Edgenuity

Warm-Up | Describing Chemical Reactions

Lesson Question

Lesson Goals

Identify the parts of a chemical _____.

Describe the law of conservation of _____.

Explain how mass is _____ in chemical equations.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	a shorthand that uses chemical symbols and molecular formulas to show what occurs during a chemical reaction
	the chemicals present before a chemical reaction occurs
	the chemicals present after a chemical reaction occurs

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Words to Know

	a number that indicates how many times to multiply a variable
	a letter, number, or symbol that is smaller and just below the normal line of type
	a natural law stating that the same amount of mass is present before and after a chemical reaction

Chemical Bonds and Molecular Formulas

[ ] and symbols

- Carbon – [ ]
- Oxygen – [ ]
- Gold – [ ]

Chemical [ ]

- Ammonia – [ ]
- Carbon dioxide – [ ]
- Water – [ ]

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Parts of a Chemical Equation: Overview

A chemical equation is a way of showing a chemical reaction using chemical symbols and formulas.

- Parts of a chemical [ ]:
  - [ ] – the chemicals or individual substances present before the reaction begins
  - [ ] – the chemicals or individual substances present at the end of the reaction
  - [ ] – used to say “react to form” or “yields”

Parts of a Chemical Equation: Chemical Formulas

Methane and oxygen react to form carbon dioxide and water.

- [ ] – $CH_4 + 2O_2$
- [ ] – $CO_2 + 2H_2O$
- Plus sign – indicates that both of the chemicals exist separately from each other on each side of the equation

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Parts of a Chemical Equation: Chemical Formulas

- _____ – a number placed in front of an entire chemical substance to indicate the number of molecules of that substance that react in the equation
    - The coefficient is a multiple and can be used along with the subscripts in a chemical formula to identify the number of atoms of a particular element present in that formula

Circle the coefficients in this equation.

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

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The Purpose of a Chemical Equation

The purpose of a chemical _____ is:

- to show how the substances in a chemical reaction _____.
- to keep _____ of all elements and the number of atoms of each element on each side of the equation. .

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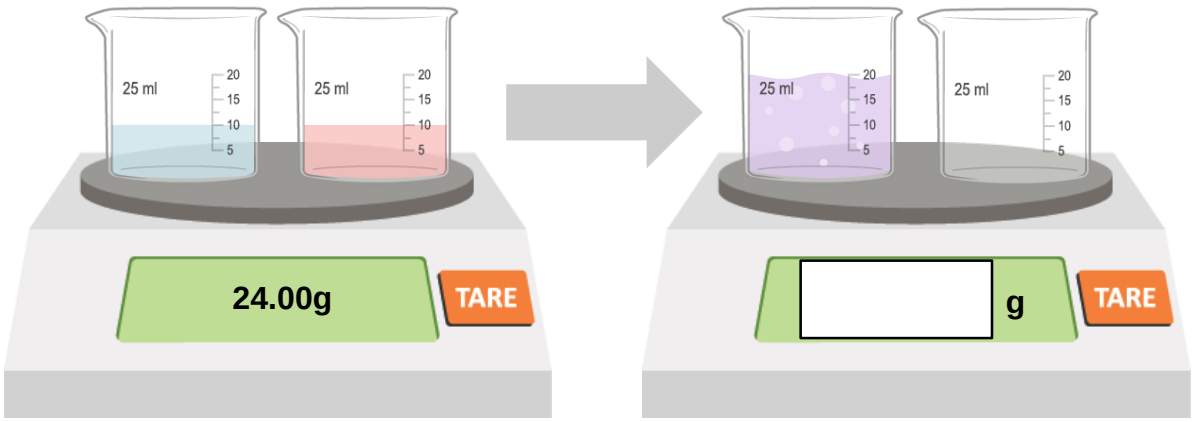
Mass of Substances Before and After a Reaction

Law of _____ of mass

Indicate the amount of mass present after the chemical reaction.



Conservation of Mass: How to Count Atoms

_____ include:

C = _____

H = _____

O = 2 × 2 = _____

_____ include:

C = _____

H = 2 × 2 = _____

O = _____

Methane and oxygen _____

to form carbon dioxide and water.

$CH_4 + 2O_2$ _____ $CO_2 + 2H_2O$

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Conservation of Mass: Count Atoms in Reactants and Products

[ ] is broken down to form oxygen and hydrogen gas.

$$2H_2O \rightarrow 2H_2 + O_2$$

- [ ] include:
  - H = [ ]
  - O = [ ]
- [ ] include:
  - H = [ ]
  - O = [ ]

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Conservation of Mass: Count Atoms in Reactants

- [ ] reacts with lead nitrate to form lead iodide precipitate and potassium nitrate solution.

$$2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$$

Complete the table by filling in the number of atoms in the reactants and products.

Reactants	Products
K = [ ]	2
I = [ ]	[ ]
Pb = [ ]	[ ]
N = [ ]	1
O = [ ]	[ ]

Summary | Describing Chemical Reactions

Lesson Question

How is mass conserved in a chemical reaction?

Answer

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Review: Key Concepts

- General form for a chemical [ ]:
  - Reactants → [ ]

According to the law of conservation of mass, the number of [ ] of each element stays the [ ] before and after a chemical reaction.

- Examples:
  - Water decomposes to form oxygen and [ ] gas.
    - $2H_2O \rightarrow 2$ [ ] $+ O_2$
  - Methane and oxygen react to form [ ] and water.
    - $CH_4 + 2O_2 \rightarrow$ [ ] $+ 2H_2O$

Summary | Describing Chemical Reactions

Use this space to write any questions or thoughts about this lesson.