Predicting and identifying physical and chemical changes from chemical reactions.</li> <li>• Balancing chemical reactions.</li> <li>• Classifying chemical reactions by reaction type; single replacement, double replacement, synthesis, decomposition, combustion.</li> <li>• Classifying chemical reactions by driving forces; formation of a solid (precipitation),</li> </ul>

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			<p>formation of water (acid/ base) and transfer of electrons (reduction/ oxidation).</p> <ul style="list-style-type: none"><li>● Drawing models of physical and chemical changes in reactions with correct stoichiometric ratios.</li></ul>
<b>5 Quantifying Transformations of Matter</b>	<b>I</b>	<b>Measurements, the Mole, Empirical and Molecular Formulas</b>	<ul style="list-style-type: none"><li>● Recording measurements using the proper number of significant figures.</li><li>● Understand the concept of weighing by counting and relative mass.</li><li>● The Mole concept, molar mass, relative number of particles in a mole</li><li>● The concept of percent composition and calculations involving percent composition.</li><li>● Concept of empirical and molecular formulas.</li></ul>