

Chemistry - Unit 1 - Classification and Properties of Matter

Unit Focus

Students are introduced to Chemistry through the study and classification of matter and its properties at the macroscopic level. Students will deepen their understanding of the changes matter undergoes by performing laboratory investigations and observation of chemical phenomena which will allow the students to distinguish between chemical and physical changes. Students will also become familiar with the language of the course and the elements of the Periodic Table, which are the fundamental building blocks of all matter. Since all chemical changes involve energy, students are introduced to the concept that there is a single quantity called energy. Students will further investigate and learn through laboratory investigation that a system's total energy is conserved, and within the system, energy is continually transferred from one object to another and between its various possible forms.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<p>Next Generation Science <i>High School Physical Sciences: 9 - 12</i></p> <ul style="list-style-type: none"> Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. <i>HS-PS3-1</i> <p>Next Generation Science Standards (DCI) <i>Science: 11</i></p> <ul style="list-style-type: none"> The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions. <i>PS1.9.B3</i> Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. <i>PS3.9.A2</i> <p>Student Growth and Development 21st Century</p>	<p>T1 Analyze qualitative and quantitative data to interpret patterns, draw conclusions, and/or make predictions. T2 Use the scientific process to generate evidence that addresses the original questions.</p>	
	Meaning	
	Understanding(s)	Essential Question(s)
	<p>U1 A physical change does not change the identity of a substance, but a chemical change does change the identity of a substance. U2 Compounds are composed of elements bonded together and their structure can only be changed through chemical means. U3 Mixtures may be separated based on the physical property differences of the components of the mixture.</p>	<p>Q1 When an object changes, can it be changed back? Q2 How can you demonstrate that atoms are conserved during a chemical reaction? Q3 How can I quantify the heat change in a given scenario?</p>
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
<p>K1 Macroscopic vs. microscopic domain K2 How to separate mixtures K3 Pure substances have definite proportions K4 Compounds can only be broken down chemically K5 Indicators of chemical reaction K6 Chemical and physical changes can absorb or release heat energy.</p>	<p>S1 Differentiate between compounds and elements (pure) and mixtures S2 Identify chemical and physical changes and properties S3 Calculate the change in energy, temperature, or other relevant variables for a physical change using calorimetry data.</p>	

Stage 1: Desired Results - Key Understandings

Capacities Matrix

Critical Thinking

- Analyzing: Students will be able to examine information/data/evidence to make inferences and identify possible underlying assumptions, patterns, and relationships. *MM.1.2*

Collaboration/Communication

- Collective Intelligence: Students will be able to work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. *MM.3.1*