

ChemMatters Magazine April 2023

Chemistry Concepts & Standard Alignments (NGSS, CCSS)

Correlations to Next Generation Science Standards



Article	Chemistry Concepts	NGSS Connections
<i>From Pond Scum to Product</i>	Polymers Molecular structure	<p>HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> <p>HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> PS.1.A: Structure and Properties of Matter LS2.C: Ecosystem Dynamics, Functioning, and Resilience ETS1.B: Developing Possible Solutions <p>Crosscutting Concepts:</p> <ul style="list-style-type: none"> Scale, proportion, and quantity Systems and system models Energy and matter <p>Science and Engineering Practices:</p> <ul style="list-style-type: none"> Constructing explanations (for science) and designing solutions (for engineering) <p>Nature of Science:</p> <ul style="list-style-type: none"> Science is a human endeavor.
<i>The Chemistry That Keeps Trains Moving</i>	Physical change Physical properties Gas laws Pressure Temperature	<p>HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.</p> <p>HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.</p> <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> PS.1.A: Structure and Properties of Matter ETS1.C: Optimizing the Design Solution <p>Crosscutting Concepts:</p> <ul style="list-style-type: none"> Scale, proportion, and quantity Systems and system models Structure and function <p>Science and Engineering Practices:</p> <ul style="list-style-type: none"> Constructing explanations (for science) and designing solutions (for engineering)

		<p>Nature of Science:</p> <ul style="list-style-type: none"> Scientific knowledge assumes an order and consistency in natural systems.
<p><i>The Ingredients in Your Cosmetics: What Do They Do?</i></p>	<p>Physical properties</p> <p>Chemical change</p> <p>Mixtures</p> <p>Solutions</p> <p>Solute/solvent</p>	<p>HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.</p> <p>HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> PS.1.A: Structure and Properties of Matter ETS1.C: Optimizing the Design Solution <p>Crosscutting Concepts:</p> <ul style="list-style-type: none"> Cause and effect Structure and function Stability and change <p>Science and Engineering Practices:</p> <ul style="list-style-type: none"> Constructing explanations (for science) and designing solutions (for engineering) <p>Nature of Science:</p> <ul style="list-style-type: none"> Science addresses questions about the natural and material world.
<p><i>Chemistry and the Sandy Seashore</i></p>	<p>Physical properties</p> <p>Chemical properties</p> <p>Acids</p> <p>Gas laws</p> <p>Kinetic molecular theory</p> <p>Mixtures</p>	<p>HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.</p> <p>HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.</p> <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> PS.1.A: Structure and Properties of Matter PS.2.B: Types of Interactions ESS3.D: Global Climate Change <p>Crosscutting Concepts:</p> <ul style="list-style-type: none"> Patterns Cause and effect Systems and system models Stability and change <p>Science and Engineering Practices:</p> <ul style="list-style-type: none"> Obtaining, evaluating, and communicating information <p>Nature of Science:</p> <ul style="list-style-type: none"> Scientific knowledge assumes an order and consistency in natural systems.