

## Chemistry Subject Group Overview

Unit Name	Atoms and Moles	Electrons and Periodicity	Properties and Bonding	Reactions	Stoichiometry	Thermochemistry, Kinetics, and Equilibrium	Solutions and Acids/Bases	
Time Frame	4 weeks	4 weeks	7 weeks	3 weeks	3 weeks	7 weeks	8 weeks	
Course Name: Chemistry	<b>Standards</b>	SC1. a, b, d SC3. c	SC1. c, e, f, g	SC2. a, b, c, d, e, f SC3.c SC5. c	SC3. a, b	SC3. d, e	SC2. g SC4. a, b, c, d SC5. a, b	SC6. a, b, c, d, e, f, g, h
	<b>Science and Engineering Practices</b>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Use mathematics and computational thinking</li> <li>Construct explanations and design solutions</li> <li>Engage in argument from evidence</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Develop and use models</li> <li>Construct explanations and design solutions</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Ask questions and define problems</li> <li>Develop and use models</li> <li>Plan and carry out investigations</li> <li>Construct explanations and design solutions</li> <li>Engage in argument from evidence</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Plan and carry out investigations</li> <li>Use mathematics and computational thinking</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Plan and carry out investigations</li> <li>Use mathematics and computational thinking</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Develop and use models</li> <li>Plan and carry out investigations</li> <li>Construct explanations and design solutions</li> <li>Engage in argument from evidence</li> </ul>	<b>SEPs</b> <ul style="list-style-type: none"> <li>Obtain, evaluate, &amp; communicate information</li> <li>Ask questions and define problems</li> <li>Develop and use models</li> <li>Plan and carry out investigations</li> <li>Use mathematics and computational thinking</li> </ul>
	<b>Approaches To Learning</b>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>	<b>ATL</b> <ul style="list-style-type: none"> <li>Communication skills</li> <li>Social skills</li> <li>Self Management skills</li> <li>Research skills</li> <li>Thinking skills</li> </ul>
	<b>Statement of Inquiry</b>	<b>Statement of Inquiry</b> All substances are composed of tiny, discrete particles that interact to shape the properties and behavior of materials in the world around us.	<b>Statement of Inquiry</b> Recurring patterns in elemental properties across the periodic table provide essential insights into the behavior and characteristics of elements.	<b>Statement of Inquiry</b> Attractive forces exist between atoms, ions, and molecules and govern the structure, properties, and reactivity of matter.	<b>Statement of Inquiry</b> Mass is preserved in chemical reactions and provides a tool to predict and understand the quantity of reactants and products in a given reaction.	<b>Statement of Inquiry</b> Quantitative relationships exist between reactants and products in chemical reactions and help us predict the amount of substances involved and their corresponding yields.	<b>Statement of Inquiry</b> Chemical reactions are governed by the energy changes and feasibility of the reactions and the factors that influence the speed and outcome of diverse chemical transformations.	<b>Statement of Inquiry</b> A dynamic exchange of solute and solvent particles exists within aqueous solutions, leading to the establishment of chemical equilibrium and influencing crucial properties like pH levels.

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<b>Phenomenon</b>	<b>Phenomenon</b> When a drop of food coloring is added to a glass of water, it disperses and gradually spreads throughout the water, demonstrating the presence of particles moving and interacting with water.	<b>Phenomenon</b> Astronomers can deduce the elements present in a star's atmosphere by closely examining the patterns of light emission and absorption coming from the star.	<b>Phenomenon</b> Hydrophobic coatings repel water while preserving the natural behavior of raindrops, creating visually striking and impermanent artworks that become visible during rain events and disappear when the pavement dries.	<b>Phenomenon</b> A candle transforms into gases, water vapor, and soot during combustion, yet the total mass of the reactants remains the same as the total mass of the products formed.	<b>Phenomenon</b> Airbags inflate to protect vehicle passengers when a collision sensor triggers solid sodium azide to rapidly decompose into nitrogen gas and sodium metal.	<b>Phenomenon</b> Luminescent chemical reactions release energy as photons creating mesmerizing glows and vivid colors that are often observed in fireflies and marine organisms and utilized in forensic investigations.	<b>Phenomenon</b> The pH of seawater is decreasing due to increased carbon dioxide absorption by the oceans, negatively impacting marine ecosystems, coral reefs, and marine life with potential far-reaching consequences on biodiversity and global food chains.
<b>Global Context</b>	<b>Global Context</b> Orientation in Space and Time	<b>Global Context</b> Scientific and Technical Innovation	<b>Global Context</b> Scientific and Technical Innovation	<b>Global Context</b> Scientific and Technical Innovation	<b>Global Context</b> Scientific and Technical Innovation	<b>Global Context</b> Globalization and Sustainability	<b>Global Context</b> Fairness and Development
<b>Key Concepts</b>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> <li>● Relationships</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Structure and Function</li> <li>● Scale, Proportion, and Quantity</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Structure and Function</li> <li>● Stability and Change</li> <li>● Patterns</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Relationships</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Structure and Function</li> <li>● Stability and Change</li> <li>● Patterns</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> <li>● Change</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Stability and Change</li> <li>● Scale, Proportion, and Quantity</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> <li>● Change</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Stability and Change</li> <li>● Scale, Proportion, and Quantity</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> <li>● Change</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Energy and Matter</li> <li>● Stability and Change</li> <li>● Cause and Effect</li> </ul>	<b>Key Concept(s)</b> <ul style="list-style-type: none"> <li>● Systems</li> </ul> <b>CCCs</b> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Structure and Function</li> </ul>
<b>Related Concepts</b>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Evidence</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Evidence</li> <li>● Patterns</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Patterns</li> <li>● Form</li> <li>● Consequences</li> <li>● Interaction</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Balance</li> <li>● Interaction</li> <li>● Transfer</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Evidence</li> <li>● Consequences</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Energy</li> <li>● Movement</li> <li>● Function</li> <li>● Conditions</li> <li>● Evidence</li> <li>● Consequences</li> <li>● Transfer</li> </ul>	<b>Related Concept(s)</b> <ul style="list-style-type: none"> <li>● Models</li> <li>● Movement</li> <li>● Interaction</li> <li>● Conditions</li> <li>● Function</li> </ul>

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Design Cycle Trans-disciplinary	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Atomic Models</li> <li>● Atomic Structure</li> <li>● Isotopes and Ions</li> <li>● Relative Abundance and Atomic Mass</li> <li>● Avogadro’s # and Moles</li> <li>● Percent Composition</li> <li>● Empirical and Molecular Formulas</li> <li>● Mass, Moles, and Molecules Relationships</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Modern Atomic Models</li> <li>● Energy Levels and Sublevels</li> <li>● Orbitals</li> <li>● Electron Configuration</li> <li>● Light Emission</li> <li>● Nuclear Fusion</li> <li>● Periodicity</li> <li>● Effective Nuclear Charge</li> <li>● Shielding</li> <li>● Atomic Radius</li> <li>● Ionization Energy</li> <li>● Electronegativity</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Physical and Chemical Properties</li> <li>● States of Matter</li> <li>● Gas Laws</li> <li>● Molar Volumes of Gases</li> <li>● Intermolecular Forces</li> <li>● Hydrogen Bonding</li> <li>● Dipole-Dipole Forces</li> <li>● Dispersion Forces</li> <li>● Intramolecular Forces</li> <li>● Ionic Bonding</li> <li>● Covalent Bonding</li> <li>● Metallic Bonding</li> <li>● Nomenclature</li> <li>● Lewis Dot Structures</li> <li>● Polarity</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Chemical Reactions</li> <li>● Indicators of a Reaction</li> <li>● Chemical Equations</li> <li>● Law of Conservation</li> <li>● Balancing Equations</li> <li>● Synthesis</li> <li>● Decomposition</li> <li>● Single Replacement</li> <li>● Double Replacement</li> <li>● Combustion</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Stoichiometry</li> <li>● Significant Figures</li> <li>● Moles to Moles</li> <li>● Mass to Moles</li> <li>● Moles to Mass</li> <li>● Mass to Mass</li> <li>● Percent Yield</li> <li>● Limiting Reactants</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Heat</li> <li>● Endothermic</li> <li>● Exothermic</li> <li>● Enthalpy</li> <li>● Heat Change</li> <li>● Hess’ Law</li> <li>● Phase Changes</li> <li>● Heating Curves</li> <li>● Reaction Rates</li> <li>● Collision Theory</li> <li>● Transition State Theory</li> <li>● Activation Energy</li> <li>● Changing Reaction Rates</li> <li>● Catalysts</li> <li>● Forward Reaction</li> <li>● Reverse Reaction</li> <li>● LeChatelier’s Principle</li> </ul>	<b>CORE IDEAS</b> <ul style="list-style-type: none"> <li>● Solvation</li> <li>● Dissociation</li> <li>● Rate of Dissolving</li> <li>● Molarity</li> <li>● Percent by Mass</li> <li>● Dilution</li> <li>● Solution Preparation and Proper Labeling</li> <li>● Colligative Properties</li> <li>● Acids and Bases</li> <li>● Percent Dissociation</li> <li>● H<sub>3</sub>O<sup>+</sup> Concentration</li> <li>● pH</li> <li>● Arrhenius Model</li> <li>● Bronsted-Lowry Model</li> <li>● Neutralization</li> </ul>
MYP Assessments/ Performance Tasks	<ul style="list-style-type: none"> <li>● Unit 1 Common Formative Assessment(s)</li> <li>● Unit 1 Common Summative Assessment</li> <li>● MYP Criterion A, B, C</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 2 Common Formative Assessment(s)</li> <li>● Unit 2 Common Summative Assessment</li> <li>● MYP Criterion A, B, C, D</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 3 Common Formative Assessment(s)</li> <li>● Unit 3 Common Summative Assessment</li> <li>● MYP Criterion A, B, C</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 4 Common Formative Assessment(s)</li> <li>● Unit 4 Common Summative Assessment</li> <li>● MYP Criterion A, B, C</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 5 Common Formative Assessment(s)</li> <li>● Unit 5 Common Summative Assessment</li> <li>● MYP Criterion A, B, C</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 6 Common Formative Assessment(s)</li> <li>● Unit 6 Common Summative Assessment</li> <li>● MYP Criterion A, B, C</li> </ul>	<ul style="list-style-type: none"> <li>● Unit 7 Common Formative Assessment(s)</li> <li>● Unit 7 Common Summative Assessment</li> <li>● MYP Criterion A, B, C, D</li> </ul>
Differentiation For Tiered Learners	Marietta City Schools teachers provide specific differentiation of learning experiences for all students. Details for differentiation for learning experiences are included on the district unit planners.						
Course Levels	<b>Marietta City Schools offers Enhanced, Honors, Accelerated, and AP classes to provide differentiated learning experiences for students.</b>						