

Predicting Products Of Chemical Reactions Worksheet

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Part 1: Building a Foundation

Which of the following is a synthesis reaction?

Hint: Look for a reaction where two or more reactants combine to form a single product.

- A) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- B) $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
- C) $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgCl}$
- D) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

Which of the following is a synthesis reaction?

Hint: Think about how elements combine to form compounds.

- A) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
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Which of the following is a synthesis reaction?

Hint: Consider how the reactants combine to form products.

- A) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
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- A) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

Which of the following are indicators of a chemical reaction? (Select all that apply)

Hint: Consider changes that suggest a new substance is formed.

- A) Change in color

- B) Formation of a precipitate
- C) Dissolving sugar in water
- D) Production of gas

Which of the following are indicators of a chemical reaction? (Select all that apply)

Hint: Consider the observable changes that occur during a reaction.

- A) Change in color
- A) Formation of a precipitate
- A) Dissolving sugar in water
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Hint: Think about the signs that suggest a chemical change has occurred.

- A) Change in color
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Explain the law of conservation of mass and its importance in balancing chemical equations.

Hint: Consider how mass is treated in chemical reactions.

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List the five main types of chemical reactions and provide a brief description of each.

Hint: Think about the different ways substances can interact.

1. Synthesis Reaction

2. Decomposition Reaction

3. Single Replacement Reaction

4. Double Replacement Reaction

5. Combustions Reaction

Which of the following best describes a decomposition reaction?

Hint: Look for a reaction where a compound breaks down into simpler substances.

- A) Two elements combine to form a compound.
- B) A compound breaks down into simpler substances.
- C) An element replaces another in a compound.
- D) Two compounds exchange ions.

Which of the following best describes a decomposition reaction?

Hint: Consider how compounds break down into simpler substances.

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Part 2: Application and Analysis

Given the reaction: $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$, which metal is more reactive?

Hint: Consider the reactivity series of metals.

- A) Zinc
- B) Copper
- C) Both are equally reactive
- D) Cannot be determined

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In a combustion reaction involving methane (CH_4), which products are typically formed? (Select all that apply)

Hint: Think about the products of burning hydrocarbons.

- A) Carbon dioxide
 A) Water
 A) Oxygen
 A) Carbon monoxide

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Apply the law of conservation of mass to balance the following equation: $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$.

Hint: Count the number of atoms of each element on both sides.

Apply the law of conservation of mass to balance the following equation: $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$.

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In the reaction $2KClO_3 \rightarrow 2KCl + 3O_2$, what type of reaction is occurring and why?

Hint: Consider the changes happening to the reactants.

- A) Synthesis, because two products are formed.
- A) Decomposition, because a compound breaks down into simpler substances.
- A) Single replacement, because one element replaces another.
- A) Double replacement, because two compounds exchange ions.

In the reaction $2KClO_3 \rightarrow 2KCl + 3O_2$, what type of reaction is occurring and why?

Hint: Consider the nature of the reactants and products.

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Analyze the following reaction: $\text{Na}_2\text{CO}_3 + \text{CaCl}_2 \rightarrow 2\text{NaCl} + \text{CaCO}_3$. Which of the following statements are correct? (Select all that apply)

Hint: Think about the characteristics of the reaction.

- A) This is a double replacement reaction.
- B) Calcium carbonate is a precipitate.
- C) Sodium chloride is insoluble in water.
- D) The reaction follows the solubility rules.

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Part 3: Evaluation and Creation

Which of the following scenarios would most likely result in an endothermic reaction?

Hint: Consider reactions that absorb heat.

- A) Mixing vinegar and baking soda
 B) Dissolving ammonium nitrate in water
 C) Burning wood in a fireplace
 D) Combining hydrogen and oxygen to form water

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Evaluate the following statements about balancing chemical equations. Which are true? (Select all that apply)

Hint: Think about the rules for balancing equations.

- A) Coefficients can be fractions.
 B) Subscripts can be changed to balance equations.
 C) The number of atoms for each element must be equal on both sides.
 D) Balancing equations is based on the law of conservation of mass.

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Create a balanced chemical equation for a reaction between aluminum and hydrochloric acid, and describe the type of reaction.

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