

WEEK	TOPIC	TERM 1 Objectives/activities	Assessment
1	Oxidation /Reduction	<ul style="list-style-type: none"> <li>○ Explain what is meant by (a) oxidation (b) reduction in terms of <u>Oxidation number</u>, <u>gain or loss of electrons</u>, and <u>gain or loss of oxygen</u></li> <li>○ Examples of REDOX reactions</li> <li>○ Rules for determining REDOX reactions</li> <li>○ Define the terms oxidising and reducing agents in terms of               <ol style="list-style-type: none"> <li>1) Electrons</li> <li>2) Oxidation number</li> </ol> </li> <li>○ Recognize oxidising and reducing agents</li> <li>○ Give examples of compounds which can act as both oxidising and reducing agents</li> <li>○ Describe tests to identify oxidising and reducing agents.</li> </ul>	<b>Class work</b> Hand out: Writing redox reactions and identifying what is oxidised and reduced
2	Oxidation /Reduction	<ul style="list-style-type: none"> <li>○ Describe the action of common oxidizing and reducing agents</li> <li>○ Describe REDOX in our everyday activities.               <ol style="list-style-type: none"> <li>1) Action of bleaches</li> <li>2) Rusting</li> <li>3) Browning of cut fruit and vegetables</li> <li>4) Food preservation</li> <li>5) Breathalyser test</li> </ol> </li> <li>○</li> </ul>	<b>SBA</b> : to investigate the reactions of oxidising and reducing agents
3	Oxidation /Reduction	<ul style="list-style-type: none"> <li>○ Examples of REDOX reactions</li> <li>○ Rules for determining REDOX reactions</li> <li>○ Define the terms oxidising and reducing agents in terms of               <ol style="list-style-type: none"> <li>1) Electrons</li> <li>2) Oxidation number</li> </ol> </li> <li>○ Recognize oxidising and reducing agents</li> <li>○ Give examples of compounds which can act as both oxidising and reducing agents</li> <li>○ Describe tests to identify oxidising and reducing agents.</li> </ul>	<b>Test:</b> Oxidation and Reduction

WEEK	TOPIC	TERM 1 Objectives/activities	Assessment
4	Term 1 Electrolysis	<ul style="list-style-type: none"> <li>○ What is electrolysis?</li> <li>○ Classification of the elements and compounds as conductors and non-conductors or insulators</li> <li>○ strong VS weak electrolytes</li> <li>○ Metallic vs electrolytic conduction</li> <li>○ Writing Half reactions</li> <li>○ Factors affecting discharge of ions</li> <li>○ Type of electrode: inert or active</li> <li>○ Concentration of the electrolyte</li> <li>○ Position in the electrochemical series</li> <li>○ Determining the ions in solution</li> <li>○ Writing half reactions at the cathode and anode</li> <li>○ Drawing electrolysis apparatus</li> <li>○ Factors affecting discharge of ions</li> </ul>	<b>Class work:</b> Writing half reactions
5	Applications of electrolysis	<ul style="list-style-type: none"> <li>○ Extraction of metals from their ores</li> <li>○ Purification of metals (Electrorefining)</li> <li>○ Electroplating</li> <li>○ Anodising</li> <li>○ Flowing mercury cathode</li> <li>○ Down's process</li> <li>○ Accumulator an dry cell</li> </ul>	<b>Assessment Quiz</b> <b>Describe how electrolysis can be used to</b> <ol style="list-style-type: none"> <li>1. extract metals from their ores</li> <li>2. purify metals</li> <li>3. electroplate</li> <li>4. anodize aluminium</li> </ol>
6	Electrolysis	<ul style="list-style-type: none"> <li>○ Review applications of Electrolysis</li> <li>○ Explain why electrolysis is used to extract metals high in the electrochemical series from their ores</li> <li>○ Describe how you would purify a sample of copper. Include the equations for the reactions occurring at the anode and cathode</li> <li>○ Give the equations for the reactions that occur at the anode and cathode during:               <ol style="list-style-type: none"> <li>a. chrome plating and nickel plating</li> </ol> </li> <li>○ What is anodising?</li> </ul>	<b>SBA 1</b> Electrolyte / non-electrolyte  <b>SBA 2</b> Electrolysis of CuSO <sub>4</sub> & NaCl  <b>Test applications of electrolysis</b>  <b>Draft Investigative projects due</b>

WEEK	TOPIC	Objectives/activities	Assessment
7	Rates of Reactions	<ul style="list-style-type: none"> <li>○ Define 'rate of reaction: The change in concentration of reactant or product with time at a stated temperature</li> <li>○ Identify the factors which affect the rate of a reaction</li> <li>○ Concentration</li> <li>○ Temperature</li> <li>○ Surface area</li> <li>○ Presence or absence of a catalyst</li> <li>○ Pressure in gases</li> <li>○ Light (halogens)</li> </ul>	<b>SBA:</b> reaction of sodium thiosulphate with hydrochloric acid showing the <b>effect of concentration</b> on the rate of reaction
8	Rates of reactions	<p>Experiment to observe the effect of temperature on reaction</p> <ul style="list-style-type: none"> <li>○ Draw the apparatus for the reaction</li> <li>○ Explain what happens when the temperature is changed</li> <li>○ Write the equation for the reaction</li> <li>○ Plot a graph of temperature against 1/t seconds</li> </ul>	<b>SBA:</b> Reaction of sodium thiosulphate with HCl showing the effect of temperature on the rate of reaction.
9	Rates of reactions	<p>Review rates of reactions</p> <ul style="list-style-type: none"> <li>○ Tell how the rate can be altered by changing: temperature; surface area; pressure; light and catalyst</li> <li>○ Draw a graph to determine the rate of a chemical reaction</li> </ul> <p>What is the test for the gas evolved? List the substance that worked best to increase the rate of the reaction</p> <ul style="list-style-type: none"> <li>○ Explain how a catalyst works</li> </ul>	<p><b>Page 199 – 200 exp 11D</b></p> <p><b>SBA</b></p> <p><b>Test:</b> Rates of reactions</p> <p><b>Experiment:</b> To demonstrate the effect of catalyst on the reaction rate</p> <p>Determine which substance increased the reaction rate</p>
		○	
10	Enthalpy	<ul style="list-style-type: none"> <li>○ Explain what is meant by the energy change for a reaction</li> <li>○ Define: endothermic, exothermic. activation energy,</li> <li>○ Draw energy profile diagrams</li> <li>○ Energy involved in bond breaking and bond formation</li> </ul>	<p>Written assignment</p> <p>:questions on enthalpy</p> <p>Assignment read chapter 8 Energy in Chemistry</p>

<b>WEEK</b>	<b>TOPIC</b>	<b>Objectives/activities</b>	<b>Assessment</b>
<b>11</b>	<b>Enthalpy</b>	<ul style="list-style-type: none"> <li>○ Carry out simple calculations involving energy changes</li> <li>○ Heat of solution</li> <li>○ Heat of combustion</li> <li>○ Heat of neutralization</li> <li>○ Carry out experiments to determine: enthalpy of solution</li> <li>○ Enthalpy of combustion</li> <li>○ Enthalpy of neutralization</li> </ul> Revise enthalpy	Assignment: enthalpy calculations  <b>SBA:</b> Heat of solution <b>SBA:</b> Heat of Combustion
<b>12</b>	<b>Enthalpy</b>	<ul style="list-style-type: none"> <li>○ Heat of combustion</li> <li>○ heat of solution and</li> <li>○ heat of neutralization</li> </ul>	<b>Enthalpy test</b>
<b>13</b>		End of term exam	<b>Exam</b>

<b>WEEK</b>	<b>TOPIC</b>	<b>TERM 2 Objectives/activities</b>	<b>Assessment</b>
<b>1</b>	<b>Characteristics of Metals and non-metals</b>	<ul style="list-style-type: none"> <li>○ Identify where the metals and nonmetals are positioned in the periodic table</li> <li>○ Describe and compare the physical properties of the metals and non-metals</li> <li>○ Describe the chemical properties of the following metals: Na, K, Ca, Mg, Al, Zn, Fe, Pb, Cu</li> </ul>	<b>SBA</b> comparing the reactivity of metals with sulphuric acid & displacement reactions
<b>2</b>	<b>Characteristics of Metals and non-metals</b>	<ul style="list-style-type: none"> <li>○ Discuss the reactivity of metals and their compounds</li> <li>○ Use experimental data to arrange metals in order of reactivity</li> <li>○ Describe the chemical properties of non-metals</li> </ul>	<b>SBA</b> hydroxides and sulphates of elements in group II <b>Quiz</b> on metals
<b>3</b>	<b>Characteristics of Metals and non-metals</b>	<ul style="list-style-type: none"> <li>○ Compare the reactivity of metals with oxygen, water and dilute acids</li> <li>○ Heating of metal compounds and their decomposition.</li> </ul>	<b>Quiz on non-metals</b> <b>SBA Planning and Design</b>
<b>4</b>	<b>Characteristics of Metals and non-metals</b>	<ul style="list-style-type: none"> <li>○ Describe:</li> <li>○ the process of extracting iron from its ore (blast furnace)</li> <li>○ Extraction of active metals such as sodium, and aluminium</li> <li>○ Production of steel</li> </ul>	<b>Test Metals and non-metals</b>
<b>5</b>	<b>Uses of metals</b>	<ul style="list-style-type: none"> <li>○ Explain why metal alloys are often used in place of metals</li> <li>○ N.B. aluminium alloys steel and solder</li> <li>○ Relate the properties of the metals (aluminium lead and iron to their alloys)</li> </ul>	<b>SBA: Qualitative Analysis</b> <b>Identifying cations</b> Al <sup>3+</sup> ; Ca <sup>2+</sup> ; Pb <sup>2+</sup> ; Cu <sup>2+</sup> ; Zn <sup>2+</sup> Fe <sup>2+</sup> ; Fe <sup>3+</sup> ; NH <sub>4</sub> <sup>+</sup> ; and
<b>6</b>	<b>Impact of metals on living systems</b>	<ul style="list-style-type: none"> <li>○ Investigate the conditions necessary for the corrosion of metals</li> <li>○ Explain the importance of metals and their compounds on living systems and environment</li> </ul>	<b>SBA: Qualitative analysis Anions</b> CO <sub>3</sub> <sup>2-</sup> ; SO <sub>4</sub> <sup>2-</sup> ; NO <sub>3</sub> <sup>-</sup> ; Br <sup>-</sup> I <sup>-</sup> Cl <sup>-</sup>

WEEK	TOPIC	Objectives/activities	Assessment
7	Non-metals	<ul style="list-style-type: none"> <li>○ Describe the physical and chemical properties of non-metals</li> <li>○ H<sub>2</sub>, Cl<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, C and S</li> <li>○ Reactions with oxygen &amp; metals</li> <li>○ Oxidising and reducing properties</li> <li>○ Physical properties m.p. b.p. conductivity luster hardness density</li> <li>○ List the uses of non-metal : carbon, sulphur, phosphorous, chlorine, nitrogen, silicon, and their compounds (including insecticides, strengthening of plastics with fibres</li> <li>○ Jewelry, tire manufacture, matches phosphate and other fertilizers, (NPK), bleaches, glass, ceramics</li> <li>○ discuss the harmful effects of non-metals on living systems and the environment:</li> </ul>	Test Chapter 22
8	Green Chemistry	<ul style="list-style-type: none"> <li>○ Define green chemistry</li> <li>○ <b><u>Discuss 12 principles of green Chemistry</u></b></li> <li>○ Prevent waste</li> <li>○ Atom economy</li> <li>○ Generate or use less hazardous substances</li> <li>○ Create products with little or no toxicity</li> <li>○ Avoid the use of solvents (e.g. separating agents</li> <li>○ Conservation of energy</li> <li>○ <u>Use renewable raw materials</u></li> </ul>	Test: Properties and uses of non-metals Non-metals Reading assignment Chapter 23
9	GREEN CHEMISTRY NON-METAL POLLUTANTS	<ul style="list-style-type: none"> <li>○ pollutants such as: SO<sub>2</sub>; CO H<sub>2</sub>S, oxide of nitrogen, CO<sub>2</sub>, CFC's, nitrates, phosphates herbicides and pesticides</li> <li>○ disposal of solid waste such as plastic</li> <li>○ avoid reaction processes with too many intermediate stages</li> <li>○ Use catalysts</li> </ul>	Quiz harmful effects of air pollutants

10	Green chemistry	<ul style="list-style-type: none"> <li>○ Design for degradation</li> <li>○ Monitor processes to prevent pollution</li>   <li>○ Minimize the potential for accidents at the reaction or work site</li> <li>○ Benefits and examples of green chemistry</li> </ul>	Test Chapter 23
11	Green Chemistry	<ul style="list-style-type: none"> <li>○ Define and outline the principles of green chemistry</li> <li>○ Revision gases</li> <li>○ Metals</li> <li>○ Electrochemistry</li> <li>○ Enthalpy</li> <li>○ Periodicity</li> <li>○ Identifying unknowns</li> <li>○ Atomic structure and bonding</li> <li>○ States of matter</li> <li>○ Mixtures and separations</li> </ul>	Pre CSEC EXAM
12	.	Mock exam Acids bases and Salts Organic chemistry Rates of chemical reactions Types of chemical reactions Green Chemistry Oxidation and reduction Electrolysis Metals and no-metals Mole concept	PRE CSEC EXAM