

# ChemMatters Magazine February 2022

## Chemistry Concepts & Standard Alignments (NGSS, CCSS)



### Correlations to Next Generation Science Standards

Article	Chemistry Concepts	NGSS Connections
<b><i>Shining a Light on Candles</i></b>	Chemical change Observations Combustion Density Saturated vs. unsaturated	<p><b>HS-PS1-3.</b> 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><b>Disciplinary Core Ideas:</b></p> <ul style="list-style-type: none"> <li>• PS1.A: Structure and Properties of Matter</li> <li>• ETS1.C: Optimizing the Design Solution</li> </ul> <p><b>Crosscutting Concepts:</b></p> <ul style="list-style-type: none"> <li>• Cause and effect</li> <li>• Structure and function</li> <li>• Stability and change</li> </ul> <p><b>Science and Engineering Practices:</b></p> <ul style="list-style-type: none"> <li>• Constructing explanations and designing solutions</li> </ul> <p><b>Nature of Science:</b></p> <ul style="list-style-type: none"> <li>• Scientific knowledge is open to revision in light of new evidence</li> <li>• Science is a way of knowing.</li> </ul>
<b><i>What's in Marshmallows?</i></b>	Physical properties Gas laws Mixtures	<p><b>HS-PS1-3.</b> 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><b>Disciplinary Core Ideas:</b></p> <ul style="list-style-type: none"> <li>• PS1.A: Structure and properties of matter</li> <li>• ETS1C: Optimizing the design solution</li> </ul> <p><b>Crosscutting Concepts:</b></p> <ul style="list-style-type: none"> <li>• Stability and change</li> <li>• Structure and function</li> </ul> <p><b>Science and Engineering Practices:</b></p> <ul style="list-style-type: none"> <li>• Constructing explanations and designing solutions</li> </ul> <p><b>Nature of Science:</b></p> <ul style="list-style-type: none"> <li>• Scientific knowledge assumes an order and consistency in natural systems.</li> </ul>

<p><b><i>The Photo-electric Effect –Putting Electrons to Work</i></b></p>	<p>Electrons Electricity Electromagnetic spectrum</p>	<p><b>HS-PS4-3.</b> Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.</p> <p><b>Disciplinary Core Ideas:</b></p> <ul style="list-style-type: none"> <li>• PS.4.A: Wave Properties</li> <li>• PS4.B: Electromagnetic Radiation</li> </ul> <p><b>Crosscutting Concepts:</b></p> <ul style="list-style-type: none"> <li>• Cause and effect</li> <li>• Energy and matter</li> <li>• Systems and System Models</li> </ul> <p><b>Science and Engineering Practices:</b></p> <ul style="list-style-type: none"> <li>• Constructing explanations and designing solutions</li> </ul> <p><b>Nature of Science:</b></p> <ul style="list-style-type: none"> <li>• Science models, laws, mechanisms, and theories explain natural phenomena.</li> </ul>
<p><b><i>Could the Future of Vaccines be Pain-free?</i></b></p>	<p>Physical properties Intermolecular forces</p>	<p><b>HS-PS1-3.</b> 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><b>HS-ETS1-3.</b> 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><b>Disciplinary Core Ideas:</b></p> <ul style="list-style-type: none"> <li>• PS1.A: Structure and properties of matter</li> <li>• PS2.B: Types of interactions</li> <li>• ETS1.C: Optimizing the design solution</li> </ul> <p><b>Crosscutting Concepts:</b></p> <ul style="list-style-type: none"> <li>• Stability and change</li> <li>• Cause and effect</li> <li>• Systems and system models</li> </ul> <p><b>Science and Engineering Practices:</b></p> <ul style="list-style-type: none"> <li>• Planning and carrying out investigations</li> <li>• Constructing explanations and designing solutions</li> </ul> <p><b>Nature of Science:</b></p> <ul style="list-style-type: none"> <li>• Scientific knowledge is based on empirical evidence.</li> </ul>