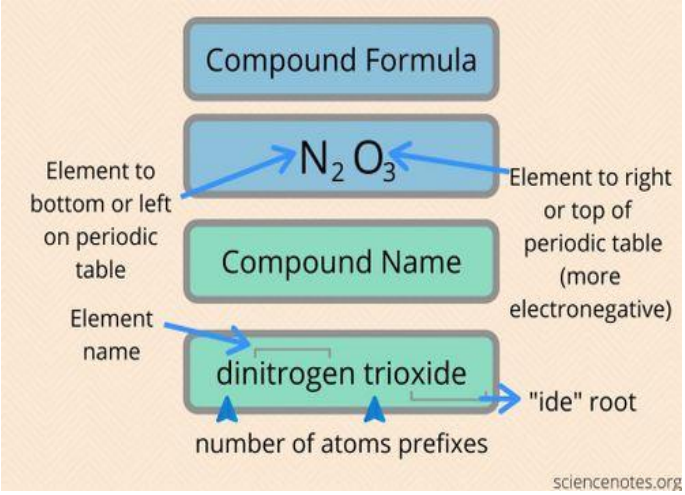
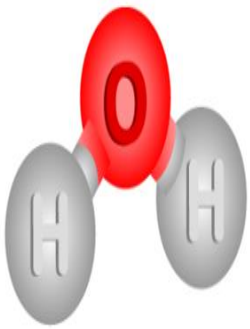
BASIC 9

WEEKLY LESSON PLAN – WEEK 1

Strand:	Diversity of Matter		**Sub-Strand:**	Materials	
Content Standard:	B9.1.1.1 Show an understanding of formation of binary chemical compounds and their uses (Acids, Bases and Salts)				
Indicator (s)	B9.1.1.1.1 Identify by name binary chemical compounds and discuss their uses. B9.1.1.1.2 Discuss the formation of binary chemical compounds. B9.1.1.1.3 Describe the characteristics of common acids, bases and salts.		**Performance Indicator:** Learners can identify the chemical compounds in products they use at home.		
Week Ending	13-09-2024				
Class	B.S.9	**Class Size:**		**Duration:**	
Subject	Science				
Reference	Science Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook				
Teaching / Learning Resources	Poster, Word chart, Videos.		**Core Competencies:**	• Critical thinking • Problem Solving • creativity and Innovation	

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
MONDAY	Discuss with Learners on the meanings of some keywords and terminologies pertaining to the topic. **Keywords;** o element o Compound o Detergent o Nomenclature o Binary o Chemical o Precaution	1. Discuss with Learners on the meaning of Chemical Compound. 2. Assist Learners to identify names of chemical compounds. 3. Learners brainstorm to identify and name chemical compounds from a collection of materials commonly found at home, school and the community 4. Explain to the Learners on the rules nomenclature of binary covalent compounds follows. **Binary molecular (covalent) compounds** Binary molecular (covalent) compounds are formed as the result of a reaction between two nonmetals. Although there are no ions in these compounds, they are named in a similar manner to binary ionic compounds. The nomenclature of binary covalent compounds follows these rules: 1. The first element in the formula is given first, using the element's full name. 2. The second element is named as if it were an anion. 3. Prefixes are used to denote the numbers of atoms present. If the first element exists as a single atom, the prefix *mono-* is omitted. For example, CO is called carbon monoxide rather than monocarbon monoxide. These examples show how the rules are applied for the	Learners to practice writing the chemical symbols of the elements identified in the chemical compounds. **Exercise;** Write the formulas for the following chemical compounds: 1) silicon dioxide 2) nickel (III) sulfide 3) manganese (II) phosphate 4) silver acetate 5) diboron tetrabromide 6) magnesium sulfate heptahydrate 7) potassium carbonate 8) ammonium oxide 9) tin (IV) selenide 10) carbon tetrachloride

		covalent compounds formed by nitrogen and oxygen: **compound** / **systematic name** / **common name** N_2O — dinitrogen monoxide — nitrous oxide (laughing gas) NO — nitrogen monoxide — nitric oxide NO_2 — nitrogen dioxide N_2O_3 — dinitrogen trioxide N_2O_4 — dinitrogen tetroxide N_2O_5 — dinitrogen pentoxide 	
THURSDAY	Using a poster, explain to the Learners on how binary molecule compounds are formed.	1. Assist Learners to explain binary compound. 2. Learners brainstorm to distinguish among elements, molecules, ions and compounds. 3. Discuss with the Learners on how to write molecular formula of binary compounds. 4. Learners brainstorm to explain binary acid and binary compound.   Binary compounds are chemical compounds comprising of two distinct elements. An element is a	Learners in small groups to compare and contrast different binary chemical compounds based on their composition and properties. **Exercise;** Write the molecular formula for each compound. 1. nitrogen dioxide 2. dioxygen difluoride 3. sulfur hexafluoride 4. selenium

		substance that cannot be further divided into any simpler substances using chemical methods. **How to write molecular formula of binary compounds;** A binary compound is made up of two elements. In ionic compounds , one element is a metal and the other element is a nonmetal. In covalent, or molecular, compounds both elements are nonmetals. **Binary Molecular Compounds** When naming molecular, or covalent, compounds, if an element in the formula has a subscript, the name of that element includes a Greek prefix that means the subscript number. The name of the second element is changed in the same way as ionic compounds. Greek prefixes are used on both elements, if required. If the first element in the compound has no subscript, no prefix is used. **Examples of Molecular Compounds** NF3: nitrogen trifluoride NO: nitrogen monoxide N2O: dinitrogen monoxide (laughing gas) N2O4: dinitrogen tetroxide PCl5: phosphorus pentachloride S2F10: disulfur decafluoride H2O: dihydrogen monoxide (water) NH3: nitrogen trihydride (ammonia)	monoxide
FRIDAY	Review Learners knowledge on the previous lesson.	1. Assist Learners to explain acid, base and salt chemicals with examples. 2. Discuss with the Learners on theories of acids and bases. 3. Using Poster and pictures, explain to the Learners on how to find the pH of acids and bases. 4. Assist Learners to identify the properties of acids and bases. **Acid;** An acid is any hydrogen-containing substance that is capable of donating a proton (hydrogen ion) to another substance. Acidic substances are usually identified by their sour taste. An acid is basically a molecule which can donate an H^+ ion and can remain energetically favorable after a loss of H^+. ***Acids are known to turn blue litmus red.*** **Base;** A base is a molecule or ion able to accept a hydrogen ion from an acid. **Theories of Acids and Bases**	Learners brainstorm to identify the uses of acid, base and salt. **Exercise;** 1. What are the physical properties of the base? 2. What is an acid and its properties? 3. What makes something an acid or a base? 4. Can acid

		Three different theories have been put forth in order to define acids and bases. These theories include the Arrhenius theory, the Bronsted-Lowry theory, and the Lewis theory of acids and bases. A brief description of each of these theories is provided in this subsection. Acids and bases can be defined via three different theories. • The ***Arrhenius theory*** of acids and bases states that "an acid generates H^+ ions in a solution whereas a base produces an OH^- ion in its solution". • The ***Bronsted-Lowry theory*** defines "an acid as a proton donor and a base as a proton acceptor". • Finally, the ***Lewis definition*** of acids and bases describes "acids as electron-pair acceptors and bases as electron-pair donors". Also Check ⇒ Dilute Acids **pH of Acids and Bases** In order to find the numeric value of the level of acidity or basicity of a substance, the pH scale (wherein pH stands for 'potential of hydrogen') can be used. The pH scale is the most common and trusted way to measure how acidic or basic a substance is. A ***pH scale measure can vary from 0 to 14***, where 0 is the most acidic and 14 is the most basic a substance can be. **1. Properties of Acids** • Acids are corrosive in nature. • They are good conductors of electricity. • Their pH values are always less than 7. • When reacted with metals, these substances produce hydrogen gas. • Acids are sour in taste. • Examples: Sulfuric acid [H_2SO_4], Hydrochloric acid [HCl], Acetic acid [CH_3COOH]. **2. Properties of Bases** Some properties, like a bitter taste, are owned by all bases. The bases feel slippery, too. Dream on what slippery soap looks like. And this is a foundation. Furthermore, when immersed in water, bases	react with metals? 5. What is the main difference between an acid and a base?

conduct electricity because they consist of charged particles in the solution.

- They are found to have a soapy texture when touched.
- These substances release hydroxide ions (OH^- ions) when dissolved in water.
- In their aqueous solutions, bases act as good conductors of electricity.
- The pH values corresponding to bases are always greater than 7.
- Bases are bitter-tasting substances which have the ability to turn red litmus paper blue.
- Examples: Sodium hydroxide [NaOH], milk of magnesia [$Mg(OH)_2$], calcium hydroxide [$Ca(OH)_2$].

3. Neutral Substances

The neutral substance is a substance which is not acidic or basic, has the same amount of hydrogen and hydroxyl ions, and does not alter the colour of the litmus surface.

- These substances do not display any acidic or basic characteristics.
- Their pH values approximate to 7.
- Neutral substances have no effect on red or blue litmus paper.
- The pH of pure water is exactly 7.
- Examples: Water, Common salt (NaCl)

Difference between Acids and Bases

Acids	**Bases**
Acid gives off hydrogen ions when dissolved in water.	Bases give off hydroxyl ion when dissolved in water.
It turns blue colour litmus paper into red.	It turns red colour litmus paper into blue.
It has a sour taste.	It has bitter taste and soapy to touch.
Its pH value ranges from 1 to 7.	Its pH value ranges from 7 to 14.

		Example: HCl, H_2SO_4 etc.	Example: NaOH, KOH etc.

Name of Teacher: **School:** **District:**