ಪಠ್ಯವಸ್ತು

5ನೇ ತರಗತಿ

ವಿಜ್ಞಾನ

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
1. The Living World	Charecterstics of Life Habitat	• Characteristics of living and non living • Differences between plants and animals • Different types of Habitats and examples	• Able to Understand the characteristic features of living and nonliving. • Differentiate between plants and animals • Learn about the habitats of various animals	• Specimens Pictures Charts Visits	Visits, Collection of pictures (album)	
2. Materials	States of matter • Relation between matter and energy • Effect of temparature on solids, liquids and gases • Types of elements. • Common elements in	• Solids, Liquids and Gases • Effects of temperature on solids, liquids and gases • Mass, density, pressure, buoyancy • Definition metals and non metals. • Air, Water, Soil • Elements in - Water - Soil	Will be able to understand and distingevish solids, liquids and gases. Will understand what is mass, Density, Pressure, Buoyancy distinguighes between metals and non-metals, understands that air is matter.	Show all states of matter Conduct experiments, show charts. Charts	Charts a few metals and a few non-metals to be shown to students.	4 4

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
	nature • Pure and impure substances	• Symbol - (Symbol elements) • Solid element - Liquid element - Gas element • Elements, Compounds and Mixtures	Experimentally distinguishes between Hydrogen and Oxygen. - Recognizes symbols of a few elements. - Recognizes liquid and gaseous elements. - Classifies elements, compounds and mixtures.	Voltametes, burning splinter. Periodic table Sample of Glucose, sugar, water, Sand Nacl, N, K, Ca, S.	Voltameter experiment Introduction of burning splinter into test tubes liberating Hydrogen and Oxygen - Play way method can be followed - Dramatization - Dramatization, Group activity	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
2. Materials	Water	• Elements present in Water • Sources of water • Physical properties of Water • Biological importance - for plants and animals.	• Lists out the sources of water. • Reasons out the importance of lakes and streams. • Analyses the importance of water to organisation.	Charts of rivers, streams and Oceans.	1) Voltameter experiment 2) Dramatization 3) Gardening 4) Visit to water treatment plant	
	• Potable water	• Potable water - characteristics	Understands the meaning of potable water.	Aquarium maintainance, Growing plants in different conditions. Chart	Film show Experimentation	
	• Air	• Earth's atmosphere • Constituents of air • Air-occupies space, air has weight, air help in burning.	Lists out the constituents of air. Experimentally determines that air has weight. Reasons out the importance of air (Oxygen) in combustion understands mollculer allignment.	Spring balance, foot ball bladder, air pump. Candle, water, Beakers Chart	Dermonstration	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
3. How Things Work	Electrical circuit	• Electric current • Basic law of electronics • Electric cell - working and uses	Will understand what is electric current. Will understand how an electric cell works		Charts & labwork.	6
	Electrical devices	• Fuse - Components and function • Fuse Characteristics	Will know how a fuse works and what is it made up of and its uses.			
	Combustion	• Definition - types and examples. • Oxygen Ignition, temperature are essential for combustion	Understands combustion triangle.	Charts	Demonstration	4
		• Fire triangle - • Slow, Fast and rapid combustion • Controlled combustion (gas stove)	Compares and contrasts slow, fast and rapid combustion.	Charts	Demonstration	
	Transportation	• Means of transportation • Fuels used in different vehicles				
	Sublimation	- Sublimation solids, non-sublimation solids examples	Understands sublimation	NH_4Cl, NaCl, Burner, Beaker Dish.	Experiment to demonstrate sublimation	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
4. Food 4. Food	Constituents Antotrophism & Heterotrophisom Sources of food	• Carbohydrates-Elements present • Proteins-elements present • Carbohydrate-As a source of energy • Autotrophes and Heterotrophs - Types and examples • Basic concepts of agriculture. • Natural fuels - wood, - Natural gas - Coal - Petroleum • Factors essential for combustion of fuels. • Products of combustion	• Understand the Importance of the food. • Appreciate the smooth balance that exists between plants and animals in nature. • Understand the importance of agriculture in food production.	Charts, Specimens and pictures	Collection of grains etc. Heating Sugar, Bread, Rice to show the presence of Carbon Collection	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
5. Environmental Science	• Family and friends • Work and Play • Shelter and Clothing	• Relationships • Family tree • Our likes and dislikes, - attitudes • Team games • Local games • Excercises • Dignity of labour • Regional differences • Neighbourhood concept • Society	Understand the basic values Learn to respect the elders. Understand the team spirit	Pictures, moral stories games stories Drama	Roleplays (Dramas...) Role plays	
6. Natural Resource	• Importance of Air, Water, Light and Soil	• Sources of water • Methods of conserving • Sun-As a natural resouce of light • Importance of air • Importance of soil (to living organisms)	Understand the influence of nonliving factors on living organisms.	T.V. Shows Charts Collecting the information	Preparing charts	

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Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
Living World	Diversity in habitats of plants and Animals	Basic adaptations animal form and function (Generalised) Structure and function of animal body structure. Functions of different parts of a plant	Understand the adaptation of animals to their habitats. Learn the different parts of an animal and plant and their functions. To Develop the skill of drawing diagrams.	Plant specimens, pictures charts	Visits Collection of different plants.	
	Green house effect Global warming	Effects of heat on water.	Understands green house effect. Analyses the effect of global warming	Models	Demonstration through models.	2

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
2. Materials	Effect of heat on water Water cycle Composition of water	Boiling point of water, occurrence of water, Steps involved in water cycle Evaporation Condensation Rain	Experimentally determines boiling point of water. Understands water cycle. Understands the importance of water bodies in rain fall	Thermometer round bottom flask.	Experiment Dramatization	4
	Dissolution of particles in water	Process of dissolution, water - a universal solvent. Ions - types, conductivity, ionic solutions	Understands solute, solvent, solution concept. Recognizes Ions and conductivity in ionic solution	Samples of NaCl, H_2O, Sugar, Sand.	Experiments Experiments	3
	Melting point, boiling point, measuring devices, Archimedes priniciple, Floating bodies	Separation of Particles by temperature. Common balance and spring balance Hydrometer	- Observes experiments on separtaion of particles. - Understands the working of balance. - Understands the concept and working of hydrometer.	Burner, round bottom flask, Thermometer corks.	Experiments	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Kinds of matter	Solids, liquids and gases examples Classification of elements IUPAC - method used to asign symbols Gaseous matter - arrangement examples - Metals, Nonmetals } Properties Metalloids-properties and Examples. Noble gases-properties and Examples. Representation of elements by first letter - Example : Latin Names Examples.	• Recalls the states of matter • Cites examples • Differentiates between metals, nonmetals and metalloids • Understands the properties of elements • Represents elements symbollically	Periodic table	Chart Role Play	6
3. How things work	Conductors Insulators Domestic Wiring Fire Extinguishers	Meaning - Types, function and examples. Functions and examples of insulators Pattern of domestic wiring Construction and working of soda acid	• Will understand the concept of conductor, Insulators, their uses and function. • Will understand how domestic wiring is done Understands the principle and working of fire to	Charts	Dramtizaion Arrange fire extinighing demo by fire department.	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
		type, fire extinguisher. combustible substance, sulphur and its uses phophorous and its uses.	previous page extinguighers. Understands the uses of 'S' and 'P'.			
4. Food	Major constituents of food	Carbohydrates Protein, lipids Types and examples	Understand the different constituents of the food and their functions. Classfies the different constituents to the respective group.	Samples of starch, cereals, sugars.		6 4
5. Natural Resources	**Water** Scarcity of water Methods of conservation of water Soil conservation	• Methods of conservation of waters • Water management • Rain water harvesting • Soil conservation need and methods. • Soil erosion • Preventive mearures.	• Understands the meaning and importance of conservation. • Understands the water cycle and importance of water cycle in maintaing the balance in nature. • Learns the steps to check soil erosion.	Video films Chart Computer graphics photograp's	Visit to a water managment / purification centre.	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
6. Motion	Physical quan	Sl units of Time, Displacement, speed, velocity. Meanings and definitions of displacement, speed and velocity. Average speed, $V = \frac{d}{t}$ (Formula)	Understand the concept of speed, displacement, velocity, average speed.			6
7. Energy - work - force	Kinetic energy Potential Heat Light Sound Electric energy Unit of force Newtons laws of motion	Kinetic and potential energies are forms of mechanical energy $KE = \frac{1}{2} mv^2$ $PE = mgh$ Newton $F = ma$ Evaporation Sublimation	Differentiates between kinetic energy and potential energy. Will be able to understand how heat is a form of energy light is a form of energy		Charts lab work	8
Astrophysics	Earth and its structure	Introduction solar system Members of solar system Features of each planet and Natural satellites.	Will understand about our solar system and about each member	Charts and Pictures	Visit to an observatory	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
9. Natural Phenamena	Lightening Thunder Floods Atmosphere	Causes and effects of lightening. Protection from lightening meaning, formation and effects of thunder. Effects Introduction, meaning Layers - Troposphere Exosphere, stratophere Ionosphere - Function - Magnetosphere Gases in the atmosphere - Inductrial uses. Interference of man in natural phenomena.	Will understand how thunder and lighteny are produced. Recognises the layers of atmosphere. Understands the functions of each layer. Understands the functions of each layer. Understands the ill effects of mans intervension	Chart Powerpoints	Demonstrations Dramatization	4

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
	Hydrocarbons	• Hydrocarbons as engine fuels • Examples of hydrocarbon fuels • Natural gas, Coal, petroleum products. Conservation of fuels.	Recognizes hydrocarbons. Understands source of energy to engines. Understands the need to conserve fuels.	Charts.	Interaction Dramatization	
7. Motion	Motion	• Meaning • Motion is relative • Kinds of motion - Translatory - Rotatory - Ocillatory with examples.	Will understand the conecpt of motions & types.	Lab experiments Pendulum	lab work	8
8. Energy work and Force	Forms of energy	Main sources of Energy • Changes from one form to another • Force Causes change in a body • Measurment of work • F = ma Simple problems	Energy is needed to do work.	Examples from daily life.	lab work	3

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity / Process	Periods
9. Natural Phenomena	Eclipses	• Types with illustration				
	• Phases of moon	• Crescent • Gibbous • Waxing phases				
	• Earth	• Introduction • Factors responsible for life				

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Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
1. The Living World	• Unicellular and multicellular organisums	• Cellular organisation prokaryotie and enkaryotic cells. • Unicellular organism and multicellulan organisms. • Levels of organisation - Cells-Tissues - organs - organsystems - organism	• Understands the meaning of the terms uni& multi cellular. prokaryote and enkaryotes. • Distingnish between unicellular and multillular organisms • Classify the organisms into prokaryotes & enkaryotes.	Microscope PC, sliders, specimen charts.	Culture preparation (Yeast)	
	• Reproductions	• Types - Vegetative - Asexnal - Sexnal • Brief account of pollination and fertilization	• Understands the Importance of reproduction • Notes the differences between vegetative, Asexual and sexual reprovention. • Understands the importance of sexnal reproduction. • Develops the skill of drawing diagrams.	Specimen (Potato, Onion) Charts Charts	Collection of stem Asexual reporducting	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
2. Materials	• Properties of solid liquids and gases	• Physical and chemical properties of solids, liquids & gases.	Will understand the properties of solids, liquids and gases.	Charts		4
	• Classification of substances	• Acids - Bases and Salts. • Properties examples and uses. • Neutralization. • P^H value	Differentiates between acids, bases and salts. Conducts experiments on neutralizaion.	Chemicals for simple experimants on nentralization.	Experimentation	4
	• Atom	• Structure of Hydrogen atom. • Fundamental particles of an atom. • Electronic shells • Position of neutrons and protons • Basic properties of protons, neutrons and electrons. • Dalton's atomic theory	Understands the concept of P^H. Recognizes fundamental particles of an atom. Understands structure of atom.	Charts		6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Water • Hard and soft water	• Meaning of hard water • Salts present • Disadvantages • Soft water - Advantages • Heavy water - Causes and Uses	Understands the limitation of hard water. Understands the advantages of soft water. Understands the uses of heavy water.	Charts Charts	Experimentation	
	• Electrolysis Inertgases Ozone	• Electrolysis of water • Meaning of electrolytes and examples. • Diagram of electrolytic cell. • Inert gases of atmosphere and Uses • Allotropy of oxygen • Physical properties of Ozone • Importance of Ozone layer	Conducts experiment on electrolysis - Cites examples for electrolytes Appreciates the importance of ozone.	Charts Charts Charts	Experimentation Dramatization	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
3. How things work	• Electrical appliances in everyday life	• Simple and complex elctrical circuits • Symbols for different elements of circuits • Identification of appliances at home and Industry • Function and applications in different fields.	Understands the concept of electricity, safety measures. Will know which appliances work on electricity.	Showing a circuit lab activity.		4
	• Chemical reactions	• Combination, Decomposition displacement and double displacement. • Preparation of oxygen in the laboraty properties and uses. • Preparation of Carbon dioxide Properties & uses.	- Recognizes chemical reactions - Conducts expericments on preparation of Oxygen, Carbon dioxide.	lab activity		4
	• Attotropy • Common compounds of carbon	• Allotrophic forms of carbon • Sodium carbonate, sodium bicarbonate calcium carbonate.	Recalls allotropy, Appreciates the uses of carbon compounds.			4

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
4. Food	• Tests for constituents • Hydrocarbons	• Tests for carbohydrates - Proteins - Fats and oils • Petorleum - Coal - Natural gas	• Understands the methods to identity Carbohydrates, Proteins Fats and oils, through simple tests.	Tests	Tests (Lab work)	
5. Enviromental Science	• Pollution	• Types Water Causes and remedies Air Causes and remedies • Acid rains - Sewage treatment Soil pollution - Causes - remedies	• Understand the effects of air and water pollution on human health. • Learn the methods to prevent the different types of pollution	Video films Charts	Visit to the water purifying recycling centres	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
6. Motion	Acceleration Friction	• Meaning and definition - Acceleration - Uniform acceleration - SI Units • Types - Sliding Rolling Static • Advantages and disadvantages	Understands the concept of acceleration, and retardation. Will understand the different types of friction		lab activity	4
	Bond formation	• Elementary idea on bond formation • Compounds on different from elements and mixtures • Chemical bond - Formation of chemical bond due to sharing of electrons.	Understands bond formation and its types.	Charts	Demonstration	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
7. Energy work and force	Heat and temperature	• Definition of heat and temperature • Measurment of temperature • Types of thermometer	Will understand difference between heat and temperature. Will know about the types of thermomenter.		Lab activity	
	• Light and shadow	• Shadows from opaque bodies • Transparent • Translueent • Opaque	Will know what opaque, transparent and translucent bodies.		Lab activity	6
8. Space Science	Constellations	• Eliptical orbit • Examples of constellation • Zoadiac constellation • Galaxies - detinitions & types • Concept of light year	Will know about constellations, galaxies. Will about know light year.		Visit to a planetorium or space observatory	4

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
8. Natural Phenomena	• Lenses and uses • Multiple reflection • Total internal reflection	• Images formed by convex lens, properties and uses of convexlens • Dispersion of light • VIBGYOR • Multiple reflection • Total internal reflection - mirage	Will understand the difference between differente lens, Understands dispersion, reflection, total, internal reflection, mirage and VIBGYOR		Charts Lenses lab activity	6

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8ನೇ ತರಗತಿ

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Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
1. The Living world	Classification of living organisms	• Nature, Scope and branches of biology • Classification of living organisms • Brief history • Two kingdom to five kingdom clasifcation • Linnaean Hierarchy • Binomial nomenslature • Systematic position of any one plant (mango) and any one animal (man).	• Understanding the nature and scope of life science • Appreciating efforts of scientists in developing systematic classfication. • Appreciating evolutionarny basis of classification • Identifying and systematically classifying a few organisms that they see around • Developing the skill of drawing diagrams of some organisms	• Microscpic observation of micro organisms • Observation of preserved specimens • Preparation of herbaria • Naturewalk, bird watching • Collection of any 5 different types of plants and classifying them systematically • Preparing picture albums	• Use of microscope • Models • Charts • Culturing micro-organisms like Parameciums and yeast.	6
	Study of Cells and tissues	• History of cell biology • Concept of cell • Structure and function of cell - Cell membrane-passive and active transports. - Cytoplasm - Organelles (Including Nucleus)	• Defining a cell • Understaning the structure of a cell • Understanding structure and functioning of cell organelles. • Differentiating between plant and animal cells	• Preparation of models of cells • Charts	• Observation of some cells under microscope • Demonstration of osmosis and diffusion by simple experiments	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
			• Applying the knowledge of diffusion and osmosis in daily life • Developing the skill of drawing plant and animal cell.			
2. Materials	Heat	a) Heat and Temperature, definition and differences, effects, applications b) Temperature scales and Interconversion c) Thermometer : types and application • Farenheit to kelvin Celcius to Farenheat Melting point, Boiling point. • Solids, liguids, gases, density and specific gravity	- will understand the concepts of heat, temperature. - Will develop the skill of using thermometers	Thermometers Experiments Charts	Visit to a doctor's clinic or hospital.	6
	Use of chemicals in daily life	• Preparation - Properties and uses of Chlorine, Sulphurdioxide	Will learn the preparation methods of chemicals. - To know use of compounds, in daily life.	Charts Experiments.	Visit.	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Water.	• Baking soda. • Manufacataure of Soaps and detergents and uses • Liquid soaps. • Chemical properties of H_2O • Deliquesent and effervessent sub-stances • Removal of hardness of water.	Classify the substances Methods of softeniny water	- Charts - Samples - Experiments.	Guest lectures	
3. How Things work	Communication Electronics Lenses	Meaning and means of communication & devises • Radio • Television • Telephone Very • Mobile bassic • Internet • Fax Lenses • Converse and concave • Reflection and refraction • Dispersion • Total internal reflection • Formation of rainbow • Laws of reflection and refraction • Mirage	Will learn the means of communication. Will develop the skills to use the devises Will learn about the functioning of lens	Radio, Telephone Mobile Charts Lens glass slab prism spectacles	A visit to a FM station TV Station	8

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Atomic structure	Atoms • Fundamental Particles of atom and its properties • Isotopes - Properties • Atomic masses • Atomic number • Valency • Molcular masses • Equivalent masses • Mole concept with examples	Understanding basic concepts about atom. - Finding valency of elements. - Finding molecular masses. - To understand mole concept.	Charts Animation CD's	Models Preparing Charts.	6
4. Food	Constituents of Food	Constituents of Food, • Carbohydrates • Lipids • Proteins • Vitamins • Minerals • Roughages • Water Classification and functional descrifation Tests to detection of constituents of food : • Sugar • Starch • Protein • Lipid	• Understanding the need and importance of food. • Recognizing the constituents of food and their importance • Developing skill of testing the constituents	Charts Food sources containing various constituents	• Preparation of charts • Tests to detect the constituents.	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Food Production	Food Production : • Soil management • Irrigation • Organic farming, crop rotation, mixed farming, hybridization • green revolution Crop protection : • Uses of manures, chemical fertilizers and biofertilizers, • Nitrogenous, Phosphates, inorganic and organic fertilizer and • Advantages and Disadvantages of fertilizers.	• Understanding the importance of soil and water management in agriculture. • Understanding the importance of biofertilizers and organic farming • Learning the method of preparing compost • Appreciating the ccontribution of Indian scientists in the field of agriculture.	• Visit to Gardens & Agriculture farms. • Samples of Fertilizers	• Guest Lectures • Visits • Collection of pictures of Indians scientists	6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
5. Microbes and man	Historical Background	• Importance of Biogenesis • Microbes and their types. • General Characteristics of each type • Structure of a bacteriophage, Bacillus, Amoeba, Chlamydomonas, Yeast and Aspergillus. • Microbial Infections one example for each group. • Mode of Infection-Symptoms, causes and preventive measures with respect to microbial infection to be mentioned as an example from each group.	• Understanding the importanc of microbes • appreciating the contribution of scientists in the field of microbiology • Recognizing the symptoms of microbial infections • Learning the culturing techniques	Charts Permanent slides of Micro organisms	• Preparation of slides • Culturing bacteria • Role plays on microbial diseases	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
6. Environmental Science	Concept of Ecosystem	Ecosystem - concept and definition, Biotic and abiotic components. - Types of ecosystems - Natural and Man made - Terrestrial and equatic - Interdependence between biotic and abiotic components.	• Understanding the concept of ecosystem • Appreciating the independency of living and nonliving	• Charts • Models	• Nature games. • Role plays. • Guest lectures • Construction of aquarium • Study of a natural pond • Preparation of Models of ecological pyramids.	
	Energy flow in the ecosystyem	• Energy flow • Food chain • Food web • Ecological Pyramids - Pyramid of numbers - Pyramid of Biomass - Pyramid of energy • Biomagnification	• Understanding the significance of food chain and food web in maintaining ecological balance • Appreciating the energy relationships in the ecosystem			

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
Natural Resources	Renewable and non-renewable resouces	• Renewable and non-renewable resources. - Water - Soil - Forest - Wild life - Fossil fuels - Mineral resources • Conservation of metallic and non-metallic minerals	• Understanding and differentiating the natural resources • Developing awareness about conservation. Understanding the conservation of metallicions	• Charts • Charts	• Preparation of chats on resources • Collection of pictures Charts	2
7. Life Processes	Nutrition	• Nutrition and types • Photosynthesis - Definition - Process - Light dependent and light independent reactions - factors affecting rate of photsynthesis - experiments related to photosynthesis • Digestion - Definition	• Recognizing the importance of nutrition and types. • Understanding the stages of photssynthesis • Importance of plants in ecological balance • Developing skills of conducting experiments • Develping skills of drawing diagrams of digestive and	Charts Models Experiments		

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
		- Digestion in amoeba - Cockroach - Man Disorders related to digestive system. • Respiration -Definition - Types Respiration in plants in amoeba, in cocroach, in man Disorders related to respiratory system.	respiratory systems of man. • Understanding the process of digestion • Understanding the importance of respiration • Understanding the application of anaerobic respiration in industries		Working models respiratory system • Experiments on Respiration	
8. Reproduction and Heredity	Reproduction in Higher plants	• Reproduction in higher plants • Pollination - Types - Agents - Importance • Fertilization • Fruits and Seeds - Grains - Cereals - Pulses - Vegetables	• Understanding the importance of sexual reproduction • Appreiating the role of agents in pollination • Appreciating the role of insects in cross pollination	• Charts • Collection of different types of flower, fruits and seeds. • Obeservation of diversity of flowers iin nature	Colllection and classification of flowers fruits and seeds. Samples of grains, cereals and pulsers • Visiting a near by botanical garden	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods

9. Motion	Matter - atomic structures
	
	Chemical reactings
		• Motion, distance travelled, displacement, speed, problems
		• Newton's laws of motions 1st, 2nd, 3rd
		• acceleration
		• Retardation force, momentum problems
		• Atomic structure
		• Contributions of Dalton, Rutherford and Neil bohs.
		• Cathode and Anode rays & their properties.
		• Chemical reactions types
		  • Combination
		  • Decomposition
		  • Displacement
		  • Double displacement
		• Balancing Chemical Equations
			• Will understand the concepts of motion, DT, Displacement & will learn the newtons laws and retardation
			• Able to understand atomic structure and
			- atomic theory.
			
			- Will understand various types of chemical reactions.
			- Able to understand the balaning chemical equations.
				Experiments
				
				Charts
				Models
				CD's
				
				Expts
				Condeating in lab
				Observation in surrounding
					Experiments
					
					Models
					
					Charts
					
					Model can de prepared by using LED's
						6
						
						6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
10. Energy, Work and Force		• Energy. Definations. • Law of conservation of energy • KE, PE, Power, Units problems Sound Sound • Reflection of sound • Characteristics of sound • Solids, liquids, gases, density, sp gravity • Heat & temp defemtions differences effects & applications • Thermometer, types, & applications, The different beales & under conversions • MP, BP, difference between heat & temp, units.	Will understand the concept of energy. Will distinguish between PE and KE. Know about how sound is produced, propogated etc.	Charts Experiments	A visit to a (HPS)	4

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
11. Space Science	Solar System	• Solar system introduction • Geocentric & Heliocentric model • Planets • Zodiacal Constellations	Will understand about the solar system.	Star gazing, umbrella, Models charts	A Visit to a planetarium	6
12. Evolution of Life	Origin of life Theories on Evolution	• Origin of Life. Oparin's theory of chemical evolution. • Theories on evolution - Lamark's theory - Darwin's theory - Neo-Darwinism	• Understanding the significace of biogenesis • Appreciating the process of organic evountion • Appreciating the contribution of scientists in describing the process of evolution.	Charts		

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Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
1 The Living Word	Lower Form of Life Non Chordates Cell Division	• Lower forms of life • Bacteria • Blue-green algae • Golden - brown algae • Protozoa • Non Chordates - Porifera to chinodermata Habitat, Structure, General Charecteristics, Mode of nutrition, Reproduction, Economic importance and examples with reference to the above mentioned groups. • Cell division - Mitosis - Meiosis	• Understanding the diversity in lower forms of life • Describing the structune of bacteria, yeast, Algae and Protozoa • Appreciating the need and process of cell division • Identifying the stages of Mitosis and Meiosis • Understanding the Significance Meiosis	Microscipic Slides and Specimens Charts Slides	Videos and Movies Collection of Shells. Videos Movies Observation, Cell Division in Onion root tip Models	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
2. Materials	Heat	1) Properties of Matter Malliability, ductility, elasticity 2) Expansion of solids, Liquids, gases 3) Anamolous expansion of water and application 4) Specific heat and latent heat 5) Bimetallic strips and applications 6) Thermostat-uses.	Will understand about ductility, malliability elasticity, expansion, bimeltalic strips, Thermostats.	Experiments working thermostats, bimettalic strips etc	Visit to an electric repair shop, a small workshop	8
		Synthetic materials • Cement - Composition, manufaturing, and users. • Plastic - types, uses • Plastic - As a non degradable waste • Degradable plastic properties and uses of few Inorganic compounds Sodium Carbonate, Sodium Bi-carbonate, Aateium plaster of paris, Nitrozacid	• Knowing the raw materials of cement. • Knowing the types of plastics - Uses - Disadvantages - uses of Certain chemicals	Samples Advertisment Brochures Samples of Compounds Charts	Visit Leeture demonstration guest leetures. Visit Prepare	5

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
3. How Thinks Work		• Basics of computer • Hardware, Software • Electricity, ohm's law, resistance, problems • Light and nature of light • Fluroscent and Incandescent light • Photo electric effect, applications • Laser • Lens, lens formula • Image formation • Optical instruments • Camera • Telescope • Microscope • Binoculars	• Will know more about a computer • Will develop the skill of using it • Will know about light and nature of light develop the skill of using optical instuments	Working models, charts Construction of optical instruments, working models	Visit to a planetorium, Installing installing a school telescope.	8
	Matter atomic structure.	Electronic configuration • Atomic numbers 1 to 20. • Orbital, Suborbital and sub energy levels Pouli's exclusion principle Aufban and Hund's rule	able to know the concepts of atoms. able to know filling of electrons in an atom.	Charts Animation CDs	Models	5

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
4. Food		Malnutrition : • Over and under nutrition Defeciency Disorders : • Phynoderma • Kwashiorkar • Nutritional Marasmus • Night Blindness • Beri beri • Scurvy • Rickets • Osteomalacia • Simple goitre • Anaemia	• Understanding the effects of malnutrition • Understanding the deficiency disorders.	Charts		
		Food Protection and Preservaion. • Chemical method, Dehydration, Radiation method, cold storage, freezing, Pasteurization, Wrapping, coating method and canning	• Gaining knowledge on preservation techniques			
		<u>Food Adulteration:</u> • Adulterants • Illeffects of adulteration • Simple tests to detect adulteration	• Identifying the adulterants & their Ill efects, Cneating awareness		Experiments related to detection of adultants	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	uses of chemical fertiliers	• Prevative measures • Quality controlling agencies Fertilizers • Manufactures of fertilizers • Physical and Chemical Properties. Selection of fertilizer and uses, NH_3 as a constituent of fertilizer, synthesis of ammonia, menufacture of super phosphate.	• able to know preparation of fertilizers. - Composition of fertilizers. - Uses.	Samples Charts	Guest lecture.	4
5. Microbes and man		• Role of microbes in environmental Management - Decomposition of organic matter - Ecological and Biological balance - Mentioning of carbon and nitrogen cycles - Water purification, Sewage treatment. • Role of microbes in - Soil fertility - Genetic engineering	• Understanding the role of microbes in maintaining ecological and biological balance	Visits to related centres and industries	Experiments related to fermentation, Guest lectures Visit to water sewage treatment plant	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
		• Beneficial aspects of microbes, application of microbes in - Food industry - Pharmaceutical industry - Leather industry and - Brewing industry				
6. Environmental Science	• Nutrient flow Natural Resources	• Biogeo chemical cycles - Carbon, Nitrogen, Oxygen, Water cycles. • Metallic ores of Karnataka • Byproducts of Coal Conservation of natural resources - Water - Soil - Forest - Wild life - Fossil fuel	• Appreciating the importance of material recycling • learn important. metallic ores. - Learn byproducts of coal. • Understanding the need conservation. • Understanding the methods of conservation	• Charts Samples ores of metals. Charts	Preparation of Charts Visit to national parks and wildlife sanctuaries	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
7. Life Processes	Transport of substances Transport in plants Transport in Animals Loss of Water in plants	Transport of food and water in plants - Definition of transport system. - Importance of transport system - Aseent of sap - Forces responsible and involved in ascent of sap. - Organic translocation • Transport in Animals-amoeba,Cockroach & Man - Circulatory systems in cockroach and in man - Lymphatic system Disorders related to human heart • Loss of water in plants - transpiration Definition of transpiration & types - Cuticular - Lenticular - Stomatal	• Understanding the need for transport. • Understanding the funcationing of Xylem are Phloem • Understanding the Structue and function of human heart. • Appreciating the importance of transpiration	Charts Models	Demonstration of Asent of Sap Experiments on transpiration Working Models of circulatory and excretory system	6 6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Excretion in animals	Differences between transpiration and evaporation Importance of traspiration Exeretory system in animals, Definition of exeretion, Excretion in amoeba, Cockroach, man. structure and function of human Kidney - Urine fromation in man - Skis as an exeretory organ. - Disorders related to excretory system.	• Understanding the significance for excretion			
8. Reproduction and Health	Reproducion in Animals	• Reproduction in Animals • Reproduction in Amoeba • Reproduction in Cockroach • Reproductive system of male and female Cockroach - Metamorphosis in Cockroach.	• Understanding the process of reproduction in animals	Charts Models	Guest lectures Display of charts	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Human Reproduction	• Human reproduction - Male reproductive system - Female reproductive system - Reproductive cycle - Fertilization and development - Advantages of internal fertilization. - Twins - Artificial Repoductive Techniques.	• Understading the basies of human reproduction • Appreciating the methods of artificial reproductive technique			
9. Motion		• Circular Motion • Centrepetal Force • Centrefugal force • Gravitation • Universal law of gravitation • Acceleration due to gravity & problems	Will know in detail about circular motion and gravitation	Charts		6
	Chemical bonding and its types. - reactions	Bond formation • Covalent • Ionic • Metallic	Knowing about bonding in compouds, molecules. - Knowing oxidation, reduction reactions.			

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Redivactivity	• Hydiogen • Pi • Sigma • Oxidation and reduction reactions Radioactivity alpha, beta and gama Irotopes - Radioisotopes - uses	- Knowing about radivactivity - Knowing about types of radiation. - Knowing the application of Isotopes.	Charts, Animation CP's Models	Working modes, still models static models	
10. Energy, Work and force		- Electric Energy - Effects - Ohm's law (detailed) Problems. - Electromagnectic Madiation - Uses - Electro magnetic spectrum - Photo Electric effect uses.	Will know about Resistames ohm's law etc Will understand the photo electric effect	Charts Charts		6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
11. Space Science		• Structure of sun • Solar system • Inner planets • Comets • Asteroids • Natural Satellites • Metioroids • Kepler laws of planetory motion	Will understand about the solar system in detail	Taking the kids to a planetorium sky observation, The solar system model, charts		6
12. Evolution of Life	Evidences in favour of Evolution	• Evidences supporting evolution - Comparitive anatomy - Vertigial organs - Embryological evidence - Fossil evidence - Definition of a fossil - Types - Dating of fossits - Living fossils Peripatus, Dipnoi - Archeopteryx - Prototheria • Geological Time Scale	• Understanding the evidences in favour of evolution	Film shows, Videos		

ಪಠ್ಯವಸ್ತು

10ನೇ ತರಗತಿ

ವಿಜ್ಞಾನ

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
1. The Living World	Classification of Higher plants Chordates	Plantae Nonvascular plants - Higher algae and Byophytes. - Vascular plants Pteridophyta, Spermatophyta-Habitat, General Charectaristics and Economic importance of the above mentioned groups. • Life cycle of Bryophytes and Pteridophytes • Classification of flowering plants monocots and dicots. • Animalia - Characteristics of chordata, differences between chordates and non-chordates-subphyla, proto Chordate (hemi, uro and cephalochordates)	• Understanding the organization in higher plants • Recognizing the diversity in plants • Developing the skill of drawing the diagrams • Recognizing the characteristics and examples of chordates	• Specimens • Yisits to zoological garden & botanical garden	• Observation of slides and specimens • Collection of cones of gymnosperms • Preparation of herbaria • Making picture albums.	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
		and vertebrata. • General characteristies of Pisces - Cartilage and Bonyfishes - Blue revolution. • Genral charecteristics of Amphibia Transition from water to land, parental care • General charecteristits of reptiles - Terrestrial adaptation - Economic importance - Poisonous appartus of snake • General charectesistics of Aves - Reptiles to birds (Archaeopteryx) - Flight adaptation - Bird migration • General charecteristics of mammals - Echo location in bats.				

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
The Living World (b)	Cells and Tissues Plant Tissues Animaltissues	• Plant tissues. • Meristematic Tissue - Apical - Intercalary - Lateral • Simple permanent tissue - Parenchyma - Collenchyma and - Sclerenchyma • Complex permanent Tissues - Xylem and Phloem - Arrangement of Vascular bundles in monocot & dicot stems. • Animal Tissues Structure, Type, Location and function of the following. - Epithelial tissue - Squamous, cuboidal, columnar and stratified - Connective tissue - Aerolar, Adipore, Fibrous, Elastic, Cartilage, Bone, Blood and lymph - Nervous tissue Structure and function of a neuron.	• Understanding the type of tissues in plants and animals • Appreciating the diversity in structure and function • Developing the skill of drawing diagrams • Appreciating the economic importance of some plants and animals	Charts Slides Specimens	• Macerative technique to show tissues • Sectioning and staining of stem and root.	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
2. Materials	Electronics	- Semi Conductors types, application - Diode - Transistors - Doping - Super conductivity	Will know the concepts of semi conductivity, super conductivity, doping etc.			6
	Synthetic materials	Manufacture of • paper • Ceramics • Glass • Silicon and uses Optical fibres - - Composition - Properties and - uses	able to know the manufacture - Methods - Uses - Structures able to know the uses	Samples Charts Charts	Visits, guest lectures observations, guest lectures	5
3. How Things work		- Radio transmission - TV - Electromagnetic Induction - Faraday's laws - DC Motor - AC & DC Dynamo - Heat Engines	Will understand the Radio transmission & TV working Understand the functioning of AC & DC Dynamo, DC Motor, heat engines, ultra sound scanners, MRI	TV, Radio, Charts Motors, Dynamo, Heat engines Scanners	A Visit to a Radio shop & Radio, Transmission Centre A Visit to a Hospital	8

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
	Metallurgy	- External, internal efficiency - Ultrasound scanners - MRI • Periodic classification • Metallurgy-properties of metals, Occurence. • Concentration of ores and methods • Refining of metals • Alloys of Cu, Fe, Al and uses. • Extraction of Fe and Aluminium	• Understanding metallury concepts • Use of alloys	Metals, Charts CD's, Ores of metals Alloys, prodeucts	Visit, Guest lectures.	6
	Organic Chemistry	Manufacture of Sugar, fermentation of sugar. manufacture of alcohol, Organic compounds : • Aliphatic • Alycyclic • Aromatic • Functional group NH_2, CHO, COOH, OH. Polyfunctional compounds, hydogenation of oils.	Knowledge of constituents of snger alcohol, - Hydrocarbons.	- Charts	Diagram, Visit,	12

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
4. Food	Plant Breeding Techniques	Plant Breeding Techiniques • Common breeding techniques • Hybridization • Tissue Culture-Application and limitations • Genetically modified plants • Hydroponics • Aeroponics • Roof gardening Role of biotechnology in Food Industries • Preservatives • Odorants • Colorants	• Understanding the various techniques of plant breeding. • Understanding application and limitations of plant tissue culture • Appreciating the role of biotechnology in plant and animal breeding	Videos and Movies in related topics	Visits to plant breeding centres Guest lectures	
	Animal breeding techniques	Animal Breeding Techniques • Animal husbandry • Animal breeding techniques.				

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
5. Microbes and Man	Microbial Diseases Sexually Transmit-table Infections	• Microbial Diseases Causes-Symptoms and preventive measures of... • Chikungunya • Bird flu and dengue. • Sexually Transmittable Infections (STI) - Syphilis - Gonorrhea - Genital herps - Genital warts - HIV / AIDS - Hepatitis - B.	• Developing an awareness on microbial diseases • Becoming familiar with preventive measures • Developing life skills towards reproductive health • Skill of drawing • Awarness about HIV	Visits to primary health centres	Roleplays, Dramtization Guest lectures Awareness Programmes	
6. Environmental Science	Environmental Problems	• Environmental Problems • Causes, effects and Prevention of the following - Air pollution - Acid rain - global warming - Ozone depletion - Water pollution - Thermal Pollution	• recognizing different types of pollution • Creating awareness regarding ill effects of pollution • Analysing reasons for global environmental problems.	CD's, Charts, Videos	Charts, Videos showing acidrain, globalwarming • Visits to recycling units	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
		- Soil Pollution - Noise pollution - Radiation pollution				
	Waste Disposal	Disposal of biodegradable and non biodegradable wastes.				
	Natural Resources	• Solar energy and devices • Wind energy • Tidal energy • Geothermal energy • Alternative sources of energy • Biofuels	Will understand solar energy - able to know devices of solar energy. - able to know importance of alternate energy sources. - able to know the importance of biofuels in human life activities. - able to know the importance of geothermal energy	Charts, Solar devices, CD's	Conduct exhibition in shcool level. - Prepare models. (Working, Static) Visit, Guest lecture.	5

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
7. Life Processes	Control and coodrdination in plants Chemical coordination Nervous Coordiation in animals	• Control and co-ordination • Chemical co-ordination in plants • Irritability in plants • Plant hormones - Auxins, Gibberllins, Cyto Kines, Abscisic acid, Ethylene - Role & uses of plant hormones in agriculture - Bonsai Culture • Chemical coordination in animals - Homeostasis - Endocrineglands - Hormones-Steroids and nonsteroids - Location, function and effect of hyper and hypo secretions. • Nervous co-ordination in animals. • Nervous system in Man. - Conduction of nerve impulses - CNS - PNS - ANS Brain mapping ill effects of drugs. • Sense organs in man. Eye-Ear-Stru & function Nose, Tougue - Skin Defects & care of sense organs.	• Analysing the role of plant hormones • Appreciating the art of practies like Bonsai • Differentiating exocrine and endocrine glands • Appreciating the influence of hormones on life proceses • Skill of drawing diagrams	Models Charts	• Experiments related to growth • Pictures of diseases caused by hormonal deficiency	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
8. Reproduction and Heredity	Heredity and Variation	• Heredity and Variation • Mendel's experiments - Principle of dominance - Laws of segregation - Law of independent assortement • Deviation from the principle of dominance - incomplete dominance • Sex determination • Sex linked inheritance • Sex abnormalities • DNA - Hereditary Material components and structures Brief account of Watson & Krick's contributions DNA replication Gene-The physical basis of herdity, Application of DNA technology - DNA finger print technology - Recombinant DNA technology - Cloning - stem cell culture.	• Understanding the mechanism of inheritance • Appreciating the contribution of mendel. • Understanding the different patterns of inheritance • Gaining knowledge on DNA & its replication • Understanding the process and application of DNA finger printing	Guest lectures Videos Movies	• Checker board problem solving	

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
9. Motion	Eltrolysis Types of reactions	Types of motion - linear motion - Circular Motion - Wave motion - Simple harmonic motion applications & examples • Faraday's law of electrolysis, Elertrolytes & Types and seamples • Gas laws • Boyle - Charl's law Grahm's laws of diffusition • Electrolytes and non-electrolytes • Applications Exothermic and Endothermic reation - definition - Examples	Will understand the concept of motion & types • able to understand the concepts of Electrolysis. • Uses of Eletrolsytes. • Applications. Recognise the reactions that take place in our surrounding	Charts Experiments Charts Experiments	Drawing skill. Demonstration Conduct Experiments	6 6

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
10. Energy, Work and Force	Nuclear Energy	Sound - Properties - Echo - Wave Yelocity V-nλ - Ultrasonics - Doppler Effect - Sonar - Radar • Nuclear energy - Fission - Fusion • Nuclear reactor	Will understand the concept of sound generation, propogation, Echo formation etc. Sonar Radar • able to understand the process • Understand the difference • Application of Nuclear reactor.	Charts • Charts • Animation	• Prepare model of Nuclear reactor (Static model) • Prepare animation model of chain reacting of U_{92}^{235} (Fission)	6 4
11. Space Science		• Birth - Life - death of a star • Black hole • Colour of Star • Bigbang theory • Galaxies & types - Working of Rockets - Multistage Rockets - Artificial Satellites - Orbital Velocity - Escape velocity - Indian Contribution to space science - Chandrayan	Will understand the birth, life, death of stars Big bang theory. Rockets, Working satellites	Charts Charts Models A detailed exhibition of Indian work in space science	A Visit to a sky observatory, Planetorium	8

Theme	Sub Theme	Key Concepts	Objectives	Resources	Activity Process	Periods
12. Evolution of Life	Human Evolution	Evolution of man - Trends in human evolution - Human ancestors - Distinct features of each stage	Appreciating the stagess in human evolution	Charts	• Preparation of Models	