



# Honors Chemistry - Unit 1 - The Structure of Chemistry

## Unit Focus

Students will begin their study of honors chemistry by describing matter on the macroscopic scale. Students will perform laboratory investigations and observe demonstrations of chemical phenomena in order to describe matter both qualitatively and quantitatively. Students will classify matter, describe chemical and physical properties of matter, and learn how to make precise measurements. Students will solve problems using dimensional analysis, a problem-solving method that will be used throughout the year. Students will apply proper laboratory skills as they perform laboratory investigations involving separation techniques and the use of a calibration curve to predict the sugar content of beverages.

## Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<b>Next Generation Science</b> <i>High School Physical Sciences: 9 - 12</i>	<b>T1</b> Analyze qualitative and quantitative data to interpret patterns, draw conclusions, and/or make predictions. <b>T2</b> Make precise measurements.	
Understanding(s)	Essential Question(s)	
<ul style="list-style-type: none"><li>Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. <i>HS-PS1-7</i></li></ul>	<b>U1</b> A physical change does not change the identity of a substance, but a chemical change does change the identity of a substance. <b>U2</b> Compounds are composed of elements bonded together and their structure can only be changed through chemical means. <b>U3</b> Mixtures may be separated based on the physical property differences of the components of the mixture. <b>U4</b> Scientific numeracy includes the ability to use universal mathematical operations and procedures to calculate, analyze and present scientific data and ideas.	<b>Q1</b> What changes have occurred here based on my observations? What conclusions can I draw about the nature of that change? <b>Q2</b> What is the composition of this sample? How can the composition be determined? <b>Q3</b> How does a scientist communicate the degree of uncertainty in a measured or calculated value? <b>Q4</b> How can multiple units be used to express the same quantity, and how can proportional relationships be used to understand how quantities are related?
Acquisition of Knowledge and Skill		
Knowledge	Skill(s)	
<b>K1</b> Macroscopic vs. microscopic domain <b>K2</b> How to separate mixtures <b>K3</b> Pure substances have definite proportions <b>K4</b> Compounds can only be broken down chemically <b>K5</b> Indicators of chemical reaction	<b>S1</b> Differentiate between compounds and elements (pure) and mixtures <b>S2</b> Identify chemical and physical changes and properties <b>S3</b> Apply both precision and accuracy in recording experimental data.	

## Stage 1: Desired Results - Key Understandings

<p><b>Madison Public Schools Profile of a Graduate</b></p> <p><i>Critical Thinking</i></p> <ul style="list-style-type: none"><li>Analyzing: Examining information/data/evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)</li></ul> <p><i>Collaboration/Communication</i></p> <ul style="list-style-type: none"><li>Collective Intelligence: Working respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. (POG.3.1)</li></ul>	<p><b>K6</b> Significant figures in a measurement include all known digits plus one estimated digit.</p> <p><b>K7</b> Significant figures rules govern how to round off an answer to a calculation.</p> <p><b>K8</b> Density is the ratio of mass to volume for a given substance.</p> <p><b>K9</b> Vocabulary: heterogeneous, homogeneous, pure substance, element, compound, mixture, solution, endothermic, exothermic.</p>	<p><b>S4</b> Use significant figures in measurements and calculations.</p> <p><b>S5</b> Solve problems using dimensional analysis.</p>
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