Considering the Alignment Among National and State Science and Mathematics Standards

Kathleen Morris, Lori Kurth, Project 2061

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Standards Statements for the Topic "Conservation of Matter"

California

Grades 9-12 Chemistry

The conservation of atoms *in chemical reactions* ***leads to the principle of conservation of matter*** *and the ability to calculate the mass of products and reactants.*

As a basis for understanding this concept, students know:

- how to describe chemical reactions by writing balanced equations.
- the quantity one mole is defined so that one mole of carbon 12 atoms has a mass of exactly 12 grams.
- one mole equals 6.02×10^{23} particles (atoms or molecules).
- how to determine molar mass of a molecule from its chemical formula and a table of atomic masses, and how to convert the mass of a molecular substance to moles, number of particles or volume of gas at standard temperature and pressure.
- how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products, and the relevant atomic masses.
- how to calculate percent yield in a chemical reaction.
- how to identify reactions that involve oxidation and reduction and how to balance oxidation-reduction reactions.

Benchmarks

4D 6-8 #7

No matter how substances within a closed system interact with one another, or how they combine or break apart, the total mass of the system remains the same. **The idea of atoms explains the conservation of matter:** If the number of atoms stays the same no matter how they are rearranged, then their total mass stays the same.

National Science Education Standards

Content Standard B
Physical Science: Properties and changes of properties in matter
Grades 5-8

Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is conserved…

Standards Statements for the Topic "Equivalent Number Forms"

Virginia

Identify representations of a given percent and describe orally and in writing the equivalence relationships among fractions, decimals, and percents.
(Grade 6 – 6.1)
Compare, order, and determine equivalent relationships between fractions, decimals, and percents…
(Grade 7 – 7.1)
Compare and order decimals, fractions, [and] percents…
(Grade 8 – 8.1c)

Benchmarks
Use, interpret, and compare numbers in several equivalent forms such as integers, fractions, decimals, and percents. **(12B 6-8 #2)**

NCTM Standards
Recognize and generate equivalent forms of commonly used fractions, decimals, and percents. (Grades 3-5) Work flexibly with fractions, decimals, and percents to solve problems. (Grades 6-8)