

STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING -CHENNAI – 06 TNCF – 2017 – DRAFT SYLLABUS –

SCIENCE

STANDARD 1 -10

Draft Syllabus for Classes 1-5 (EVS & Science) Primary Science

Sl.No	Topic	Environmental Science		Science		
		Class 1	Class 2	Class 3	Class 4	Class 5
1	My Family	Picture descriptions 1.1. My family 1.2. My Relatives 1.3. Good Manners- (Greeting, Respect, Welcome, Discipline)	Picture descriptions 1.1. Family Tree 1.2. Neighbourhood (Help, Co-operation) 1.3. Kinds of Houses 1.4. Traditional games 1.5. Games- Played at home 1.6. Values and social skills 1.7. Care for elders	-----	-----	-----
2	Plants	Picture descriptions 2.1 Plants around us: 1. Fruits 2. Flowers 3. Leaves 4. Vegetables	Picture descriptions 2.1. Parts of a plant 2.2. Different kinds of Plants - Grasses, Herbs, Shrubs, Trees -Climbers and creepers 2.3. Tree as habitat 2.4. . Benefits of plants	2.1. Parts of plants and their functions 2.2. Types of roots - Tap, Fibrous 2.3. Types of Plants based on habitat - Land, Water and Desert	2.1. Flowering plants 2.2. Parts of flowers and their functions 2.3. Green and Non-green plants 2.4. Plants as Primary Producers(Food preparation in plants) 2.5. Edible Parts of plants- Root, Stem, Leaves, Flowers, Seed 2.6. Exotic plants	2.1. Why do flowers have bright colours and smell? 2.2. Pollination 2.3. Life cycle of Flowering Plants 2.4. Dispersal of seeds 2.5. Cotyledons 2.6. Germination of seeds 2.7. Agriculture-Types of soil -Sandy soil -Loamy Soil -Clayey Soil 2.8. Friends of farmer -Honey Bee -Earthworm -Dragon fly

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3	Animals	Picture descriptions 3.1. Identification of animals around us (Birds, Insects, Mammals) 3.2. Protection of animals 3.3. My favourite Animal (Activity)	Picture descriptions 3.1. Animals and their homes 3.2. Types of animals- Domestic and wild 3.3. Animals associated with Human Welfare 3.4. Animals and their young ones	3.1. Animals in different environment- Land, Air and Water 3.2. How do animals procure food 3.3. Food and mouth parts in relation to food eaten (Birds and Insects- Mosquito, Butterfly) 3.4. Herbivores Carnivores Omnivores	3.1. Animal group behaviour 3.2. Special senses in ants and bats 3.3. Night active animals 3.4. Parental care (Kangaroo, Cow and Human) 3.5. Structure of insects (pictorial descriptions)	3.1. Honey Bee- Types, kinds and its uses, Apiculture- Social Life 3.2. Life cycle of butterfly 3.3. Reproduction in animals i) Asexual, Sexual, ii) Oviparous animals iii) Viviparous animals 3.4. Endangered Species (Red Boo 3.5. Sanctuaries and National parks 3.6. Prevention of cruelty to animals
4	My Food	Picture descriptions 4.1. I need food 4.2. Our Daily Food- Activity 4.3. Journey of Rice (Story)	Picture descriptions 4.1. Why do we need food? 4.2. Sources of food 4.3. Healthy and Unhealthy foods 4.4. Junk foods 4.5. Healthy food habits	4.1. Ingredients of food 4.2. Balanced diet 4.3. Food Habits in different places 4.4. different age groups 4.5. Traditional food Nutrition garden	4.1. Raw and cooked food (Activity- Salads Preparation) 4.2. Cooking Practices 4.3. Cooking Utensils 4.4. Food hygiene 4.5. Food during illness 4.6. No Wastage of food	4.1. Preservation and spoilage of food 4.2. Kitchen safety 4.3. Food Pyramid (what should we eat) 4.4. Obesity 4.5. Deficiency disease/ Malnutrition
5	My body	Picture descriptions 5.1. Parts of my body (Head, Face, Cheek, Chin, Teeth, Tongue, Eye, Nose, Ear, Skin, Hand, Leg) 5.2. My Senses 5.3. Keeping clean and healthy	Picture descriptions 5.1. Simple Body Movements 5.2. Role of Sense organs 5.3. Stages of growth	5.1. Cleanliness (Hand wash, Toilethabit, Bathing) 5.2. Precautions to be taken to Protect the sense organs 5.3. Good touch, Bad Touch and Don't Touch (within family) 5.4. Helping people with physical or sensory challenges 5.5. Importance of physical exercises	5.1. Internal organs (Brain, Heart, stomach, Lung, Kidney, Muscles and Bones) 5.2. Importance of Oral Health 5.3. Good touch, Bad touch and Don't Touch - Known and unknown persons	5.1. Organ Systems - Digestive System - Respiratory System - Circulatory System - Excretory System - Nervous System (Brain- Fore, Mid, Hind Brain)

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6	Water	Picture descriptions 6.1. Fun with water 6.2. We need water in daily life	Picture descriptions 6.1. Sources of water- Rain Water, Well, Bore Well, Waterfalls, River, Stream, Pond, Lake, Sea, Ice, Glaciers, Iceberg 6.2. Journey of rain (Song)	6.1. Water as a prime source of life 6.2. Potable Water 6.3. Saving Water 6.4. Conservation of water bodies – Ponds and lakes	6.1. Change of state in water (Ice, Water and Steam) 6.2. Water cycle and importance 6.3. Rain water harvesting	6.1. Fresh Water Management 6.2. Waste water management 6.3. Water pollution: Causes and Prevention 6.4. Water borne Diseases
7	Air	-----	7.1 Our Surrounding (PanjabhooDas) - Land - Water - Fire - Air - Sky	7.1. Science fun-wind (air) experiments 7.2. Breathing (Inhale and Exhale) 7.3. Moving Air, Types of wind- Breeze, Gale and Storm	7.1. Air is a mixture 7.2. Composition and Proportions of components in Air 7.3. Effects of breathing Unclean Air	7.1. Atmospheric layers 7.2. Game with wind (air) 7.3. Air Pollution- Causes and prevention 7.4. Air borne diseases 7.5. Importance of air and wind energy (Wind mill) in daily life
8	Matter and Materials	Picture descriptions 8.1 Materials around the child: (Wood, Stone, Sand, Clay, Metals, Cloth)	Picture descriptions 8.1. Natural and Man-made materials 8.2. Introduction of matter 8.3. Physical Properties of matter (Colour, Odour(Smell), Taste and Shape)	8.1. States of matter 8.2. Introduction - Change of states of matter 8.3. Properties of matter	Basic concept 8.1. Properties of Materials (Hard, Soft, Shiny, Dull, Smooth, Rough, Waterproof, Transparent, Flexible, Rigid) 8.2. Transparent, opaque and Translucent objects /Reflection	8.1 Transformation of natural resources into materials for use (Fibre to fabric and Grain to food) 8.2 List out:- House hold things from Olden days and modern days 8.3 Conduct experimental set up to test floating, sinking and mixing

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9.	Force, Work, and Energy	----	----	9.1 Simple movements and actions 9.2 Force - Push and Pull, Friction and their applications	9.1. Work and Energy 9.2. Simple machines	9.1 Energy and Different forms of energy -Mechanical Energy, -Wind Energy, -Heat Energy, -Light Energy, (simple Explanation with simple examples) 9.2 Conservation of
10.	Transport	Picture descriptions 10.1 Transport - Story	Picture descriptions 10.1. Mode of Transport 1. Road ways 2. Water ways 3. Air ways 4. Railways	----	----	----
11.	Day and Night	Picture descriptions 11.1. Day sky – Sun 11.2. Night sky- Moon, stars 11.3. Thunder and Lightning	Picture descriptions 11.1. Sky Observation (Day and Night) 11.2. Rhythms of day and night (Animals, Plants) 11.3. Directions (East, West, North and South) and Time	----	----	----
12.	Our Environment	Picture descriptions 12.1 Living and non- living - Soil, Mountain River, Sea, Pond, Lake, Sky, Sun, Air, Plants, Animals	Picture descriptions 12.1 Environments - Plains - Forest - Hills - Deserts - Ponds - River - Sea	12.1. Abiotic and Biotic factors 12.2. Interaction between Abiotic and Biotic factors	12.1 Waste Management 12.2 3R-Reduce, Reuse, Recycle 12.3 Conserve Environment 12.4 Environment friendly materials	12.1 Farms: -Dairy farm -Poultry farm 1.2 Manure 12.4 Vermi culture

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13	Science in everyday life	<p>Picture descriptions</p> <p>Wonders of Science</p> <p>13.1. Type of clothes</p> <p>13.2. Clothes for different Seasons and Reasons</p>	<p>Picture descriptions</p> <p>Wonders of Science</p> <p>13.1. Flower: Colour and smell Plants have sense</p> <p>13.2. Touch me not plant</p> <p>13.3. Activity-calotrophis-Erukku flower</p>	<p>13.1 Kitchen science</p> <ul style="list-style-type: none"> - Boiling - Pressure cooker - Refrigerator <p>13.2 Activity-Thermometer - Boiling temperature of Water and Milk</p>	<p>13.1. Milk and its uses</p> <p>13.2. What happens when food materials are being cooked?</p> <p>13.3. Baking of bread, Biscuit and Cake</p>	<p>13.1. Biography of a Tamil Nadu Scientist -C.V Raman- Why the sky is Blue</p> <p>13.2. Learning scientific principles in daily life – Reversible and Irreversible Process</p> <p>13.3. Quantity and quality of waste materials generated in school/home environment</p>
14	Our Society	<p>Picture descriptions</p> <p>14.1. Local Festivals</p> <p>14.2. Village/Town Specific Festival</p> <ul style="list-style-type: none"> - Pongal - Diwali, --Ramzan, - Christmas <p>14.3. Our Friends: Teacher, Doctor, Police, Postman, Milkman, Vegetable vendor, Nurse, Shop keeper</p>	<p>Picture descriptions</p> <p>14.1 Festivals and fairs</p> <p>14.2</p> <ul style="list-style-type: none"> -Religious festivals -National festivals - Folk arts and song (Nativity based) <p>14.3 Science fair /exhibition</p> <p>14.4 Our friends: Farmer, Electrician, Driver, Plumber, Soldier, Tailor, carpenter and Conductor</p>	<p>·</p> <p>·</p> <p>·</p> <p>·</p>	<p>·</p> <p>·</p> <p>·</p> <p>·</p>	<p>·</p> <p>·</p> <p>·</p> <p>·</p>
15	My home and my neighborhood	<p>Picture descriptions</p> <p>15.1. My Home</p> <p>15.2. Village /Town/City</p> <p>15.3. Neighbourhood</p> <p>15.4. Safety</p>	----	----	----	----

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16	My beloved Motherland	----	Picture descriptions 15.1 Village/Town/City 15.2 National days 15.3 National symbols 15.4 National Flag 15.5 State symbols 15.6 Father of our Nation 15.7 First President 15.8 First Prime Minister	----	----	----

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CLASS VI to X - Physics

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
1.Measurement	Measurement Concepts of Measurements Fundamental units (Length, time and mass) – Definition Methods of Measurement of Length, Mass and Time Multiples and sub-multiples of units.	Measurement Idea of derived quantities and Units (Area, Volume, Density of solids and liquids) Explanation and Measuring Astronomical distance. 1 AU & 1 light year. Numerical problems	Measurement S.I. System of units – Temperature - Electric current Amount of substance – Luminous intensity, Angle & Solid Angle Physical quantities, formulae and its units; Quartz clock. Type of watch. Accuracy & Measurement. Estimation & approximation Numerical problems	<u>Measurements and measuring Instruments:</u> Introduction <ul style="list-style-type: none"> • Importance of accurate measurements • S.I. Units • Scientific Notation • Measuring Length principle, pitch, least count, zero error of Vernier Caliper & Screw Gauge. Experiments Measuring Mass & weight * Beambalance *Spring balance *Digital balance	-----

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
	<p>Volume of regular and irregular object.</p> <p>SI system Beam balance & Electronic balance Numerical problems</p>				
2. Work, Power and Energy	<p>Forces and Motion. Moving things around us Types of Motion</p> <p>Linear and Circular</p> <p>Uniform and Non-uniform motion</p> <p>Measuring speed and Units of speed</p> <p>Science today – Robot</p> <p>Problems related to Speed, Distance and Time</p> <p>Numerical problems</p>	<p>Motion and rest</p> <p>Distance - displacement</p> <p>Speed & velocity</p> <p>Distance- time graph</p> <p>Velocity – time graph</p> <p>Acceleration – time</p> <p>Centre of gravity and three states of equilibrium</p> <p>Plumb line and spirit level,</p> <p>Science today</p> <p>Adventures in sports – like a bird flies</p> <p>measure and calculate the speed of moving objects</p> <p>pulse rate Numerical problems</p>	<p>Forces and Pressure</p> <p>Definition</p> <p>Action of force and its effects</p> <p>Forces(definitions only)</p> <p>Pressure</p> <p>Pressure exerted by liquids and gases</p> <p>Pressure exerted by air</p> <p>Atmospheric pressure</p> <p>Pascal's law, application. Surface tension & viscosity.</p> <p>Friction, applications</p> <p>Factors affecting Friction Friction - necessary</p> <p>Increasing and reducing friction</p> <p>Numerical problems</p>	<p>Forces and Motion</p> <p>Types of Motion: Circular motion</p> <p>-Uniform circular motion</p> <p>-Centripetal force</p> <p>-Centripetal acceleration</p> <p>-Centrifugal reaction</p> <p>Motion of Falling body</p> <p>-Free fall.</p> <p>Graphical representation of Motion along straight line. Velocity-Time graph.</p> <p>Equations of Motion. work</p> <p>power</p> <p>Numerical problems</p> <p>Simple pendulum</p>	<p><u>Kinematics:</u></p> <p>Introduction</p> <p>Newton's Laws of Motion</p> <p>- 1st Law</p> <p>- 2nd Law</p> <p>- 3rd Law</p> <p>Mass-Weight and Weightlessness</p> <p>Acceleration due to gravity</p> <p>Mass of Earth.</p> <p>Numerical problems</p>
3. Light	-----	<p>Light</p> <p>Sources of Light</p> <p>Rectilinear propagation of Light</p> <p>Pinhole camera</p> <p>Shadows</p> <p>Colours in Spectrum</p> <p>Reflection</p> <p>Plane Mirror (Right or left)</p>	<p>Light</p> <p>Types of mirror(Spherical and Parabolic mirror)</p> <p>Images of spherical mirrors</p> <p>Parts of curved mirrors (Centre of curvature, principal focus, pole, principal axis, focal length)</p> <p>Application of mirrors</p> <p>Laws of reflection</p> <p>Regular and Irregular reflections</p>	<p>Light</p> <p>Introduction: Speed of light</p> <p>Optical Geometry</p> <ul style="list-style-type: none"> ❖ Laws of Reflection ❖ Laws of Refraction ❖ Total internal reflection and its application 	<p>Optics</p> <p>Introduction</p> <p>Revision of properties of light</p> <p>Laws of Refraction</p> <p>Scattering of light</p> <p>Optical Geometry</p> <p>Image formation of Concave and Convex lens</p> <p>Lens formula Magnification</p> <p>Refractive Index Power of lens</p>

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		Sunlight – seven colours – dispersion & synthesis of colours – Newton's Disc. Numerical problems	Multiple reflections Multiple images (periscope, kaleidoscope) Refraction – Snells' law (Qualitative) Dispersion – using prism Numerical problems	Mirrors. ❖ Plane Mirrors- Lateral inversion ❖ Spherical mirrors ❖ Image Formation of Spherical Mirrors ❖ Sign Convention ❖ Mirror Formula ❖ Properties of the image ❖ Distance for full image.	Optical Instruments: Human Eye Power of Accommodation Defects of Eye and Correction Telescope & Types, Microscope- simple, compound and travelling. microscope.
4. Heat	Heat Heat – introduction Hot and cold objects Expansion in solids Cubical and linear Uses of heat Reasoning questions based on expansion to be included Flow of Heat (Hot to cold) Thermal Equilibrium Sources of heat sun, combustion or burning, friction, electrical heat and temperature Numerical problems	Heat Heat & Temperature. Thermodynamic scales: Celsius, Fahrenheit, Kelvin and Rankin. Measuring temperature: Clinical and Laboratory thermometer. Thermometric liquids Numerical problems.	Heat (Qualitative) Effects of Heat Transfer of Heat Conduction, Convection and Radiation Calorimetry and Calorimeter Thermostat Thermos flask	Heat Effects of Heat. Heat-transfer- Calculation. Specific Heat Capacity. Thermal capacity. Change of State. Specific Latent heat. Numerical problems.	Thermal Physics:- Introduction • Effects of Heat * Expansion of Matter due to heat, * Real and Apparent expansion * application Gas: * Boyle's Law – Verification * Charles's Law Gas Equation Temperature * Kelvin/ Absolute Scale of temperature Numerical problems
5. Electricity	Electricity Conductors and Insulators. An electric circuit Symbols of electric components sources of Electricity – Primary and Secondary cells	Electricity 1. Explain the classification of materials based on electrical properties.	Electricity Electric charges at rest Types of charges Transfer of charges Electroscope Gold leaf electroscope 6. Lightning and Thunder	Electricity Effects of Current - Heating effect - Magnetic effect - Electric charges electric field - Coulomb's law	Electrical Circuits: 1. Electric Current 2. Electric Circuit 3. Electric Potential 4. Potential difference 5. Circuit diagram 6. Ohm's Law

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		2. Describe simple electric circuit – Open circuit and Closed circuit. 3. Explains heating effect and magnetic effect of electric current.	7. Earthing 8. Lightning arresters 9. Types of circuits - simple, series, parallel 10. Effect of electric current Chemical effect – electro plating heating effect- electric fuse	- Circuit diagrams: Series and parallel - Direct and alternating current - Safety of Electricity	7 Electrical Resistivity and Conductivity 8 System of Resistors 9 Heating effect of electric current 10 Electric Power 11 Domestic Electric Circuits 12 Numerical problems 13. LED Bulb, 14. LED TV
6 Magnetism	Magnetism - Discovery of magnets - Magnetic and non magnetic materials - Magnetic poles - Properties of Magnets - Science today – Flying trains	-----	Magnetism Magnets and its types – Field around a bar magnet, Tracing magnetic field using compass needle. – Types of magnetic materials – Magnetic properties – Earth's magnetism – Uses of magnets.	1. Introduction 2. Magnetic field 3. Magnetic lines of forces 4. Force on a current carrying conductor in a magnetic field 5. Parallel current carrying conductor 6. Fleming's left hand rule 7. Electric motor 8. Electromagnetic Induction, Transformer 9. Fleming's Right hand rule 10. Electric Generator 11. Applications of electromagnets Numerical problems	-----
7. Sound	-----	-----	Sound Wave motion Medium of Propagation Sound produced by vibrating body (activities – rubber band, striking a pan, vibrating dish)	Sound Introduction: Production and propagation of sound waves Characteristics and types of waves: Amplitude, Time Period, Frequency, Wavelength & Velocity.	Acoustics 1. Sound waves 2. Reflection of Sound waves 3. Echo 4. Use of Echoes 5. Determination of speed of sound by the method of Echo Doppler's effect. 6. Numerical problems

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
			Human ear and hearing – Larynx, windpipe, vocal cord Musical instruments Properties of sound (Pitch , frequency and Timbre) Audibility and range Noise and noise pollution Numerical problems	Deduction of Sound waves; Reflection of Sound waves. Echo; Reverberation Decibel (db); Ultrasonic SONAR ;Stethoscope and ECG	
8. Universe and Space Science	Night sky (stars , planets, constellation) Solar system – geocentric and Heliocentric Orbit – light year – Astronomical unit Evolution of universe of current theory	Basic concepts of Universe- milky way Building blocks of Universe Satellites - Natural and Artificial ISRO	History of Chandrayan & Mangalyan probe Rocket parts and fuels Launching of rockets NASA	The Universe <ul style="list-style-type: none"> • Building blocks of Universe • Orbital Velocity and timeperiod • Keplers laws • ISS 	
9. Fluids	-----	-----	-----	Fluids <ul style="list-style-type: none"> • Pressure in Fluids • Relative Density • Buoyant force or up thrust-Cartesian divider • Atmospheric Pressure • Equal volume of fluids equal Buoyant Forces • Archimedes's Principle Density: <ul style="list-style-type: none"> • Density • Measurement of density • Buoyancy & Floatation • Hydrometer Common Hydrometer <ul style="list-style-type: none"> ➤ Making of Lactometer ➤ Atmospheric Pressure ➤ Measuring Atmospheric Pressure ➤ Pascal's Principle ➤ Jockey and Hydraulic lift 	-----

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
10. Atomic physics	-----	-----	-----	-----	Atomic physics Radioactivity Properties of alpha, Beta, gamma Rays. Nuclear fission Chain reactions Nuclear Fusion Uses of Radio Activit safety measures Nuclear Reactor [out line]

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CLASS VI to X – Chemistry

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
1. Matter around us	Matter 1.1 Classification of matter 1.2 Solids, liquids, gases Introduction 1.3 Pure substances and mixed substances Need for Separation 1.6 Definition of Separation 1.7 Separation of substances 1.7.1 Hand picking 1.7.2 Winnowing 1.7.3 Sieving 1.7.4 Magnetic Separation 1.7.5 Sedimentation 1.7.6 Decantation 1.7.7 Filtration	Matter 1.1 Separation of substances - Evaporation - Condensation - Crystallization. 1.2 Effect of temperature on - solid, liquid and gases 1.3 Occurrence of Elements and Compounds in nature 1.4 Elements in human body 1.5 Elements in air 1.6 Molecules of Elements and Compounds 1.7 Symbols of some common elements 1.8 Atomicity of elements	Matter 1.1 Compounds in solid state 1.2 Compounds in liquid state 1.3 Compounds in gaseous state 1.4 Uses of compounds in day to day life 1.5 Metals and non-metals 1.6 Symbols of elements 1.7 Formula of common compounds 1.8 (5 examples) 1.9 Valency	Matter 1.1. Classification of matter characteristics of matter differences between mixture and compound 1.2. Types of mixtures 1.3. Homogenous mixture and heterogeneous 1.4. Sublimation 1.5. Types of distillation 1.6. -Definition of absorption and adsorption 1.7. types of chromatography 1.8. Centrifugation	Solution 1.1. Solution - Solvent and Solute - Types of Solution - Aqueous and Non - aqueous solution- Saturated and unsaturated solution - Diluted and Concentration solution 1.2. Factors affecting Solubility, Solubility of Compounds - Tables 1.3. % of Composition

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
				1.9. solvent extraction 1.10. Solution & Colloids 1.11. Solute and solvent - types of solution - colloids, true solution and suspension - types of colloids -tyndal effect Brownian movement – applications. 1.12. Emulsion and its types	1.4. Mass Percentage 1.5. Volume Percentage 1.6. Hydrated Salts (eg.) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{MgSO}_4 \cdot 5\text{H}_2\text{O}$ 1.7. Deliquescence salts 1.8. Problems based on Solubility products and percentage
2. Changes around us	Changes around us 2.1 What is change ? 2.2 Change of state 2.3 Classification of changes 2.3.1 slow and fast 2.3.2 reversible and irreversible 2.3.3 desirable and undesirable 2.3.4 natural and man made 2.4 solute, solvent, solution	Changes around us 2.1. Physical change 2.1.1. Crystallization 2.1.2. Melting 2.1.3. Evaporation 2.1.4. Freezing 2.1.5. Sublimation 2.1.6. Chemical change 2.1.7. Rusting of iron 2.1.8. Burning 2.2. Curdling 2.3. Chemical reaction of Baking Soda 2.4. with lemon juice 2.5. Conditions needed for a chemical change 2.6. Indicators of a chemical change 2.7. Periodic and non-periodic change 2.8. Endothermic and Exothermic change 2.9. Fermentation	Changes around us 2.1. Chemical reactions based on 2.2. contact 2.3. solution of reactants, 2.4. Electricity 2.5. heat, 2.6. light, 2.7. catalyst 2.8. Effects of chemical reactions 2.9. heat, light, sound and pressure	-----	-----

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
3. Air	<u>Air</u> 3.1. Atmosphere 3.2. Composition of air 3.3. Importance of air for survival of plants and animals 3.4. Burning and combustion 3.5. Uses of air 3.6. Experimental verification of N_2 , CO_2 and O_2 in Air	-----	<u>Air</u> 3.1. Oxygen, Carbon dioxide and Nitrogen 3.1.1. Occurrence 3.1.2. Physical and chemical properties 3.2. Nitrogen fixation 3.3. Global warming 3.4. Acid rain	--- ---	-----
4. Water	<u>Water</u> 4.1. Availability of water 4.2. Sources of water 4.3. Composition of water 4.4. Importance of water 4.5. Three states of water and inter conversions 4.6. Water vapour 4.7. water cycle		<u>Water</u> 4.1. Water 4.1.1. Composition 4.1.2. Determination 4.1.3. Preparation 4.1.4. and Properties 4.2. Universal solvent 4.3. Potable water 4.4. Water pollution 4.5. Common pollutants 4.6. Controlling water pollution 4.7. Water treatment methods 4.8. Hardness of water removal of hardness	--- ---	-----
5. Atomic Structure	-----	1. <u>Atomic Structure</u> 5.1. Structure of an atom 5.2. Sub-atomic particles and its properties 5.3. molecules, compounds mixture and its types 5.4. symbols	2. <u>Atomic Structure</u> 5.1. Laws of chemical combination 5.2. Various views of Atomic structure 5.2.1. John Dalton 5.2.2. J.J.Thomson 5.3. Cathode ray experiment 5.4. Limitation of Thomson model 5.5. Valence 5.6. Writing Molecular formula (Criss-cross method) 5.7. Ions	3. <u>Atomic Structure</u> 5.1. Discovery of nucleus Rutherford model of an atom - experiment, observation, conclusion and limitations. 5.2. Bohr's model of an atom 5.3. Postulates and limitations 5.4. Characteristics fundamental particles -Composition of nucleus 5.5. Atomic number &	4. <u>Modern atomic theory</u> 5.1. Avogadro hypothesis and uses 5.2. -Vapor Density 5.3. -Relation between Vapor density and molecular mass 5.4. -Atoms and molecule Difference 5.5. -Relative Atomic mass and molecular mass 5.6. -Mole Concept,

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
			5.8. Types of ions 5.9. Different valent ions 5.10. Information conveyed by Molecular Formula 5.11. Reactants, products and balancing simple equations 5.12. Simple problems	Mass Number 5.6 Isotopes, isobar, isotones, - Electronic configuration of atoms, valence electrons and valence laws of chemical combination, volumes (Gay lusse's) 5.7 Introduction of Quantum Numbers	problems 5.7 -Average atomic mass 5.8 Electronic Configuration:s, <i>p, d, f</i> Blocks 5.9 characteristics of s block and d block elements
6. Acids, Bases and Salts	-----	-----	Acids and Bases 6.1. Definition of acids and bases 6.2. Properties of Acids & Bases 6.3. Uses of Acids and Bases in daily life 6.4. Neutralization Reaction (definition only) 6.5. Natural indicators	<u>Acids, Bases and Salts</u> 6.1. -Types 6.2. Identification 6.3. Properties 6.4. uses 6.5. Aquaregia	-----
7. Wastes and its Management	--	Wastes and its Management 7.1. Synthetic fibers 7.1.1. Types and uses 7.2. Polymers 7.3. Plastics 7.3.1. Types and uses 7.3.2. Hazardness of Plastics 7.4. PLA Plastics 7.5. Various methods of disposing Plastics 7.6. Biodegradable plastics 7.7. Plastic eating Bacteria 7.8. Glass 7.9. Types and use	-----	-----	-----

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
8. Chemistry in Everyday life	Chemistry in Everyday life 8.1. Fertilizers 8.2. Cements 8.3. Gypsum / Epsom 8.4. Plaster of Paris 8.5. Soaps and Detergents 8.6. Phenol 8.7. - Adhesives	Chemistry in Everydaylife 8.1. Medicines 8.1.1. Antibiotics 8.1.2. Analgesics 8.1.3. Antipyretic 8.1.4. Antiseptics 8.1.5. Antihistamine 8.1.6. Antacids / ORS 8.2. Combustion and its types 8.3. Flame and its structure 8.4. Fire control 8.5. Fire extinguishers	Chemistry in Everyday life 8.1. Hydrocarbons 8.2. Natural gas 8.3. Producer gas 8.4. Coal gas 8.5. Water gas 8.6. Bio gas 8.7. Coal and its types 8.8. Petroleum 8.9. Refining of petroleum 8.10. Characteristics of ideal fuel 8.11. Specific energy/Calorific value 8.12. Octane number 8.13. Cetane number 8.14. Solar energy as a non-depleting fuel 8.15. applications of solar energy	Carbon and its compounds 8.1. Introduction of carbon 8.2. Special features of carbon 8.3. Catenation 8.4. Multiple bond 8.5. Isomerism 8.6. Allotropy 8.7. Valency 8.8. Physical and Chemical properties of carbon	<u>Carbon and its compounds</u> 8.1. Characteristics of organic compounds 8.2. Classification of organic Compounds 8.3. Homologous series 8.4. Nomenclature - rules for 8.5. writing IUPAC name 8.6. Hydrocarbon 8.6.1. Alkanes : C_nH_{2n+2} 8.6.2. Alkenes : C_nH_{2n} 8.6.3. Alkyne: C_nH_{2n-2} 8.7. Carbonyl Compounds (Functional groups) Alcohol, Aldehyde, Ketone, Carboxylic acid, Ester, Ether 8.7.1. Preparation 8.7.2. Naming 8.7.3. Properties 8.7.4. Uses 8.8. preparation of ethanol and ethanoic acid 8.9. Corrosion 8.10. metallurgical process 8.11. Organic compounds in Daily life 8.12. Soap 8.13. Detergent 8.14. Comparison of Soap and detergent

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
9. Chemical Reaction	-----	-----	-----	<p>Chemical bonding</p> <p>9.1. Bond - Definition</p> <p>9.1.1. Types of Bond</p> <p>9.1.2. Octet rule</p> <p>9.1.3. Lewis rule</p> <p>9.1.4. Kossell rule</p> <p>9.2. Formation of Ionic Bond</p> <p>9.2.1. NaCl, MgCl₂, CO₂</p> <p>9.3. Formation of covalent bond</p> <p>9.3.1. Fajan's rule</p> <p>9.3.2. H₂, O₂, N₂, F₂, Cl₂, CH₄</p> <p>9.4. Differences between ionic and Covalent bonds</p> <p>9.5. Characteristics of ionic and covalent bonds</p> <p>9.6 Formation of coordinate bond</p> <p>9.6.1 Lewis concept</p> <p>9.6.2 NH₃ - BF₃</p> <p>9.7 Oxidation, Reduction and Redox reaction,</p> <p>9.8 Oxidation number</p> <p>9.9 Problems on Determination of Oxidation number</p>	<p>Types of Chemical Reaction</p> <p>9.1. Combination – decomposition, double displacement Precipitation- neutralization- Reversible – Irreversible</p> <p>9.2. - Equilibrium state</p> <p>9.2.1. Rate of the chemical Reaction</p> <p>9.3. -Factors influencing -</p> <p>9.4. pH Scale : pH Paper</p> <p>9.5. Role of pH in Ever daylife</p> <p>9.6. pH- Calculation -</p> <p>9.7. problems</p> <p>9.8. Ionic product of water</p>
10. Periodic classification of elements	-----	-----	-----	<p>Periodic classification of elements</p> <p>10.1. Early concepts</p> <p>10.1.1. Doberinar's Triads</p> <p>10.1.2. New land law of octave</p> <p>10.1.3. Mendeleev's octave table</p> <p>10.1.4. Modern periodic table</p> <p>10.2 Postulate , advantages and limitations</p>	<p>Periodic classification of elements</p> <p>10.1. Modern periodic law</p> <p>10.2. Period table characteristics of group and periods</p> <p>10.3. Periodic trend in properties - Atomic radius ionic radii ionization energy, electron affinity and electro negativity</p>

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
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11. Applied Chemistry	-----	-----	-----	11.1. Introduction of applied chemistry 11.2. Nano chemistry 11.3. Pharmaceutical chemistry 11.4. Electro chemistry 11.5. Radio Chemistry 11.6. Dye chemistry 11.7. Agricultural chemistry/Food Chemistry 11.8. Forensic chemistry 11.9. Definition, future application, Day today life, uses of Applied chemistry	-----

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CLASS VI to X – Biology

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
1. Living world of Plants	1.2. The habitat of the living plants 1.2.1 Habitat - Types aquatic, Terrestrial, deserts, mountains 1.2.2. Plants adaptation and modifications of plants - tendrils, Climbers, thorns 1.3. Plants – form and function 1.3.1. Morphological structure and function of root, stem and leaves	1.1. Characteristics of living things 1.2. Habitat – Aquatic and Terrestrial plants 1.3. Herbs, shrubs and trees 1.4. Parts of plants - Root, stem, leaves and flowers Reproduction in plants, Pollination, Types of Pollination, Pollinators, Fertilization 1.5. Modification of roots, stems, leaves 1.6. Kinds of stems	Plant Kingdom 1.1. Binomial nomenclature 1.2. Bentham and Hooker. system of Classification 1.3. Algae 1.4. Fungi 1.5. Bryophytes 1.6. Pteridophytes 1.7. Gymnosperms 1.8. Angiosperms 1.9. Monocotyledons 1.10 Dicotyledons 1.11 Medicinal plants	Movements in plants Introduction Types of movements in plants with Experiments 1.1. Tropic movements 1.2. Phototropism 1.3. Geotropism 1.4. Hydrotropism 1.5. Nastic movements – types thigmonasty, photonasty, thermonasty. Photosynthesis in plants Transpiration in Plants	Plant Anatomy Introduction Structure of root(T.S) Structure of stem(T.S) Structure of leaf. (T.S) Plant Physiology Structure and function of chloroplast and mitochondria 1. Photosynthesis 2. Respiration 3. Transpiration
2. Living World of Animals	1. Bio Diversity 2.1 Unicellular and multi cellular organisms 2.1. Variations between body and shape e.g. Fish, lizard and birds	Basis of Classification 2.1. Need for classification 2.2. The 5 kingdom classification Binomial Nomenclature (Introduction)	Micro Organisms 2.1 Virus, bacteria, algae, fungi and protozoa. 2.2 Uses of roorganisms in medicine, agriculture, industry and daily life 2.3 Harmful microorganisms 2.4 Microbes in food process.	Diversity in living organism Animalia Invertebrata - Protozoa - Porifera - Coelenterata - Platyhelminthes - Nematoda - Annelida - Arthropoda - Mollusca - Echinodermat - Prochordata	Type study- Invertebrata, Vertebrata

	2.2. different adaptation of Animals E.g. Camel		2.5 Relationship between man and microbes – Balances, imbalances and uses. 2.6 Effect of Prions and virons on Human	Vertebrata - Pisces - Amphibia - Reptilia - Aves - Mammalia 2-3 specific characters Table - Nomenclature of animals (Binomial names)	
3. Health and Hygiene	3.1 Components of Food 3.2.1 Nutrients (carbohydrates, proteins, fats, vitamins and minerals) 3.2.2 Health and Nutrients, Balanced diet, Malnutrition, Physical exercise and rest 3.2.3 Personal cleanliness (Introduction for Bacteria and Virus) 3.2.4. Importance of Balanced diet 3.2.5. Deficiency and its diseases	Test for Starch, protein and Fat Taking care of our body 3.1 taking care of our teeth, our eyes, hair 3.2 hygienic habits 3.3 communicable diseases (Bacteri and Virus Any 3 3.4 safety and first aid (cuts and burns)	Reaching the Age of Adolescence 3.1. Adolescence and puberty 3.2. Secondary sexual characters 3.3. Role of hormones in reproduction 3.4. Reproductive phase of life in human 3.5. Menstrual Cycle 3.6. Reproductive Health 3.7. Nutritional needs for Adolescence 3.8. Personal hygiene for Adolescence	Food for Living world 3.1. Methods of preservation of food - food and some common adulteration - ISI, AGMARK, FPO, FCI (Soft drinks, packed foods, frozen foods) 3.2. Deficiency diseases 3.3. (Tabular column) Deficiency disorders their causes and symptoms along with sources	Prevention and protection 3.1 sexual and other abuses 3.2 Smoking hazards. 3.3 Cancer and Prevention (Smoking, tobacco, alcohol) 3.4 Drugs and De-addiction 3.5 Diseases, Disorders and preventing Diabetes and its types 3.6 Heart disease, 3.7 Obesity 3.8 AIDS – causes prevention and awareness
4. Organization in Organisms	4. Organ systems of human body 4.1. Introduction to various 4.2. The skeletal system 4.3. The muscle system 4.4. The circulatory system 4.5. The respiratory system 4.6. The digestive system 4.7. The nervous system 4.8. The excretory system 4.9. The sensory system 4.10. The endocrine system	Human Body – Form & Function 4.1. Introduction of human organ systems and functions 4.2. The body and health as understood in the Indian system health care	Movements 4.1. Movements of animals (Earthworm, cockroach, birds, fish and snakes) 4.2. Human body and its movements 4.3. Joints and types of joints 4.4. Skeleton 4.5. Muscles movement and types	Organs and their systems in animals Digestive system in human 4.1. Organs 4.2. Alimentary canal of man 4.3. Digestive enzymes chart Excretory system in human o Skin o Kidneys o Structure of Nephron o Urine formation Reproductive system in human • Male • Female	4.1. Nervous system 4.2. Introduction- Generation of impulses neurotransmitter - Nerve fiber - Central Nervous system (CNS) 4.3. Structure of Brain and spinal cord 4.4. Cerebro spinal fluid (CSF) 4.5. Reflex action 4.6. Peripheral nervous system 4.7. Autonomic nervous system

5 . Life Process	Structural Organization of A Cell 5.1. The cell 5.2. Types of cells	Functional Units of life 5.1 Plant and animal cell comparison 5.2 Cell as a Fundamental unit of life – 5.3 Human cells related to functions. 5.4 Structure and function of all cell organelles (in brief.)	Organization of Life 5.1. Organization-- cells tissues – organs – organ system. 5.2 Diffusion, osmosis and osmoregulation 5.3 Homeostasis. 5.4 Design of the body – based on function – some examples. 5.5 Cellular respiration. 5.6 Metabolism	Plant tissues 5.1. Meristematic tissues and its types 5.2. Permanent, simple and complex tissues 5.3 Simple Parenchyma, Collenchyma, Sclerenchyma Types and their functions • Complex tissue - Xylem and phloem (T.S., L.S) Types and their functions - Animal tissues o Epithelial tissues o Connective tissues o Muscular tissues o Nervous tissues - Cell division - Types - Amitosis, mitosis, meiosis	Heredity and Evolution Mendel's experiments 5.1. History of mendel 5.2. Monohybrid cross 5.3. Dihybrid cross 5.4. Mendelian laws 5.5. Structure and types of chromosomes DNA 5.7 Sex determination in Human beings- Variation and Mutation 5.8 Theories special creations of Evolution - Lamarckism 5.9 Darwinism – 5.10 Evidences for Evolution 5.11 Paleo botany 5.12 Ethnobotany 5.13 Astrobiology 5.14 Exobiology (only introduction)
6.Environmental Science – Resource use and Management	Our Environment 6.1. Ecosystem - Aquatic, terrestrial - food chain Recycling of waste– 6.2 Bio degradable and non bio degradable 6.3 3R cycle 6.4 Pollution - 6.5 Types of pollution – Air, water, land and noise pollution	Water –A Precious Resource 6.1. Availability of water 6.2. Sources of water 6.3. Forms of water 6.4. Ground water 6.5. Depletion of water 6.6. Distribution of water 6.7. Scarcity of water 6.8. Water management- 6.8.1. Rain water harvesting 6.8.2. Desalination of sea water (R.O)	Conservation of Plants and Animals 6.1. Deforestation and afforestation & reforestation 6.2. Endangered species 6.3. Red data book 6.4. Wildlife sanctuary and National parks 6.5. In-situ, Ex-situ Conservation 6.6. PBR (Peoples Bio diversity Register) 6.7. Bio Magnification 6.8. Blue Cross	Environmental Biology 6.1 Biogeochemical cycle a. -Carbon b. -Water c. -Nitrogen 6.2 Adaptations of plant a-Xerophytes b-Mesophytes c-Hydrophytes 6.3 Adaptation of Animals to temperature, light and habitat – E.g. Bat, Earthworm 6.4 Farm ponds 6.5 Water Conservation 6.6 Recycling of water 6.7 IUCN	Environmental management 6.1. Conservation 6.2. Forest 6.3. Wild life 6.4. Soil (erosion) 6.5. Renewable 6.6. Fossil fuels 6.7. Solar energy 6.8. Bio gas/ Shale gas 6.9. Wind, water and tidal energy 6.10. Rain water harvesting 6.11. Coal and Petroleum 6.12. Electrical 6.13. e-waste management 6.14. Sewage Management 6.15. Solid waste Management

7. Economic Biology	7.1. Plants as Food 7.2. Fiber yielding plants 7.3. Ornamental plants 7.4. Timber yielding plants 7.5. Medicinal plants 7.6. Spices 7.7. Inter relationship between plants and animals	1: Animals in Daily Life 7.1. Animal products (Food, Clothing,) 7.2. Animal Fibers(wool, silk) 7.3. Hazards in silk and wool industries (ANTHRAX) 7.4. Sericulture and Ahimsha/ Peace silk 7.5. Poultry farming 7.6. Animal protection and maintenance	1.Crop Protection and Management 7.1. Agricultural practices 7.2. Basic practices of crop protection 7.3. Preparation of soil and sowing 7.4. Irrigation 7.5. Weed Management 7.6. Harvesting Modern equipments 7.7. Storage 7.8. Rotation of crops 7.9. Seed Bank, Seed Balls, Preservation of Seeds, Heirloom Seed 7.10 Bio indicators List of Agricultural Reasearch Institutions-IARI, ICAR,KVK 7.11 FOLIAR SPRAYS (EM, Vermiw ash, panchgavya) 7.12 Bio Predators /Bio pesticides, Bio repellants and Bio - fertilizer	Applied Biology 7.1. Introduction 7.2. Medicinal plants 7.3. Horticulture 7.4. Hydroponics 7.5. Aquaponics 7.6. Aeroponics 7.7. Manuring (Bio - Manuring) 7.8. Dairy farming 7.9. Aquaculture 7.10. Pisciculture 7.11. Prawn culture 7.12. Vermi-technology 7.13. Apiculture 7.14. Mushroom 7.15. Floriculture 7.16. vegetable farming	Breeding in and animals Introduction 7.1. Selection of crop (types with techniques) crop varieties and improvement, crop 7.2. Polyploidy - Types 7.2.1. Induced Mutation 7.2.2. Hybrid - Hybridization plant (one hybridization Experiment) 7.3. Animal Breeding 7.3.1. Inbreeding 7.3.2. Outbreeding 7.3.3. Heterosis 7.4. Biotechnology in Medicine 7.5. Genetic Engineering - Cloning - stem cell - DNA Finger printing technology, GMO (Genetically modified organisms)
8. World of Microbes	----	----	----	Introduction: 8.1. Microbes and their types - Prions, Bacteria, Viruses, Fungi 8.2. Applications of Microbes in agriculture, industries medicine, Biological scavengers. 8.3. Harmful effect of microbes diseases - endemic, epidemic - pandemic 8.4. Water borne diseases 8.5. Air borne diseases 8.6. Vector borne diseases 8.7. Chikungunya, Dengue, Bird flu, swine flu 8.8. Syphilis, Gonorrhoea, Genital warts, Genital, herpes, Hepatitis - B, AIDS 8.9. Immunization Schedule	

9. Circulation and Transportation					<p>Circulation in animal</p> <p>9.1. Heart and blood vessels 9.2. Types - Arteries - veins 9.3. Blood composition and its function 9.4. Cardiac cycle – 9.5. types of circulation 9.6. Heart beat 9.7. Blood pressure 9.8. Blood groups and blood donation 9.9. Lymphatic system</p> <p>Transportation in plants</p> <p>9.10. Absorption 9.11. Transport of food, minerals and water 9.12. Transpiration 9.13. Translocation 9.14. Ascent of sap</p>
10. Hormones					<p>Introduction</p> <p>10.1. Plant Hormones & their uses 10.1.1. Auxin 10.1.2. Cytokinin 10.1.3. Gibberellin 10.1.4. Abscisic acid 10.1.5. Ethylene 10.1.6. Vent experiment</p> <p>10.2. Endocrine glands - Introduction 10.2.1. Pituitary gland 10.2.2. Thyroid gland 10.2.3. Para Thyroid gland 10.2.4. Pancreas 10.2.5. Adrenal gland 10.2.6. Thymus 10.2.7. Testes 10.2.8. Ovaries</p>
11. Reproduction					<p>11.1. Introduction 11.2. Asexual reproduction 11.2.1. Fragmentation 11.2.2. Fission 11.2.3. Budding 11.2.4. Regeneration 11.2.5. Sporeformation</p>

					<p>11.3. Sexual reproduction</p> <p>11.4. Sexual reproduction in a typical flowering plant</p> <p>Parts of flowers</p> <p>Process of reproduction</p> <ul style="list-style-type: none"> - Pollination and - Fertilization <p>Sexual reproduction in human Male reproductive system</p> <p>Female reproductive system</p> <p>Reproductive health</p> <ul style="list-style-type: none"> - Family planning - Women's Health <p>UTI, (Toilet hygiene, napkin hygiene, washing procedure)</p>
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