

# Chemistry Curriculum Map

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UNIT TITLE & ESSENTIAL QUESTION	UNIT TIMELINE	UNIT CONTENT & SKILLS	CORE TEXTS & MATERIALS	FORMATIVE & SUMMATIVE ASSESSMENTS	CSRE ALIGNMENT	NEXT GENERATION/ CORE CONTENT STANDARDS
<p><b>Matter</b></p> <p>EQ: How do we describe, classify, and measure matter?</p>	<p>4 weeks</p>	<p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT create and defend a scientific claim (<i>RCHS Focus Skill</i>)</li> <li>- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context (CCSS)</li> <li>- Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text (CCSS)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Types of Matter</li> <li>- Phases of Matter</li> <li>- Physical/Chemical Properties and Changes</li> <li>- Separation Techniques</li> <li>- Percent Composition/Percent Error</li> <li>- Solubility</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Founds of Chemistry: Ancient Chemists</a></li> <li>• <a href="#">Unit 2 Vocabulary: Lesson 1</a></li> <li>• <a href="#">TED-ED: Solid, liquid, gas ... and plasma?</a></li> <li>• <a href="#">Physical and Chemical Properties</a></li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Chemistry Reference Tables</a></li> <li>• <a href="#">What is Solubility?</a></li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">PhET Colorado: States of Matter</a></li> <li>• <a href="#">CK-12: Air Matters</a></li> <li>• <a href="#">CK-12: Camping</a></li> </ul> <p><b>Digital Resources</b></p> <ul style="list-style-type: none"> <li>• Google JamBoard</li> <li>• Newsela</li> </ul>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>• Air Matters (Virtual)</li> <li>• Camping (Virtual)</li> <li>• Density</li> <li>• Solubility</li> <li>• Oreo / Percent Composition</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Solubility Mini Lab Report (Introduction, Materials, Procedure, Conclusion)</li> <li>• Unit 1 Exam (Multiple Choice and Short Answer) (<b>Summative</b>)</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Draw upon your past learning, prior experiences, and the richness of your cultural background to make meaning of new concepts and apply learning on an ongoing basis.</li> <li>• Connect in-school learning with the world outside the classroom.</li> <li>• Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 3.1x, 3.1w, 3.1q, 3.1kk, 3.1r, 3.1u, 3.1s, 3.1t, 3.1nn, 3.1oo, 3.2a, 3.1jj</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-S2-6</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>• ELA-LITERACY.R ST.9-10.4, ELA-LITERACY.R ST.9-10.8</li> </ul>

<p><b>Atomic Theory</b></p> <p>EQ: How can we use models to represent and support interactions we cannot readily observe?</p> <p>How does changing amounts of subatomic particles affect the properties of an atom?</p>	<p>4 weeks</p>	<p>- Density</p> <p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT will be able to paraphrase the central idea or conclusion of a text (<i>RCHS Focus Skill</i>)</li> <li>- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context (<i>CCSS</i>)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Structure of the Atom</li> <li>- Isotopes</li> <li>- Average Atomic Mass</li> <li>- Electron Configuration</li> <li>- Lewis Dot Diagram</li> <li>- History of the Atomic Model</li> <li>- Ions</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>● <a href="#">A Look Inside the Atom</a></li> <li>● <a href="#">The Mystery of Matter: "Out of Thin Air" (Documentary)</a></li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>● <a href="#">Chemistry Reference Tables</a></li> <li>● <a href="#">Ion Dot Diagrams</a></li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>● <a href="#">PhET Colorado: Build an Atom</a></li> <li>● <a href="#">CK-12: Average Atomic Mass</a></li> <li>● <a href="#">CK-12: Rutherford's Gold Foil Experiment</a></li> </ul> <p><b>Digital Resources</b></p> <ul style="list-style-type: none"> <li>● Google JamBoard for student collaboration</li> <li>● NearPod for student participation and discussion</li> <li>● Newsela</li> </ul>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>● Black Box</li> <li>● Build an Atom (Virtual)</li> <li>● Isotopes of Cheerium</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>● History of the Atomic Model Gallery Walk</li> <li>● Water on the Moon: Response (Double-Entry Journal / Storyboard)</li> <li>● Element Project (<b>Summative</b>)</li> <li>● Unit 1 &amp; 2 Word Mapping</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>● Respectfully, and with care, engage in difficult conversations, particularly those that challenge power and privilege in our society.</li> <li>● Draw upon your past learning, prior experiences, and the richness of your cultural background to make meaning of new concepts and apply learning on an ongoing basis</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>● 3.1a, 3.1b, 3.1c, 3.1d, 3.1e, 3.1f, 3.1h, 3.1i, 3.1j, 3.1k, 3.1l, 3.1m, 3.1n, 5.2d</li> </ul> <p><b>NGSS</b></p> <ul style="list-style-type: none"> <li>● HS-PS1-1</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>● ELA-LITERACY.R ST.9-10.1, ELA-LITERACY.R ST.9-10.4</li> </ul>
<p><b>Nuclear Chemistry</b></p>	<p>2 weeks</p>	<p>Skills:</p>	<p>Teacher-made Google Slides are used during</p>	<p><i>Labs</i></p>	<p>In this unit, students will ....</p>	<p><b>NYSS:</b></p>

<p>EQ: Should the US invest in nuclear energy?</p>		<ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT create and defend a scientific claim (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT will be able to paraphrase the central idea or conclusion of a text (<i>RCHS Focus Skill</i>)</li> <li>- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context (CCSS)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Radioactivity</li> <li>- Fission vs Fusion</li> <li>- Nuclear Equations</li> <li>- Half-Life</li> </ul>	<p>class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Nuclear Energy: Risk or Opportunity</a></li> <li>• <a href="#">Inside Chernobyl's Reactor Four Control Room</a></li> <li>• <a href="#">Returning to Fukushima   Explorer</a></li> <li>• <a href="#">Uses of Nuclear Radiation   Fuse School</a></li> <li>• <a href="#">The Mystery of Matter: "Unruly Elements" (Documentary)</a></li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Chemistry Reference Tables</a></li> <li>• <a href="#">Claim, Support, Question graphic organizer</a></li> <li>• <a href="#">Applications of Radioactive Elements Readings</a></li> </ul> <p><b>Digital Resources</b></p> <ul style="list-style-type: none"> <li>• Google JamBoard for student collaboration</li> <li>• NearPod for student participation and discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Half-Life of Pennies</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Cheat Sheet (daily review)</li> <li>• Nuclear Word Maps</li> <li>• Should the US invest in nuclear energy? (Claim, Support, Question based on video evidence)</li> </ul>	<ul style="list-style-type: none"> <li>• Express respectful agreement or disagreement with opinions, validating the knowledge of peers, or challenging their viewpoints in constructive ways.</li> <li>• Connect in-school learning with the world outside the classroom.</li> </ul>	<ul style="list-style-type: none"> <li>• 3.1o, 4.4a, 5.3a, 3.1p, 4.4b, 4.4f, 4.4c, 5.3b, 5.3c, 4.4e, 4.4d</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-8</li> </ul>
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<p><b>Periodicity</b></p> <p>EQ: How does the arrangement of elements in the Periodic Table and electron configuration predict properties?</p>	<p>1 week</p>	<p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT identify patterns within a provided set of data (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT analyze the structure of relationships among concepts in a text (data), including relationships among key terms (CCSS)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Atomic Radius</li> <li>- Ionic Radius</li> <li>- Ionization Energy</li> <li>- Period</li> <li>- Group</li> <li>- Octet Rule</li> <li>- Electronegativity</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Tutor Hotline: Periodic Trends</a></li> <li>• <a href="#">The Mystery of Matter: “Unruly Elements” (Documentary)</a></li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Periodic Trends Notes Handouts</a></li> <li>• <a href="#">Jigsaw Activity</a></li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">AACT Simulation: Periodic Trends</a></li> </ul> <p><b>Digital Resources</b></p> <ul style="list-style-type: none"> <li>• Google JamBoard for student collaboration</li> <li>• NearPod for student participation and discussion</li> </ul>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>• Trend of Atomic Radius</li> <li>• Trend of Ionization Energy</li> <li>• Trend of Electronegativity</li> <li>• Metal Reactivity</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Organizing the Periodic Table (Inquiry)</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the diverse learning styles and interests of those in the class community.</li> <li>• Work cooperatively toward goals and hold each other accountable in supportive ways.</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 3.1y, 3.1g, 3.1v, 3.1z, 3.1aa, 3.1bb</li> </ul> <p><b>NGSS</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-1</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>• ELA-LITERACY.R ST.9-10.5</li> </ul>
<p><b>Chemical Bonding</b></p> <p>EQ: How does the structure of an atom affect bonding?</p>	<p>3 weeks</p>	<p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT will be able to paraphrase the central idea or conclusion of a text (<i>RCHS Focus Skill</i>)</li> <li>-</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Women in Chemistry: Paula Hammond</a></li> </ul> <p><b>Handouts</b></p>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>• Bonding Inquiry (Virtual)</li> <li>• Polarity of Liquids</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Covalent / Ionic Names and Formulas Quiz</li> <li>• Molecular Shape Practice</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Connect in-school learning with the world outside the classroom.</li> <li>• Take risks and view mistakes as opportunities to grow</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 5.2a, 5.2h, 3.1cc, 5.2b</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-2, HS-PS2-6, HS-PS1-1, HS-PS1-3</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>• ELA-LITERACY.RST.9-10.5</li> </ul>

		<p>Content:</p> <ul style="list-style-type: none"> <li>- Covalent, Ionic, Metallic Bonds</li> <li>- Drawing Covalent Bonds</li> <li>- Molecular Shapes</li> <li>- IUPAC Names and Formulas</li> <li>- Bond Polarity</li> <li>- Molecular Polarity</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Afraid of needles? Vaccines could come without the jab</a></li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">PHeT Colorado: Build a Molecule</a></li> </ul>	<ul style="list-style-type: none"> <li>• How does surface tension allow the water strider robot to walk on water? Response</li> <li>• Vaccine Article Annotation and Response</li> </ul>	academically and emotionally.	
<p><b>Stoichiometry</b></p> <p>EQ: Which relationships can be derived from a balanced chemical equation?</p>	2 - 3 weeks	<p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT develop a data table, diagram, or model (<i>RCHS Focus Skill</i>)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Conservation of Mass</li> <li>- Balancing Chemical Equations</li> <li>- Gram Formula Mass</li> <li>- Moles</li> <li>- Types of Chemical Reactions</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">TED-ED: How big is a mole?</a></li> </ul> <p><b>Handouts</b></p> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">PHeT Colorado: Reactants, Products, and Leftovers</a></li> <li>• <a href="#">CK-12: Airbag</a></li> </ul>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>• Sandwich Conservation (Virtual)</li> <li>• Alka-Seltzer Lab</li> <li>• Airbag (Virtual)</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Gram Formula Mass A/B Partner Discussion</li> <li>• Balancing Equations Practice</li> <li>• Stoichiometry Mini Quiz (Balancing, Percent Composition, Gram-Formula Mass)</li> <li>• Interpreting Chemical Reactions into Art</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Work cooperatively toward goals and hold each other accountable in supportive ways.</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 3.2b, 3.3a, 3.3c, 3.3f, 3.3e</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-7</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>• ELA-LITERACY.R ST.9-10.5</li> </ul>
<p><b>Energy</b></p> <p>EQ: Why is paraffin an effective phase-change material to prevent winter ice in NYC?</p>	2 - 3 weeks	<p>Skills:</p> <ul style="list-style-type: none"> <li>- SWBAT will be able to paraphrase the central idea or conclusion of a text (<i>RCHS Focus Skill</i>)</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>- Heat vs Temperature</li> <li>- Heating / Cooling Curves</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• <a href="#">TED-ED: What is a calorie?</a></li> </ul>	<p><i>Labs</i></p> <ul style="list-style-type: none"> <li>• Gas Laws Inquiry (Virtual)</li> <li>• Popcorn and Gas Laws</li> </ul> <p><i>Assessments</i></p> <ul style="list-style-type: none"> <li>• Generating Heating / Cooling Curves from data</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Advocate for varied ways of learning (i.e. project-based learning, presentations, station work, small group work) that accommodate the</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 4.1a, 4.2a, 4.2b, 3.4a, 3.4b, 3.4c, 3.4e, 4.2c, 4.1b, 3.1II, 3.1mm</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-4, HS-PS3-1</li> </ul> <p><b>CCSS:</b></p>

		<ul style="list-style-type: none"> <li>- Heat Equations</li> <li>- Potential Energy Diagrams</li> <li>- Entropy</li> <li>- Combined Gas Law</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Veritasium: Sound + Fire = Rubens' Tube</a></li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Newsela: Urban Heat Islands and how to cool them</a></li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">PHeT Colorado: Gas Properties</a></li> </ul>	<ul style="list-style-type: none"> <li>• Why is paraffin an effective phase change material ... and could it be effective in a given city?</li> <li>• Urban Heat Islands: Annotation and Response</li> <li>• Teaching a Unit Lesson through a Comic (Mini-Project)</li> </ul>	<p>diverse learning styles and interests of those in the class community.</p> <ul style="list-style-type: none"> <li>• Draw upon your past learning, prior experiences, and the richness of your cultural background to make meaning of new concepts and apply learning on an ongoing basis.</li> <li>• Connect in-school learning with the world outside the classroom.</li> </ul>	<ul style="list-style-type: none"> <li>• ELA-LITERACY.R ST.9-10.4</li> </ul>
<p><b>Solutions</b></p> <p>EQ: What are the characteristic properties and behaviors of chemical solutions?</p> <p>How can I use my voice to inform my community about pollution in our area and how can I mobilize them to action?</p>	3 weeks	<p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>- SWBAT create and defend a scientific claim (<i>RCHS Focus Skill</i>)</li> <li>- SWBAT will be able to paraphrase the central idea or conclusion of a text (<i>RCHS Focus Skill</i>)</li> </ul> <p><b>Content:</b></p> <ul style="list-style-type: none"> <li>- Solubility</li> <li>- Saturation</li> <li>- Acids vs. Bases</li> <li>- pH Scale</li> <li>- Indicators</li> <li>- Molarity</li> <li>- Neutralization</li> </ul>	<p>Teacher-made Google Slides are used during class to provide notes to students.</p> <p><b>Videos</b></p> <ul style="list-style-type: none"> <li>• Dark Waters (2019)</li> </ul> <p><b>Handouts</b></p> <ul style="list-style-type: none"> <li>• <a href="#">2020 Drinking Water Supply Quality Report: NYC</a></li> <li>• Various for Lead/pH data</li> </ul> <p><b>Virtual Labs</b></p> <ul style="list-style-type: none"> <li>• <a href="#">PHeT Colorado: Acid-Base Solutions</a></li> </ul>	<p><b>Labs</b></p> <ul style="list-style-type: none"> <li>• Acid-Base Inquiry (Virtual)</li> <li>• Determining the pH of an Unknown using Indicators</li> </ul> <p><b>Assessments</b></p> <ul style="list-style-type: none"> <li>• Dark Waters movie response</li> <li>• Creating a social media post related to lead contamination in NYC water supplies</li> </ul>	<p>In this unit, students will ....</p> <ul style="list-style-type: none"> <li>• Experience multiple perspectives on a topic and be afforded the opportunity to draw your own conclusions on that topic.</li> <li>• Generate ideas about people or concepts that peers may like to learn about and share these ideas with your teachers and school leaders.</li> </ul>	<p><b>NYSS:</b></p> <ul style="list-style-type: none"> <li>• 3.1oo, 3.1pp, 3.1qq, 3.1rr, 3.1ss, 3.1tt, 3.1uu, 3.1ww, 3.1xx, 3.1yy, 3.1zz</li> </ul> <p><b>NGSS:</b></p> <ul style="list-style-type: none"> <li>• HS-PS1-2, HS-PS2-6, HS-PS1-3</li> </ul> <p><b>CCSS:</b></p> <ul style="list-style-type: none"> <li>• ELA-LITERACY. RST.9-10.5</li> </ul>