

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.

$$\bigcirc$$
 A) $2H_2 + O_2 \rightarrow 2H_2O$

$$\bigcirc$$
 B) 2H₂O \rightarrow 2H₂ + O₂

$$\bigcirc$$
 D) CH₄ + 2O₅ \rightarrow CO₅ + 2H₅O

Which of the following is a synthesis reaction?

Hint: Think about how elements combine to form compounds.

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

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 A) 2H₂O \rightarrow 2H₂ + O₂

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 A) CH₄ + 2O₂ \rightarrow CO₂ + 2H₂O

Which of the following is a synthesis reaction?

Hint: Consider how the reactants combine to form products.

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.
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A) Dissolving sugar in waterA) Production of gas
Which of the following are indicators of a chemical reaction? (Select all that apply)
Hint: Think about the signs that suggest a chemical change has occurred.
A) Change in color
A) Formation of a precipitate
A) Dissolving sugar in waterA) Production of gas
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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.

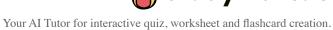
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Hint: Consider how mass is conserved in chemical reactions.



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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.
O) 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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○ A) Zinc
○ A) Copper
A) Both are equally reactive
A) Cannot be determined
In a combustion reaction involving methane ($\mathrm{CH_4}$), 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: $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$.

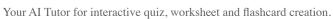
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Hint: Count the number of atoms of each element on both sides.



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Hint: Consider the changes happening to the reactants.	
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A) Diggle replacement because a compound breaks down into simpler substances.	
A) Single replacement, because one element replaces another. A) Double replacement, because two compounds exchange ions.	
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In the reaction $2KCIO_3 \rightarrow 2KCI + 3O_2$, what type of reaction is occurring and why?





Hint: Consider the nature of the reactants and products.
A) Synthesis, because two products are formed.
○ B) Decomposition, because a compound breaks down into simpler substances.
C) Single replacement, because one element replaces another.
O) Double replacement, because two compounds exchange ions.
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A) Synthesis, because two products are formed.
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A) Single replacement, because one element replaces another.
A) Double replacement, because two compounds exchange ions.
Analyze the following reaction: Na,CO, + CaCl, → 2NaCl + CaCO,. 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.
A) Calcium carbonate is a precipitate.
A) Sodium chloride is insoluble in water.
A) The reaction follows the solubility rules.
Analyze the following reaction: Na₂CO₃ + CaCl₂ → 2NaCl + CaCO₃. Which of the following statements are correct? (Select all that apply)
Hint: Consider the characteristics of the reactants and products.
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C) Sodium chloride is insoluble in water.
D) The reaction follows the solubility rules.
Analyze the following reaction: $Na_2CO_3 + CaCl_2 \rightarrow 2NaCl + CaCO_3$. Which of the following statements are correct? (Select all that apply)
Hint: Think about the properties of the reactants and products.
A) This is a double replacement reaction.
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A) The reaction follows the solubility rules.
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 sodaB) Dissolving ammonium nitrate in waterC) Burning wood in a fireplace
O) Combining hydrogen and oxygen to form water
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Hint: Consider the energy changes involved in the reactions.
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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.
Hint: Consider the products formed from the reaction.

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