## Answer all the questions below then check your answers

- Which of the following metals reacts vigorously with hydrochloric acid?
  - a) Copper
- b) Silver
- c) Zinc
- d) Gold
- What is the general product formed when a metal reacts with an acid? 2.
- a) Metal oxide b) Salt and water c) Salt and hydrogen gas
- d) Metal hydroxide
- Define a salt in terms of chemistry. 3.
- What type of reaction occurs between a metal and an acid, and what are the Ь. general products?
- 4. Write the word and balanced chemical equation for the reaction between magnesium and hydrochloric acid.
- Describe what happens during the reduction and oxidation in the reaction 5. between zinc and sulfuric acid.

6. Match the acid with the correct salt produced when it reacts with zinc:

Acid	Salt
Hydrochloric	Zinc sulfate
Sulfuric	Zinc nitrate
Nitric	Zinc chloride

	7.	Fill	in	the	gaps	to	com	olete	the	sentences	bel	ow:
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- a. When zinc reacts with hydrochloric acid, the products are the salt
  \_\_\_\_\_\_ gas.
- 8. Describe the process of oxidation and reduction in terms of electron transfer, using the reaction between magnesium and sulfuric acid as an example.
- 9. Write the word and balanced chemical equation for the reaction between aluminium and nitric acid.

## Answers

1.	Which of the following metals reacts vigorously with hydrochloric acid?							
	a) Copper b) Silver c) Zinc d) Gold							
	Answer: c) Zinc							
2.	. What is the general product formed when a metal reacts with an acid?							
	a) Metal oxide b) Salt and water c) Salt and hydrogen gas							
	d) Metal hydroxide							
	Answer: c) Salt and hydrogen gas							
3.	Define a salt in terms of chemistry.							
	Answer: A salt is a compound formed when the hydrogen ion (H <sup>+</sup> ) from an acid replaced by a metal ion or an ammonium ion (NH <sub>4</sub> <sup>+</sup> ).	i						
Ь.	What type of reaction occurs between a metal and an acid, and what are the general products?							
	Answer: The reaction between a metal and an acid is a type of displacement reaction. The general products are a salt and hydrogen gas.							
4.	Write the word and balanced chemical equation for the reaction between magnesium and hydrochloric acid.							
	Answer:							
	Word Equation:							
	Magnesium + Hydrochloric Acid → Magnesium Chloride + Hydrogen							

## Symbolic Equation:

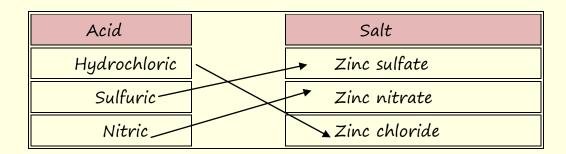
$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

5. Describe what happens during the reduction and oxidation in the reaction between zinc and sulfuric acid.

Answer:

Oxidation: Zinc is oxidized as it loses electrons ( $Zn \rightarrow Zn^{2+} + 2e^{-}$ ). Reduction: Hydrogen ions ( $H^{+}$ ) from sulfuric acid are reduced as they gain electrons to form hydrogen gas ( $2H^{+} + 2e^{-} \rightarrow H_{2}$ ).

6. Match the acid with the correct salt produced when it reacts with zinc:



- 7. Fill in the gaps to complete the sentences below:
- a. When zinc reacts with hydrochloric acid, the products are the salt \_\_\_\_\_ gas.

Answer: zinc chloride, hydrogen gas

b. In the reaction between magnesium and sulfuric acid, the \_\_\_\_\_

is oxidised and the \_\_\_\_\_\_ ions are reduced.

Answer: magnesium, hydrogen

8. Describe the process of oxidation and reduction in terms of electron transfer, using the reaction between magnesium and sulfuric acid as an example.

## Answer:

In the reaction between magnesium and sulfuric acid, oxidation and reduction can be described in terms of electron transfer:

Oxidation: Magnesium atoms lose two electrons to form magnesium ions

$$(Mg \rightarrow Mg^{2+} + 2e^{-}).$$

Reduction: Hydrogen ions  $(H^{+})$  from sulfuric acid gain electrons to form hydrogen gas:

$$(2H^+ + 2e^- \rightarrow H_2).$$

This demonstrates that oxidation is the loss of electrons, while reduction is the gain of electrons.

9. Write the word and balanced chemical equation for the reaction between aluminium and nitric acid.

Answer:

Word Equation:

Aluminium + Nitric Acid → Aluminium Nitrate + Hydrogen

Symbolic Equation:

$$2AI + 6HNO_3 \rightarrow 2AI(NO_3)_3 + 3H_2$$