STRUCTURE AND TRANSFORMATION OF MATTER

A basic understanding of matter is essential to the conceptual development of other big ideas in science. In the elementary years of conceptual development, students will be studying properties of matter and physical changes of matter at the macro level through direct observations, forming the foundation for subsequent learning. During the middle years, physical and chemical changes in matter are observed, and students begin to relate these changes to the smaller constituents of matter—namely, atoms and molecules. By high school, students will be dealing with evidence from both direct and indirect observations (microscopic level and smaller) to consider theories related to change and conservation of matter. The use of models (and an understanding of their scales and limitations) is an effective means of learning about the structure of matter. Looking for patterns in properties is also critical to comparing and explaining differences in matter.

Week	Guiding Questions	Core Content for Assessment	Program of Studies/Sample Activities
1-6	**Matter** How does the structure of matter affect its' properties and uses?	**SC-08-1.1.1 Students will:** • **interpret models/representations of elements;** • **classify elements based upon patterns in their physical (e.g., density, boiling point, solubility) and chemical (e.g., flammability, reactivity) properties.** Models enhance understanding that an element is composed of a single type of atom. Organization/interpretation of data illustrates that when elements are listed according to the number of protons, repeating patterns of physical (e.g., density, boiling point,	**Physical Science** S-8-PS-1 Students will analyze properties (e.g., boiling point, solubility) and changes of properties in matter. S-8-PS-2 Students will measure and represent (e.g., graph) forces on objects and motions (e.g., constant speed, changing speed) of objects. S-8-PS-3 Students will investigate transfer of energy (e.g., heat, light, electricity, mechanical motion, sound). **Suggested Activities** ❖ Create models of atoms and their subatomic structure. ❖ Research families of chemical elements such as the halogens. ❖ Play the element board game.