

Physical Science

UNIT 6: Chemical Reactions



ESSENTIAL QUESTION

BIG IDEAS

How are chemical reactions involved in what we do and see?

Students understand atoms can be rearranged to produce new substances while conserving energy and matter.

GUIDING QUESTIONS

Content:

- How can a chemical change be represented by a balanced chemical equation?
- How can the products of a chemical reaction be predicted based on the type of reaction?

Process:

- How does a balanced equation represent the conservation of matter?
- How can the pattern of reaction types predict the products of a chemical reaction?

FOCUS STANDARDS

HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Physical Science

UNIT 7: Chemical Quantities



ESSENTIAL QUESTION

BIG IDEAS

How are quantities of reactants and products in a chemical reaction mathematically related?

Students understand quantitative relationships exist in chemical reactions.

How do substances combine or change (react) to make new substances?
How does one characterize and explain these reactions and make predictions about them?

GUIDING QUESTIONS

Content:

- How do scientists count and measure atoms?
- How are the amounts of substances consumed and produced in a chemical reaction calculated?

Process:

- Why do stoichiometric calculations always begin with a balanced chemical equation?
- How can dimensional analysis and the mole ratio mathematically determine the amounts of reactant and products involved in a chemical reaction?

Reflective:

- Why do chemists use the unit “mole”?
- How would a business use the concept of stoichiometric relationships when creating a product?

FOCUS STANDARDS

HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.