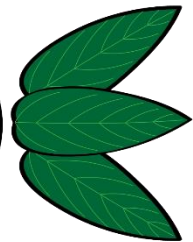
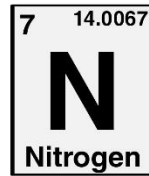
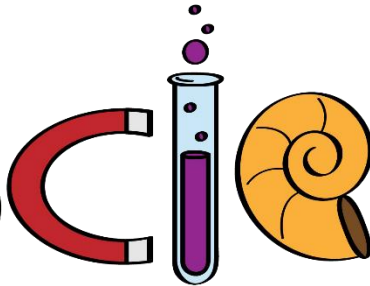
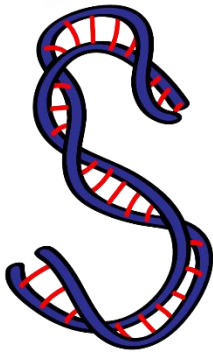




**ASPIRE**  
INTERNATIONAL SCHOOL



**Science Department**

**2023/2024**

**Year 8**

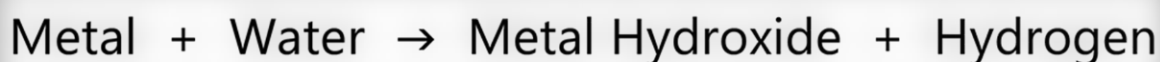
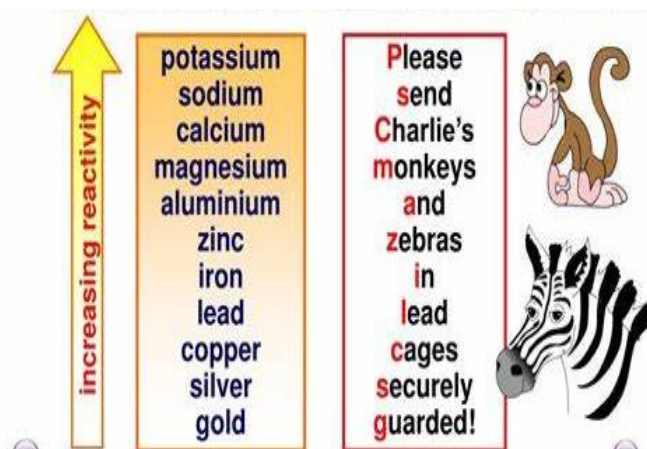
**Summary notes on Unit 5**

**Name:** .....

**Class:** .....

## 5.1 Reactivity and displacement reaction & 5.2 Using reactivity series and displacement reactions

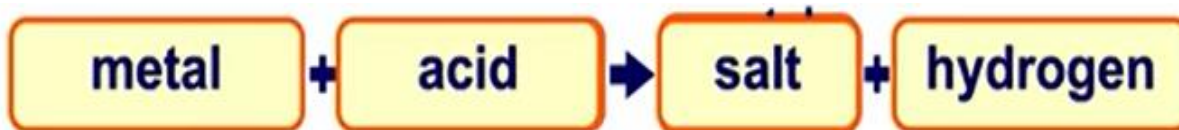
- + Reactivity series means: a list of metals in order of how reactive they are; the most reactive are at the top of the list and the least reactive at the bottom.
- + Potassium is extremely reactive why?
- + Because it has only one valence electron so it is very easy to lose it forming a positive ion.
- + However copper is a weakly reactive?
- + because it has more valence electron so it is harder to become a positive ion.
- + **Reaction of any metal with water:**



Like : Sodium + water  $\rightarrow$  Sodium hydroxide + Hydrogen.

**( Explosive reaction )**

- + **Reaction of metal with acid:**



Like: Sodium + Hydrochloric acid  $\rightarrow$  sodium chloride + hydrogen

## ✚ Reaction of metal with oxygen:

**Like : Sodium + oxygen → Sodium Oxide.**

## Displacement reactions

▶ a reaction in which a more reactive metal ‘pushes out’ a less reactive one from a compound.

✚ A Reaction between zinc and copper sulfate:

✚ Zinc will displace the copper at its salt because the zinc is more reactive than copper forming zinc sulfate and copper.

✚ A reaction between iron and magnesium chloride:

✚ No reaction will happen because iron can’t displace the magnesium , because iron is less reactive than magnesium

✚ Carbon can be used to extract some metals from their ores like iron.



iron oxide + carbon → iron + carbon dioxide

✚ Can iron displace aluminium from aluminium oxide? Explain your answer.

✚ No, because iron is less reactive than aluminium.

### Reactivity series of metals

K	Potassium	Most reactive ↑ Increasingly reactive ↓ Least reactive
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
C	Carbon	
Zn	Zinc	
Fe	Ferum	
Sn	Tin	
Pb	Lead	
Cu	Copper	
Hg	Mercury	
Ag	Silver	
Au	Gold	

### How to prepare Salts

Metal + acid → Salt + Hydrogen

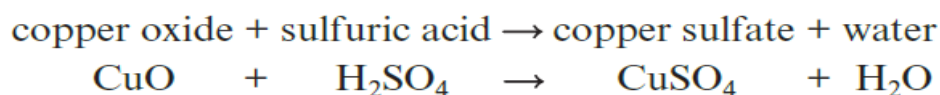
Metal carbonate + acid → salt + carbon dioxide + water

Acid + Alkali → Salt + water

**silver and copper will not react** with acids to make salts, are **too unreactive**.

We can do this by starting with a **metal oxide**.

Example of unreactive metal in their oxide form:



Example of word equation of preparing salts from metal carbonate:

acid + carbonate → salt + water + carbon dioxide

Sulfuric acid + Calcium carbonate → Calcium Sulfate + water + carbon dioxide

Hydrochloric acid + Calcium carbonate → Calcium chloride + water + carbon dioxide

Example of word equation of preparing salts from neutralization reaction:

sodium hydroxide + hydrochloric acid → sodium chloride + water

### How to purify salts:

Step 1: Filtration: separation of salts solution from unreacted metal or metal carbonate.

Step 2: Evaporation: remove water from salt.

Step 3: Crystallization: leave in a warm place until it forms crystals.

<b>How to test the presence of the following gases</b>		
Carbon dioxide	Hydrogen	Oxygen gas
By bubbling carbon dioxide through limewater, which will go cloudy and limewater turns to milky.	By using splint will produce pop, sneaky sound	By using splint, the splint will glow and relight

Name of acid	Formula	Salts formed from the acid	Example of salt	Formula of salt
hydrochloric acid	HCl	chlorides	sodium chloride	NaCl
sulfuric acid	H <sub>2</sub> SO <sub>4</sub>	sulfates	copper sulfate	CuSO <sub>4</sub>
nitric acid	HNO <sub>3</sub>	nitrates	potassium nitrate	KNO <sub>3</sub>