

# FUNDAMENTALS OF CHEMISTRY

## SENIOR ONE

THEME	TOPIC	COMPETENCY
Introduction to Chemistry and Experimental Techniques	a. Chemistry and society	Assesses the application of chemistry in our everyday life and its contribution to our economy.
	b. Experimental chemistry	Understands that chemistry is a process of evidence-based enquiry involving the collection of evidence about the natural world, identification of trends and patterns in the evidence and the development of theories that help us explain the evidence.
Particle Nature of Matter	c. Matter and changes of states of matter	Uses the knowledge of the arrangement and motion of particles to explain the properties of solids, liquids and gases.
	d. Using materials	Explores how materials are used and relates these uses to their molecular structures.
Temporary and Permanent Changes to Matter	e. Temporary and permanent changes	Recognizes the occurrence of temporary and permanent changes, and their importance in everyday life.
	f. Mixtures, elements and compounds	Recognizes the characteristics of mixtures and compounds.
Air and Environment	g. Air	Appreciates that air is a mixture of gases in which oxygen is the active constituent, and he/she can describe processes that may affect air quality.
	h. Water	Investigates evaporation and condensation as natural processes essential for replenishing supplies of fresh water in the water cycle.
Earth and Space	i. Rocks and minerals	Appreciates that rocks are composed of different minerals and these determine the properties of the rocks.

TOPIC	KEY IDEAS
a. Chemistry and society	<ol style="list-style-type: none"> <li>1. Meaning of chemistry.</li> <li>2. How chemistry integrates/ relates with other subjects.</li> <li>3. Reasons for studying chemistry</li> <li>4. Applications of chemistry</li> <li>5. Careers that require knowledge of chemistry.</li> <li>6. Benefits of chemistry to Uganda's economic development</li> </ol>
b. Experimental chemistry	<ol style="list-style-type: none"> <li>1. Meaning of;- experimental chemistry; laboratory; apparatus</li> <li>2. Laboratory tools and their uses</li> <li>3. List of laboratory rules and regulations and their importance</li> <li>4. Safety in the laboratory and safety symbols.</li> <li>5. Meaning and steps of scientific method of investigation</li> <li>6. Accidents that can occur in the lab and how to mitigate or avoid them.</li> <li>7. Meaning and examples of mixtures.</li> <li>8. What separation of mixtures entails.</li> <li>9. Use of scientific method to separate; -iron fillings from a mixture of iron fillings and sand/salt/sulphur; salt from salt and sand; ethanol from ethanol and water; components of crude oil; components of air; fermented liquor; components of ink/dye.</li> <li>10. Determining purity of substance (water) using its boiling point and comparing expt. results of impure and pure samples with theoretical results.</li> <li>11. Determining purity of substance (ice cubes/naphthalene) using its melting point and comparing expt. results of impure and pure samples with theoretical results.</li> <li>12. Drawing heating/cooling curves of substances (water, ice cubes and naphthalene).</li> </ol>
c. Matter and changes of states of matter	<ol style="list-style-type: none"> <li>1. Meaning of matter</li> <li>2. States of matter and examples of substances in each state.</li> <li>3. Behavior of matter in different conditions. (Kinetic theory of matter to explain particle arrangement, inter-particle forces, movement of particles).</li> <li>4. Properties of matter. (shape, flow and compressibility)</li> <li>5. Change of states involving either heat gain or loss.</li> <li>6. Demonstrating the cooling effect of evaporation and how it contributes to maintaining body temperature constant.</li> </ol>
d. Using materials	<ol style="list-style-type: none"> <li>1. Classifying materials (natural and synthetic groups).</li> <li>2. Molecular structure of materials and their uses.</li> <li>3. Meaning of polymer</li> <li>4. Types of polymers (natural and synthetic)</li> <li>5. Examples of each type of polymers</li> <li>6. Physical properties of polymers relates to uses.</li> <li>7. How common materials pollute environment.</li> <li>8. Recycling of materials. (Considering non-biodegradable ones).</li> <li>9. Effect of heat on the structure and properties of materials.</li> </ol>

e. Temporary and permanent changes	<ol style="list-style-type: none"> <li>1. Meaning of permanent change and temporary change</li> <li>2. Examples of materials that form new substances and others that change temporarily when heated.</li> <li>3. Designing and carrying out practical investigation for; heating and cooling of candle wax; sublimation of iodine; rusting of iron nail; boiling an egg; burning a piece of paper.</li> <li>4. Citing temporary (reversible) and permanent (irreversible) changes to matter under different conditions in daily life.</li> </ol>
f. Mixtures, elements and compounds	<ol style="list-style-type: none"> <li>1. Determining whether a substance (water) is pure or not.</li> <li>2. Meaning of element; mixture; compound and characteristics.</li> <li>3. Classifying substances into elements, mixtures or compounds.</li> <li>4. Different mixtures (soluble and insoluble solutions).</li> <li>5. Miscible and immiscible liquids and how to separate them.</li> <li>6. Separating pure substances from mixtures (obtaining fresh water from sea water).</li> <li>7. Purifying rock salt by crystallization.</li> </ol>
g. Air	<ol style="list-style-type: none"> <li>1. Meaning and Components of air</li> <li>2. Separating components of air by fractional distillation.</li> <li>3. Uses of different components of air.</li> <li>4. Meaning of pollution</li> <li>5. Sources of air pollution</li> <li>6. Effects of different air pollutants on the environment.</li> <li>7. Meaning of rusting</li> <li>8. Conditions necessary for rusting to occur.</li> <li>9. Investigation to show that oxygen and water are necessary for rusting.</li> <li>10. Burning of different substances in air to form oxides.</li> </ol>
h. Water	<ol style="list-style-type: none"> <li>1. Occurrence of water</li> <li>2. Physical and chemical properties of water</li> <li>3. Water cycle and characteristics of water</li> <li>4. Meaning, causes, effects and prevention of water pollution (considering areas where water pollution might occur).</li> <li>5. Process of sewage treatment.</li> </ol>
i. Rocks and minerals	<ol style="list-style-type: none"> <li>1. Meaning and types of rocks (igneous, sedimentary and metamorphic rocks).</li> <li>2. How rocks are formed</li> <li>3. Mineral composition and use of different rock types.</li> <li>4. Physical properties of different rock types</li> <li>5. Meaning of weathering</li> <li>6. Process of weathering (soil formation)</li> <li>7. Types of weathering</li> </ol>