

Unifying Theme: Changes

Essential Standards and Clarifying Objectives

2.P.2 Understand properties of solids and liquids and the changes they undergo.

2.P.2.1 Give examples of matter that change from a solid to a liquid and from a liquid to a solid by heating and cooling.

2.P.2.2 Compare the amount (volume and weight) of water in a container before and after freezing.

2.P.2.3 Compare what happens to water left in an open container over time as to water left in a closed container.

3.P.2 Understand the structure and properties of matter before and after they undergo a change.

3.P.2.3 Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.

3.P.3 Recognize how energy can be transferred from one object to another.

3.P.3.1 Recognize that energy can be transferred from one object to another by rubbing them against each other.

3.P.3.2 Recognize that energy can be transferred from a warmer object to a cooler one by contact or at a distance and the cooler object gets warmer.

Unpacking

What does this clarifying objective mean a child will know, understand and be able to do?

2.P.2.1 Students know that solids are materials that maintain their own shapes, while liquids tend to assume the shapes of their containers. Students know example of materials that can be classified as solid and materials that can be classified as liquid. Students know water can be a liquid or a solid and can go back and forth from one form to the other when heat is added or removed. Other examples include: candle wax, shortening, rock/lava. Students know things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them.

2.P.2.2 Students know how to measure and compare the volume of a liquid poured into different containers. Students know how to measure and compare the weight of water poured into different containers. Students know if water is turned into ice and then the ice is allowed to melt, the amount of water is the same as it was before freezing.

2.P.2.3 Students know how to measure and compare the volume of liquid poured into different containers. Students know that a container of water left open will contain less water over time, while a closed container of water will not change.

3.P.2.3 When heat is applied to an object the particles in that object begin to vibrate more rapidly. They also begin to move further apart. As the particles move farther apart, the object may change from one state to another (solid to liquid, liquid to gas). Students know that heating or cooling matter will alter the properties of that matter.

3.P.3.1 Students know that rubbing objects together results in friction which releases heat energy.

3.P.3.2 Students know that objects can transfer energy by touching or by giving off or receiving energy waves. Heat can move from one object to another in more than one way. Convection (more commonly gases and liquids) and conduction (more commonly solids) are best understood at this level, not as vocabulary terms, but rather through effects that may be observed using everyday materials such as water, air, cooking and heating utensils.