

GRADE 10 | 2024

Physical Sciences: Chemical Reactions and Equations

Physical Sciences

CAPS ALIGNED

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1. Writing Chemical Formulae

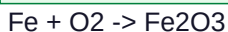
Chemical formulae show the types and numbers of atoms in a compound. Subscript numbers show how many atoms of each element.

2. Balancing Chemical Equations

FORMULA: Reactants $\rightarrow$ Products

Law of Conservation of Mass: atoms are neither created nor destroyed

EXAMPLE: Balance



3. Types of Reactions

- Synthesis (combination): $\text{A} + \text{B} \rightarrow \text{AB}$ (two substances combine)
- Decomposition: $\text{AB} \rightarrow \text{A} + \text{B}$ (one substance splits)
- Single displacement: $\text{A} + \text{BC} \rightarrow \text{AC} + \text{B}$ (one element displaces another)
- Double displacement: $\text{AB} + \text{CD} \rightarrow \text{AD} + \text{CB}$ (ions exchange partners)
- Combustion: $\text{fuel} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ (burning in oxygen)

4. Energy Changes in Reactions

Exothermic Reactions

Release energy (heat) to the surroundings. Temperature of surroundings INCREASES. Products have LESS energy than reactants.

EXAMPLE: Exothermic

Combustion of methane:



Endothermic Reactions

ABSORB energy from the surroundings. Temperature of surroundings DECREASES.

FORMULA: Activation energy: the minimum energy needed for a reaction to occur

A catalyst lowers the activation energy, speeding up the reaction.