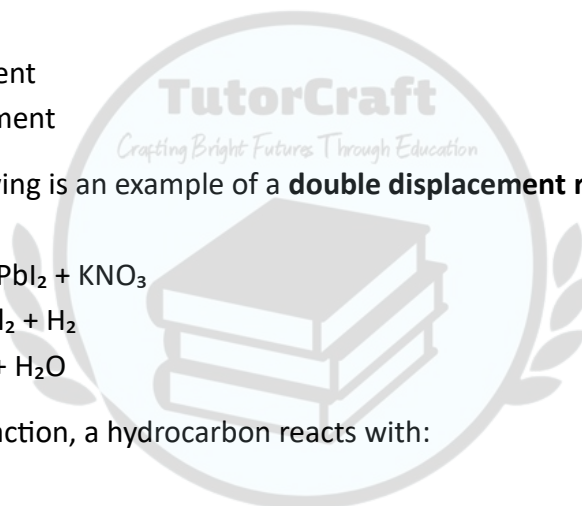
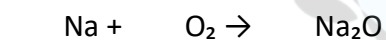


- Which of the following is an example of a **synthesis reaction**?
 - $\text{H}_2\text{O} \rightarrow \text{H}_2 + \text{O}_2$
 - $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$
 - $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
 - $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
- In a **decomposition reaction**, what happens to the reactants?
 - They combine to form a single product
 - A substance breaks down into simpler substances
 - Two compounds exchange elements
 - A hydrocarbon burns in oxygen
- What type of reaction is represented by the equation below?
 $2\text{HCl} + \text{Zn} \rightarrow \text{ZnCl}_2 + \text{H}_2$
 - Synthesis
 - Decomposition
 - Single displacement
 - Double displacement
- Which of the following is an example of a **double displacement reaction**?
 - $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
 - $\text{Pb}(\text{NO}_3)_2 + \text{KI} \rightarrow \text{PbI}_2 + \text{KNO}_3$
 - $\text{Mg} + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
 - $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
- In a combustion reaction, a hydrocarbon reacts with:
 - Carbon dioxide
 - Oxygen
 - Hydrogen
 - Nitrogen
- Which of the following **balanced** chemical equations represents a combustion reaction?
 - $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
 - $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
 - $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
 - $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- What is the **law of conservation of mass**?
 - Energy cannot be created or destroyed
 - The total number of atoms before and after a reaction must be the same



- c) Mass can change during a chemical reaction
d) New atoms are created during chemical reactions
8. What type of reaction occurs when a metal reacts with an acid to produce a salt and hydrogen gas?
a) Synthesis
b) Decomposition
c) Single displacement
d) Double displacement
9. Which of the following is a **correctly balanced** equation?
a) $\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$
b) $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
c) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
d) $\text{Mg} + \text{Cl}_2 \rightarrow \text{Mg}_2\text{Cl}$
10. In a **neutralization reaction**, what are the two main products?
a) Acid and base
b) Salt and water
c) Carbon dioxide and oxygen
d) Metal and gas

-
11. **Balance the following equation:**

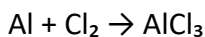


12. **Identify the reaction type:**



13. **Write the products** for the combustion of C_6H_{12} (hexane) in oxygen.

14. **Balance and classify the reaction:**

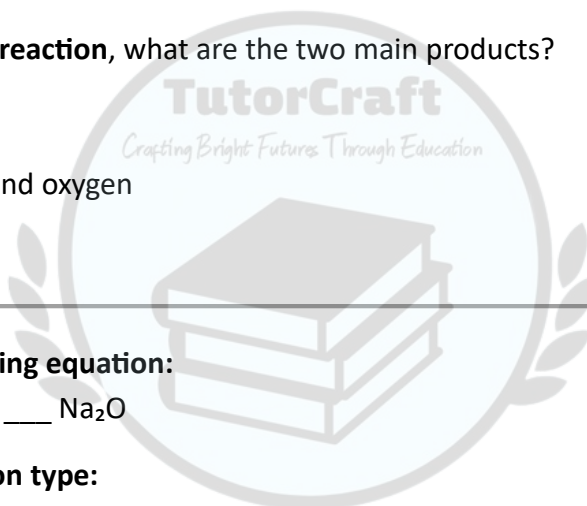


15. **Explain why mass is conserved** in a chemical reaction.

16. **Predict the products** of the reaction:



17. **Write the balanced equation** for the reaction between sulfuric acid (H_2SO_4) and sodium hydroxide (NaOH).



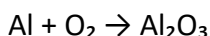
18. **What type of reaction occurs** when silver nitrate (AgNO_3) reacts with sodium chloride (NaCl)? Write the balanced equation.

19. **Balance the equation and identify the reaction type:**



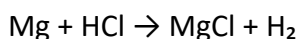
20. **Explain the difference** between a single displacement and a double displacement reaction. Give an example for each.

21. **A student writes the following unbalanced equation:**



Balance the equation and determine the type of reaction.

22. **Identify the errors in the following equation and correct them:**



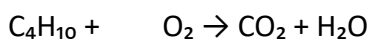
23. **Write the balanced chemical equation** for the decomposition of hydrogen peroxide (H_2O_2) into oxygen and water.

24. **Explain why combustion reactions always require oxygen.**

25. **A chemical reaction occurs when a strip of zinc is placed in hydrochloric acid.**

- What type of reaction is this?
- Write the balanced equation.

26. **Determine the missing reactant** in the combustion reaction:



27. **Write a real-life example** of a single displacement reaction and explain its importance.

28. **Explain why some elements can replace others** in a single displacement reaction. Refer to the **reactivity series** in your answer.

29. **A scientist observes a reaction where a white solid forms after mixing two clear solutions.**

- What type of reaction is this?
- What is the solid formed called?

30. **A propane gas burner is used in a lab.**

- Write the balanced equation for the complete combustion of propane (C_3H_8).

- What are the dangers of an **incomplete combustion** reaction?

