

COMMON SYLLABUS 2009
CLASSES I to II – ENVIRONMENTAL STUDIES
CLASSES III to X – SCIENCE

A. National Curriculum Framework 2005 – Primary Stage (Classes I to V)

- ❖ Primary science education has to be a phase of joyful learning for the child... The main objectives at this stage are to arouse curiosity about the world (natural environment, artifacts and people) and have the child engage in exploratory and hands-on activities that lead to the development of basic cognitive and psychomotor skills language, observation, recording, differentiation, classification, inference, drawing, illustrations, design and fabrication, estimation and measurement.
- ❖ This is the stage, ---- to emphasize language development through and for science learning.
- ❖ The criteria for identifying the content at the primary stage are relevance, meaningfulness and interest to the child. The content should provide opportunities to deal with the real and concrete world of the children, rather than a formal abstract world.
- ❖ The pedagogy should essentially be based on activities in and out of classroom, as well as other methods such as stories, poems, plays and other kinds of group activities.
- ❖ Concern for environment and inculcation of related values can be promoted through activities (planting of seeds, protecting trees, not wasting water, etc.) and practices relating to health, hygiene and social interactions are best taught by example rather than through recitations from a text book. The atmosphere in the classroom should not stress the child to perform, but allow learning to take place at individual pace and permit free interaction among children and the teacher.
- ❖ The assessment should aim at gaining greater insight into various aspects of the child's learning: language comprehension, reading ability, articulation, ability to work with hands and in groups, skills of observation, classification, drawing, and the other skills which constitute learning at this stage.
- ❖ Every primary school must have an activity room or an area where a class can assemble for individual or small-group activities (Projects) to be carried out in the school.
- ❖ Children may be encouraged to draw and write by converting three sides of the classroom into a blackboard at eye-level.
- ❖ While deciding content across grades we should steer away from the pipeline approach whereby some concepts get introduced too early for any meaningful understanding, on the grounds that they are required at a later stage. It must be realized that a difficult concept is not simplified merely by presenting it briefly, without rigour. Rather, the pre-requisites in terms of ideas, experiences and activities should be provided at the appropriate levels.
- ❖ There should be proper articulation between the secondary and higher secondary stages.

B. How Children Learn

- ✓ “Young children are **actively engaged in making sense of their worlds**. Young children exhibit a strong desire to apply themselves in intentional learning situations. They also learn in situations where there is no external pressure to improve and no feedback or reward other than pure satisfaction—sometimes called achievement or

competence motivation. One of the responsibilities of school is to motivate the students to explore, succeed, understand and harness it for effective learning.”

- ✓ “If one believes that learning differences are determined by gradual increases in capacity or speed of processing, one would expect relatively uniform increases in learning across most domains. But if one believes that strategies and knowledge are important, one would expect different levels of learning depending on the children’s conceptual knowledge & their control over strategies that organize their knowledge for learning. Although children learn readily in some domains they can learn practically anything by sheer will & effort. When required to learn about non-privileged domains they need to **develop strategies** of intentional learning. **In learning children need to understand what it means to learn, who are they as learners and how to go about planning, monitoring, revising & reflecting upon their learning & that of others.** Children lack knowledge & experience but not reasoning ability. Although young children are inexperienced they reason facilely with the knowledge they have.” A curriculum must reflect this.

- ✓ “Between 5-10 years of age children’s understanding of the need to use strategic effort in order to learn becomes increasingly sophisticated and their ability to talk about and reflect on learning continues to grow throughout the school years. By recognizing this dawning understanding in children one can **begin to design learning activities in the early school years that build on and strengthen their understanding of what it means to learn and remember.** The fact that children use diverse strategies is not a mere idiosyncrasy of human cognition. Good reasons exist for people to know and use multiple strategies. Strategies differ in their accuracy, in the amount of time their execution requires, in their processing demands and in the range of problems to which they apply. Strategic choices involve trade offs among these properties. **The broader the range of strategies that children know, and can apply, the more precisely they can shape their approaches to the demands of particular circumstances.”**

C. Guiding Principles:

- A. Joyful & non threatening – build a feeling of I Can
- B. Content ---contextually relevant, age appropriate
 - By age appropriate it means:
 - who is the child in that age group?
 - how does the child learn?
 - what facets of his/her learning are relevant to enhance --
 - contextual relevance--- things seen heard, felt, touched, tasted by the child – in the “sensorium” of the child—directly relevant to the immediate world.
- C. Evocative
- D. Sensitive to gender, class, life in a pluralistic society, nature (environment)
- E. Encourage Exploration
- F. Experiential

Based on the above,

- We look at four outcomes—Content, Skill, Experiential & Value
- We create space for Questions & Observations
- We include generic skills--- language, thinking, reflecting
- Evaluation

D. Outcomes

Outcome	Description	Methodology	Statement
Content	<ul style="list-style-type: none"> • Classes 1, 2 Content cannot be read independently by student. • Reading aloud--listening, Looking at Pictures, Discussions, Doing activities together are the main modalities • In classes 3, 4 children are independent readers. Stories, poems, Narratives, Descriptions are the main modalities of content exploration 	<ul style="list-style-type: none"> • Text book • Cards 	NOW I KNOW
Functional	<ul style="list-style-type: none"> ✓ A skill list is provided. ✓ In the younger classes functional outcomes can also reflect applications ---things the child can do 	<ul style="list-style-type: none"> ✓ Skills translate into methodologies in the following ways— • Read (picture reading for classes 1, 2) • Write (answers, record) • Discuss • Narrate/ Show & Tell • Ask & Find out • Think (cognitive skill) • Draw 	NOW I CAN
Experiential	<ul style="list-style-type: none"> ➤ Exploration using the 5 senses ➤ Kinesthetic ➤ Work with hands 	<ul style="list-style-type: none"> ➤ Observe ➤ Find Out ➤ Do/ Make (experiments, projects) 	NOW I CAN
Value	<ul style="list-style-type: none"> • Social—building sensitivity to caste, class, gender—living in a pluralistic society • Being with peers • Environmental—an ethic of care with animals, plants, things we use, wastes we generate • Self —respecting feelings, change, caring for one’s health, being safe 	<ul style="list-style-type: none"> • Evocative quality of the reading material • Discussions • Activities 	NOW I WILL

Questions & Observations	<ul style="list-style-type: none"> Children's questions & observations 	<ul style="list-style-type: none"> Discussion 	
Generic Skills	<ul style="list-style-type: none"> How did you? Questions for understanding how understanding happens, problem solving, planning, finding errors 	<ul style="list-style-type: none"> Discussions— one to one with teacher / peer, small groups, large group. 	HOW DID I?

E. Methodology

Every activity has to be meaningful in the present context and relevant for further learning.

- Observation based
- Exploratory
- Multi sensorial
- Integrated (with all the other learning in math & language)
- Skill based (skills & content go together)

The methodology should scaffold for all the above listed outcomes
It should allow room for children's questions and observations.

F. List of Skills

Some relevant skills are listed below.

(This is not a comprehensive listing nor does it reflect children's capabilities entirely)

Skill	Skill Subsets
Drawing	Draw from your imagination
	Draw following the dotted lines
	Draw following instructions
	Learning to represent
	Draw within a grid
	Continue the pattern
	Color
Observation Observe around you Observe in the pictures given	Observe & Imitate/ Tabulate/ Draw/ Record/ Match/ Pair/ Find similarities/ Read a Picture Story in the card, text. Observe & Find connections/ Describe/ Narrate/Group/ Name/Find the missing objects/Classify/Differentiate Observe & Color/ Count/ Sequence Identify from a description

Art	Make observing the pictures
	Make observing the sequence in the pictures
	Make from your imagination
	Make with a theme given
Spatial Skills	Jigsaws--- Put the pieces together to make a picture
	Find your way through the maze
	Pre-mapping in the classroom
	Spotting shapes in the environment
	Spot differences between
	Find the similar one
	Mapping the neighbourhood
Cognitive Skill	
Questioning	Articulating a question clearly
	Sequencing a set of questions
	Sustaining a question
	Ability to frame a set of questions
Reading Comprehension	Spotting key words
	Spotting unknown words

	Comprehension
	Explaining a concept to another
Following Instructions	Following a set of instructions
Written Work	Answering a question -a small paragraph
Written/Spoken skills	Describing phenomenon, situation (oral+ written)
	Explaining observed phenomenon, situation (oral+ written)
	Investigative expression
	Authentic noting down of data
	Small summaries
	Reporting observations & results systematically
Comparison	Observing similarities, differences patterns , trends
	Comparing outer features—abstract qualities
	Spotting similarities in differences
Categorization	Sorting , Pairing and Grouping
	Defining a basis for categorization
	Grouping on the basis of the category
	Shifting & regrouping on a fresh basis
	Representing classes, subclasses

	Tabulation
Measurement	Selecting of appropriate measuring instrument
	Using appropriate units of measurement
Estimation	Quantities, distances
Counting	Fostering math skills through science
Sequencing	Sequencing—earlier from later, distant from near
	Sequencing steps in a planned activity
	Can make or follow a flow diagram
	Making a timeline
Association	Making links between seen & unseen
	Drawing an inference between conclusion & prior data
	Ability to go from previous knowledge to present learning
Problem Solving	Can begin to problem solve
Ability to Memorize	Songs, stories, rhymes, facts
Making Models	Make simple models following instructions

H. Contest Areas at a Glance

My Natural Biological Environment	Plants Animal Birds Insects
My Natural Physical Environment	Day & Night, Air and Water
My Self	My Body, Keeping Healthy
Man, Matter Materials-- -use of the environment	Natural resources 3 states of matter, Properties of materials & their use

to meet needs	matter→material-→ wastes—(generation, management)
Work	How I help Push & pull Tools & energy to help us work
Science in Every day life	Science & questions Local innovations Kitchen science Biography of a scientist
Travelogue	Transport Travel to different environments

I. Syllabus for Classes 1-5

Topic	Environmental Studies		Science		
	Class 1	Class 2	Class 3	Class 4	Class 5
1.Plants	<p>1. Plant Kingdom</p> <p>1.1. The tree as a habitat to many birds, animals insects</p> <p>1.2 Plants and flowers around the child</p>	<p>World of plants</p> <p>1.1 Parts of a plant</p> <p>1.2 Different kinds of Trees, Shrubs, Herbs, Grasses, Climbers and creepers around the child.</p>	<p>World of plants</p> <p>1.1 Parts of a plant</p> <p>1.2 Leaves</p> <p>1.3 Flowers</p> <p>1.4 Type of Root</p> <p>1.5 Stem</p> <p>1.6 Different kinds of fruits and seeds</p> <p>1.7 Water Plants</p>	<p>1.1 Edible parts</p> <p>1.2 Life cycle (seed to seed)</p> <p>1.3 Germination</p> <p>1.4 Plants in our society (sacred trees, grasses, flowers and festivals, Vanamahotsav)</p>	<p>1.1 Web of Life</p> <p>1.2 Pollination,</p> <p>1.3 Dispersal of seeds</p> <p>1.4 Plants as primary producers</p>
2.Animals & Birds	<p>2. Animals</p> <p>2.1 Animals, Birds insects around the child</p> <p>2.2 Protection of animals</p>	<p>2.1 Birds Around the child ---Spotting & describing birds, animals</p> <p>2.2 Nests of birds,</p> <p>2.3 Care of the young ones</p> <p>2.4 Food</p>	<p>2.1 Animals in different environments -land, air, on trees</p> <p>2.1 Morphology External features</p> <p>2.2 Food & mouth parts in relation to the food eaten</p> <p>2.3 Herbivore, carnivore, and omnivore</p> <p>2.4 Movement</p> <p>2.5 Camouflage</p>	<p>2.1 Special Senses of Animals</p> <p>2.1 Care of their young</p> <p>2.3 Animal Communities</p>	<p>2.1 Diminishing spaces for animals</p> <p>2.2 Sanctuaries</p> <p>2.3 Prevention of cruelty to animals</p>

Topic	Environmental Studies		Science		
	Class 1	Class 2	Class 3	Class 4	Class 5
3.Small Creatures Around the children			3.1 Names of the Small Creatures around the children 3.2 Habitat water, soil, garden, in the home 3.3 Morphology 3.4 Food 3.5 Movement	3.1 Nocturnal Insects 3.2 Life of Ants	3.1 Life cycle of a butterfly 3.2 Bee
4. Day and Night	4. Day and Night 4.1 Rhythms of the day and night life around the child 4.2 Day and Night – Sky 4.3 Animals and people who have different rhythms of life	4.1 Night sky observation Sky at a day 4.2 Directions	4.1 Earth and Moon 4.2 Phases of Moon 4.3 About the moon 4.4 Full moon, New Moon 4.5 Day and night formation	4.1 Solar Family 4.2 Sky at a night	4.1 Space 4.2 Space Travel
5. Water	5. Water and Air 5.1 On a rainy day 5.2 Air 5.3 Uses of Water	5.1 Life in and around water. Sources of water (river, tank, lake) fresh water, sea water	5.1 Use of water 5.2 Potable water 5.3 Prevention of water borne diseases 5.4 Pollution and its Prevention 5.5 Water pollution and mosquito breeding	5.1 Too much and too little rain Droughts, floods 5.2 Conserving Water 5.3 Tapping water -- traditional water harvesting structures 5.4 Water scarcity difficulties people experience in procuring water	5.1 Understanding some properties of water 5.2 Water for all

Topic	Environmental Studies		Science		
	Class 1	Class 2	Class 3	Class 4	Class 5
6.Air		6.1 Air and Breath	6.1 Kinds of winds	6.1 Air is a mixture of gases 6.2 Constituents of air	6.1 Understanding some properties of air 6.2 Uses of air
7.Food	7. Food 7.1 Types of Food 7.2 Journey of Milk 7.3 Vegetable Fair	7.1 Names of the cereals, pulses, greens, millets, vegetables, fruits 7.2 Dairy products and their preparation 7.3 Meat of animals, egg 7.4 Spices 7.5 Food eaten by people of different ages	7.1 Ingredients of food eaten 7.2 Sources of food 7.3 Having a nutritious meal –(Balanced diet) food groups, nutrients 7.4 Food eaten in different places	7.1 Raw and cooked food 7.2 Food in illness 7.3 Utensils used in cooking 7.4 Cooking Practices 7.5 Food hygiene	7.1 Preservation and spoilage of food 7.2 Kitchen safety
8. My Body	8. Our Body 8.1 Five Sense Organs 8.2.Exploration of Sounds 8.3 Sounds of Birds and Animals	8.1 Simple body movements running, skipping, playing. 8.2. Gender- Male, Female 8.3 Parts of the body 8.4 Right & left	8.1 Skin, muscles, bones, joints, teeth, hair	8.1 Over view of the internal organs of the human body 8.2 Digestion of food	8.1 Brain, 8.2 Sense organs
9. Keeping Healthy and Clean	9. Health and Hygiene 9.1 Daily good habits for hygiene 9.2 Protection of the sense organs	9.1 Keeping the surroundings clean classroom, public places 9.2 Importance of toilets, types and its uses	9.1 Food for good health 9.2 Health and Exercise 9.3 Eye Exercises for better vision	9.1 Personal safety (At home, on the road, in school and common Places.)	9.1 Spread and prevention of a disease. 9.2 Avoiding public places . Using a toilet 9.3 Knowing the nearest Health centers

Topic	Environmental Studies		Science		
	Class 1	Class 2	Class 3	Class 4	Class 5
10. Man, Matter and Materials		10.1 Things to touch and feel 10.2 Sand and Mud. 10.3 A day in the beach 10.4 Natural resources- wood, stone, sand, clay, metals, water 10.5 Indian toys using natural materials (link to people who make them)	10.1 Three states of matter (examples)	10.1 Transformation of natural resources into materials for use (one example from industry & one from agriculture) 10.2 Generation of waste 10.3 Kinds of wastes and sources 10.4 Recycling	10.1 Properties of materials 10.2 Different kinds of houses --variation with climate
11. Work		11.1 Push and pull to work	11.1 Tools to work (Different kinds of tools and their design for use) Tools used by the various professionals	11.1 Energy and work (Relationship between energy, force and movement)	11.1 Renewable sources of energy 11.2 Non renewable sources of energy Uses and applications of energy 11.3 Conserving energy
12. Science in Everyday Life	12. Daily Life 12.1. Helping Family Members 12.2. My Family 12.3. Clothing 12.4. Friends who help use 12.5. Public Places		12.1 Science around as (Toys)	12.1 Need based science Innovations (Ex. Printing Machines, Telephones, Computer) 12.2 Science Question	12.1 Biography of a scientist

Topic	Environmental Studies		Science		
	Class 1	Class 2	Class 3	Class 4	Class 5
13. Travelogue	13. Travel Experience 13.1. Bus Travel 13.2. Various types of Transport System	13.1 Along a river (Animals, plants, people, activities and preservation)	13.1 To a Forest (Animals, plants, produce from forests) 13.2 Deforestation and its consequences, conservation	13.1 To a farm (animals, plants, people, growing a crop) 13.2 Don't harm animals. 13.3 Environment cleanliness	13.1 To a Botanical Sanctuary (Edible plants Medicinal plants Aromatic plants, timber yielding plants, Seeds) 13.2 Kinds of Flowers (Fragrances, Dyes Flower Motifs)

CLASS VI to X

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
1. Applied Biology	1: The World of Plants 1.1 Medicinal plants 1.2 Plants as Food 1.3 Fiber yielding plants 1.4 Ornamental plants 1.5 Timber yielding plants 1.6 Spices 1.7 Animals and their uses	1: Animals in Daily Life 1.1 Uses of animals 1.2 Animal products (Food, Clothing, etc.,) 1.3 Animal Fibers 1.4 Sericulture 1.5 Apiculture 1.6 Poultry 1.7 Animal protection and maintenance	1: Crop Protection and Management 1.1 Agricultural practices 1.2 Basic practices of crop protection 1.3 Preparation of soil and sowing 1.4 Irrigation 1.5 Protection from weeds 1.6 Harvesting. 1.7 Storage 1.8 Marketing 1.9 Rotation of crops 1.10 Biotechnology in Agriculture 1.11 Biotechnology in food processing	1: Improvement in Food Resources 1.1 Improvement in crop yields 1.2 Nutrient management 1.3 Uses of manures and fertilizers 1.4 Protection from pests and diseases 1.5 Hybridization in Plants and animals 1.6 Animal husbandry 1.7 Poultry farming 1.8 Pisciculture, 1.9 Apiculture 1.10 Aquaculture	1: Heredity and Evolution 1.1 Heredity 1.2 Variations 1.3 Evolution 1.4 Speciation 1.5 Human evolution 1.6 Evolution tree 1.7 Genetic engineering 1.8 Bio technology and cloning 1.9 Stem cell-Organ culture 1.10 Microbial production. 1.11 Biosensor – Bio chips 1.12 Science today – Gene Therapy
Periods		14	16	20	14

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
2. Health and Hygiene	2. Food Habits 2.1. Food variety 2.1.1 Food materials and sources 2.1.2 Plant and animal products used as food 2.1.3 Nutrition 2.1.4 Types of nutrition 2.1.5 Food habits of animals 2.2 Components of Food 2.2.1 Nutrients (carbohydrates, proteins, vitamins, fats and minerals) 2.2.2. Need of various nutrients 2.2.3. Balanced diet 2.2.4. Deficiency and diseases	2: Nutrition in Plants and Animals 2.1 Mode of nutrition in plants 2.2 Autotrophic and heterotrophic nutrition 2.2.1 Photosynthesis 2.2.2 Other modes of nutrition in plants 2.3 Nutrition in animals 2.4 Nutrition in amoeba 2.5 Human digestive system 2.5.1 Types of teeth 2.6 Ruminants	2: Reaching the Age of Adolescence 2.1 Adolescence and puberty 2.2 Secondary sexual characters 2.3 Ductless glands 2.4 Role of hormones in reproduction 2.5 Reproductive phase of life in human 2.6 Sex determination 2.7 Reproductive Health 2.7.1 Nutritional needs 2.7.2 Personal hygiene 2.7.3 Prevention and protection from sexual and other abuse 2.7.4 Smoking hazards. 2.7.5. Sprouting 2.7.6. Cancer and Prevention	2: Addiction and Healthy Life Style 2.1 Addictions 2.2 Kinds of addictions— (drug, alcohol, smoking, substance abuse) 2.3 Prevention of addiction 2.4 Healthy Life style – Prevention of Heart Diseases, Obesity	2: Immune System 2.1 Health and its significance 2.2 Diseases and causes 2.3 Diseases caused by microbes and prevention 2.4 Modes of transmission 2.5 Immunization 2.6 Treatment and prevention 2.7 Biotechnology in Medicine 2.8 HIV and Prevention
Periods		16	16	10	15
3. My Body		3: Human Body – Form & Function 3.1 Brief overview of human body— structure & functions of all the Human organ systems 3.2 The body & health as	3: Body Movements 3.1 Human body and its movements 3.2 Joints and types of joints 3.3 Skeleton	3: Human Body – Organ System 3.1 Skin 3.2 Musculoskeletal system 3.3 Digestive system 3.4 Excretory system 3.5 Circulatory system 3.6 Respiratory system	3: Structure & Function of the Human Body – Organ System 3.1 Nervous system 3.2 Endocrine system 3.3 Cell division - Stages of Meiosis 3.4 Heredity

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		understood in the Indian system of health care 3.3 Diseases, Disorders and preventing Diabetes Mellitus 3.3.1 Advantages of physical activity 3.4 Preservation of food 3.4.1 Methods of preservation (heating, freezing, drying and adding preservatives). 3.4.2 Fast food – its ill effects 3.5 Science today – Irradiated food	3.4 Movements of animals (Earthworm, cockroach, birds, fish and snakes)	(Microscopic structure of the tissues involved for each system)	
Periods		16	16	18	15
4. World of Plants		4: Plants – Morphology 4.1 Characteristics of living things 4.2 Habitat – various habitats of plants 4.3 Herbs, shrubs and trees 4.4 Parts of plant 4.4.1 Root, stem, leaves and flowers	4: Pictorial Feature of Plant Kingdom 4.1 Fungi 4.2 Flowering & Non Flowering 4.3 Algae 4.4 Bryophytes 4.5 Pteridophytes 4.6 Gymnosperms 4.7 Angiosperms 4.8 Monocotyledons	4: Structure and Physiological Functions of Plants 4.1 Plant cells 4.2 Plant tissues 4.3 Plant Functions 4.3.1 Photosynthesis 4.3.2 Transpiration, 4.3.3 Respiration, 4.3.4 Transportation 4.4 Plant Nutrition	4: Reproduction in Plants 4.1 Modes of reproduction - vegetative, asexual and sexual reproduction in plants 4.2 Pollination 4.3 Fertilization 4.4 Fruits and seeds

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		4.5 Modification of roots, stems, leaves 4.6 Kinds of stem 4.7 Movements in plants 4.8 Observation of plants & trees recording data, drawing .	4.9 Dicotyledons 4.10 Structure of root 4.11 Structure of stem 4.12 Structure of leaf.	4.5 Movements in plants. 4.6. Sensitivity in plants.	formation 4.5 Seed dispersal
Periods		16	16	18	15
5. World of Animals	6. Bio Diversity 5.1 Different types of organisms 5.2 Unicellular and multi cellular organisms	5: Basis of Classification 5.1 Need for classification 5.2 The 5 kingdom classification 5.3 Binomial Nomenclature	5: Micro Organisms 5.1 Virus, bacteria, algae, fungi and protozoa. 5.2 Uses of microorganisms in medicine, agriculture, industry and daily living 5.3 Harmful microorganisms 5.4 Microbes in food preservation. 5.5 Relationship between man & microbes – Balances, imbalances and uses.	5: Animal Kingdom 5.1 Invertebrates 5.2 Vertebrates --focus on special features in addition to basic functions. 5.3 Various Modes of reproduction in animals (asexual and sexual reproduction) 5.4 Reproduction in human 5.5 Fertilization 5.6 Development of embryo 5.7 Viviparous 5.8 Oviparous 5.9 Young ones to adult	5: A Representative Study of Mammals Morphology 5.1 Habitats 5.2 Adaptations 5.3 Basic Physiological Functions. 5.4 Circulatory system in man. 5.5 Excretory system in man. 5.6 Relationship of structure to functions 5.7 Animal Behaviour 5.8.1 Behaviour (social, reproductive, parental care) 5.8.2 Some case studies from researchers(animals behavior)
Periods		14	16	20	15

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
6. Life Process	6. Structural Organization of Cell 6.1 The cell 6.2 Types of cell 6.3 Plant and animal cell comparison The cell structure and functions	6: Respiration in Plants and Animals 6.1 Need for respiration 6.2 Respiration in human being. 6.3 Respiration in animals 6.4 Respiration in plants	6: Diversity in Living Organism 6.1 Cell as a fundamental unit of life – type of human cells related to functions. 6.2 Structure & function of all organelles in brief. 6.3 Organization-- cells – tissues – organs – organ system. 6.4 Homeostasis. 6.5 Cellular respiration. 6.6 Metabolism. 6.7 Design of the body – based on function – some examples.	6: Cells and Tissues 6.1 Prokaryotic and eukaryotic cells 6.2 Multi cellular organisms 6.3 Cell as a basic unit of life. 6.3.1 Cell membrane and Cell wall 6.3.2 Cytoplasm 6.3.3 Cell organelles 6.4 Nucleus, 6.4.1 Chromosomes- DNA structure 6.5 Cell division and types, stages of mitosis. 6.6 Diffusion /exchange of substances between cells and their environment 6.7 Tissues Types, structure and function of plant tissues	6: Life Processes 6.1 Definition 6.2 Types of nutrition and human digestive system 6.3 Respiration 6.4 Transportation in plants-water and minerals and animals - blood circulation 6.5 Excretion in plants and animals 6.6 Nervous system 6.7 Coordination in plants 6.8 Movement due to growth 6.9 Hormones in animals
Periods		14	20	18	15
7. Environmental Science - Ecology		7: Ecosystem 7.1 Ecosystem (Biotic and abiotic factors) 7.2 Food chain 7.3 Food web 7.4 Flow of Energy 7.5 Biomes 7.6 The different biomes---	7: Conservation of Plants and Animals 7.1 Conservation of forest and wild life 7.2 Deforestation and aforestation 7.3 Flora and fauna 7.4 Endangered species 7.5 Red data book 7.6 Migration 7.7 Wildlife sanctuary and	7: Bio-Geochemical Cycle 7.1 Life –non-life interactions (biotic & abiotic factors) 7.2 Water cycle 7.3 Nitrogen cycle 7.4 Carbon cycle 7.5 Oxygen cycle	7: Conservation of Environment 7.1 Bio degradable and non bio degradable wastes 7.2 Water management 7.3 Wild life sanctuaries 7.4 Balance in Ecosystem 7.5 Coal and petroleum 7.6 Green chemistry

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		vegetation & climatic zones 7.6.1 Important of forest 7.6.2 Different flora & fauna in the biomes	National park 7.8 Threats to biodiversity 7.9 Traditional knowledge & people’s initiatives in biodiversity conservation 7.10 Human wildlife conflicts		7.7 Science today – Towards a global village
Periods		14	16	7	15
8. Environmental science – Resource use and Management	8.Our Environment 8.1 Garbage 8.2 Disposal of garbage 8.3 Vermi composting 8.4 Pollution 8.5 Types of pollution – Air, water, land and noise pollution	8. Water –A Precious Resource 8.1 Availability of water 8.2 Sources of water 8.3 Forms of water 8.4 Ground water 8.5 Depletion of water 8.6 Distribution of water 8.7 Scarcity of water 8.8 Water management— rain water harvesting 8.9 Science today – 8.9.1 Drinking ice berg 8.9.2Desalination of sea water	8: Pollution of Air, Water and Soil 8.1 Air pollution 8.1.1 Sources of air pollution 8.2 Water pollution 8.2.1 Sources of water pollution 8.3 Water purification 8.4 Land pollution 8.5 Sources of land pollution 8.6 Science today – Bio pole – easily decomposable and reusable plastics	8: Pollution and Ozone Depletion 8.1 Kinds of pollution 8.1.1Air pollution 8.1.2Water pollution 8.1.3Soil pollution 8.1.4Radio active pollution 8.1.5Noise pollution 8.2. Global warming 8.2.1.Green house effect 8.3 Ozone layer depletion 8.4 Science today – Oil spills	8: Waste Water Management 8.1 Journey of water 8.2 Sewage 8.3 Treatment 8.4 Domestic practices 8.5 Sanitation and diseases 8.6 Alternate arrangement for sewage disposal 8.7 Sanitation in public places 8.8 Energy Management 8.8.1 Energy audit (home, school) 8.8.2 Renewable sources (solar, hydrogen, wind) 8.8.3 Non–renewable sources—(coal, petroleum, natural gas)

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		8.9.3 Sweet water on earth			8.8.4 Bio-fuels— generation & use 8.8.5 Energy Conservation & How we can help.
Periods		17	16	13	15
9. Matter	9 Separation of Substances 9.1 Separation and its importance 9.1.1 Definition 9.2 Methods of separation (hand picking, winnowing, sieving, magnetic separation, sedimentation, decantation, filtration, evaporation, condensation and crystallization) 9.3 Need of Separation by more than one method .	9: Matter in our Surroundings 9.1 Physical nature of matter 9.2 Characteristics of particles of matter 9.3 States of matter 9.4 Effect of temperature on solid, liquid and gas.	9: Elements and Compounds Around us 9.1 Types of pure substances 9.2 Element 9.2.1 Occurrence of elements in Nature 9.2.2 Elements found in Human Body 9.2.3 Classification of elements based on states (solids, liquids ,Gases) 9.2.4 Classification of Elements based on properties 9.3 Symbol of elements 9.4 Molecule of an element 9.5 Compound 9.5.1 Characteristics of Compounds 9.5.2 Classification of compounds 9.5.3 Uses of compounds-day to day life. 9.5.4 Molecule of compound 9.6 Formula of compound	9: Is Matter Around us Pure? 9.1 Mixtures 9.2 Characteristics of Mixtures 9.2.1 Difference between Mixtures compound 9.3 Types of Mixtures 9.3.1 Homogeneous mixtures and their Types 9.3.2 Heterogeneous mixtures and their Types 9.4. Separation of different components of Mixtures 9.4.1 Sublimation 9.4.2 Immiscible liquids 9.4.3 Miscible liquids	9 Solutions 9.1 Solute and Solvent 9.2 Types of Solutions 9.3 Solubility 9.4 Factors affecting Solubility 9.5 Problems

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
			9.7 Valency		
Periods		20	16	11	14
10. Atomic Structure			10. Atomic Structure 10.1 Ancient views of atomic structure 10.2 Laws of chemical Combination 10.3 Dalton's atomic theory 10.3.1 Merits 10.3.2. Demerits 10.4 Electrical nature of matter 10.5 Discovery of Fundamental Particles 10.5.1 Discovery of Electrons 10.5.2 Properties of Cathode Rays 10.5.3 Discovery of Protons 10.5.4 Properties of fundamental particles 10.6 Atomic model 10.6.1. J.J. Thomson's model of atom 10.6.2. Limitation of Thomson Model	10: Atomic structure 10.1 Discovery of Nucleus 10.2 Rutherford Experiment 10.3 Rutherford Model of Atom 10.3.1 Limitations 10.4 Bohrs Model of Atom 10.5 Discovery of Neutrons 10.6 Characteristics of Fundamental particles 10.6.1 Composition of Nucleus 10.7. Atomic number and Mass number 10.8 Isotopes 10.9 Electronic Configuration of Atoms 10.9.1 Valence Electrons and valency	10: Atoms and Molecules 10.1 Modern atomic theory 10.2 Avogadro Hypothesis 10.2.1 Atomicity 10.2.2 Relation between vapour density and molecular mass of agas 10.3 Difference between Atom and Molecules 10.4 Relative Atomic Mass 10.5. Relative Molecular mass 10.6 Mole Concepts 10.6.1 Mole-Definition 10.6.2 Problems based on mole concept
Periods			16	11	14

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
11. Exploring Chemical Changes and Formulation	11: Changes Around us 11.1 Classification of changes 11.2 Slow and fast 11.3 Reversible and irreversible 11.4 Desirable and undesirable 11.5 Periodic and non periodic 11.6 Exothermic and endothermic	10: Matter and Its Nature 10.1 Physical Changes (crystallization, melting, evaporation, freezing and sublimation) 10.2 Chemical changes (rusting of iron, burning and curdling, chemical reaction of Baking Soda with lemon juice) 10.2.1 Differences between physical and chemical changes 10.3 Acids, Bases and Salts 10.3.1 Acids, Bases and salts (used in our daily life) 10.3.2 Natural indicators (No Equations) 10.3.3 Neutralization (in everyday life)		11 Chemical equation 11.1 Types of ions and radicals. 11.2 Learning to write chemical symbols and chemical formulae by crisscrossing valencies 11.3 Introduction to write chemical reactions 11.4 Balancing chemical equations 11.5 Informations conveyed by chemical equation 11.6 Informations not conveyed by Chemical equation	11: Chemical Reactions 11.1 Types of chemical reactions 11.2 Rate of chemical reaction 11.2.1 Factors influencing the rate of the chemical reaction 11.3 Acids 11.3.1 Classification of acids 11.3.2 Chemical properties of acids 11.3.3 Uses of acids 11.4 Bases 11.4.1 Classification of bases 11.4.2 Chemical properties of bases 11.4.3 uses of bases 11.5 Identification of acids and bases 11.6 pH scale 11.6.1 pH paper 11.6.2 Importance of pH in everyday life. 11.7 Salts 11.7.1 Classification of salts 11.7.2 Uses of salts
Periods		18		11	13
12. Exploring Chemical				12: Periodic Classification of Elements	12: Periodic Classification

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
Families	-			12.1 Early attempts of classification of elements. 12.2 Mendeleev's periodic table 12.3 Mendeleev's classification of elements 12.3.1 Metals and Non-Metals 12.3.2 Physical properties of Metals and Non Metals 12.3.3 Chemical properties of Metals and Non Metals 12.3.4 Reactivity series 12.3.5 Uses of Reactivity series 12.3.6. Alloys 12.3.7 Uses of Alloys 12.3.8 Nano Science	of Elements 12.1 Modern periodic law 12.2 Modern periodic table 12.3 Characteristics of modern periodic table 12.4 Metallurgy 12.4.1 Introduction 12.4.2 Terminologies in metallurgy 12.4.3 Differences between Minerals and Ores 12.5 Occurrence of metals 12.6 Metallurgy of Al, Cu and Fe 12.6.1 Metallurgy of Aluminium 12.6.2 Metallurgy of Copper 12.6.3 Metallurgy of iron 12.7 Alloys 12.7.1 Methods of making alloys 12.7.2 Copper Aluminium and Iron alloys 12.8 Corrosion 12.8.1 Methods of preventing corrosion
Periods				14	13
13. Exploring the World	13. Chemistry in Everyday Life 13.1 Synthetic fibers 13.2 Types and uses 13.3 Plastics	11. Combustion and Flame 11.1 Combustion and its type	11. Coal and Petroleum 11.1 Coal 11.1.1. Types of Coal 11.2 Petroleum	13. Chemical Bonds 13.1 Octet rule 13.2 Types of Chemical bond 13.3 Formation of Ionic	13. Carbon and its Compounds 13.1 Introduction 13.2 Compounds of carbon 13.3 Modern definition of

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
	13.4 Types and uses of plastics 13.5 Plastics and environment 13.6 Glass and uses 13.7 Cement and uses Soaps, detergents - Preparation and uses.	11.2 Fire control 11.3 Flame and its structure 11.4 Efficiency of fuels 11.5 Fuels and environment	11.2.1 Occurrence and Refining 11.3 Natural gas 11.4 Natural Resources - limitation 11.5. Science today	And Covalent bond 13.3.1 Common Properties of ionic compounds 13.3.2 Common Properties of covalent compounds 13.4 Differences between Ionic and covalent compounds 13.5 Coordinate covalent bond. 13.5.1. Common properties of coordinate compounds	organic chemistry 13.4 Bonding in carbon and its compounds 13.5 Allotropy 13.6 Physical nature of carbon and its compounds 13.7 Chemical properties of carbon compounds 13.8 Homologous series 13.9 Hydrocarbons and their types 13.10 Functional groups 13.10.1 Classification of organic compound based on functional group. 13.11 Ethanol 13.12 Ethanoic acid
Periods		18	16	13	13
14. Matter and Measurement	14. Measurement 14.1 Standard unit of measurement (Length, time and mass) 14.2 SI unit 14.3 Multiples and sub Multiples of units.	12. Measurement 2.1 Idea of derived quantities- Area- Volume and Density of solids and liquids 2.2 Concept of indirect measurement or	12.Measurement S.I. System of units- Temperature Electric current Amount of substance Luminous intensity Angle, Solid Angle	14. Measuring Instruments 14.1 Concept of small Measurements 14.2 Measuring Length 14.2.1. Vernier Calipers 14.3.Measuring mass &	14. Measuring Instruments 14.1.Screw Gauge 14.2.Measuring long Distances – Astronomical distance, light year.

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		estimation- Example (Time- Simple pendulum) 2.3 Measuring astronomical distances		Weight – Concept of various balances-common balance, Spring Balance, Physical balance, Digital balance (concept only) 14.4. Measuring Time - Concept of various Clocks, Analog, Digital, Quartz, Atomic Clocks	
Periods		17	4	9	4
15. Forces and Movement	15: Motion 15.1 Moving things around us 15.2 Types of Motion 15.3 Linear and Circular 15.4 Uniform and Non uniform Science today - Robot-	13: Motion 13.1 Speed 13.2 Measuring speed And Units of speed 13.3 Distance- time graph 13.4 Velocity 13.5 Acceleration 13.6 Science today – Adventures in sports – like a bird flies	13: Force and Pressure Definition 13.1 State of motion 13.2. Action of force & its effects 13.4 Contact forces 13.4. Non contact forces 13.4.1. Magnetic forces 13.4.2 Gravitational force 13.4.3 Electrostatic force 13.5. Pressure 13.6. Pressure exerted by liquids and gases 13.7. Pressure exerted by air 13.8. Atmospheric pressure 13.9. Pascal's law 13.10. Friction 13.10.1. Factors affecting friction	15: Motion and liquids 15.1 Uniform and non uniform motion 15.2 Measuring the rate of motion 15.3 Rate of change of velocity 15.4 Graphical representation of motion 15.5 Equation of motion by graphical method 15.6 Uniform circular motion 15.6.1 Centripetal and centrifugal forces 15.7 Liquids 15.7.1 Up thrust & buoyancy 15.7.2 Archimedes 15.7.3 Relative	15: Laws of Motion and Gravitation 15.1 Balanced and imbalanced forces 15.2 First law of motion 15.3 Inertia and mass 15.4 Momentum 15.5 Second law of motion- $F=ma$ 15.6 Third law of motion 15.7 Conservation of momentum and proof 15.8 Moment of force and couple 15.9 Gravitation 15.9.1 Newton's law of gravitation 15.9.2 Mass 15.9.3 Weight 15.9.4 Acceleration

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
			13.10.2. Friction - necessary evil 13.10.3. Increasing and reducing friction	15.7.4 Explanation for a body wholly or partially immersed in a liquid	15.9.5 Mass of Earth Science Today- Chandrayan, Cryogenic Techniques and Manned Space Station
Periods		14	18	20	15
16. Exploring Energy	16. Types of Energy 16.1. Sources of energy 16.2. Electricity, chemical, mechanical and solar energy	14: Electricity and Heat 14.1 Electric cell 14.2 An electric circuit 14.3 Symbols of electric components 14.4 Electric switch 14.5 Conductors and insulators 14.6 Heating effect of electric current 14.7 Magnetic effect of electric current 14.8 Electro magnet 14.9 Electric bell 14.10 Heat 14.10.1 Sources of heat (sun, combustion (or) burning,	14: Electricity and Heat 14.1 Three kinds of circuit- Simple, series and parallel. 14.2 Conduction of electricity in liquids 14.3 Chemical effects of electric current 14.4. Applications of Chemical effects of electric current 14.4.1 Electroplating 14.5. Electric charges at rest 14.5.1 Types of charges 14.5.2 Transfer of charges 14.5.3 Story of lightning and thunder 14.5.4 Lightning – safety	16: Work, Power, Energy, and Heat 16.1 Work 16.2 Energy 16.2.1 Potential energy 16.2.2 Kinetic energy 16.3 Law of conservation of energy 16.4 Rate of doing work or power 16.5 Unit of power 16.6. Heat 16.6.1 Thermal Capacity – Specific Heat Capacity 16.7 Change of State – melting and boiling point. 16.8 Kelvin’s scale of Temperature 16.9 Gas laws and Gas equation	16: Electricity and Energy 16.1 Electric current and circuit 16.2 Electric potential and potential difference 16.3 Circuit diagram 16.4 Ohm’s law 16.5 Resistance of a conductor 16.6 System of resistors 16.7 Heating effect of electric current 16.8 Joules law of heating 16.9 Role of fuse. 6.10 Domestic electric circuits. 6.11 Electric power 6.12 Chemical effect of electric current 6.13 Electrolysis electro chemical cells 6.14 Primary and Secondary

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
		friction, electrical). 14.10.2 Hot and cold objects 14.10.3 Heat and temperature 14.10.4 Measuring temperature – Clinical and Laboratory thermometers	14.6 Heat 14.6.1 Effects of Heat 14.7 Transfer of heat – conduction, convection and radiation		cells 6.15 Sources of Energy 16.15.1 Conventional sources of energy 16.15.2 Non- conventional source of energy 16.15.3 Nuclear energy 16.15.4 Radioactivity 16.15.5 Nuclear fission and nuclear fusion 16.15.6 Nuclear reactivity advantages 16.15.7 Hazards of nuclear energy 16.15.8 Science today – Energy from seas.
Periods		15	20	16	15
17. Exploring Phenomena	17.1 Magnetism 17.1.1 Discovery of magnets 17.1.2 Magnetic and non magnetic materials 17.1.3 Magnetic poles 17.1.4 Preparation of Magnets Science today – Flying trains 17.2 Light 17.2.1 Sources of light 17.2.2 Shadows 17.2.3 Path of light. 17.2.4 Pinhole camera 17.2.5 Plane mirrors and	15: Light 15.1 Reflection 15.2 Plane Mirror (Right or left) 15.3 Images of spherical mirrors 15.4 Sunlight – seven colors – dispersion & synthesis of colors – Newton’s Disc.	15: Light 15.1. Laws of reflection 15.1.1 Regular and irregular reflections 15.1.2 Multiple reflections 15.1.3 Multiple images 15.2. Refraction (Snell’s law not included). 15.3. Dispersion – using prism 15.4 Total internal reflection 15.5. Human eye – Image formation 15.6. Sound 15.6.1. Sound needs a medium for	17: Sound 17.1 Production of sound 17.2 Propagation of sound 17.3 Longitudinal and Transverse waves 17.4 Reflection of sound 17.4.1 Echo 17.4.2 Reverberation 17.5 Range of hearing 17.6 Application of ultra sound (Sonar, Doppler effect)	17: Magnetic Effect of Electric Current and Light 17.1 Magnetic field and magnetic lines of force 17.2 Magnetic field due to current carrying conductor 17.2.1 Magnetic field due to current carrying Straight conductor 17.2.2 Magnetic field due to current carrying Circular loop 17.3 Force on a current

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
	reflection		propagation 15.6.2. Sound produced by human 15.6.3. Human ear and Hearing 15.6.4. Amplitude, Time period and frequency of vibration 15.6.5 Audible and Inaudible sounds. 15.6.6 Noise 15.6.7 Noise pollution 15.7. Science today – Fiber optics – sending message by light		carrying conductor in a magnetic field 17.3.1 Fleming left hand rule 7.4 Electric motor 7.5 Electromagnetic induction 17.5.1 Faraday’s experiments 7.6 Electric generator 7.7 Light 17.7.1 Reflection of light by Spherical mirrors – image formation and Mirror Formula 17.7.2 Refraction – Laws of refraction. 17.7.3 Refractive index 17.7.4 Refraction by spherical lenses 17.7.5 Image formation by lenses 17.7.6. Lens formula and magnification 17.7.7 Power of lens 17.7.8 Refraction of light through a prism 17.7.9 Dispersion- By a glass prism 17.7.10 Atmospheric refraction 17.7.11 Human eye –

Topic	STANDARD VI	STANDARD VII	STANDARD VIII	STANDARD IX	STANDARD X
					Defects and rectification 17.7.12 Science today – Hubble space telescope
Periods		17	18	11	20
18. Technology	“Naan Paarthen”	“Naan Purindukonden”	“Unakku – Theriyuma?”	Practical and Projects	Practical and Projects