



Physical Science Frameworks Pacing Guide

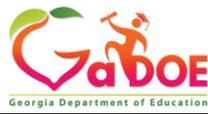
Stability and Change in Reactions

Crosscutting Concepts: Energy & Matter; Stability & Change

Topics: Atomic and molecular motion; Behavior of gases; Conservation of matter; Solutions; Solvents; Acids and Bases; Energy of reactions

8-week Instructional Segment

Anchoring Phenomenon	GSE	Sample Lessons	Disciplinary Core Ideas	Science and Engineering Practices	Instructional Notes
<p>Overall: Chemical reactions in cars or rockets.</p> <p>Lesson Level: A burning candle will lose mass as it burns</p> <p>A potato chip bag will explode due to rapid change in altitude.</p> <p>Certain drinks conduct electricity</p> <p>Color-changing cabbage juice</p>	<p>SPS3a, b; SPS5a, b; SPS6a, b c, d, e; SPS7a</p>	<p>Where Oh Where Did My Candle Go?</p> <p>The Case of the Exploding Chip Bag</p> <p>What's Inside Our Drinks?</p> <p>Acids and Bases in Everyday Life</p>	<p>Frameworks of K-12 Science Education: <i>By the end of grade 12</i></p> <ul style="list-style-type: none"> Substances react chemically in characteristic ways. In a 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. The total number of each type of atom is conserved, and thus the mass does not change. 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. 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 each other; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and vibrate in position but do not change relative locations. Solids may be formed from molecules, or they may be extended structures with 	<p>Planning and carrying out an investigation</p> <p>Developing and using models</p> <p>Asking questions and defining problems</p> <p>Analyzing and interpreting data</p> <p>Constructing explanations</p> <p>Obtaining, Evaluating and Communicating Information</p>	<p>Additional topic, focus, and phenomena teacher notes can be found within instructional segments.</p> <p>Safety: Care should be taken with open flames All chemicals should be handled based on their SDS</p> <p>By the end of this unit, students are using the following language in their speaking and writing during EXPLAIN or ELABORATE.</p> <ul style="list-style-type: none"> -Molecular motion -Phases of matter -Solutions -Conservation of Matter



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| | | | repeating subunits (e.g., crystals). <ul style="list-style-type: none">• Chemical processes and properties of materials underlie many important biological and geophysical phenomena. | | |
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This instructional segment will connect to the previous segment, structure and function of matter as an understanding of basic atomic structure is an assumed prerequisite for this unit. This instructional segment should also connect to the overarching theme of how a car or rocket works in terms of the (simplified) combustion reactions in these systems. This instructional segment also connects to the following unit as an understanding of these concepts are required to explain nuclear decay, and energy transformations at the molecular level.