

1

Space, Time and Matter

(Physical Science)

Essential Question: What are the physical properties of solids and liquids?

Enduring Knowledge	Science Concepts	GE	Evidence of Understanding
<p>Properties of Matter: All living and non-living things are composed of matter having characteristic properties that distinguish one substance from another.</p>	<p>a. Objects are made of one or more materials such as paper, wood, metal, or cloth. b. Similarities and differences in physical properties can be identified.</p>	9	Identifying, recording and comparing characteristics of objects made of similar and different properties
<p>Properties of Matter: All living and non-living things are composed of matter having characteristic properties that distinguish one substance from another.</p>	<p>a. Solids and liquids are states of matter and have properties that can be described. b. Solids have the properties of hardness, color, and ability to maintain shape. c. Liquids have properties of color, tendency to flow, ability to mix with other liquids, and taking the shape of the container.</p>	12	Identifying, describing and comparing the state of matter of solids and liquids
<p>Physical Change: A transfer of energy can result in the physical change of state of a substance .</p>	<p>a. Heating and cooling (changes in temperature) can change states of matter. Water can be a liquid or a solid through the processes of melting and freezing.</p>	14	Describing and reporting the change in properties when heat is applied to a solid or when heat leaves a liquid (e.g., water and ice)
<p>Energy: Energy is necessary for change to occur. It is the ability of matter to bring about change. - There are many forms of energy. - The total energy in the universe is constant. - Energy can be transformed and transferred, but not destroyed. (Conservation of Energy) - Energy transfers and transformations exhibit the characteristics of systems with inputs, processes and outputs as well as connections to other systems.</p>	<p>a. Heat can move from one object to another. b. The temperature of substances can change.</p>	23	Experimenting, observing, and describing how heat moving from one object to another can cause temperature changes

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Focusing Questions	Potential Inquiries/Activities	Resources/Notes
<p>Choose 2 objects and compare their physical properties.</p> <ul style="list-style-type: none"> - Understand that objects are usually made up of more than one material, even if all materials are not visible (e.g., bookshelves w/ nails). - Understand what physical properties are - Understand that objects can share some properties but be different with other properties 	<p>What are objects in the classroom made of? Use your senses to compare 2 objects (Venn Diagram).</p>	
<p>How are liquids and solids different?</p> <ul style="list-style-type: none"> - Matter has different forms. - The state of matter is determined by specific properties. - An important physical property of solids is its ability to hold its own shape. - Physical properties of a liquid are the ability to flow and to take the form of the container it is in. 	<p>What do you need to do to your object to find if it is a liquid or a solid? (i.e., sand, salt, stuffed animal, colored water).</p>	
<p>How can a substance's state of matter be changed?</p> <ul style="list-style-type: none"> - Matter's state can be changed. - Matter's state is defined by its properties. - Different substances change state at different temperatures. 	<p>How can you change an ice cube into water?</p> <ul style="list-style-type: none"> - Put ice cube in baggie and hold it in your hands. The heat of your hands will melt it. - weigh baggie as ice cube and water. 	<p><u>Uncovering Student Ideas in Science</u> by Keeley, Eberle, Farrin</p>
<p>How is the temperature of a substance changed?</p> <ul style="list-style-type: none"> - An object can hold heat. - An object can be heated. - Heat is energy that transfers from one object to another. - A substance has a temperature. - Temperature is measurable. - The environment can cause temperature changes of a substance. 	<p>How can you change the temperature of a ceramic mug?</p> <ul style="list-style-type: none"> - Put hot water or ice cubes inside the mug. - Have students feel mug before and after. 	