PENANG SANGAM HIGH SCHOOL
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LESSON NOTES

Subject: Basic Science **Year/Level: 9**

Week 23

Strand	**2: MATTER**
Sub Strand	**2.3 : REACTIONS**
Content Learning Outcome	**Investigate** how elements and compounds are formed and **describe** interactions between elements

Bases

- commonly considered as the opposite of acids.
- Bases come in two forms:
  1) Soluble bases (alkalis)
     dissolve in water.
  2) Insoluble bases
     do not dissolve in water.
- Both soluble and insoluble bases react the same way with acids.

Properties of Bases and Alkalis

• Concentrated alkalis are corrosive (‘burns’ your skin).
They must be handled with care.(example- caustic soda)
• All alkalis have a bitter taste and a soapy feel.
• When heated, alkalis react with ammonia salts to form ammonia gas.
• Alkalis turn red litmus paper to a blue colour
• Alkalis are good electrical conductors.
• Many alkalis (soluble bases) contain hydroxyl ions (OH^-) and have a pH more than 7.
• Alkalis react with acids to form salt and water only.

Common Alkalis and Their Uses

Alkali	Formula	Uses
Sodium hydroxide	NaOH	Making soap, washing powders and drain cleaners.
Calcium hydroxide	$Ca(OH)_2$	Making mortar and reducing the acidity of soil.
Ammonium hydroxide (ammonia solution)	NH_4OH	Making fertilizer and cleaning liquid (agent).
Potassium hydroxide	KOH	Making paint removers and dyes for fabrics
Magnesium hydroxide	$Mg(OH)_2$	Making indigestion tablets and 'milk of magnesia'

Neutralization:
When an acid and a base mix they cancel out each other and become neutral.

2.3.2 Chemical Reactions
Word and Chemical equations

- Chemicals react together to form new substances or break up to form new ones.
- The evidence that a chemical reaction has taken place can be:
  - ✓ a gas given off
  - ✓ heat or light given out
  - ✓ a new substance forms

- **Reactants**:
  Chemicals or substances used to start a reaction

- **Products**
  substance that is formed or we finish up.

- In the equation, the reactants are on the left-hand side (LHS) and the products are on the right-hand side (RHS) of the arrow.

- The process can be written as:
  Reactant 1 + Reactant 2 ⟶ Product

- A verbal description of what happens in the reaction is called a **word equation**.
- In a word equation, a **plus (+) sign** is used to show that two things (reactants) are joining together, or there are two or more products.
- An **arrow** is used to show that a chemical reaction takes place.
- For example, when iron rusts, iron oxide is formed.

- The word equation for the reaction is: Iron + Oxygen ⟶ Iron oxide

ACTIVITY:

1. List the two types of bases.
   a) _____
   b) _____
2. State three evidence that a chemical reaction has taken place.

a) _____

b) _____

c) _____

3. Write a word equation of; when sodium combines with chloride to form sodium chloride.

…STAY SAFE…