

# 4

## Space, Time and Matter

### (Physical Science)

Enduring Knowledge	Science Concepts	GE	Evidence of Understanding
<b>Properties of Matter:</b> All living and non-living things are composed of matter having characteristic properties that distinguish one substance from another.	a. All matter has weight that can be measured. b. The weight of the whole is the same as the sum of the parts. c. Most objects/substances are made of smaller parts.	9	Investigating and measuring how the total weight of the parts of a substance, no matter how they are combined, remains the same (e.g., water and gravel mixture, a Lego car system, the weight of sugar plus the weight of water equals the total weight of the sugar solution)
<b>Properties of Matter:</b> All living and non-living things are composed of matter having characteristic properties that distinguish one substance from another.	a. Solids, liquids and gases are states of matter that can be observed, described, and measured. b. Gases take up as much space as you give them	12	Identifying, describing and comparing the properties of selected solids, liquids and gases
<b>Properties of Matter:</b> All living and non-living things are composed of matter having characteristic properties that distinguish one substance from another.	a. Gas is a state of matter that takes up space.	13	Experimenting with gas in a closed container (such as a balloon or a bag) and describing how pressure on the container changes when the volume of the gas changes
<b>Physical Change:</b> A transfer of energy can result in the physical change of state of a substance .	a. Adding heat can change a substance from a solid, to a liquid, to a gas.	14	Investigating and explaining what happens to liquids in open containers
<b>Energy:</b> 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.	a. Light maintains direction of motion until it interacts with another object. b. Light can be reflected or absorbed.	28	Investigating with flash lights and other light sources and describing how light rays reflect off of objects Explaining what occurs when light rays are blocked (e.g., shadows)

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Focusing Questions	Potential Inquiries/Activities	Resources/Notes
<p><b>What happens to matter when it changes state?</b> - Matter is conserved; it is not created or destroyed.</p>	<p>How can you conserve matter when it changes states? If a substance melts how does the mass change?</p>	<p>Book: <a href="#"><u>30 Formative Science Assessments</u></a></p>
<p><b>How can states of matter be observed, described, and measured?</b> - Objects have many observable properties (e.g., size, weight, shape, color, temperature, texture, smell, sound, sink/float, and magnetism). - Matter can be in the state of a solid, liquid, or gas. - Gases take the shape of a container. - Gases will continue to expand to try and fill a space.</p>	<p>Observe, describe, and measure the states of matter.</p>	
<p>- Volume is the amount of space an object occupies. - When the density of a gas is increased in a closed container, the pressure is increased. - When the volume of a gas in a closed container is compressed, the pressure is increased.</p>	<p>Design an inquiry to show what happens to a gas under pressure.</p>	<p>- Cartesian Diver</p>
<p>- Some changes of state happen quickly; others take place over time.</p>	<p>Identify the ways in which matter changes when heat is added.</p>	<p>- Hot plate</p>
<p><b>What is light?</b> - Light is a form of energy. - Light travels in a straight line until it hits an object. - Objects can reflect or absorb light. <b>What causes shadows?</b> - A shadow occurs when the source of light is blocked by an object or substance.</p>	<p>How can you observe the motion of light?</p>	<p>- Mirrors, prisms, lens - Radiometer</p>