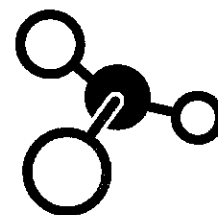


PS1: Matter and Its Interactions

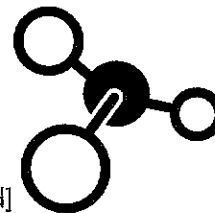
PS1.A: Structure and Properties of Matter



2nd Grade	5th Grade	6th Grade	7th Grade	8th Grade	Physical Science	Chemistry
<p>Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature.</p> <p>Matter can be described and classified by its observable properties.</p>	<p>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means.</p> <p>A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects.</p>	<p>All living things are made Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. 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.</p>	<p>Substances are made from different types of atoms, which combine with one another in various ways.</p> <p>Atoms form molecules that range in size from two to thousands of atoms.</p> <p>Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g. crystals).</p>	<p>Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.</p>	<p>Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons.</p> <p>The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states.</p>	<p>Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons.</p> <p>The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states.</p>

PS1: Matter and Its Interactions

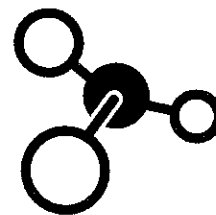
PS1.A: Structure and Properties of Matter [continued]



2nd Grade	5th Grade	6th Grade	7th Grade	8th Grade	Physical Science	Chemistry
<p>Different properties are suited to different purposes.</p> <p>A great variety of objects can be built up from a small set of pieces.</p>	<p>The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.</p> <p>Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)</p>	<p>The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.</p>	<p>Each pure substance has characteristic physical and chemical.</p>			<p>The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms.</p> <p>A stable molecule has less energy than the same set of atoms separated; one must provide at least this energy in order to take the molecule apart.</p>

PS1: Matter and Its Interactions

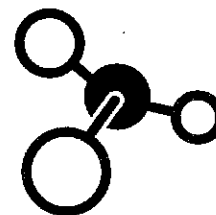
PS1.B: Chemical Reactions



2nd Grade	5th Grade	7th Grade	8th Grade	Physical Science	Chemistry
<p>Heating or cooling a substance may cause changes that can be observed.</p> <p>Sometimes these changes are reversible, and sometimes they are not.</p>	<p>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)</p> <p>When two or more different substances are mixed, a new substance with different properties may be formed.</p>	<p>Substances react chemically in characteristic ways.</p> <p>In 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.</p>	<p>Substances react chemically in characteristic ways.</p> <p>In a chemical process, the atoms that make up the original substances regrouped into different molecules, and these new substances have different properties from those of the reactants.</p> <p>The total number of each type of atom is conserved, and thus the mass does not change.</p> <p>Some chemical reactions release energy, others store energy.</p>	<p>The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.</p> <p>Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules and the rearrangements of atoms into new molecules, with consequent changes in the sum of all bond energies in the set of molecules that are matched by changes in kinetic energy.</p> <p>The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.</p>	<p>The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.</p> <p>Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules and the rearrangements of atoms into new molecules, with consequent changes in the sum of all bond energies in the set of molecules that are matched by changes in kinetic energy.</p> <p>In many situations, a dynamic and condition-dependent balance between a reaction and the reverse reaction determines the numbers of all types of molecules present.</p> <p>The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.</p>

PS1: Matter and Its Interactions

PS1.C: Nuclear Processes



Chemistry	Physics
Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy.	Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy.