Academic Year : 2025/2026

Ascot High School

Science Department

Chemistry Course Outline Sept. – Dec., 2025

Grade 10

National Goals: 1. Jamaicans are empowered to achieve their fullest potential

General Objective: Be aware that matter is made up of particles.

UNIT	DURATION	TOPIC	SPECIFIC OBJECTIVES	SUGGESTED TEACHING AND LEARNING ACTIVITIES	ASSESSMENT
Week 1 - Sept. 1 - 05		GRADE ORIENTATION / DIAGNOSTIC TEST			
Week 2 - Sept. 8-12		DIAGNOSTIC TEST CONTINUATION			

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States of Matter	**3 Weeks** **Sept.15-Oct. 3**	**Particulate Theory of Matter**	By the end of the lesson, students should be able to: 1. State at least two key assumptions of the particle theory of matter, such as: a. All matter is made up of tiny particles. b. Particles are in constant motion. 2. Describe and explain diffusion and osmosis as evidence that supports the particle theory of matter. 3. List and describe the three states of matter: solid, liquid, and gas. 4. Compare the three states of matter in terms of: a. Energy of the particles b. Arrangement of the particles c. Movement of the particles	**Activity 1** **Think-Pair-Share (Starter Activity):** Pose the question: "What do you think all matter is made of?" Learners brainstorm individually, discuss in pairs, then share with the class. Responses will be to introduce the 3–4 key assumptions. **Activity 2** In small groups, after interactive simulation using PhET States of Matter, students create posters comparing solids, liquids and gases using diagrams and keywords. **Activity 3** Teacher demonstrate simple diffusion and osmosis experiments to link to the idea of matter being made up of tiny invisible particles that are constantly moving.	**Class work activity- 10%** 1.Interpret the results in terms of particle theory when a ball of cotton wool soaked in conc. aqueous ammonia and another in conc. hydrochloric acid are put simultaneously in opposite ends of a transparent tube (such as an old burette that was previously damaged - end broken off near the tap and that end made smooth in a flame) and stoppered. 2. Practice exam style questions on the topic. **END OF UNIT TEST – 10%**
General Objective: Understand that different types of mixtures can be separated based on the properties of the components					

States of Matter	**2 Weeks** **Oct. 06- 17**	**Mixtures and Their Separations**	By the end of the lesson(s), students should be able to: 1. Explain the difference between pure substances and mixtures, using examples. 2. Compare and contrast solutions, suspensions, and colloids, based on particle size, appearance, and stability. 3. Identify and classify different types of solutions (e.g., solid-liquid, liquid-liquid, gas-liquid), based on the states of solute and solvent. 4. Investigate how temperature affects the solubility of solids in water, through practical experiments and data analysis. 5. Select and justify appropriate separation techniques (e.g., filtration, evaporation, distillation, chromatography) based on the physical properties of the	**Activity 1** Examples such as oxygen, air, salt, saltwater, iron etc. will be placed on the board by the teacher. In small groups or pairs, learners will sort the words into **pure substance** and **mixtures**, sharing reasons with class for choices. **Activity 2** **Visual Observation Lab:** Provide three sample mixtures (e.g., salt water, muddy water, milk or starch solution). Learners observe and record differences in appearance, settling, and light scattering. **Activity 3** **Effect on Temperature on Solubility** ***Lab Experiment:** Students heat water to different temperatures, add the same amount of solute (e.g., salt or potassium nitrate), and record how much dissolves. ****Graphing Activity:** Students graph solubility vs temperature to analyze trends. *****Prediction & Reflection:** Before the experiment, students predict outcomes. Afterward, they explain results in terms of particle movement. **Activity 4**	**Homework assignment-10%** Based on your knowledge of separation techniques and reference to a list of the solubility of common compounds, plan, giving reasons, the steps in the separation of the solid components in a mixture of: - sodium chloride - lead chloride - ammonium chloride - barium sulphate. **Lab exercise on separation techniques:** a. filtration and evaporation- (separating from a mixture of sand and saltwater/seawater) b. chromatography – separating components of screen methyl orange **(PRACTICAL – 20%)**

			components in a mixture. 6. Describe the steps involved in the extraction of sucrose from sugar cane, and explain the purpose of each step in the process.	Show a short video of the sugar extraction process, pausing to explain each step. Following video presentation and discussion/explanation allow students to create a flowchart depicting the process involve in the extraction of sugar.	**END OF UNIT TEST – 10%**
Weeks 7-8 - Oct. 20-31		**MID- TERM / SESSIONAL TEST** **Particulate Nature of matter **Mixtures and their Separations			
General Objectives: Be familiar with the concept of the atom as the basic building block of matter					
Atomic Structure	**4 Weeks** **Nov. 03- 28**	1. **Structure of Atoms** **2. Chemical Notation** **3. Isotopes**	By the end of the lesson, students should be able to: 1. Recall and represent the structure (shell diagram) of atoms (atomic numbers 1 – 20), including: c. the properties and location of protons, neutrons, and electrons, d. atomic number and mass number, 2. Define the term relative atomic mass in relation to the carbon-12 isotope.	**Structure of Atoms** Present learners with a group worksheet that they complete together using previous knowledge (gr.9). Focus areas include but not limited to: a. table comparing protons, neutrons and electrons (location, mass and charge). b. missing information of elements 1-20 to complete (symbol, atomic #, # of protons, electrons etc.) c. draw shell diagrams (electronic structures) for elements using information completed. **RAM calculations**	Worksheets practice sheets Creative activity } **10 %**

			3. Use isotopic abundances calculate the relative atomic masses of elements. 4. Interpret notation in the form a c X b d **where:** a = mass number b = atomic number c = charge on the atom d = number of entities (atoms, ions) X – chemical symbol of the element 5. Define the term *isotopes*, and give examples of elements with isotopes. 6. Identify at least three common uses of radioisotopes in everyday life, industry, or medicine.	Following worked examples, learners complete practice sheet for RAM calculations and or compete in a group competition to solve RAM problems and earn points/prize. **<u>Nuclear notation</u>** In groups, using numbers the rolled on dice, students will build their own nuclear notation and present to class explaining its parts. **<u>Nuclear notation</u>** In pairs, learners create mini posters that they will display in the lab. Learners observe display and record notes in notebooks	**<u>Mini Poster display</u> (HW– 10%)** Each pair of learners will research and present on 1 radioisotope: name, use and how it works. **END OF UNIT TEST – 10%**
Weeks 13-14 -Dec. 01- 13					

	REVISION / END OF TERM EXAMINATION – 40%