



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

CHEMISTRY 2

Grade 11

Course Description:

This course is designed to equip learners with the knowledge and skills to explain the various intermolecular forces of attraction that influence the physical properties of substances. Drawing on the electronic structure of carbon and the types of bonds it forms, learners are able to explain the diversity of organic compounds. The course also enables learners to explore the characteristics of key biomolecules found in living organisms—such as carbohydrates, lipids, proteins, and nucleic acids—and relate their properties to their biological functions. Additionally, learners develop the ability to write balanced chemical equations for reactions occurring in the environment, biological systems, and industrial processes. They gain a fundamental understanding of the Law of Conservation of Mass as the basis of mass relationships in chemical reactions, appreciate the importance of balancing chemical equations and perform calculations to determine quantities of reactants and products based on the mole concept. The lessons can be applied in environmental science, community-based issues, and industrial processes especially relating them to green chemistry and the United Nations' Sustainable Development Goals.

Elective: Academic

Prerequisite: Chemistry 1

Time Allotment: 80 hours for one semester, 4 hours per week

Schedule: Second Semester

Quarter 3

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Intermolecular forces	1. intermolecular forces, such as hydrogen bonds, influence the physical properties of substances;	1. use a diagram to differentiate the intermolecular forces and the intramolecular forces in the molecules of liquid water; 2. use secondary sources to explain the effect of intermolecular forces on liquid properties such as surface tension, viscosity, vapor pressure, boiling point, and molar heat of vaporization; 3. use a table to compare the intermolecular forces of attraction and properties of water, acetone, and ethanol in terms of boiling point, viscosity, surface tension;

<p>2. Organic compounds</p>	<p>3. hydrocarbon and its derivatives play a crucial role in organic reactions and the behavior of organic compounds;</p> <p>4. there are four major classes of organic compounds called biomolecules: and</p> <p>5. carbon compounds undergo several types of common chemical reactions.</p>	<p>4. explain why the carbon atom is the basis of organic chemistry referring to its electronic structure and types of bonds formed;</p> <p>5. explain the differences of the major groups of organic compounds, such as alkanes, alkenes, alkynes, haloalkanes, and alcohols, based on the bonding patterns and their functional groups;</p> <p>6. write the general formula for and list the elements present in carbohydrates, lipids, proteins, and nucleic acids and explain why some of these are referred to as macromolecules and others are polymers; and</p> <p>7. describe some simple reactions of organic compounds, such as combustion of organic fuels, addition, condensation, and saponification of fats.</p>
<p>Performance Standards</p> <p><i>By the end of the quarter,</i> learners differentiate intermolecular forces and intramolecular forces on the molecules of liquid water. They explain the significance of the carbon-hydrogen and carbon-carbon bonds and identify the major groups of organic compounds. They write equations for the processes of photosynthesis and respiration. Furthermore, they examine the characteristics of biomolecules and discuss their significance in both biological and everyday contexts.</p>		
<p>Suggested Performance Task</p> <ul style="list-style-type: none"> • Conduct a laboratory activity to investigate how intermolecular forces of attraction affect physical properties. This activity can also focus on the properties of liquids, especially water, which could explain its unique properties. 		

Quarter 4

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
1. Types of chemical reactions	1. there are 6 main types of chemical reactions, many of which occur naturally in the environment and in living things;	1. use secondary sources to identify examples of synthesis/combination, decomposition, single displacement, double displacement, combustion and acid-base reactions; 2. write the balanced chemical equations of various chemical reactions in real-life scenarios by applying the Law of Conservation of Mass; 3. identify examples of chemical reactions that occur in the environment and in living things, such as photosynthesis, respiration, digestion, Maillard reaction, hydrolysis, oxidation-reduction;
2. The Mole Concept	3. the mole is a fundamental unit in chemistry which is used to quantify and relate the mass of substances and to the number of particles that facilitate calculations in chemical reactions; and	4. explain the development and importance of the Mole Concept;
3. The Law of Conservation of Mass and stoichiometry	4. mass relationships in chemical reactions help to understand how to calculate the amounts of reactants and products involved in chemical reactions observed in daily life activities, environmental science, and industrial processes.	5. determine the molar mass of a number of common elements, such as hydrogen, oxygen, magnesium, lead, sodium and chlorine, and the molar mass of a number of common compounds, such as water, sodium chloride and carbon dioxide; 6. calculate mass, mole, and number of particles in a given chemical reaction such as in respiration, photosynthesis, and environmental and industrial reactions; 7. describe the environmental effects of various chemical reactions by examining their efficiency and byproducts, and suggest ways to minimize their negative impacts; and

		8. propose strategies that integrate chemistry concepts to minimize the negative impacts of certain chemical reactions in the environment.
<p>Performance Standards <i>By the end of the quarter,</i> the learners describe different types of chemical reactions and balance a chemical equation. They explain the relationship between Avogadro's number and the chemical unit, the mole of any substance. They explain the Law of Conservation of Mass and perform stoichiometric calculations to determine quantities of reactants and products.</p>		
<p>Suggested Performance Task</p> <ul style="list-style-type: none"> • Create an infographic on a selected chemical reaction that is experienced in real-life setting or those emphasizing its application in environmental chemistry, pharmaceuticals, and industrial processes. They can also share innovation or proposed possible innovations in the selected application of chemical reaction that could be used to achieve UN Sustainable Development Goals. 		