

*Interactions of Matter*

<b>Unit Outcomes</b> At the end of this unit, your student should be able to:	<b>Key Vocabulary</b> Terms to deepen the student's understanding
<ul style="list-style-type: none"> <li>✓ Conclude whether matter should be classified as an element, compound or mixture based on arrangement of atoms</li> <li>✓ Explain the arrangement of the elements on the Periodic Table of Elements using reactivity and physical properties</li> <li>✓ Compare physical properties to chemical properties</li> <li>✓ Explain how the law of conservation of mass is supported by atoms and balanced chemical equations</li> <li>✓ Explain how matter cannot be created or destroyed during a reaction and the number of atoms remain the same during a reaction</li> <li>✓ Conclude that reactions must be studied in a closed system</li> </ul>	<ul style="list-style-type: none"> <li>✓ Physical properties</li> <li>✓ Physical change</li> <li>✓ Melting point</li> <li>✓ Boiling point</li> <li>✓ Appearance</li> <li>✓ Density</li> <li>✓ Solubility</li> <li>✓ Classification</li> <li>✓ Chemical properties</li> <li>✓ Chemical change</li> <li>✓ Atomic number</li> <li>✓ Law of conservation of mass</li> <li>✓ Reactants</li> <li>✓ Products</li> <li>✓ Reactivity</li> <li>✓ Toxicity</li> <li>✓ Element</li> <li>✓ Compound</li> <li>✓ Periodic Table</li> <li>✓ Subatomic particles</li> <li>✓ Protons</li> <li>✓ Neutrons</li> <li>✓ Electrons</li> <li>✓ Atomic mass</li> <li>✓ Atoms</li> <li>✓ Chemical equation</li> <li>✓ Chemical reaction</li> </ul>
<b>Key Standards Addressed</b> Connections to Common Core/NC Essential Standards	<b>Where This Unit Fits</b> Connections to prior and future learning
<p>8.P.1.1 Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements.</p> <p>8.P.1.2 Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of elements.</p> <p>8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.</p> <p>8.P.1.4 Explain how the idea of atoms and a balanced chemical equation support the conservation of matter.</p>	<p><b>Coming into this unit, students should have a strong foundation in</b></p> <ul style="list-style-type: none"> <li>✓ Recognizing what matter is and that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.</li> <li>✓ Explaining the effect of heat on the motion of atoms and molecules by describing what happens to particles during a phase change.</li> <li>✓ Comparing weight of matter to the sum of its parts before and after an interaction</li> <li>✓ Summarizing the properties of a new material formed to those of the old material to justify that a change has occurred.</li> </ul> <p><b>This unit builds to the following future skills and concepts:</b></p> <ul style="list-style-type: none"> <li>▪ Classifying matter as elements, compounds, or mixtures based on atom arrangement</li> <li>▪ Classifying matter as being homogeneous or heterogeneous; mixture or pure substance; element or compound; metal, nonmetal or metalloid; solution, colloid, or suspension</li> <li>▪ Inferring type of chemical bond in a given substance</li> <li>▪ Predicting chemical formulas and names of simple compounds</li> <li>▪ Comparing the relative strengths of ionic, covalent, and metallic bonds</li> <li>▪ Interpreting the names and formulas of compounds</li> <li>▪ Creating and interpreting data from Bohr models and</li> </ul>

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	<p>Dot diagrams</p> <ul style="list-style-type: none"> <li>▪ Inferring valence electrons, oxidation number and reactivity from the location of elements on the Periodic Table.</li> <li>▪ Classifying reactions as synthesis, single replacement, double replacement, or decomposition</li> <li>▪ Illustrating the law of conservation of matter by balancing chemical equations</li> <li>▪ Analyzing the law of conservation of matter and how it applies to types of chemical equations</li> </ul>
<p style="text-align: center;"><b>Additional Resources</b></p> <p>Materials to support understanding and enrichment</p>	<p style="text-align: center;"><b>“Learning Checks”</b></p> <p>Questions Parents Can Use to Assess Understanding</p>
<ul style="list-style-type: none"> <li>✓ CK12.org textbook: <a href="#">Intro to Matter</a></li> <li>✓ Discovery Ed link: <a href="#">Combining and Separating</a></li> <li>✓ Discovery Ed lesson: <a href="#">Properties of Matter</a></li> <li>✓ CK12.org textbook: <a href="#">Periodic Table</a></li> <li>✓ Discovery Ed link: <a href="#">Periodic Table</a></li> <li>✓ Educational videos, lessons and games on a variety of science topics <a href="http://www.neok12.com/">http://www.neok12.com/</a></li> <li>✓ Chem4kids website: explanations and quizzes on matter, equations, elements, etc. <a href="http://www.chem4kids.com/files/matter_intro.html">http://www.chem4kids.com/files/matter_intro.html</a></li> <li>✓ Jefferson Lab: practice balancing chemical equations <a href="http://education.jlab.org/elementbalancing/">http://education.jlab.org/elementbalancing/</a></li> </ul>	<ul style="list-style-type: none"> <li>✓ How do elements combine to form compounds?</li> <li>✓ Can any two elements form a compound?</li> <li>✓ How do the properties of the compound compare to the properties of the elements that formed it?</li> <li>✓ What is the difference between a compound and a mixture?</li> <li>✓ How does the arrangement of the elements on the Periodic Table relate to their reactivity and physical characteristics?</li> <li>✓ What evidence would you look for to determine if a physical change or a chemical change has occurred?</li> <li>✓ Explain how atoms in a balanced equation supports the law of conservation of mass?</li> </ul>