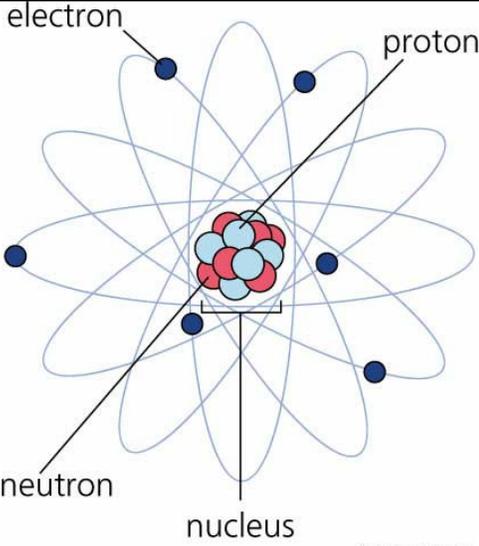
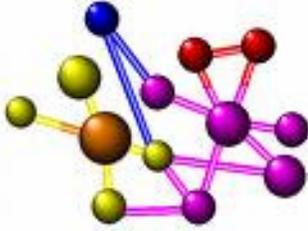
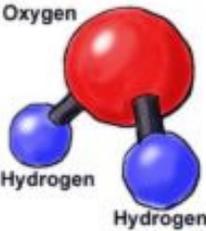
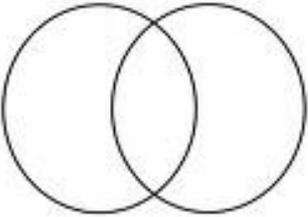
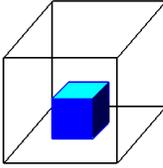
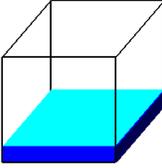
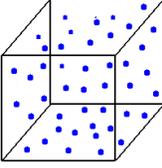


## Matter - SOL 5.4 – Science Study Guide

<p><b>Matter</b> is anything that has mass and takes up space. All things, living and dead, are made of matter.</p>	What is matter?
<p>All matter, regardless of its size, shape, or color, is made of <b>particles</b> (atoms and molecules) that are too small to be seen by the eye.</p> <p>There are more than 100 known elements that make up all matter. The smallest part of an element is an atom.</p>	What is matter made of?
<p><b>Atoms</b> are the smallest particles of matter. Atoms cannot be divided into smaller parts without changing their properties. Atoms have a nucleus surrounded by a cloud of electrons.</p>	What are atoms?
 <p>The diagram illustrates an atom with a central nucleus. The nucleus is composed of red spheres (protons) and blue spheres (neutrons). Surrounding the nucleus are several blue spheres representing electrons, which are arranged in a cloud-like pattern. Labels with arrows point to an 'electron', a 'proton', a 'neutron', and the 'nucleus'. A small bracket is visible under the nucleus label. The text 'Academy Artworks' is written at the bottom right of the diagram.</p>	What does an atom look like?
<p><b>Molecules</b> are the smallest whole bit of a substance. Molecules are made of two or more atoms.</p>	What are molecules?

 <p style="text-align: right;">molecule</p>	<p>What does a molecule look like?</p>
<p>When two or more elements combine to form a new substance, it is called a <b><u>compound</u></b>.</p> <p>There are many different types of compounds because atoms of elements combine in many different ways (and in different whole number ratios) to form different compounds.</p>	<p>What is a compound?</p>
<p>Examples of <b><u>compounds</u></b> include water (H<sub>2</sub>O) and table salt (NaCl). The smallest part of a compound is a molecule.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Oxygen</p> <p>Hydrogen</p> <p>Hydrogen</p> </div> <div style="text-align: center;">  </div> </div> <p style="display: flex; justify-content: space-around; width: 100%;"> <span>water</span> <span>salt</span> </p>	<p>What are some common examples of compounds?</p>
<p>A <b><u>mixture</u></b> is a combination of two or more substances that do not lose their identifying characteristics when combined.</p> <div style="text-align: center;">  </div>	<p>What is a mixture?</p>

<p>A <b>solution</b> is a mixture in which one substance dissolves in another.</p> 	<p>What is a solution?</p>
<p>Be sure that you can compare and contrast <b>mixtures</b> and <b>solutions</b>.</p> <p>Be able to compare and contrast <b>elements</b> and <b>compounds</b>.</p> <p>Be able to compare and contrast <b>atoms</b> and <b>molecules</b>.</p>	<p>How do I show what I know about atoms, elements, molecules and compounds?</p> 
<p>Be sure that you can construct and interpret models of atoms, elements, molecules, and compounds.</p>	<p>How else can I show what I know about atoms, elements, molecules and compounds?</p>
<p>Matter can exist as a solid, a liquid, and a gas.</p> <p><b>Solids</b> keep their shape and have a fixed size, shape, and volume. The particles in a solid are packed tightly together (touching) and vibrate back and forth.</p> <p><b>Liquids</b> take the shape of their container. They have a movable surface, but their volume is fixed. The particles in a liquid are spread out a little and are able to slide past each other.</p> <p><b>Gases</b> take the shape of their surface. The size, shape, and volume of gases changes depending upon the size of the container. The particles in a gas are very spread out and move very quickly in all directions.</p>	<p>What are the three states of matter?</p>

 <b>States of Matter</b> 		<p>What do the three states of matter look like?</p>
 <p><b>Solid</b></p> <p>Holds Shape Fixed Volume</p>	 <p><b>Liquid</b></p> <p>Shape of Container Free Surface Fixed Volume</p>	 <p><b>Gas</b></p> <p>Shape of Container Volume of Container</p>
<p>As its temperature increases, many kinds of matter change from a solid to a liquid to a gas. As its temperature decreases, that matter changes from a gas to a liquid to a solid. As the temperature increases, the particles begin to move faster and cause them to change states. <b>Example:</b> As a candy bar heats up on a hot day, the particles in the candy bar begin to move faster which results in the candy bar melting and becoming a liquid. As the temperature decreases, the particles slow down. <b>Example:</b> As the particles in water get colder they begin to slow down to form a solid, ice.</p>		<p>How does temperature affect matter?</p>
<p>Be sure that you can construct and interpret a sequence of models (diagrams) showing the activity of molecules in all three states of matter.</p>		<p>How do I show what I know about heat and the states of matter?</p>
<p>Be sure that you can design an investigation to determine how heat affects the states of matter (e.g., water). Include in the design ways information will be recorded, what measures will be made, what instruments will be used, and ways the data will be graphed.</p>		<p>How else can I show what I know about heat and the states of matter?</p>