



Grade 6 - Unit 1 - Properties of Matter

Unit Focus

Students will participate in many hands-on activities exploring the properties of matter. Phase changes, density, molecular movement and relevant mathematical calculations will be emphasized. This unit will include a design component as students will create an object to perform in a specific manner by applying their understanding of the properties of matter. In the culminating experience, students will move through several lab stations as they analyze the behavior of different examples of matter and demonstrate their understanding by explaining the phenomenon using content-specific science terminology.

The concepts explored in this unit will support students in Unit 2 when they apply their understanding of molecular properties to weather and climate.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Next Generation Science Standards (DCI) Science: 6 <ul style="list-style-type: none">Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of those characteristics may be incorporated into the new design. (ETS1.6.C1)Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (PS1.6.A2)Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (PS1.6.A3)In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (PS1.6.A4)The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (PS1.6.A6)Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (PS1.6.B1)The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one	<i>Students will be able to independently use their learning to...</i> T1 Make observations and ask questions to define a problem based on prior knowledge and curiosity that stimulates further exploration, analysis, and discovery. T2 Use the scientific process to generate evidence that addresses the original questions.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Different kinds of matter exist and many of them can be either solid or liquid, depending on the temperature. Matter can be described by its observable properties. U2 Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. U3 The properties of matter are responsible for many of the everyday natural phenomenon people experience such as weather.	<i>Students will keep considering...</i> Q1 How can different types of matter be measured? Q2 How and why does matter change form? Q3 How can the properties of matter explain natural phenomenon? Q4 What do the results tell me? What patterns do I see or what conclusions can I draw?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 Everything is made of matter. K2 Matter of any type can be subdivided into particles that are too small to see.	<i>Students will be skilled at...</i> S1 Calculate mass, weight, volume and density in order to classify/identify different liquids/solids.

Stage 1: Desired Results - Key Understandings

<p>object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (PS3.6.A1)</p> <ul style="list-style-type: none"> Energy is spontaneously transferred out of hotter regions or objects and into colder ones. (PS3.6.B3) <p>Madison Public Schools Profile of a Graduate</p> <ul style="list-style-type: none"> Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2) 	<p>K3 Matter can exist as solids, liquids, and gasses.</p> <p>K4 There are specific (color, odor, shape, malleability, etc.) and general (mass, weight, volume, density) properties of matter.</p> <p>K5 Vocabulary: solid, liquid, gas, matter, properties, specific and general properties, mass, weight, volume, density, gravity, molecule, phase, phase change</p>	<p>S2 Explain various phenomena by applying appropriate concepts of the properties of matter.</p> <p>S3 Design an object that can will float and sink simultaneously by applying understanding of the properties of matter.</p>
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