

## Appendix 1. Implementing the Common Core Standards

PSc. 2.1: Understand types, properties, and structure of matter.

- 2.1.1. Classify matter as homogeneous, or heterogeneous, pure substance or mixture, element or compound, metal, nonmetal or metalloid, solution, colloid or suspension.
- 2.1.2. Explain phases of matter and the physical changes it undergoes.
- 2.1.3. Compare chemical and physical changes that matter undergoes.
- 2.1.4. Compare physical and chemical properties of matter.

The unit addresses the classification of matter as well as chemical and physical properties and changes through the investigation of the properties of various metals and non-metals. Some of the metals are used in the building of race cars.

PSc. 2.2: Understand chemical bonding and chemical interactions.

- 2.2.5. Classify types of chemical reactions.

The unit covers the standard during the study of chemical reactions. The combustion reaction is studied in relationship to the combustion engine.

PSc. 3.1: Understand types of energy, energy conservation and energy transfer.

- 3.1.1. Explain thermal energy and its transfer.
- 3.1.2. Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy, and heat.

The standard is addressed as students investigate the heat transfer involved in the cooling process of the engine. The process of fuel combustion in a gasoline powered engine is studied as well as the conversion of potential energy to other forms such as kinetic energy.