

BUDHA DAL PUBLIC SCHOOL, SAMANA

ANNUAL CURRICULUM PLAN SESSION 2023-24

CLASS: XI

SUBJECT: CHEMISTRY

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities & Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	Behavioural (Application based)			
May	Structure of atom wave nature of EM radiations, photoelectric effect, black body radiation, atomic spectra, Bohr's model of atom, Dual nature of atom , Heisenberg's uncertainty principle, quantum mechanical model , quantum numbers, Pauli's exclusion principle, Aufbau's principle, electronic configuration of ions, Hund's rule of maximum multiplicity	After studying this unit students will be able to 1. Understand the nature of EM waves and terminologies associated with it. 2. Know and understand the black body radiations and photoelectric effect. 3. Learn the study of atomic spectra and its types. 4. Relate the failure of one atomic model to overcome the drawbacks of the same to frame a new theory. 5. Know and understand Heisenberg's uncertainty principle and enhance the numerical solving ability. 6. Know the principle of working out the electronic configuration and will be	After studying this unit students will be able to 1. Observe details in a more scientific way and will become more open in expressing their ideas after learning how the scientists draw conclusions through a very small detail. 2. Appreciate and Demonstrate the use of various low frequency and high frequency waves to situations like detection of fractures by X-rays, relieve of muscle pain by infra-red etc. 3. Develop a sense of maturity regarding failures in life as to how one failure leads to a new path of success. 4. Develop an attitude to simplify things and frame some logical norms for any kind of dealings in life like filling of electrons in a very organized and a set norm	Problem solving Writing electronic configurations of various molecules and ions	Students have learnt 1. The nature of EM waves and terminologies associated with it. 2. The process of radioactivity. 3. The black body radiations and photoelectric effect. 4. The study of atomic spectra and its types. 5. To relate the failure of one atomic model to overcome the drawbacks of the same to frame a new theory. 6. Heisenberg's uncertainty principle and have enhanced the ability to solve numerical. 7. the principle of working out the electronic configuration and will be able to understand various properties of a number atoms . 8. To Develop a sense of maturity regarding failures in	Assignment Half yearly examination

		<p>able to understand various properties of a number atoms .</p>	<p>does not lead to any confusion.</p>		<p>life as to how one failure leads to a new path of success. 9. To Appreciate and Demonstrate the use of various low frequency and high frequency waves to situations like detection of fractures by X-rays , relieve of muscle pain by infra red etc. 10. Atomic spectra: Emission spectra, Absorption spectra, continuous spectra, line spectra, band spectra. 11. Failure of Rutherford's model of atom, overcoming the failure through Bohr's model for hydrogen atom, deriving mathematical relation of energy of an electron by Bohr's theory, numerical solving to calculate the energy of an electron. 11.Dual behavior of matter : de Broglie Equation, its derivation , and numerical 12Heisenberg's uncertainty principle, its significance and numerical related to it . 13. Quantum mechanical model of an atom , Quantum numbers , Pauli's exclusion principle:, Aufbau's principle :. Hund's rule of maximum multiplicity. 14. Stability of completely</p>	
--	--	--	--	--	---	--

					filled and Half-filled Orbitals : configuration of various atoms and ions	
July	<p>Classification of elements Modern periodic law and the present form of periodic table, periodic trends in properties of elements – atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.</p>	<p>After studying this unit students will be able to 1. Know how the concept of grouping elements in accordance to their properties led to the development of Periodic Table. 2. Compare the positive points and drawbacks of previous models of classification of elements e.g. laws of triads and octaves, Mendeleev’s law 3. Appreciate the utility of Mendeleev’s periodic classification in designing of the modern periodic classification 4. understand the Periodic Law; understand the significance of atomic number and electronic configuration as the basis for periodic classification; 5. name the elements with $Z > 100$ according to IUPAC nomenclature; 6. classify elements into <i>s</i>, <i>p</i>, <i>d</i>, <i>f</i> blocks and learn their main characteristics; 7. recognize the periodic</p>	<p>After studying this unit students will be able to 1. Understand and appreciate the importance of classification and will learn how to proceed to study, analyze and solve a problem through a systematic and sequential approach. They will develop the skills of analysis, classification (sorting) and critical thinking. 2. They will also develop analytical and critical thinking through thoughtful study of the pattern of the classification and the properties of elements followed by discussion on normal & exceptional trends in the properties. 3. Through study and discussion on work done by the scientists, they will be motivated to follow a path of optimum values and life skills so that they can get success in life.</p>	<p>Problem solving activity based on periodic trends</p>	<p>Students have learnt : 1. Students have developed an understanding about the need & importance of classification of elements and knowledge of historical back ground of the classification of elements. 2. With the help of the above information and subsequent discussion held on it they have developed an insight into significance of having skills of classifying & arranging things systematically so that further studies become easier and effective. 3. They have developed the skills of analysis, sorting, arranging through the study of this chapter and now critically think before explaining reasons about particular pattern of classification. 4. Students can predict periodic position of elements and can predict probable trends in properties of the elements in terms of their metallic/ non-metallic nature, ionization enthalpy, size, electro affinity, electronegativity, nature of compounds etc.</p>	<p>Assignment and Half yearly examination</p>

		<p>trends in physical and chemical properties of elements;</p> <p>8. compare the reactivity of elements and correlate it with their occurrence in nature;</p> <p>9. explain the relationship between ionization enthalpy and metallic character;</p> <p>10. Use scientific vocabulary appropriately to communicate ideas related to certain important properties of atoms e.g., atomic/ ionic radii, ionization enthalpy, electron gain enthalpy, electro negativity, valence of elements.</p>			<p>5. They can explain the periodic trends in the properties of the elements.</p>	
--	--	--	--	--	---	--

<p>April</p>	<p>Some Basic concepts of chemistry Importance and scope of chemistry, Law of conservation, Law of constant proportion, Law of multiple proportion Postulates of Daltons atomic theory, Relative atomic mass, calculation of molecular mass, formula mass, Concept of mole, Ways of expressing concentration such as strength</p>	<p>After studying this unit students will be able to 1.explain the characteristics of three states of matter 2.classify different substances into elements, compounds and mixtures 3.explain various laws of chemical combination 4.appreciate significance of atomic mass, average atomic mass, molecular mass and formula mass 5.describe the terms – mole and molar mass express concentration of solution in different unit 6.calculate the mass per cent of different elements constituting a compound</p>	<p>After studying this unit students will be able to 1. Appreciate the role of chemistry in different spheres of life like supply of healthy food, contribution to better health and sanitation, saving environment etc. 2.Appreciate the use of chemistry only for the welfare of the human being 3. Discourage the consumption of drugs like LSD, cocaine etc, which cripple society. 4. Deal with safety issues while working in lab.</p>	<p>Volumetric analysis/laboratory equipment Previous years question papers, practice work sheets.</p>	<p>Expected Learning Outcomes: 1.To explain the characteristics of three states of matter; 2.To classify different substances into elements, compounds and mixtures; 3.To explain various laws of chemical combination; 4.To appreciate significance of atomic mass, average atomic mass, molecular mass and formula Mass; 5.To describe the</p>	<p>Assignment, practice questions, Half yearly examination</p>
---------------------	--	---	---	--	--	--

	,molarity, molality, mass and volume percentage ,ppm ,mole fractions and stoichiometric calculation and limiting reagent.	7. perform stoichiometric calculations.			terms – mole and molar mass; 6.To calculate the mass per cent of different elements constituting a compound; 7.Perform stoichiometric calculations.	
Aug	Chemical bonding/ Ionic , covalent, coordinate bond. Lewis dot representation, various theories to explain geometry of molecules like VSEPR, VBT and MOT ,hybridization involving s,p,d,f orbital's, hydrogen bonding	Student will be able 1.Understand Kossel-Lewis approach to chemical bonding; 2. Explain the octet rule and its limitations, 3.Draw Lewis structures of simple molecules;• 4.Explain the formation of different types of bonds; 3.Describe the VSEPR theory and predict the geometry of simple molecules; 4.Explain the valence bond approach for the formation of covalent bonds; 5.Predict the directional properties of covalent bonds; 6.Explain the different types of hybridization involving <i>s</i> , <i>p</i> and <i>d</i> orbitals and draw shapes	After studying this unit students will be able to 1. Appreciate how chemical bonding keeps atoms together that are necessary for their existence. 2. Appreciate chemical bonds lends itself to discovering some important appreciation of our surroundings. 3. Students will then be challenged to think about the chemical bonds that are essential to the functioning of our body. What bonds exist among atoms within our bodies that are sustaining us.	Practice 1.Drawing electron dot structure 2.Predicting and drawing shapes of organic compounds using VSEPR theory	.1. Student have developed an understanding of KÖssel-Lewis approach for chemical bonding; 2. with the help of above information and subsequent discussion they can explain the octet rule and its limitations, 3.Student can draw Lewis Structures of simple molecules and ions. 4.They can explain the Formation of different types of bonds. 5.With the help of VSEPR theory they can predict the geometry of simple molecule 6.After understanding valence bond approach for the formation of covalent bonds student have developed an insight to predict the directional properties of covalent bonds;	Practice questions, assignment

		<p>of simple covalent molecules;</p> <p>7. Describe the molecular orbital theory of homonuclear diatomic molecules;</p> <p>8. Explain the concept of hydrogen bonding</p>			<p>7. They can explain the different types of hybridization involving <i>s</i>, <i>p</i> and <i>d</i> orbitals and draw shapes of simple covalent molecules;</p> <p>8. student can describe the molecular orbital theory of homonuclear diatomic molecules;</p> <p>9. They can explain the concept of hydrogen bonding</p> <p>10. Student have learnt and appreciate that chemical bonds lends itself to discovering some important appreciation of our surroundings. For instance, understanding how the significant bonding of H₂O leads to unique properties of water, chemical bonding occurs around us and in us leads to a description of the processes necessary for our survival. If we're able to understand the bonds that result from electrons then we can understand the chemical reactions that take place that sustain us.</p>	
August	Redox reaction/ Oxidation reduction, redox reaction, oxidizing agent, reducing	After studying this unit students will be able to 1. Define the terms oxidation , reduction, redox reaction, oxidizing	After studying this unit students will evaluate that like variable oxidation states variations in life can also allow us to exhibit our various hidden	Problem solving activity based on redox reaction, Balancing of equation in acidic	Students have learnt 1 .To define the terms oxidation , reduction, redox reaction, oxidizing agent, reducing agent.	Practice questions will be given

	<p>agent, mechanism of redox reactions by electron transfer and oxidation number concept.</p> <p>Identification of oxidant and reluctant.</p> <p>Classification of redox reaction into various types.</p> <p>Balancing redox equations and Galvanic cell.</p>	<p>agent and reducing agent.</p> <p>2. Explain mechanism of redox reactions by electron transfer and oxidation number concept.</p> <p>3. Use the concept of oxidation number to identify oxidant and reductant.</p> <p>4. Classify redox reaction into various types.</p> <p>5. Balance chemical equations using oxidation number and half reaction method.</p>	<p>character</p>	<p>and basic medium</p>	<p>2. The mechanism of redox reactions by electron transfer and oxidation number concept.</p> <p>3. To use the concept of oxidation number to identify oxidant and reluctant.</p> <p>4 .To classify redox reaction into various types.</p> <p>5. To balance chemical equations using oxidation number and half reaction method.</p> <p>6.students have learnt to evaluate that like various oxidation states of atoms variation in life also allow us to exhibit our various hidden character</p>	

<p>October</p>	<p>Thermodynamics system and surroundings close, open and isolated systems, internal energy, work and heat, first law of thermodynamics state functions: U, H, ΔU and ΔH standard states for ΔH enthalpy changes for various types of reactions .Hess's</p>	<p>After studying this unit student will be able to 1.Explain the terms system and surroundings 2. Discriminate between close, open and isolated systems. 3. Explain internal energy, work and heat. 4.state first law of Thermodynamics and express it mathematically. 5. Explain state functions: U, H and correlate ΔU and ΔH. 6. Define standard states</p>	<p>Children will be able to – 1. Appreciate and realize the justified use of energy and will create awareness about conservation of energy 2. Devise new techniques to conserve energy and start using renewable means of energy 3. The concept of entropy shall make them appreciate the importance of discipline, regularity, order while working in any field to complete a task.</p>	<p>Numerical based on the topic will be given</p>	<p>1.Students have learnt to Explain the terms like system and surroundings 2. They can discriminate between close, open and isolated systems. 3. They have developed an understanding of the variables like internal energy, work and heat. 4.They can state first law of thermodynamics and express it mathematically. 5. They can correlate ΔU and ΔH. 6. They can define standard</p>	<p>Assignment, practice questions and worksheets</p>
-----------------------	---	--	--	---	---	--

	<p>law of constant heat summation extensive and intensive properties spontaneous and nonspontaneous processes and second law of thermodynamics entropy as a thermodynamic state function Gibbs energy change (ΔG); establish relationship between ΔG and spontaneity, ΔG and Equilibrium constant.</p>	<p>for ΔH. 7. Calculate enthalpy changes for various types of reactions. 8. State and apply Hess's law of constant heat summation. 9. Differentiate between extensive and intensive properties. 10. Define spontaneous and nonspontaneous Processes. 11. Explain entropy as a Thermodynamic state function and apply it for spontaneity. 12. explain Gibbs energy change (ΔG) and establish relationship between ΔG and spontaneity, ΔG and equilibrium constant.</p>			<p>states for ΔH. 7. student can calculate enthalpy changes for Various types of reactions and also state and apply Hess's law of constant heat summation. 8. They can differentiate between extensive and intensive properties and can also define spontaneous and nonspontaneous Processes. 9. Student can explain entropy as a thermodynamic state function and apply it for spontaneity. 10. They can explain Gibbs energy change (ΔG) and establish relationship between ΔG and spontaneity, ΔG and equilibrium constant. 11. They can use energy judiciously and developed various skills and values required to achieve success in life.</p>	
<p>October + November</p>	<p>Equilibrium chemical equilibrium Dynamic nature of equilibrium involved in physical and chemical processes.</p>	<p>After studying this unit students will be able to 1. Identify dynamic nature of equilibrium. 2. State the law of equilibrium. 3. Write expression for eq. constant.</p>	<p>Children will be able to: Appreciate and explain the scientific reason behind the following phenomena from daily life: 1. Clothes dry quicker when there is a breeze or we keep on shaking it.</p>	<p>1. Numerical based on the topic 2. concentration time graph</p>	<p>Students have learnt to 1. Identify dynamic nature of equilibrium. 2. State the law of equilibrium. 3. Write expression for eq. constant. 4. Explain various factors that affect equilibrium.</p>	<p>Practice questions numericals</p>

	law of equilibrium, characteristics of equilibrium involved in physical and chemical processes, expressions for equilibrium constants, establish a relationship between K_p and K_c ; various factors that affect the equilibrium state of a reaction,	4. Explain various factors that affect equilibrium.	2. We sweat more on a humid day. 3. Transport of oxygen by hemoglobin in blood. 4. Removal of CO_2 from the tissues by blood. On the basis of their knowledge and understanding they will be able to create awareness about above phenomena and hence cope up and guide others to do the same in justified manner.		5. Appreciate and explain the scientific reason behind the various phenomena from daily life.	
November	Equilibrium ii classify substances as acids or bases according to Arrhenius, bronsted-Lowry and Lewis concepts, classify acids and bases as weak or strong in terms of their ionization constants, explain the dependence of degree of ionization on concentration of the electrolyte and that of the common ion, describe pH	After studying this unit student will be able to 1.classify substance as acids or bases describe pH scale. 2.Understand common ion effect and solubility product. 3.Calculate solubility product. 4.apply concept of common ion effect and solubility product in qualitative analysis	1. They will apply their knowledge of significance of pH in day to day life 2. They will appreciate and understand the application of solubility product and common ion effect in salting out of soap. 3. They will also apply these concepts while doing qualitative analysis.	Qualitative analysis	Students have learnt 1. to classify substance as acids or bases 2.to describe pH scale. 3.to Calculate solubility product 4.to apply concept of common ion effect and solubility product in daily life like in purification of salt 5. to apply their knowledge of significance of pH in daily life while choosing eatables, drinks, cosmetics and medicines.	assignment

	scale for representing hydrogen ion concentration, ionization of water and its dual role as acid and base, describe ionic product (K_w) and pK_w for water, buffer solutions, calculate solubility product constant.					
November	Organic chemistry some basic concepts	After studying this unit student will be able to 1. understand reasons for tetra valence of carbon and shapes of organic molecules; 2. Write structures of organic molecules in various ways and classify the organic compounds. 3. name the compounds according to IUPAC system of nomenclature and also derive their structures from the given names; 4. Understand the concept of organic reaction mechanism. 5. Explain the influence of electronic displacements on structure and reactivity	Student will use various methods to purify organic compounds and appreciate the use of this technique in day to day life.	Nomenclature of organic compounds. A video to explain process and use of various purification technique of organic compounds will be shown.	Students have learnt 1. the reasons for tetra valence of carbon and Shapes of organic molecules. 2. to write structures of organic molecules in various ways. 3. to classify the organic compounds. 3. to name the compounds according to IUPAC system of nomenclature and also derive their structures from the given names; 4. the concept of organic reaction mechanism; 5. to explain the influence of electronic displacements on structure and reactivity of organic compounds; 5. to recognize the types of organic Reactions. 8. Student have learnt how the	Assignment/workshops

		of organic compounds.			pure substances are obtained by using various techniques and appreciate the use of these technique in day to day life like separating drugs from blood,use of fractional distillation in separating crude oil in petroleum industry,use of TLC technique in forensic department in order to solve suspicious matter.	
November	HYDROCARBON	<p>After studying this unit students will be able to</p> <ol style="list-style-type: none"> 1. Name hydrocarbons according to IUPAC system of nomenclature. 2 .recognize and write structures of isomers of alkanes, alkenes, alkynes aromatic hydrocarbons. 3. Learn about various methods of preparation of hydrocarbons. 4.distinguish between alkanes, alkenes, alkynes and aromatic hydrocarbons on the basis of physical and chemical properties; 5.draw and differentiate between various conformations of ethane; 6.appreciate the role of hydrocarbons as sources of energy and for other industrial applications; 	<p>After studying this unit students will be able to</p> <ol style="list-style-type: none"> 1. to appreciate use of hydrocarbons for health care and industrial purpose 2.to discourage excessive use of harmful chemicals and to think for the alternating solution . 	<ol style="list-style-type: none"> 1.writing names of hydrocarbons 2.Draw isomers of hydrocarbons 	<p>Students have learnt</p> <ol style="list-style-type: none"> 1. To name hydrocarbons according to IUPAC system of nomenclature. 2. To recognize and write structures of isomers of alkanes, alkenes, alkynes and aromatic hydrocarbons. 3. About various methods of preparation of hydrocarbons. 4.to distinguish between alkanes,alkenes, alkynes and aromatic hydrocarbons on the basis of physical and chemical properties; 5.to draw and differentiate between various conformations of ethane. 6.to appreciate the role of hydrocarbons as sources of energy and for other industrial applications; 7.To Predict the formation of the addition products of 	Assignment,practice questions

		<p>7. Predict the formation of the addition products of unsymmetrical alkenes and alkynes on the basis of electronic mechanism.</p> <p>8. comprehend the structure of benzene, explain aromaticity and understand mechanism of electrophilic substitution reactions of benzene.</p> <p>9. Predict the directive influence of substituent's in monosubstituted benzene ring.</p> <p>10. learn about carcinogenicity and toxicity</p>			<p>unsymmetrical alkenes and alkynes on the basis of electronic mechanism.</p> <p>8. To comprehend the structure of benzene, explain aromaticity and understand mechanism of electrophilic substitution reactions of benzene.</p> <p>9. To predict the directive influence of substituent's in monosubstituted benzene ring;</p> <p>10. Student have developed concern for our future generation by appreciating judicious use of petroleum and natural gas and practicing in their own life. They also realized the tragic side effects of excessive use of insecticides like DDT in world war II and felt importance of cheaper alternate to it like BHC .</p>	

