



**Environmental Education
as infused in NCERT Syllabus
For
Classes I to XII
As Per NCF 2005**



**Department of Education in Science and Mathematics
National Council of Educational Research and Training
Sri Aurobindo Marg, New Delhi - 110016**

INTRODUCTION

The present status of Environmental Education (EE) in schools had its genesis in the National Policy of Education (NPE) 1986 (modified in 1992), in which 'Protection of the Environment' is stated as a common core around which a *National Curriculum Framework* (NCF) would be woven. The *National Policy on Education* 1986 emphasized the need to create awareness of environmental concerns by integrating it in the educational process at all stages of education and for all sections of society. Accordingly, the *National Curriculum for Elementary and Secondary Education: A Framework _ 1988* presented the NCERT's view: "The school curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy." In consonance with these documents, Environmental Studies was introduced as a subject at the primary level. The topics related to environment were suitably infused with different science and social science subjects at all school stages. Understanding of the environment in its totality, both natural and social, and their interactive processes, the environmental problems and the ways and means to preserve the environment was one of the General Objectives of Education as per *National Curriculum. Framework 2000*.

Environmental Education Scenario

Primary and upper primary stages:

At the primary stage, in most States/UTs integrated textbooks on environmental studies have been prescribed. In some states environmental concepts have also been integrated into language and mathematics, while in some others EVS has been bifurcated as 'science' and 'society' for which separate textbooks-cum-workbooks have been prescribed. In the NCERT curriculum, the teaching of language and mathematics has been woven around the children's immediate environment in Classes I—II and EE has been reinforced as a component of the Art of Healthy and Productive Living (AHPL). In Classes III-V, separate textbooks for environmental studies have been provided. By and large, the textbooks of science and the social sciences in most States/UTs include environmental concepts. Environmental concepts had been included in the NCERT curricula for the upper primary stage mainly through science and technology.

Secondary stage:

The concepts of EE have been prescribed in the textbooks of most States/UTs through science and the social sciences whether taught as integrated or separate subjects. NCERT textbooks of science and technology and integrated social science include various concepts of EE.

Higher secondary stage;

The majority of the concepts related to EE are found in the textbooks of biology, chemistry, physics, geography, economics, sociology and political science. This is true for NCERT and State/UT curricula. In conclusion, it can be said that EE is a compulsory part of the syllabus in schools throughout the country. EE in schools invariably aims at providing children with knowledge, attitudes and skills so that they are equipped to contribute meaningfully towards the betterment of the environment and accomplish the goal of sustainable development.

Shortcomings:

Despite these major initiatives, there appears to be still very inadequate exposure of the students to their 'habitat'; there is little active learning from the natural and social worlds around them. The prescribed activities may simply be routinely taught as a set material to be memorised through teaching in the classroom instead of being pursued by students on their own with an open mind. Activity-based projects may again be carried out in a routine fashion, sometimes with improper involvement of parents or even commercial agencies. It is clear that we need to recognise and address the challenges posed by these shortcomings as we attempt to forge ahead. This would be difficult to accomplish within the constraints posed by the current framework. Instead, we need to shift to a new paradigm.

Considering the relevance of Environmental Education, as per *National Curriculum Framework 2005* the new syllabii being proposed here aim at generating among young learners an awareness of and sensitivity to the total environment in a holistic manner and the problems associated with it. It would also equip the future custodians of the earth with the requisite knowledge of the total environment, natural and social, the problems associated with it and the necessary skills for solving these in a positive and sustainable manner. The processes and strategies suggested would help develop positive attitudes, social values and strong concern for sustainable development and further improvement of the environment. While learners would appreciate local wisdom through traditions and customs, they would also discover their linkages with both national and global concerns. In effect, the courses would prepare them to initiate and carry on practical initiative at the individual, the group and the community level for solving environmental related problem and moving toward a life of perfect harmony with their social and natural environment.

Main objectives of Environmental Education as infused in different subjects

The main focus of EE should be to expose students to the real-life world, natural and social, in which they live; to enable them to analyse, evaluate, and draw inferences

about problems and concerns related to the environment; to add, where possible, to our understanding of environmental issues; and to promote positive environmental actions in order to facilitate the move towards sustainable development. To achieve these goals, the curriculum may be based on:

- Learning about the environment;
- Learning through the environment;
- Learning for the environment;

SYLLABUS FOR PRIMARY SCHOOL MATHEMATICS

General points for Text Book Writers

We need to encourage the development of a culture of **learning outside the classroom**. If a topic is linked well with experiences, interesting exercises given then conceptual learning of math would continue beyond the 140 periods.

Syllabus for Primary Mathematics

Class I	Class II	Class III	Class IV	Class V
<p>Geometry (10 hrs.) Shapes & Spatial Understanding Develops and uses vocabulary of spatial relationship (Top, Bottom, On, Under, Inside, Outside, Above, Below, Near, Far, Before, After)</p>	<p>3-D and 2-D Shapes Observes objects in the environment and gets a qualitative feel for their geometrical attributes.</p>		<p>Geometry (16 hrs.) Shapes & Spatial Understanding Explores intuitively the area and perimeter of simple shapes.</p> <p>Makes 4 shaped, 5 faced cubes from given nets especially designed for the same.</p> <p>Reads and draws 3-D objects, making use of the conventions used in this. Draws intuitively the plan, elevation and side view of simple objects.</p>	<p>Observes objects in the environment and gets a qualitative feel for their geometrical attributes. Identifies right angles in the environment</p>
<p>Patterns (10 hrs.)</p> <ul style="list-style-type: none"> • Describes sequences of simple patterns found in shapes in the surroundings and in numbers, e.g. stamping activity using fingers and thumb. • Completes a given sequence of simple patterns found in shapes in the surroundings and in numbers. 	<p>Creates block patterns by stamping thumbprints, leaf prints, vegetable prints, etc.</p>	<p>Patterns (6 hrs.) Identifies patterns in his surroundings</p>	<p>Numbers (40 hrs) Numbers and operations Writes multiplication facts Writes tables upto 10x10 Multiplies two and three digit numbers using lattice algorithm and the standard (column) algorithm Divides a given number in various ways such as: by drawing dots by grouping by using multiplication facts, By repeated subtraction. Applies the four operations to life situations.</p>	

Measurement (13 hrs.) Length *Distinguishes between near, far, thin, thick, longer/taller, shorter, high and low. Solids around us *Collects objects from the surroundings having different sizes and shapes like pebbles, boxes, balls, cones, pipes, etc.			Measurement (21 hrs) Solves problems involving length and distances. Estimates length of an object and distance between two given locations.	
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Environmental Studies: Preamble

Introduction: Teaching of Environmental Studies

Contemporary research on how children learn to make sense of the world around them and how pedagogy in primary school can enable them to develop scientific abilities and understanding in consonance with social and environmental concerns has further supported this integrated structure.

NCF 2005 and Objectives of Environmental Studies

The present syllabus is designed to forge an integrated perspective for the primary stage of schooling that draws upon insights from sciences, social studies and Environmental Education. The National Curriculum Framework 2005 indicates some of the objectives of teaching science and social studies at the primary stage as follows:

- to train children to locate and comprehend relationships between the natural, social and cultural environment; to create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces to nurture the curiosity and creativity of the child particularly in relation to the natural environment (including artefacts and people) - to develop an awareness about environmental issues - to engage the child in exploratory and hands-on activities to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc.- to emphasise design and fabrication, estimation and measurement as a prelude to the development of technological and quantitative skills at later stages - to be able to critically address gender concerns and issues of marginalization and oppression with values of equality and justice, and respect for human dignity and rights.

Integrating ‘Subjects’ or Forging a New Understanding?

Thus biologists (if we can use that term to somehow bring together botanists and zoologists!) would naturally propose a study of plants, animals or the human body, whereas physicists would think of sound, light, force and work, while chemists would propose studying forms of matter, properties of substances, etc. The syllabus web moves outward over the three years; it gradually extends the child's understanding of her world, beginning from the immediate ‘self’ to include her family, the neighbourhood, the locality and also the country. Thus by the time



the child reaches Class V, she is able to see her 'self' in the larger context - as part of a community, the country and also, more tacitly, as located in this world. Indeed, in some flights of fancy the syllabus even goads the young child to ride on a spacecraft and leap beyond the earth, into outer space, that may yet not be comprehensible but is certainly fascinating for her. Thus, for instance, the theme on **'Food'** begins in Class III with **'cooking'**, **'eating in the family'**, about what we eat and what others eat, what animals eat, etc. It then moves on in Class IV to how food is grown, what different plants they may have seen, how food reaches us, etc. In Class V children discuss who grows it, the hardships farmers may face, while staying grounded to the reality of our own pangs of hunger or the plight of people who do not get food. In addition, **'when food gets spoilt'** explores spoilage and preservation of food, while changes in food habits and the crops grown are analysed through the experiences of elders/grandparents. Finally **'our mouth – tastes and even digests food'** sees how the saliva makes food taste sweet on chewing, while **'food for plants?'** also introduces the idea of some curious insect eating plants. **'Plants' and 'Animals' as Part of the Theme 'Family and Friends'** 'Plants' and 'Animals' have consciously been included under the theme of **'Family and Friends'** to highlight how humans share a close relationship with them and to also provide a holistic and integrated scientific and social perspective of studying them. Traditionally 'plants' or 'animals' are presented as autonomous categories, seen purely from the perspective of science. Here an attempt is made to locate them in a social and cultural context, and also to see how the lives and livelihoods of some communities, such as the gujjars, musahars or 'pattal'-makers, are closely connected with specific animals or plants. Moreover, in the universe of young children narratives of animals and plants play a significant role, and they can relate well even to the animated characters perceived as 'family and friends'.

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Taking cognisance of the way children think 'plants' are first introduced through the theme on **'Food'** - through what plants children eat, and also through the idea that we may eat the leaves, or the stem, or seeds of different plants. In fact, this comes after a discussion on questions related to 'Which' of the following is food? - red ants, birds' nest, goats' milk, etc?'. This is to sensitise them to the idea that what some of us take to be 'food' may not be so for others; that food is a deeply cultural notion. As discussed above, to allow for a more connected approach 'plants' is a sub-theme under the umbrella of Family and Friends'. Thus in Class III children look at the different **'plants around us'**, at possible changes over time from when their parents were young, and also what things around them are made of plants. They are expected to talk to their parents and other elders around them, so that these discussions can act as scaffolding to their learning. This is also indicated in the activity column of the syllabus. Children in Class III also observe the shapes, colours, aroma, etc to see the diversity of **'leaves in our lives'**, to talk of how plant leaves may be used to eat on, the times of the year when lots of leaves fall to the ground, which may be used to make compost, and also paint different leaf motifs they see on their pots, animals, clothes, walls, etc. In Class IV they look at **'flowers'** and flower sellers, and discuss **'whom trees belong to?'** while in Class V they move on to **'forests and forest people'**, the notion of parks or sanctuaries, and also

'plants that have come from far'. In this way they are enabled to construct a more holistically connected understanding, from a scientific, social, cultural and environmental perspective, that is enriched with an aesthetic and caring appreciation of plants around them. **Our Bodies, Our 'Selves': 'Family and Friends' offer Sensitivity and Sensibility By 'Feeling around with eyes shut'** they explore their senses of touch, smell, etc. - not in isolation of the people or animals they care for - but by trying to identify all those living with them only by touching, hearing or smelling them.

Class III Environmental Studies

Questions	Key Concepts/Issues	Suggested Resources	Suggested Activities
	Family influences - physical characteristics, values and habits, appreciating qualities and skills of family members; family as a support system.	Family members, local knowledge, story/poems on different festivals.	Observation, exploring from elders about extended family, narrating stories/ singing poems related to festivals, writing about any festival, drawing.
1.2 Plants Plants around us How many different kinds of plants do you see around you? What are the differences you notice? What things around you are made of plants? Is there a plant in your area that was not there when your grandparents were young? Do you know of some plants which do not grow around you, say things that we eat and not grown around you?	Exploring children's ideas about a 'plant'. Plant diversity; size, where they grow, shape, colour, aroma, etc.; dependence on plants for everyday life. Introduction of new plants / crops and changes observed by elders over time. Plants and the climate/environment.	Child's daily life experience bserveation, information from grandparents/ elders, a sample/picture of a plant, which is unusual in the local surroundings.	Observation of different plants around, compare and classification based on simple characters; Discussion about things made of plants, pencil prints of barks, leaf prints
Leaves in our lives What different kinds of [eaves do you see? Do you use plant leaves to eat on? In what other ways are leaves used?	Leaf diversity - colour, shape, texture, aroma, etc. Seasonal shedding of leaves; compost from leaves.	Child's daily life experience, observation, a story on a compost pit.	Observation, collection of different leaves, smelling different plant leaves, discussion, visit to a nearby compost pit, decorating the classroom with leaf motifs

<p>Is there some time of the year when lots of leaves fall to the ground? Are they burnt? Have you seen a compost pit?</p> <p>What leaf motifs do you find on clothes, pots, walls, animals, etc.?</p> <p>Do you decorate your house with leaves on some occasions?</p>			
<p>21</p> <p>1.3. Animals</p> <p>Animals small and big</p> <p>Which are the smallest and the biggest animals you have seen?</p> <p>Which have you only heard about? Which animals have tails?</p> <p>How many legs?</p>	<p>Exploring children's ideas of an</p>		<p>Observation of diversity of animals around you, listing, Discussion about what they eat, where they live relative size of animals they have seen, pictures in books, animals heard about. Drawing pictures of favourite animals.</p>
<p>Some creepy crawlies -and flyers too</p> <p>What different kinds of small crawling animals do you know of?</p> <p>Where and from what does each of them hide?</p> <p>Which insects can crawl and also fly?</p> <p>Which ones bite us? Can flies make us ill?</p> <p>Why does a spider make a web?</p>	<p>Exploring children's ideas of crawling animals, flyers and insects.</p>	<p>Child's daily life experience, observation, stories/ poems on insects, flyers and crawling animals (NBT)</p>	<p>Observation, of ants, flies, spiders, crickets, cockroaches, earthworms, lizards and other animals. Discussion about them, where they live, what they eat, insect bites (wasp) etc, Drawing some of them</p>

<p>Birds</p> <p>Which are the birds you see around your area?</p> <p>Do they like some trees more than others? What do they eat? Can you recognize birds by their feathers?</p> <p>What are the different sounds they make » are they saying something to each other? Are there some birds that come from other places?</p> <p>Do you feed any birds or place water for them?</p>	<p>Exploring children's ideas of birds their living places, eating habits, common features like feathers and sounds produced by them. Feeding birds.</p>	<p>Child's daily life experience, observation, stories/ poems on birds (NBT)</p>	<p>Drawings of birds; mimicking different neck movements and sounds of birds, collecting feathers.</p>
<p>1.4 Work and Play Games we play</p> <p>What games do I play? Did my grandparents play the same games? Are these indoor/ outdoor?</p>	<p>Leisure; games in school and outside, past and present; for some play is work</p>	<p>Traditional and local games; folk toys.</p>	<p>Listing, classifying indoor and outdoor Games</p>
<p>2. FOOD</p> <p>Foods from plants and animals</p> <p>Which of these is food - red ants, bird's nests, snakes, bananas, goat's milk etc.?</p> <p>What plants do you eat - what parts of the plant?</p> <p>What food do we take from animals?</p>	<p>Appreciation of cultural diversity in food; basic ideas about various plant used as food; food Tom animals.</p>		<p>Listing and discussing about food we do or do not eat; tabulating food we take from different plants and animals. Observing and drawing different parts of plants eaten.</p>

<p>Cooking What do you eat that is not cooked? What is eaten only when cooked? How do you cook food? What do you cook it on? What are the different kinds of vessels used for cooking? What are they made of? Is water used in all forms of cooking? Which food is cooked without using water? How?</p>	<p>Food may be eaten raw or cooked - steamed, boiled, baked, fried etc.; Different fuels, types of stoves; Types of vessels used in cooking, different shapes (regional/traditional), different materials etc.</p>	<p>Songs/poems on food or lack of food; local knowledge about what is edible: photographs.</p>	<p>Listing raw and cooked food; discussion on cooking methods/materials, etc; survey to find out the types of fuels/vessels used; drawing various utensils; historical time line tracing what in the kitchen has changed and roughly when. ?</p>
<p>Eating in the family Do all members of the family eat the same food in your family? Who eats more? Who eats last in your family? Who buys the food and what is bought from the market? Who cooks the food in your family? What do babies have for food? When do babies start eating and what do they eat other than milk? etc.</p>	<p>Cooking and gender/caste roles in the family; Food for the baby, significance of milk.</p>		<p>Observation and asking adults, discussion. Listing of food items bought from the market/grown at home</p>
<p>What animals eat Do animals eat the same things? What do different animals eat? Do you feed the animals around you - what? What do they take from your house even when not fed?</p>	<p>Food of domestic and wild animals; care of domestic animals</p>		<p>Observing and listing different animals and their feeding habits, ; Discussing food given to animals,; observing animals being fed, keeping food out and observing animals come and feed.;</p>
<p>3. SHELTER Houses and houses Have you seen - a house on stilts, a tent, a flat on the tenth floor, a house on wheels or a house on a boat?</p>	<p>Some unusual houses, a narrative and a discussion about why such houses are built. Different types of houses Need for shelter, need for living together</p>		<p>Pictures of different types of houses; easily available materials for model making</p>

<p>Decorating and cleaning our shelter How do you decorate your shelter? Do you draw designs on your walls/floor or decorate with leaves/flowers/other objects? How do you keep your house clean? Do you also help in cleaning? Who mops and sweeps it? Where do you throw the Garbage? Do you have any problems living in your house during rains, summer or winter? Have you seen houses with sloping roofs? Why are they made sloping?</p>	<p>My houses, Houses/shelters are decorated in different ways in different cultures; Need for shelter to provide protection from heat, cold, rain and problems faced. Need to share housework. Garbage disposal</p>	<p>Illustrations of designs/motifs used for decoration of the house</p>	<p>Draw a picture of your house. Draw the various kinds of designs/motifs used to decorate walls/floors of houses.</p>
<p>My family and other animals Who all live with you? Which animals live with you - which are the biggest and the smallest animals living in your house? From where do they get their food? Where in your house do these animals live? Which of them are seen only at night?</p>	<p>Family members; pets and other animals, insects, rodents, etc. Food for the pets and other animals. Some are seen only at night.</p>		<p>Discussion and sharing of experiences and knowledge. Drawings of insects, rodents; pets and other domestic animals.</p>
<p>Mapping my neighbourhood How big is your school? What kind of a building is it? Can you draw a picture of your school and your classroom? Do you know your way around your neighbourhood? Can we explain to someone how to reach the post office or the bus stand from our house?</p>	<p>Neighbourhood, mapping and representation in two dimensions. Directions.</p>		<p>Estimating distances, marking location of places and drawing/mapping from different perspectives, like from the top, from the front etc, Draw a map of the route from our house to the nearest shop.</p>

<p>4. Water Water for my family What are the main sources of water in your locality? Who fetches the water? From how far?</p> <p>Do all the people in your locality use the same source of water? Are some people not allowed to take water from where you take it? From where do you get water? Does it look clean enough for drinking?</p>	<p>Local sources of water; uses of water; gender roles; distance estimates; social discrimination; clean water for drinking</p>	<p>Child's daily life experience, local knowledge</p>	<p>Listing the sources of water, Exploring by asking questions from elders or people around, Discussion.</p>
<p>Do animals and plants need water? What happens if plants and animals do not get water - how do you see that a plant or animal is thirsty? Do all animals/plants need the same amount of water? Which plants/animals need the least?</p>	<p>Water for plants and animals</p>	<p>Library resource-brief information about the camel, cactus along with their pictures.</p>	<p>Reading, Discussion; Comparison of a well watered and a wilting plant.</p>
<p>Water shortage When is it difficult to get water? Are there some people in your area who always face water shortage? What would happen if we had no water? Have you seen water being wasted -low? How can we avoid it? Do you reuse water?</p>	<p>Water scarcity, wastage and recycling, water harvesting</p>	<p>Newspaper clippings about water shortage/water being wasted,</p>	<p>Poster making/ writing activity in groups with a message of saving water</p>
<p>Water is our lives Which of your daily activities use water?</p> <p>Do you and other you know wash your hands and feet before you enter the house? Why do you think this is done?</p> <p>Can you describe the scene of rainy day-with details about birds, animals, plants and yourself?</p>	<p>Use of water in different activities; cultural expressions about water/ rain/ river; observations related to rain and the response of plants animals</p>	<p>Library resources, observations related to daily life. Songs about water/river/rain?</p>	<p>Enacting different activities that utilize water/a rainy day, listing the activities in which water is used, signing rain/river/water songs/poems together in the class.</p>

<p>Storing water How do you store water In your home?</p> <p>Do you collect rainwater - how? How much water do you store every day? About how much do you use for drinking or bathing? In what kinds of containers do you store water for drinking/ washing/or for animals? What are the containers made of? If the water is at the same level in a narrow and a broad container does it mean they contain the same amount of water?</p>	<p>Measurement of volume in terms of non-standard units such as buckets, pots, etc. Estimates of quantities used for different domestic activities; safe handling of water. Containers made of different shapes and materials to store water for different purposes;</p>		
<p>5. TRAVEL Ways to travel</p> <p>How do we go to school? How do we go to other places you visit?</p> <p>How many different ways of travel do we know of?</p>	<p>Different modes of transport; short distance, long distance, newer ways of travelling.</p>	<p>Pictures of modes of transport;</p>	<p>Collect pictures of different modes of transport; classify them into different types of transport; enact a train journey/railway station, Observations of activities at the station like loading, weighing, washing trains, signalling, selling tea, level crossing etc.</p>
<p>27 6. THINGS WE MAKE AND DO Pottery</p> <p>What kinds of pots do we see around us? What containers are used to store grain?</p> <p>What kinds of containers did people make long, long back with rings of clay- when they did not have a potter's wheel? Can you make such pots and dry them in the sun - how long do you think these will last? How does the potter bake them?</p>	<p>To meet basic needs human beings make things; need natural resources, creativity; have changed the way we live An idea of the earliest pots made for storage of grain -when there was no potters wheel. The experience of making such pots with clay; drying and the need to bake them for greater strength.</p>	<p>Narratives and illustrations of pots and containers made in early times - with rings of clay (as in the Social Studies book by Eklavya)</p>	<p>Making pots of clay; also with rings; with different types of clay; drying in the sun; talking to potters or brick makers to find out how these are burnt/baked in furnaces Making different ornaments etc. with clay</p>

<p>Textiles</p> <p>In how many different ways can you wear a long cloth that is not stitched? How many kinds of saris or lungis have you seen worn by people from different parts of the country?</p> <p>How many different colours do we know of - how many new ones can we create?</p> <p>What are fast colours and what problems do we face when colours run? How do we make our own vegetable block prints and tie and dye?</p>	<p>Diversity In types of clothing we wear; even with unstitched clothing. Colours and design are used in textiles; scope or creativity; vegetable dyes</p>	<p>Some idea of mixing colours to make new ones; fast colours and colours that run; tie and dye; block printing and making our own blocks with vegetables. Samples of blocks, dyes.</p>	<p>Activity to wear/drape a dupatta or longn cloth in different styles to emulate what different people do and also to create their own designs. Play with colours and colour mixing; Using dyes to dye cloth; making blocks with potato or ladies fingers for printing on paper.</p>
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Class IV Environmental sciences

<p>1.3. Animals Animals and their friends Which animals like to move around in groups?</p> <p>Which animals are shy and do not come near you? Have you seen animals playing with or riding on different animals?</p>	<p>Herds; group behaviour; animal-human interaction</p>	<p>Observation, child's daily life experience, story on animals moving in groups, visuals</p>	
<p>Who is attracted to flowers? Why do bees/butterflies come to flowers? How do people collect the honey from bee hives?</p>	<p>Honey from flowers; bee hive and basic idea of honey collection</p>	<p>Film; description Illustrated narratives/discussion with beekeepers on the process of honey collection.</p>	<p>Observation of flowers and the insects that visit them, drawing the flowers, insects, discussion on colour, fragrance.</p>
<p>Long ears or short? Which animals have ears? Which animals have hair on their body?</p>	<p>Some animals have external ears. They also have hair.</p>	<p>Child's observation, information/ description on and illustrations about animals.</p>	<p>Listing and classification of animals with and without ears; with and without hair; drawing them; feeling them;</p>
<p>1.4. Plants Roots of plants Do all plants need water to grow? Which part of the plant absorbs water from the soil? When you tug at grass, why does it not come out easily? Why do plants/trees not get uprooted when there is a strong wind? Which roots are eaten by people during famine when nothing else grows?</p>	<p>Plants need water; roots absorb water and hold it to the ground. Roots eaten normally eaten by people like carrots, radish, sweet potato, and during famine. Aerial roots of some plants</p>	<p>Child's observation, information about the roots eaten by people; pictures/specimens of roots.</p>	<p>Observation, collection, drawing of roots of different types, Observing trees/plants whose roots are affected by activities like construction/paving/plastering. Observation and discussion about swinging on <i>pipal/hargad</i> aerial roots</p>
<p>Flowers Which plants around us have flowers? Do they come only at some times of</p>	<p>Flowering plants; seasons; observation of buds blossoming into</p>	<p>Child's observation, stories/ poems about flowers, a visit to a</p>	<p>Drawing flower motifs for clothes, Observing the flowers and buds, noting</p>

<p>the year? How is the bud different from the flower? What are the different kinds of flowers we have seen - shapes, colours, petals, aroma, etc? What do we use flowers for? Do you eat any flowers? Have you seen flower motifs painted on clothes, walls, floors, pots, animals? Who sells flowers in our area? Where do these come from? How are flowers sold - for how much?</p>	<p>flowers; different shapes, colours, petals, aroma, etc. Flowers used in everyday life, festivals, etc. Floral motifs and designs on clothes, animals, pots, walls, etc. Knowing the local flower seller; some idea of the local unit of measurement (by cubit, fixed garland, each stem, etc) and cost</p>	<p>garden. Talking to flower sellers, gardeners, etc</p>	<p>similarities and differences; observing/smelling and feeling different flowers.</p>
<p>Whom do trees belong to? Which plants/trees around you are looked after by people — by whom? Which are not? Whom do they belong to? Who eats the fruit of trees that grow wild?</p>	<p>Neighbourhood and its plants; wild and domestic plants; Fruits eaten by people living in forests.</p>	<p>Local knowledge, information about domestic and wild plants (NBT books).</p>	<p>Listing of some common trees in the neighbourhood; discussion about ownership of trees; fruits that are not eaten by us.</p>
<p>2. FOOD How we get our food How does food reach us? Who grows it? How you seen vegetables and fruits growing? How you seen plants of rice/ wheat/ dal etc? What are the spices you know of? Whichspices can we recognize by smelling or tasting</p>	<p>From field to mandi - from market to house; grown by farmers; fruit trees, vegetables, cereals, pulses, oil seeds; Spices</p>	<p>Discussion with a vegetable seller/retailer in the mandi, / truck driver who transports food items</p>	<p>Listing plants children know that provide them food; bringing samples; common spices, observing and drawing samples, recognizing them by smell and taste.</p>

<p>3. SHELTER Houses then and now Do you live in houses similar to ones your grandparents lived in? Are houses now made of similar materials as was used then? What are the differences?</p>	<p>House change over time; rural and urban differences, multistoreyed houses along with slums in cities.</p>	<p>Discussion with elders in the family. Visit to any old building in the area; changes in the construction of houses with time; houses in villages and cities.</p>	<p>Making models of houses; collection of materials used to make houses. Drawing pictures of old and new buildings.</p>
<p>Garbage? What do you do with waste in your house? Where do it throw it? Do you reuse any waste materials? Who takes away the garbage?</p>	<p>Waste materials, waste in our houses, urban/rural waste. Reduce garbage.</p>		<p>Listing things thrown away as garbage, waste. Discussion on reduction of waste</p>
<p>Where animals live Do animals live in shelters? Which animals live in water? On land? Underground? Are there any that we see only at night? Where are they during the day? Do we know of animals that make their own shelter?</p>	<p>Diversity in animal habitat and shelters. Some structures like webs have other purposes.</p>	<p>Stories/pictures of habitats and shelters animals use or make</p>	<p>Discussion, listing of animals with respect to their habitat and shelter.; making birds nests with scrap materials, making caves, rat holes etc in mud/sand pits.</p>
<p>When birds make nests When and why do birds make their shelter? Do all birds make nests? Where do different birds nest - when do they fly away? With what different materials do birds make their nests</p>	<p>Birds make nests for laying eggs. Nesting habits of different birds vary. Different materials are used for nests.</p>		<p>Observation of a bird's nest and drawing pictures. Songs and poems; dance and movement to simulate bird flight</p>
<p>4. WATER Water fit for drinking What are the major natural sources of water in your area? Is the water fit for drinking – do you clean it at home? Do you know how dirty water can make you ill? Why do we not drink seawater? How is slat separated from seawater?</p>	<p>Natural sources; inland water and sea water; potable water; diarrhoea and other common water borne diseases safe handling of water, purification of water.</p>	<p>Health personnel of the local area, library resource.</p>	<p>Discussion with the elders/health personnel about pollution of natural sources of water and its effects; demonstration/ group activity of simple methods of water purification; separation of salt from saline water.</p>

<p>Water sources Where do you see large amounts of water in your neighbourhood? Is it a tank/pond/ canal/ river /dam? What do men/ women/ children/ animals do with the water there? Is it used for bathing/washing? Who bathes/washes there and who does not? How can we ensure that this water is not made dirty? Do you find factories/people dumping garbage or harmful materials in rivers or seas? Are some animals also facing problems due to what we do to the rivers or seas?</p>	<p>Reservoirs, canals, dams etc.; Different public activities at water bodies; protection of water bodies. Water as a scarce resource and the struggle for acquiring it (those who can exploit resources by digging deeper and deeper wells).</p>	<p>Film, photographs of dams/ canals/ tanks/ ponds etc., local knowledge. Narrative on the recent struggle of the panchayat's against Coke in Plachimada, Kerala</p>	<p>Visit to the natural sources of water in the local area and observing what uses the water is put to. Discussion, and writing letters/making posters highlighting the misuse of the water body.</p>
<p>Our river/sea Which is the river closest to our locality? Do we find any change in the water flow in different seasons? Which are the big rivers we know of? Have you seen the sea? Which are the animals found in the sea/river?</p>	<p>Rivers and seas; seasonal change in water flow; animals in the sea/river. Water pollution and harmful effects on animals</p>	<p>Local knowledge, Story on the lines of the SCERT, Delhi Class VI Civics - lesson called Yamuna</p>	<p>Drawing/Painting/Make a model of a water body in the neighbourhood (using scrap materials) as well as the animals found in the river/sea.</p>
<p>Water vanishes when heated? Why do puddles dry? In which season do wet clothes dry easily? When do they dry with difficulty? Have you seen and wondered where water droplets on the outside of a cold glass of water came from?</p>	<p>Basic processes of evaporation and condensation</p>	<p>Child's daily observations and class room discussions</p>	<p>Activity on water drying up from a wet cloth or dish or water in different conditions such as sunlight and shade;</p>
<p>5. TRAVEL Animals for transport Have you traveled on a tonga / horse carriage? How is it different from travelling on a bus? Are the horses well looked after? Have you seen a horseshoe? Why is it used? What materials have you seen being transported using animals? Are there any special occasions when you ride on animals?</p>	<p>Use of animals for transport; sensitivity towards animals</p>		<p>Enacting instances of animals used for transport and people riding them.</p>

<p>Travel to another place Do you know anyone who has traveled very far from your village/city? Why did they go so far? What are they doing there? How do they travel when they visit your family?</p>	<p>Different land forms, languages, clothing, food habits, some idea of another country (only through a story/imaginary narrative)</p>		
<p>6. THINGS WE MAKE AND DO Building materials and tools How are bricks made? What tools have you seen being used for making a wall or a house? Is there a bridge to cross while coming to school? What kinds of bridges have we seen and where? How many kinds of bridges can we make?</p>	<p>Process of making involves raw materials, tools, labour, energy; changes over time in these; has changed environment too. Materials and tools used for different skills of people at engaged in a construction activity.</p>	<p>Narratives and pictures of different bridges children cross, on the lines of the book -Going to school in India(by Lisa Heydlauff Penguin); of the process of construction, use of tools and materials. Making bricks; drawing and talking about different tools. Observation of different bridges; making bridges.</p>	<p>Observing, drawing and describing different bridges and how people make their own local bridges from ropes, bamboo and logs of wood. Making toy bridges in school.</p>

Class V: Environmental Studies

<p>Clean work - dirty work? Can you list ten different types of work that people do for you. In this list what work is seen as dirty and what is seen as clean? What would happen if there were no one to - clean our streets/our home/clear the garbage?</p>			
<p>1.3 Animals How animals find their food? If you leave some food outside your house do some animals take it away? How do they find it? Do these animals also hear/speak/ see/smell/ eat/ sleep?</p>	<p>Sense organs; Comparison with humans - activities such as eating sleeping etc</p>	<p>Information about animals' senses and other functions. Narratives about animals such as ants, bees, dogs, birds, snakes etc giving ideas about their senses.</p>	<p>Observation of animals to study their response sound, food, light and other stimuli</p>

<p>What we take from animals? What animal products do we use for clothing,</p>	<p>Animal products used by us.</p>	<p>Child's daily life experience, information about products we obtain</p>	<p>Listing and drawing of items made from animal products</p>
<p>Why is the tiger in danger? Why do people kill wild animals? Which are the animals that are poached?</p>	<p>Protection of wild life; selling of animal parts</p>		<p>Discussion, reading, poster making activity with a message to save wild</p>
<p>People who depend on animals Do you know people who catch/trap/hunt/entertain using animals? Have you seen how snake charmers/gujjars depend on animals? What do you understand by cruelty to animals? Do you think a snake charmer is cruel to the snake? Have you seen scenes of hunting in rock paintings or on ancient seals?</p>	<p>Communities dependent upon animals; hunters restricted to smaller spaces; changing patterns of wild and domestic animals. To be sensitive about cruelty to animals: <i>realize</i> that people who depend on animals for their livelihood are not necessarily cruel to them. Basic idea of prehistoric hunters and the wild animals seen at that time.</p>	<p>Library resources; illustrations of pre-historic hunting scenes (Bhimbetka); Narrative of gujjars' or snake charmers' relationships with animals. Child's observation: an story/narrative about an animal and its caretaker, e.g, mahouth/tonga wala Films/pictures of shooting, skins (tiger) of animals.</p>	<p>Discussion on people whose livelihood depend on animals; drawing; Discussion on people teasing/troubling animals at the zoo/ other places.</p>
<p>1.4 Plants Forests and forest people Have you seen or heard about a forest? How do people live in forests? How is their life threatened by forests being cut? What kinds of foods do they collect from the plants there? What leaves are used for eating on? Do your parents remember places with trees/forests where there are none today? Why were the trees cut and what is there today?</p>	<p>Tribal life; effects of deforestation; communities dependent on forest produce.g. 'pattals', bamboo products, etc.</p>	<p>Information about tribal life, communities dependent on forest produce, effects of deforestation.</p>	<p>Exploring from parents, reading, and discussion.; tracing tree trunks;</p>
<p>Protected trees Have you heard of a park/sanctuary? Who looks after it? Does anybody own it? Have you seen a place where trees are worshipped or protected by the villagers?</p>	<p>Public/private ownership of trees/forests. Sacred groves; people's movements to protect their forests.</p>	<p>Story of the Chipko movement and the women's role in protecting trees.</p>	<p>Enactment of chipko andolan; poster- 'save trees'; survey and identify any 'green belt' in your neighbourhood.</p>

<p>Plants that have come from far Does tea come from a plant? Where did people first grow tea and what does the plant look like? Does it grow only in some places/climates? What did people drink when there was no tea in India?</p>	Plants from different countries.	Song/poem from Chakmak: "Alu, mirchi. chaiji; Kaun kahan seayeji" Story about the Chinar tree	Local knowledge, reading, and discussion, reciting the poem together; making tea
<p>2. FOOD When food gets spoilt How does food spoil? How do we know that food is spoilt? Which food spoil sooner than others? What can we do to prevent food from getting spoilt? What do we do to keep it fresh during travel? Why do we need to preserve food? Do you leave food in your plate?</p>	Spoilage and wastage of food, Preservation of food, drying and pickling;	Sharing family experiences Interaction with a person involved with food production/preservation;	Keep some bread, other food for a few days - see how they spoil
<p>Who produces the food we eat? Do you know of different: kinds of farmers? Do all farmers own their land? How do farmers get the seeds they plant every year? What else besides seeds is required for a crop to grow?</p>	On different types of farmers. Hardships faced by subsistence farming, including seasonal migration. Need for irrigation, fertilizers.	Farmers' narratives -Could take one example from Punjab and the other from AP. Story of a child missing school because of his/her family's seasonal migration. Family members. Visit to a farm.	Study germination of seeds, experiment to determine conditions suitable for germination; Observations in any farm
<p>What did people grow earlier? Did your grandparents or any elderly person eat the same food you eat today? Do all of us eat the same kind of food? Why do we eat different kind of food?</p>	Changing food habits, changing crops grown in some areas. Different food habits in different places/cultures	Information on food from different places.	Collection of samples or pictures of food from different places/cultures.
<p>When people do not get food Do you know of times when many people do not get enough food to eat? Have you seen where extra grain is stored? How do you know when you are hungry? Do you know of people who get ill because they do not have enough to eat?</p>	Hunger, famine (as both a natural and man-made phenomenon); grain being spoilt in storage; nutrition deficiency diseases	Print material on different calamities; Narrative of the Bengal famine as a manmade calamity; TV news bulletins etc.	Collection of pictures related to natural calamities; discussion on affects.

<p>Food for plants? What do plants need for food? Do you know of any plants that eat insects? What do animals eat? Do all animals eat the same food? Do animals eat other animals?</p>	<p>Water, manure, air for plants; Insectivorous plants e.g. pitcher plant, Venus fly trap; basic idea of food chain/web.</p>	<p>Pictures/visuals of insectivorous plants</p>	<p>Observations and discussion on food for plants; making a model of a food chain/web</p>
<p>3. SHELTER Why different houses Why do you have different kind of houses in different places? Different houses in the same place?</p>	<p>Variation in shelter: regional difference, difference due to climate and materials available, economic status etc.</p>	<p>Different houses in different climates and regions</p>	<p>Making models of houses; collection of materials used to make houses in different places.</p>
<p>A shelter for everyone? Does everyone have a shelter to live in? Why do people live together in villages, hamlets, colonies, and neighbourhoods?</p>	<p>Need for living close to others, the idea of neighbourhoods. Need for sharing resources and spaces, division of spaces.</p>	<p>Pictures of villages, colonies etc.</p>	<p>Write and draw the area you live in, find out about people who work for everybody</p>
<p>Ants live in colonies? Do you know how bees/ants live together in colonies?</p>	<p>Ant or bee colony, social behaviour in insects</p>	<p>A case study of social organization in bees/ants</p>	<p>Observations and drawings of ant colonies, different types of ants</p>
<p>Times of emergency Have you heard of houses being damaged by floods/earthquakes/ cyclones/fires/storms/lightening ? What would it have felt like? Who are the people who come to help? What can you do to help others before the doctor comes? Where can we look for help at such times? Who runs such institutions?</p>		<p>Disaster and trauma of losing one's home; community help; Hospitals, police stations, ambulance, shelters, fire station, first aid</p>	<p>Discussion, finding out about the hospital, police station, fire station, etc.</p>
<p>4. WATER Water from where in earlier times? From where and how far did your grandparents get water? How far do you have to go for water? What are underground wells/"baolis"? Do you still see them being used? Have you seen a 'piaao'?</p>	<p>Estimates of distance measurement; changes in sources and water availability over time; community service especially for long-distance travellers.</p>	<p>Illustrations, story of a 'baoli' stepwell</p>	<p>Enquiry from grand parents/ other elders; drawing, model making of a step well.</p>

<p>Water flow From where do farmers get water to grow crops? Do all crops need the same amount of water? Have you seen water flowing upwards? What are the different ways in which you have seen water being lifted? How is flowing water used to grind grain?</p>	<p>Sources for irrigation; different quantities of water for different crops; Different methods of lifting water; the use of a waterwheel</p>	<p>Farmer/ any local person who works in fields, a plant/ crop.</p>	<p>Interaction with a farmer, visit to a field, making water wheel., activity with water wheel.</p>
<p>Plants and animals in water What kinds of animals and plants live in water? Are there weeds that are covering your pond/ lake/river? Can you classify all the animals you see around you to show which ones live in water and which live on land?</p>	<p>Animals and plant life in water; classification in terms of similarities and differences</p>	<p>Weeds of different kinds; pictures of plants and animals living in different habitats.</p>	<p>Listing and classification; drawing of water body.</p>
<p>Mosquitoes and malaria Is there any stagnant water in your locality? Do you find more mosquitoes in stagnant water? Is there any way to reduce the mosquitoes in water? Have you heard of malaria? In what season do you find more people getting ill with malaria?</p>	<p>Stagnant and flowing water; mosquitoes and malaria</p>	<p>Health worker or a doctor. Newspaper articles on malaria etc.</p>	<p>Interaction with a community doctor; observation of site of stagnant/ flowing water.</p>
<p>5. TRAVEL Petrol or diesel Do all vehicles need petrol to run on? What other fuels do you know that are used for vehicles? What do trains run on? In the past what did they run on? What do tractors use as fuel? For what other purposes are petrol and diesel used? Find out the cost of a litre of petrol/diesel in your area? Do all vehicles run an equal distance on a litre of fuel?</p>	<p>Fuels used in vehicles; Fuel is costly. Non-renewable source.</p>		<p>Discussion, finding out different fuels used, comparison of cost of petrol and diesel.</p>
<p>Rough and tough Have you seen or been to a mountain? How and why do you think people make such difficult trips? How do you think they train for it?</p>			
<p>Ride on a spacecraft What all do you see in the sky - at day time? And at night? How many of the things you see in the sky are man-made? Have you heard of people traveling in a space craft?</p>			
<p>Oldest Buildings</p>			<p>Drawing pictures of the building or the monument in your nagbhourhood or memory or imagination.</p>

Syllabus for Language Teaching

1. About Language, Language Learning and Multilinguality

1.0 Introduction

Language is not only a means of communication; it is also a medium through which most of our knowledge is acquired; it is a system that to a great extent structures the reality around us for representing it in our minds. Whether we see nature or society, we see it, to a large extent, in terms of our language.

Most children learn not just one but several languages before they come to school. The number of words a child knows before she comes to school is over 5000 or so. Multilingualism is thus constitutive of our identity. Even the so-called 'monolingual' in a remote village often controls a verbal repertoire that equips her to function adequately over a large number of communicative encounters. We should also note that several recent studies have effectively demonstrated the positive relationship of multilingualism with cognitive growth, social tolerance, divergent thinking and scholastic achievement.

From the point of view of the science of language, all languages including what we call 'dialects', 'tribal', 'mixed' or 'impure' languages are equal; languages thrive in each other's company even when each one has its own quality and genius. In a multilingual class, it is absolutely imperative that every child's language is respected and becomes a part of the teaching strategies.

1.4 Language, Literature and Aesthetics

Poetry, prose and drama are potent sources not only of refining our literary sensibility but also of enriching our aesthetic life, enhancing our synaesthetic abilities and enormously

Improving our linguistic abilities, particularly reading comprehension and written articulation, Literature also includes jokes, irony, fantasy, story, parody and parable, which pervade our every day discourse.

As Marx pointed out, a language education policy cannot afford to ignore the fictional, narrative, metaphysical or rhetorical elements of language and treat it only as a useful vehicle or tool for achieving some worldly gains. A considered appreciation of the aesthetic aspects of language would inevitably lead to a preference for linguistic vitality and creativity and help us to eliminate our obsession with purity and correctness. Such processes would ensure space for dialogue and negotiation rather than monologue and aggression.

1.5 Language and Society

Even though children appear to be bom with an innate language faculty, individual languages are acquired in specific socio-cultural and political contexts. Every child learns what to say, to whom and where. As Labov has shown, languages are inherently variable, and different styles tend to be used in different contexts by different age groups. The variability in human linguistic behaviour is not thus randomly distributed but links systems of language, communication, thought and knowledge. As Aurorin points out, 'language cannot exist and develop outside

society. It is important to realize that languages are not 'discrete objects out there*', almost frozen in time and space, both physical and mental. They are actually constantly changing, fluid systems of behaviour which human beings acquire and change to define themselves and the world around them.

1.9 Objectives of Language Teaching

Since most children arrive in school with full-blown linguistic systems, the teaching of languages must have very specific objectives in the school curriculum. One of the major objectives of language teaching is to equip learners with the ability to read and write with understanding and to make them autonomous learners. Our effort is to sustain and enhance the degree of bilingualism and multilinguistic awareness that children have. We would also like to equip learners with such politeness strategies and powers of persuasion that they are able to negotiate all communicative encounters with tolerance and dignity.

We now plead for a more holistic perspective on language proficiency. After all, when we are *Speaking*, we are also simultaneously *listening* and when we are *Writing*, we are also *Reading* in a variety of ways. And then there are many situations (e.g. friends reading a play together and taking notes for its production) in which all the skills in conjunction with a variety of other cognitive abilities are used together. We also need to appreciate the fact that the same text may have several different readings and different children may articulate their responses to a text in different voices.

g. Creativity: In a language classroom, a student should get ample space to develop her imagination and creativity. Classroom ethos and teacher-student relationship build confidence in the latter to use her creativity in text transaction and activities uninhibitedly.

h. Sensitivity: Language classrooms can be an excellent reference point for familiarizing students with our rich culture, heritage and aspects of our contemporary life. Language classroom and texts have a lot of scope to make students sensitive towards surroundings, people and the nation.

1.10 Some Pedagogical Proposals

Contemporary research on language acquisition has put the learner at the centre of language learning. One major implication of putting the learner at the centre of the teaching-learning enterprise is to treat her mother tongues with respect and as substantial cognitive resources. A constructive use of children's mother tongues in the classroom does not simply mean using the interlingual translation extensively; it means that the whole language teaching pedagogy is located in multilinguality. Languages and cultures of children become powerful resources for the acquisition of the target language. There is a translinguistic perspective to poetry, drama, short story, novel and gram.

ENGLISH, HINDI, UMBU

The ten core components identified in the National Policy of Education must be suitably integrated in school curriculum. These components, which will cut across all subject areas, should be reinforced in the whole range of inputs (print and non-print, formal and informal) for teaching/learning at various stages of school education. Since all contemporary concerns and issues cannot be included in the curriculum as separate subjects of study, some emerging concerns like environmental issues, conservation of resources, population concerns, disaster management, forestry, animals and plants, human rights, safety norms and sustainable development should be suitably incorporated in the course content. Course materials should also draw upon the following concerns in an integrated manner:

1. Self, Family, Home, Friends and Pets
2. Neighbourhoods and Community at large
3. The Nation - diversity (socio-cultural, religious and ethnic, as well as linguistic), heritage (myths/legends/folktales)
4. The World - India's neighbours and other countries (their cultures, literature and customs)
5. Adventure and Imagination
6. Sports
7. Issues relating to Adolescence
8. Peace and Harmony
9. Travel and Tourism
10. Art and Culture
11. Health and Reproductive health

What is to be taught and how? Input-rich communicational environments are essential, for language learning. Inputs include textbooks, learner-chosen texts, class libraries, parallel books and materials in more than one language, media support (learner magazines/newspaper columns, radio/audio cassettes), and authentic materials, themes/sub-themes should be in conformity with the learners' immediate environment physical, social and cultural. These should lead to an understanding and practice of the values enshrined in the Constitution of India, including the Fundamental Rights and Duties. The various sub-themes to be included are personal relationships, the neighbourhood, the larger community, the nation, the world, etc. In addition to textual materials, various other inputs can be brought into the language classroom, which include cards, charts, advertisements, texts produced by children, brochures, pamphlets, radio, T.V. news, etc.

Science syllabus for classes VI to X

Themes and Format

The world of the Living, How things work. Moving things, people and ideas, Natural phenomena and Natural resources. While these run all through, in the higher classes there is a consolidation of content which leads to some themes being absent, e.g. Food from class X. In the primary classes, the 'science' content appears as part of EVS; and the themes are largely based on the children's immediate surroundings and

needs: Food, Water, Shelter etc. In order to maintain some continuity between classes V and VI, these should naturally continue into the seven themes listed above. For example, the Water theme evolves into Natural resources (in which water continues to be a sub theme) as the child's horizon gradually expands. Similarly, Shelter evolves into Habitat, which is subsumed in the world of the Living. Such considerations also suggest how the content under specific themes could be structured. Thus clothing, a basic human need, forms the starting point for the study of Materials. It will be noted that this yields a structure which is different from that based on disciplinary considerations, in which materials are viewed purely from the perspective of chemistry, rather than from the viewpoint of the child. Our attempt to put ourselves in the place of the child leads to 'motion', 'transport' and 'communication' being treated together as parts of a single theme: Moving things, people and ideas. More generally, the choice of themes - and sub themes - reflects the thrust towards weakening disciplinary boundaries that is one of the central concerns of NCF 2005.

Perhaps the most unusual feature of the syllabus is that it starts with questions rather than concepts. These are key questions, which are meant to provide points of entry for the child to start the process of thinking. A few are actually children's queries ("How do clouds form?"),

SCIENCE CLASS VI

Sub-theme	Questions	Key concepts	Resources	Activities/ Processes
1 FOOD Sources of food	What are the various sources of our food? What do other animals eat?	Plant parts and animal products as sources of food; herbivores, carnivores, omnivores	Examples of food from different parts of plants and of food from animals sources.	preparing a chart on food habits of animals and food culture of different regions of India.
Component s of food	What is our food made up of? Why do we eat a variety of food?	Carbohydrates, fats, proteins, vitamins, minerals, fibres, their sources and significance for human health; balanced diet; diseases and disabilities due to food deficiencies	Mid Day Meal; Charts, pictures/films of children suffering from food deficiencies and disabilities.	Studying the variety of food in different regions in India; preparing a menu of balanced diet in the context of the diversity of foods eaten in different parts of the country. Classifying foods according to food components; test for starch, sugars, proteins and fats.

Cleaning food	How do we separate the grains after harvesting the wheat /rice crop?	Threshing, winnowing, hand picking, sedimentation, and filtration.	Talking to some elders about practices after harvesting the crop; kit materials.	Discussion on threshing, winnowing, handpicking; experiments on sedimentation, filtration. Separating mixture of salt and sand.
2 MATERIALS Materials of daily use	What are our clothes made of? How did people manage when there were no clothes?	Different types of cloth materials - cotton, wool, silk and synthetics. Development of clothing materials	Sharing of prior knowledge with parents and community. Archaeological and historical account	Whole class discussion. Simple activities to distinguish among different types of cloth
	Are some of our clothes made of materials obtained from plants? In what kinds of places do these plants grow? Which parts of the plants are used for making clothes?	Plant fibre, especially cotton and jute; production of cotton, jute and other locally available plant fibres; types of soil required / for the growth of different fibrous plants	Sharing of prior knowledge with parents and community.	Whole class discussion. Field survey/ collecting information on locally available plant fibres (coconut, silk cotton, etc.)
Different kinds of materials	What kinds of things do we see around us?	Grouping things on the basis of common properties	Materials, kit items.	Collecting and grouping things on the basis of gross properties e.g. roughness, lustre, transparency, solubility, sinking/floating using prior knowledge, through experiments.
3 THE WORLD OF THE LIVING Things around us	Are all things around us living? What is the difference between living and non-living? Are all living things similar? Do all living things move? ? Where do plants and animals live? Can we grow plants in he dark?	Living/nonliving characteristics; habitat; biotic, abiotic (light, temperature, water, air, soil, fire)	Recollection of diversity of living organisms and the habitat where they live	Listing of things around us, listing of characteristics after making observations say on size, colour, shape etc., categorisation; observations on habitat; observing germination of seeds, also observing under dark conditions; growth and development of domestic animals, hatching of birds' eggs etc., developing drawing skills.

The habitat of the living	How does habitat affect plants and animals? How do fish live in water?	Habitat varies — aquatic, deserts, mountains etc - plants and animals show adaptation; other plant part modifications like tendrils, thorns etc. Animals in deserts and water	Potted plants or seeds, pots, etc; thermometer, any water plants, any xerophytic plants, Information on desert and aquatic plants and animals	Listing the diverse set of living organisms around us; prepare herbarium specimens of different leaves, plants; studying modifications in plants and animals; observing how different environmental factors (water availability, temperature) affect living organisms;
Plants -form and function	What is the structure and function of various parts of the plants -stem, leaf and roots? How do different flowers differ from one another? How does one study flowers?	Morphological structure and function of root, stem and leaves. Structure of the flower, differences	Plants, flowers, blade, hand lens.	Studying plant parts - types of stems, roots, leaves, seeds; experiment to show conduction by stem, activity to show anchorage by roots, absorption by roots. Study of any flower, counting number of parts, names of parts, cutting sections of ovary to observe ovules
Animals - form and function	What is inside our bodies? How do animals move? Do all animals have bones in their bodies? How do fishes move? And birds fly? What about snakes, snails, earthworms?	Structure and functions of the animal body; Human skeletal system, some other animals e-g- fish, bird, cockroach, snail	Observation of nature; model of skeleton, X-rays of arms or legs, chest, hips, jaws, vertebral column (could be given in the textbook)	Activities to study X-rays, find out the direction in which joints bend, feel the ribs, backbone etc. Observation/ discussion on movement and skeletal system in other animals
6 NATURAL PHENOMENA Rain, thunder and lightning	Where does rain come from? How do clouds form?	Evaporation and condensation, water in different states. Water cycle	Everyday experience; kit items	Condensation on outside of a glass containing cold water; activity of boiling water and condensation of steam on a spoon. Simple model of water cycle. Discussion on three states of water.

Light	Which are the things we can see through?	Classification of various materials in terms of transparent, translucent and opaque.	Previous experience, candle/torch/lamp, white paper, cardboard box, black paper.	Discussion, observation; looking across different materials at a source of light.
7 NATURAL RESOURCES Importance of water	What will happen to soil, people, domestic animals, rivers, ponds and plants and animals if it does not rain this year? What will happen to soil, people, domestic animals, plants and animals living in rivers and ponds, if it rains heavily?	Importance of water, dependence of the living on water. Droughts and floods	Experience, newspaper reports	Estimation of water used by a family in one day, one month, one year. Difference between need and availability. Discussion. Activity: plant growth in normal, deficient and excess water conditions
Importance of air	Why do earthworms come out of the soil when it rains?	Some animals and plants live in water; some live on land and some live in upper layers of soil; but all need air to breathe/to respire.	Experience	Discussion
Waste	Do you throw away fruit and vegetable peels and cuttings? Can these be reused? If we dump them anywhere, will it harm the surroundings? What if we throw them in plastic bags?	Waste; recycling of waste products; things that rot and things that don't. Rotting is supported by animals/animal and plant products.	Observation and experience	Survey of solid waste generation by households; estimation of waste accumulated (by a house/village/ colony etc.) in a day, in a year; discussion on 'what is waste'; Activity to show that materials rot in soil, this is affected by wrapping in plastics.

SCIENCE CLASS VII

Sub-theme	Questions	Key concepts	Resources	Activities/ Processes
1 FOOD Food from where	How do plants get their food?	Autotrophic and heterotrophic nutrition; parasites, saprophytes; photosynthesis	Coleus or any other plant with variegated leaves, alcohol, iodine solution, kit materials.	Need for light, green leaf for photosynthesis, looking at any saprophyte/parasite and noting differences from a green plant.
Utilization of food	How do plants and animals utilize their food?	Types of nutrition, nutrition in amoeba and human beings, Digestive system -human, ruminants; types of teeth; link with transport and respiration	Model of human teeth, charts of alimentary canal, types of nutrition etc., chart and model of amoeba. The story of the stomach with a hole.	Effect of saliva on starch, permanent slide of Amoeba. Role play with children
3 THE WORLD OF THE LIVING Surroundings affect the living	Why are nights cooler? How does having winters and summers affect soil? Are all soils similar? Can we make a pot with sand? Is soil similar when you dig into the ground? What happens to water when it falls on the cemented/bare	Climate, soil types, soil profile, absorption of water in soil, suitability for crops, adaptation of animals to different climates	Data on earth, sun - size, distance etc, daily changes in temperature, humidity from the newspaper, sunrise, sunset etc.	Graph for daily changes in temperature, day length, humidity etc.; texture of various soils by wetting and rolling; absorption / percolation of water in different soils, which soil can hold more water.
The breath of life	Why do we/animals breathe? Do plants also breathe? Do they also respire? How do plants/animals live in water?	Respiration in plants and animals	Lime water, germinating seeds, kit materials.	Experiment to show plants and animals respire; rate of breathing; what do we breathe out? What do plants 'breathe' out? Respiration in seeds; heat release due to respiration. Anaerobic respiration, root respiration

Movement of Substances	How does water move in plants? How is food transported in plants? Why do animals drink water? Why do we sweat? Why and how is there blood in all parts of the body? Why is blood red? Do all animals have blood? What is there in urine?	Herbs, shrubs, trees; Transport of food and water in plants; circulatory and excretion system in animals; sweating.	Twig, stain; improvised stethoscope; plastic bags, plants, egg, sugar, salt, starch, Benedicts solution, Ag NO ₃ solution.	Translocation of water in stems, demonstration of transpiration, measurement of pulse rate, heartbeat; after exercise etc. Discussion on dialysis, importance; experiment on dialysis using egg membrane.
Multiplication in plants	Why are some plant parts like potato, onion swollen — are they of any use to the plants? What is the function of flowers? How are fruits and seeds formed? How are they dispersed?	Vegetative, asexual and sexual reproduction in plants, pollination -cross, self pollination; pollinators, fertilization, fruit, seed	<i>Bryophyllum</i> leaves, potato, onion etc.; yeast powder, sugar	Study of tuber, corm, bulb etc; budding in yeast; T.S./L.S. ovaries, w.m.pollen grains; comparison of wind pollinated and insect pollinated flowers; observing fruit and seed development in some plants; collection and discussion of fruits/seeds dispersed by different means.
6 NATURAL Rain, thunder and lightning	What causes storms? What are the effects of storms? Why are roofs blown off?	High-speed winds and heavy rainfall have disastrous consequences for human and other life	Experience; newspaper reports. Narratives/stories	Making wind speed and wind direction indicators. Activity to show "lift" due to moving air Discussion on effects of storms and possible safety means
7 NATURAL RESOURCES Scarcity of water	Where and how do you get water for your domestic needs? Is it enough? Is there enough water for agricultural needs? What happens to plants when there is not enough water for plants? Where does a plant go when it dies?	Water exists in various forms in nature. Scarcity of water and its effect on life	Experience; media reports; case material	Discussions. Case study of people living in conditions of extreme scarcity of water, how they use water in a judicious way. Projects exploring various kinds of water resources that exist in nature in different regions in India; variations of water availability in different regions.

Forest products	What are the products we get from forests? Do other animals also benefit from forests? What will happen if forests disappear?	Interdependence of plants and animals in forests. Forests contribute to purification of air and water	Case material on forests.	Case study of forests
Waste Management	Where does dirty water from your house go? Have you seen a drain? Does the water stand in it sometimes? Does this have any harmful effect?	Sewage; need for drainage / sewer systems that are closed	Observation and experience; photographs	Survey of the neighbourhood, identifying locations with open drains, stagnant water, and possible contamination of ground water by sewage. Tracing the route of sewage in your building, and trying to understand whether there are any problems in

SCIENCE CLASS VIII

Sub-theme	Questions	Key concepts	Resources	Activities/ Processes
1 FOOD 22 Crop production	Crop production: How are different food crops produced? What are the various foods we get from animal sources?	Crop production: Soil preparation, selection of seeds, sowing, applying fertilizers, irrigation, weeding, harvesting and storage; nitrogen fixation, nitrogen cycle;	Interaction and discussion with local men and women farmers about farming and farm practices; visit to cold storage, go-downs; visit to any farm/ nursery/ garden;	Preparing herbarium specimens of some crop plants; collection of some seeds etc; preparing a table/chart on different irrigation practices and sources of water in different parts of India; looking at roots of any legume crop for nodules, hand section of nodules

Microorganisms	What living organisms do we see under a microscope in a drop of water? What helps make curd? How does food go bad? How do we preserve food?	Micro organisms - useful and harmful	Microscope, kit materials; information about techniques of food preservation	Making a lens with a bulb; Observation of drop of water, curd, other sources, bread mould, orange mould under the microscope: experiment showing fermentation of dough - increase in volume (using yeast) — collect gas in balloon, test in lime water.
3 THE WORLD OF THE LIVING Why conserve	What are reserve forests/sanctuaries etc? How do we keep track of our plants and animals? How do we know that some species are in danger of disappearing? What would happen if you continuously cut trees?	Conservation of biodiversity/wild life/plants; zoos, sanctuaries, forest reserves etc. flora, fauna endangered species, red data book; endemic species, migration.	Films on wild life, TV programmes, visit to zoo/forest area/sanctuaries etc.; case study with information on disappearing tigers; data on endemic and endangered species from MEF, Govt. of India, NGOs	Discussion on whether we find as many diverse plants /animals in a 'well kept area' like a park or cultivated land, as compared to any area left alone. Discussion on depletion of wild life, why it happens, on poaching, economics.
VI NATURAL PHENOMENA 26 Rain, thunder and lightning	What is lightning? What safety measures should we take against lightning strikes?	Clouds carry electric charge. Positive and negative charges, attraction and repulsion. Principle of lightning conductor	Articles on clouds and lightning; kit items	Discussion on sparks. Experiments with comb and paper to show positive and negative charge. Discussion on lightning conductor
VII NATURAL RESOURCES 20 Man's intervention in phenomena of nature	What do we do with wood? What if we had no wood? What will happen if we go on cutting trees/grass without limit? What do we do with coal and petroleum? Can we create coal and petroleum artificially?	Consequences of deforestation: scarcity of products for humans and other living beings, change in physical properties of soil, reduced rainfall. Reforestation; recycling of petroleum.	Data and narratives on deforestation and on movements to protect forests Narration and discussions. Project- Recycling of paper. Background materials, charts	

		paper. Formation of coal and petroleum in nature, (fossil fuels?) Consequences of over extraction of coal and petroleum.	etc.	Discussion
Pollution of air and water	What are the various activities by human beings that make air impure? Does clear, transparent water indicate purity?	Water & air are increasingly getting polluted and therefore become scarce for use. Biological and chemical contamination of water; effect of impure water on soil & living beings; effect of soil containing excess of fertilizers & insecticides on water resources. Potable water	Description of some specific examples of extremely polluted rivers.	Case study and discussion. Purification of water by physical and chemical methods including using sunlight. Discussion on other methods of water purification

SCIENCE CLASS IX

Sub-theme	Questions	Key concepts	Resources	Activities/ Process
1FOOD Higher yields	What do we do to get higher yields in our farms?	Plant and animal breeding and selection for quality improvement, use of fertilizers, manures; protection from pests and diseases; organic farming.	Visit to any fish/bee/dairy/pig etc farms; data showing harmful effects of insecticides; process for the preparation of compost, vermi-	Collection of weeds found in fields of different crops; collection of diseased crops; Discussion and studying eomposting/vermi-composting 8

3 THE WORLD OF THE LIVING Biological Diversity	How do the various plants around us differ from each other? How are they similar? What about animals? How are they similar to and different from each other?	Diversity of plants and animals -basic issues in scientific naming, Basis of classification, Hierarchy of categories/ groups, Major groups of plants (salient features) (Bacteria, Thallophyta Bryophyta, Pteridophyta, Gymnosperms and Angiosperms). Major groups of animals (salient features) (Non-chordates up to phyla and Chordates up to classes).	Specimens of some animals, and plants not easily observable around you	Discussion on diversity and the characteristics associated with any group 14
What is the living being made up of?	What are we made up of? What are the different parts of our body? the absence of air? Why is flame seen when substances burn? Can substances burn without flame? Why does a matchstick kept in the blue part of the flame not burn? Why is a red coating formed on the zinc rod when it is kept in copper sulphate solution? What is the material of the coating?	Cell as a basic unit of life; Prokaryotic and eukaryotic cells, multi cellular organisms; cell	Permanent slides, model of the human body dishes with and without covers, container that can be filled with water, cotton wool, etc.	Observation of model of human body to learn about levels of organization - tissue, organ, oxidation and reduction
3 THE WORLD OF THE LIVING Our Environment	What will happen if we bury different materials in the soil? What will happen if we kill all insects? Some of us eat meat; some do not -what about animals?	Our Environment: Environmental problems, what can we do? Bio degradable, non-biodegradable. Ozone depletion.	Discussion on food habits of animals, Finding out the various waste materials produced and their disposal in different parts of the country	Activity of burying different materials in the soil and studying periodically what happens; construction of food web using models, classification of some common plants and animals as consumers etc. 8

7 NATURAL RESOURCES 25 Conservation of Natural	How can we contribute to protect environment in our locality? What are the major global environmental issues of direct relevance to us? What are the steps expected on the part of local administration to maintain balances in nature in your region? How can we help?	Management of natural resources. Conservation and judicious use of and wild life, coal and petroleum conservation. People's participation. Chipko movement. Legal perspectives in conservation and international scenario.	Articles/stories on conservation; Posters on environmental awareness. Case studies on Chipko movement; CNG use.	Case studies with focus on commercial activities exploiting natural resources. Effect of these on varies cycles in natures.
The regional environment	How does the construction of big dams affect the life of the people and the regional environment? Are rivers, lakes, forests and wild life safe in your area?	Big dams: advantages and limitations; alternatives if any. Water harvesting. Sustainability of natural resources.	Case study material on dams Resource material on water harvesting	Case studies with focus on issues of construction of dams and related phenomena (actual / probable). Debates on issues involved
Sources of energy	What are the various sources of energy we use? Are any of these sources limited? Are there reasons to prefer some of them over others?	Different forms of energy, leading to different sources for human use: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear energy Renewable versus non renewable sources.	Experience; print material on various sources of energy; materials to make a solar heater	Discussion. Making models and charts in groups. Making a solar heater/cooker

Social Science Syllabus from class VI to X

The Social Sciences have been a part of the school curriculum before Class VI as part of the teaching of Environmental Studies. The revised EVS syllabus has attempted to draw the child's attention in Classes III-V to the broad span of time, space and the life in society, integrating this with the way in which she or he has come to see and understand the world around them.

SOCIAL SCIENCE SYLLABI FOR UPPER PRIMARY STAGE

Unit I: History: Our Pasts

Objectives:

Encourage the students to imagine what it would be like to live in the society that was being discussed, or how a child of the time would have experienced the events being talked of.

CLASS VI: OUR PASTS – I

THEMES	OBJECTIVES
The Earliest Societies (a) Hunting and gathering as a way of life, its implications. (b) Introduction to stone tools and their use. (c) Case study: the Deccan.	(a) Appreciate the skills and knowledge of hunter-gatherers. (b) Identify stone artefacts as archaeological evidence, making deductions from them.
The First Farmers and Herders Implications of farming and herding. Archaeological evidence for crops, animals house, tools, pottery, burials, etc. Case study: the northwest and northeast.	(a) Appreciate the diversity of early domestication. (b) Identify the material culture generated by people in relatively stable settlements. (c) Understand strategies for analysing these.

CLASS VII: OUR PASTS II

THEMES	OBJECTIVES
Where, When and How: Terms used to describe the subcontinent and its regions with a map. (b) An outlining of the time frame and major developments. A brief discussion on sources.	(a) Familiarize the student with the changing names of the land. (b) Discuss broad historical trends. (c) Give examples of the kinds of sources that historians use for studying this period. e.g. building, chronicles, paintings, coins, inscriptions, documents, music, literature.

CLASS VIII: OUR PASTS – III

THEMES	OBJECTIVES
Crafts and Industries: (a) Decline of handicrafts in the nineteenth century. (b) Brief reference to growth of industries in the twentieth century. <i>Case-studies: textiles.</i>	(a) Familiarize students with the processes of de-industrialization and industrialization. (b) Give an idea of the technologies of weaving and the lives of weavers.

Unit II: Geography

RATIONALE

The course at this stage comprises study of the earth as the habitat of humankind, study of environment, resources and development at different scales local, regional/national and the world.

OBJECTIVES

The major objectives of the course are to: 1. develop an understanding about the earth as the habitat of humankind and other forms of life.

Class VI: The Earth - Our Habitat

THEMES	OBJECTIVES
Planet: Earth in the solar system.	To understand the unique place of the earth in the solar system, which provides ideal condition for all forms of life, including human beings;
Globe: the model of the earth, latitudes and longitudes; motions of the earth rotation and revolution.	To understand two motions of the earth and their effects;
Four realms of the earth: lithosphere, hydrosphere, atmosphere and biosphere: continents & oceans. Major relief features of the earth.	To understand interrelationship of the realms of the earth; To understand major landforms of the earth;
India in the world: physiographic divisions of India - mountains, plateaus and plains; climate; natural vegetation and wild life; need for their conservation.	To comprehend broad physiographic divisions of India; To describe the influence of land, climate, vegetation and wildlife on human life; To appreciate the need for conserving natural vegetation and wild life.

Project/Activity

Make a chart showing distance of the planets from the sun. Draw a sketch of your school and locate the following: (i) the principal's room (ii) your classroom (iii) playground (iv) library. Show the major wildlife sanctuaries of your region on a political map of India. Arrange for a trip to a wildlife sanctuary or zoo.

CLASS VI: Our Environment

THEMES	OBJECTIVES
Environment in its totality: natural and human environment.	To understand the environment in its totality including various components both natural and human;

<p>Natural Environment: land - interior of the earth, rocks and minerals; earth movements and major land forms.(One case study related with earthquake to be introduced)</p>	<p>To explain the components of natural environment; To appreciate the interdependence of these components and their importance in our life To appreciate and develop sensitivity towards environments;</p>
<p>Air - composition, structure of the atmosphere, elements of weather and climate - temperature, pressure, moisture and wind. (One case study related with cyclones to be introduced)</p>	<p>To understand about atmosphere and its elements;</p>
<p>Water - fresh and saline, distribution of major water bodies, ocean waters and their circulation. (One case study related with tsunami to be introduced)</p>	<p>To know about distribution of water on the earth;</p>
<p>Natural vegetation and wild life.</p>	<p>To find out the nature of diverse flora and fauna</p>
<p>Human Environment: settlement, transport and communication.</p>	<p>To explain the relationship between natural environment and human habitation; To appreciate the need of transport and communication for development of the community; To be familiar with the new developments making today's world a global society;</p>
<p>Human - Environment Interaction: Case Studies - life in desert regions - Sahara and Ladakh; life in tropical and subtropical regions - Amazon and Ganga-Brahmaputra; life in temperate regions -Prairies and Veldt.</p>	<p>To understand the complex inter relationship of human and natural environment; To compare life in one's own surrounding with life of other environmental settings; To appreciate the cultural differences existing in the world which is an outcome of interaction, between human beings and their environment;</p>
<p>Project/Activity Collect stories / find out about changes that took place in their areas (identify how things/ surroundings change overnight and why). Discuss the topic "How weather forecast helps us" in your class after assigning the role of a farmer, a hawker, a pilot of an aeroplane, a captain of ship, a fisherman and an engineer of a river dam to different students. Write observations about local area house types, settlements, transport, communication and vegetation.</p>	

CLASS VIII: Resources and Development

THEMES	OBJECTIVES
Resources: resources and their types -natural and human.	To know the meaning of resources their variety, location and distribution;
Natural resources: their distribution, utilization and conservation, land and soil, water, natural vegetation, wildlife, mineral and power resources (world patterns with special reference to India).	To understand the importance of resources in our life; To appreciate the judicious use of resources for sustainable development; To develop awareness towards resources conservation and take initiative towards conservation process;
Agriculture: types of farming, major crops, food crops, fibres, beverages, agricultural development - two case studies - one from India and the other from a developed country/a farm in the US/ Netherlands/ Australia.	Learn about various types of farming and agricultural development in two different regions.
Industries: classification of industries base on size, raw material, ownership; major industries and distribution; infrastructure and development. Iron and Steel (a comparative study of Jamshedpur and a centre in USA e.g. Detroit). Textile Industry (Ahmedabad and Osaka). Information Technology (Bangalore and Silicon Valley).	To understand important forms of manufacturing industries
Human Resources - composition, population change, distribution and density.	To understand the role of human resources in development of nation's economy.

Project/Activity

Observe and report about local agricultural practices, crops grown/ manufacturing industries. Collect information regarding some endangered plants and animal species of India. Visit to an industry / local agricultural farm. Prepare a chart showing difference between life style of farmers in the developed countries and India on basis of pictures collected from magazines, newspapers and the internet.

CLASS VI

Overall Theme: DIVERSITY AND INTERDEPENDENCE

The idea of government is introduced at this grade and then elaborated upon through a discussion of the types of government at the local level, as well as different aspects of their functioning. Through focusing chapters on concrete, though narrativised, examples of land administration in the rural context and sanitation services in the urban one, the attempt is to have the child gain an experiential understanding of the ways in which local government functions.

THEMES	OBJECTIVES
SECTION 2 Urban Local Government - municipal corporation elections, decision making structures - the provision of water and the work of the municipal corporation - citizens protests to get their grievances addressed	To enable students to: understand the intricacies involved in the local administration's provision of water.

CLASS VII

Overall Theme: DEMOCRACY AND EQUALITY

UNIT 2: State Government SECTION 2 Its Functioning Through one example: land reform/irrigation/education/ water/ health discuss. <ul style="list-style-type: none">• The nature of the role played by the government - regarding resources and services.• Factors involved in distribution of resources /services.• Access of localities and communities to resources/services.	
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The Social Sciences' Syllabus for Secondary Stage

Introduction

At the secondary stage, Social Sciences helps the learners in understanding the environment in it's totality and developing a broader perspective and an empirical, reasonable and humane outlook.

Subject: History

Overall Theme for Class IX & X: India and the Contemporary World

Class IX

INDIA AND THE CONTEMPORARY WORLD – I

THEMES	OBJECTIVES
<p>Unit II: Economies and Livelihoods</p> <p>5. Forest society and colonialism:</p> <p>(a) Relationship between forests and livelihoods.</p> <p>(b) Changes in forest societies under colonialism. Case studies: focus on two forest movements one in colonial India (Bastar) and one in Indonesia.</p> <p>6. Farmers and peasants:</p> <p>(a) Histories of the emergence of different forms of farming and peasant societies.</p> <p>(b) Changes within rural economies in the modern world. Case studies: focus on contrasting forms of rural change and different forms of rural societies (expansion of large-scale wheat and cotton farming in USA, rural economy and the Agricultural Revolution in England, and small peasant production in colonial India: Opium production in Bengal) developments within pastoral societies in different places.</p> <p>Unit III: Culture, identity and Society</p> <p>8. Clothes and cultures.</p> <p>(a) A short history of changes in clothing.</p> <p>(b) Debates over clothing in colonial India.</p> <p>(c) Swadeshi and the movement for Khadi</p>	<p>Look at the impact of colonialism on forest societies, and the implication of scientific forestry.</p> <p>Discuss the social and cultural world of forest communities through the study of specific revolts. Understand how oral traditions can be used to explore tribal revolts. Show the different processes through which agrarian transformation may occur in the modern world. Understand how agricultural systems in India are different from that in other countries. □ Familiarize students with the idea that large-scale farming, small-scale production, shifting agriculture operate on different principles and have different histories.</p> <p>Show how clothing has a history, and how it is linked to questions of cultural identity, Discuss how clothing has been the focus of intense social battles.</p>

CLASS X

INDIA AND THE CONTEMPORARY WORLD – II

THEMES	OBJECTIVES
<p>Unit II: Economics and livelihoods:</p> <p>4. Industrialization 1850s-1980s:</p> <p>(a) Contrast between the form of industrialization in Britain and India.</p> <p>(b) Relationship between handicrafts and industrial production, formal and informal sectors.</p> <p>(c) Livelihood of workers. Case studies: Britain and India</p>	<p>Discuss two different pattern of industrialization, one in the imperial country and another within a colony. Show the relationship between different sectors of production.</p>

Subject: Geography

Objectives

The major objectives of the course are to: 4. Judicious utilisation of resources as well as the need for the conservation of the natural environment. 5. Inculcate a critical appreciation for conservation and environmental concerns. 6. Appreciate the rights of local communities in relation to their environment.

CLASS IX

Theme: India – Land and the People

THEMES	OBJECTIVES
Climate: factors influencing the climate; monsoon - its characteristics, rainfall and temperature distribution; seasons; climate and human life. (One case study to be introduced related with natural disasters)	To identify the various factors influencing the climate and explain the climatic variation of our country and its impact on the life of the people; To explain the importance and unifying role of monsoons;
Drainage: major rivers and tributaries, lakes and seas, role of rivers in the economy, pollution of rivers, measures to control river pollution.	To understand the river systems of the country and explain the role of rivers in the evolution of human society;
Natural Vegetation: vegetation types, distribution as well as altitudinal variation, need for conservation and various measures. Wildlife: major species, their distribution, need for conservation and various measures.	To find out the nature of diverse flora and fauna as well as their distribution; To develop concern about the need to protect the bio-diversity of our country;
Population; size, distribution, age-sex composition, population change-migration as a determinant of population change, literacy, health, occupational structure and national population policy: adolescents as under-served population group with special needs.	To analyse the uneven nature of population distribution and show concern about the large size of our population; To understand the various occupations of people and explain various factors of population change; To explain various dimensions of national policy and understand the needs of adolescents as underserved group.

Project/Activity

Learners may identify songs, dances, festivals and special food preparations associated with certain seasons in their particular region, and whether they have some commonality with other regions of India. D Collection of material by learners on the flora and fauna of the region in which their school is situated. It should include a list of endangered species of the region and also information regarding efforts being made to save them.

Posters

River pollution
Depletion of forests and ecological imbalance.

CLASS X**Theme: India – Resources and their Development**

THEMES	OBJECTIVES
Resources: Types- natural and human; Need for resource planning. Natural Resources: land as a resource, soil formation, types and distribution; changing land-use pattern; land degradation and conservation measures.	To understand the value of resources and the need for their judicious utilization and conservation;
Forest and wildlife resources: types and distribution, depletion of flora and fauna; conservation and protection of forests and wildlife.	To understand the importance of forests and wildlife in our environment as well as develop concern towards depletion of resources;
Agriculture: types of farming, major crops, cropping pattern, technological and institutional reforms; their impact; contribution of Agriculture to national economy - employment and output, food security, impact of globalisation, agriculture in national economy;	To identify various types of farming and discuss the various farming methods; To describe the spatial distribution of major crops as well as understand the relationship between rainfall regimes and cropping pattern; To explain various government policies for institutional as well as technological reforms since independence; To understand the importance of
Water resources: sources, distribution, utilisation, multi-purpose projects, water scarcity, need for conservation and management, rainwater harvesting. (One case study to be introduced)	To understand the importance of water as a resource as well as develop awareness towards its judicious use and conservation;
Mineral Resources: types of minerals, distribution, use and economic importance of minerals, conservation.	To discuss various types of minerals as well as their uneven nature of distribution and explain the need for their judicious utilisation;
Power Resources: types of power resources — conventional and non-conventional, distribution and utilization, and conservation.	To discuss various types of conventional and non-conventional resources and their utilization
Manufacturing Industries: Types, spatial distribution, contribution to industries to the national economy, industrial pollution and degradation of environment, measures to control degradation. (One case study to be introduced)	To discuss the importance of industries in the national economy as well as understand the regional disparities which resulted due to concentration of industries in some areas; To discuss the need for a planned industrial development and debate over the role of government towards sustainable development

Transport, communication and trade	To explain the importance of transport and communication in the ever shrinking world; To understand the role of trade in the economic development of a country and analyse the changing.
<p>Project / Activity</p> <ul style="list-style-type: none"> Learners may collect photographs of typical rural houses, and clothing of people from different regions of India and examine whether they reflect any relationship with the climatic conditions and relief of the area. Learners may write a brief report on various irrigation practices in the village and the change in cropping pattern in the last decade. <p>Posters</p> <ul style="list-style-type: none"> Pollution of water in the locality. Depletion of forests and the greenhouse effect. 	

Syllabus for Electives at XI & XII CHEMISTRY

Salient Features of the present syllabus are thus:

Attempt has been made to see discipline of Chemistry does not remain only the science of facts but becomes related to modern applications in the world around us. With this background, the Chemistry curriculum at the higher secondary stage attempts to: Inculcate values of honesty, integrity, cooperation, concern for life and preservation of the environment; Equip students to face challenges related to health, nutrition, environment, population, whether, industries and agriculture.

Chemistry Syllabus Class XI THEORY

Unit XIV: Environmental Chemistry

(Periods 6)

Environmental pollution - air, water and soil pollution, chemical reactions in atmosphere, smogs, major atmospheric pollutants; acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming - pollution due to industrial wastes; green chemistry as an alternative tool for reducing pollution, strategy for control of environmental pollution.

PRACTICALS C. Experiments related to pH change

(Periods 6)

a) Any one of the following experiments: Determination of pH of some solutions obtained from fruit juices, solutions of known and varied concentrations of acids, bases and salts using pH paper or universal indicator, o Comparing the pH of

solutions of strong and weak acid of same concentration, o Study the pH change in the titration of a strong acid with a strong base using universal indicator.

b) Study of pH change by common-ion effect in case of weak acids and weak bases. Scientific investigations involving laboratory testing and collecting information from

A Few suggested Projects

- Checking the bacterial contamination in drinking water by testing sulphide ions.
- Study of the methods of purification of water. D Testing the hardness, presence of iron, fluoride, chloride etc. depending upon the regional variation in drinking water and the study of causes of presences of these ions above permissible limit (if any) Investigation of the foaming capacity of different washing soaps and the effect of addition of sodium on them. Study of the acidity of different samples of the tea leaves.
- Determination of the rate of evaporation of different liquids. Study of the effect of acids and bases on the tensile strength of fibers. Analysis of fruit and vegetable juices for their acidity.

Chemistry Syllabus for Class XII

Unit X: Haloalkanes and Haloarenes

Uses and environmental effects of -- dichloromethane, trichloromethane, tetrochloromethane, iodoform, freons, DDT.

Unit XV: Polymers

(Periods 8)

Classification - natural and synthetic, methods of polymerization (addition and condensation), copolymerization. Some important polymers: natural and synthetic like polythene, nylon, polyesters, bakelite, rubber.

Unit XVI; Chemistry is everyday lite

(Periods 8)

1. Chemicals in medicines analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamin.es. 2. Chemicals in food - preservatives, artificial sweetening agents. 3.Cleansing agents - soaps and detergents, cleansing action.

PRACTICALS

E, Chromatography

i) Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of R_f values.

I. Study of carbohydrates, fats and proteins in pure form and detection of their presence in given food stuffs.

PROJECT

A Few suggested Projects

- Study of presence of oxalate ions in guava fruit at different stages of ripening. G Study of quantity of casein present in different samples of milk. Q Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- Study of the effect of potassium bisulphate as food preservative under various conditions (temperature, concentration, time etc).
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice etc.
- Extraction of essential oils present in *Saunf* (aniseed), *Ajwain* (carum), *Illaichi* (cardamom).

Physics

Salient Features

Emphasis on Physics-related technological/industrial aspects to cope up with changing demand of society committed to the use of Physics, technology and informatics. Expose the learners to different processes used in Physics-related industrial and technological applications; **P**

Physics Syllabus

Class XI

Unit VI: Gravitation

Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite, Geo-stationary satellites.

Unit VII: Properties of Bulk Matter

Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes). Effect of gravity on fluid pressure. Heat, temperature, thermal expansion; specific heat - calorimetry; change of state - latent heat, Heat transfer - conduction, convection and radiation, thermal conductivity, Newton's law of cooling.

Unit VIII: Thermodynamics (Periods 12)

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics. Second law of thermodynamics: reversible and irreversible processes. Heat engines and refrigerators.

Unit IX; Behaviour of Perfect Gas and Kinetic Theory (Periods 8)

Equation of state of a perfect gas, work done on compressing a gas. Kinetic theory of gases — assumptions, concept of pressure. Kinetic energy and temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy

(statement only) and application to specific heats of gases; concept of mean free path, Avogadro's number.

Practicals

SECTION A

8. To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination by plotting graph between force and $\sin\theta$.

Activities

5. To study the variation in the range of a jet. of water with the angle of projection.

SECTION B

Experiments

4. To determine the surface tension of water by capillary rise method. 6. To study the relationship between the temperature of a hot body and time by plotting a cooling curve. 9. To determine specific heat of a given (i), solid (ii). liquid, by method of mixtures.

Activities

4. To study the effect of detergent on surface tension by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.

Physics syllabus

Class XII

Theory

Unit IV: Electromagnetic Induction and Alternating Currents

AC generator and transformer.

Unit V: Electromagnetic waves

Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves. Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, x-rays, gamma rays) including elementary facts about their uses.

Unit VI- Optics

Scattering of light - blue colour of the sky and reddish appearance of the sun at sunrise and sunset.

Practical

SECTION B

Activities

1. To study effect of intensity of light (by varying distance of the source) on an L.D.R.

Suggested Investigatory Projects

4. To compare effectiveness of different materials as insulators of heat. 8. To study infra-red radiations emitted by different sources using photo-transistor.
9. To compare effectiveness of different materials as absorbers of sound.

XI - XII BIOLOGY COURSE

The revised syllabus stresses the connection of the study of Biology to real life problems - use of biological discoveries/innovations in everyday life - in

environment, industry, medicine, health and agriculture. The syllabus also takes up issues pertaining to environment, health and other ethical issues that arise with any interference of human beings in the natural processes, which have great relevance from the societal point of view. A discussion on these in the prescribed syllabus would help tackle prevalent misconceptions and empower the student to play a rational, responsible and informed role in society.

BIOLOGY Class XI

I DIVERSITY IN LIVING WORLD

Diversity of living organisms.

Classification of the living organisms (five kingdom classification, major groups and principles of classification within each kingdom). Systematics and binomial system of nomenclature. Salient features of animal (non chordates up to phylum level, and chordates up to class level) and plant (major groups; Angiosperms up to subclass) classification. Botanical gardens, herbaria, zoological parks and museums.

Key points for developing subject matter

Zoological parks, Botanical gardens, Herbaria and Natural museums serve as Taxonomical aids.

Iv plant physiology

Movement of water, food, nutrients, and gases. Plants and water. Mineral nutrition.

Respiration. Photosynthesis. Plant growth and development.

Key points for developing subject matter

- Cell to cell movement of water, food, gas and nutrients is dependent principally on concentration gradients and diffusion. Substances are moved against a concentration gradient through active transport. The plants lose water through their stomata. Transport of water over larger distances in plants depends on transpiration pull. Root pressure is responsible for movement of water up short distances and for guttation. Plants require a variety of mineral nutrients for their growth and development, ill Some plants are able to fix atmospheric nitrogen, p Green plants use the C₃ pathway to fix carbon dioxide and synthesize simple sugars in the presence of sunlight. Some plants have the C₄ pathway, □ Sugars are oxidised by all living organisms to release energy. Some organisms derive energy from food anaerobically. This energy is trapped as ATP and utilised for all metabolic activities. Growth regulators regulate growth and development in plants.

Practicals

Demonstrate requirement of chlorophyll and light for photosynthesis. Separate plant pigments using paper chromatography. Study rate of respiration in different plant materials. Demonstrate anaerobic respiration. Study transpiration in plants using Cobalt Chloride method. Study imbibitions of water by seeds or raisins. Study plasmolysis and osmosis. Study the effect of apical bud removal on plants.

BIOLOGY Class XII

BIOLOGY AND HUMAN WELFARE

Animal husbandry. Basic concepts of immunology, vaccines. Pathogens, Parasites.

Plant breeding, tissue culture, food production. Microbes in household food processing, industrial production, sewage treatment and energy generation.

Cancer and AIDS.



Key points for developing subject matter

- Traditionally farm animals have been bred for increased productivity, disease and pest resistance. The human body has its own defence mechanism. The defence system is constantly under attack from diverse source pollutants, chemicals and infectious organisms.
- Our body is capable of producing millions of types of antibodies to trap/remove and overcome the adverse effects of these foreign bodies/chemicals. However, against some infectious organisms we need to develop antibodies in advance, i.e. acquired immunity. Vaccination can help in developing immunity to specific diseases. Genetically engineered microorganisms are serving as bioreactors for production of vaccines and drugs. Traditional plant breeding has been the method of creating varieties that are high on yield, resistance to pests and diseases and adapted to a given climatic condition. This has been the source of green revolution in India. New methods of propagation using tissue culture and genetic alteration using DNA technology provide novel methods of crop improvement, horticulture, pest resistance. Microbes thrive by degradation/conversion of organic and inorganic compounds. These characteristics of microbes can be exploited to produce household products (yoghurt/vinegar), for industrial production, treatment of sewage and energy generation. Diseases like cancer and AIDS - the major cause of death in the modern world - need adequate preventive/control measures.

IX BIOTECHNOLOGY AND ITS APPLICATIONS

Recombinant DNA technology.

Applications in Health, Agriculture and Industry

Genetically modified (GM) organisms; biosafety issues.

Insulin and Bt cotton

Key points for developing subject matter

rDNA technology has also played a major role in production of GM foods which have the advantage of high yields, pest and disease resistance. Use of GM food and crops has raised several questions regarding its bio-safety from the point of human consumption, environment and other social issues.

X ECOLOGY & ENVIRONMENT

Ecosystems: components, types and energy flow.

Species, population and community.

Ecological adaptations.

Centres of diversity and conservation of biodiversity, National parks and sanctuaries.

Environmental issues.

Key points for developing subject matter

- The living organisms in their environment form a structural and functional unit in terms of energy flow (ecological pyramids).
- The biotic and abiotic components within an ecosystem interact with each other.
- Several types of ecosystems can be classified and identified in nature depending on the climate, habitat, energy flow pattern and the physiognomy.

- In nature, organisms do not occur singly but exist as populations and communities.
- Plants and animals are adapted to their habitats such as in deserts and in water.
- Several factors affect biodiversity including natural and anthropogenic activities.
- In India, women have played a major role in conservation of plants, animals and natural resources.
- The need of the present day is to conserve biodiversity for a sustainable living; several conservation methods have been adopted.
- Conservation of biodiversity may be *in situ* or *ex situ*.
- The 'Silent Valley' as a case study, to understand the value of environmental impact assessment and the role of peoples' participation.
- Introduction to the idea that new products, processes and ideas related to biodiversity can be patented (Intellectual Property Rights, IPR).
- Pollution, deforestation, global warming, ozone layer depletion, underground water level and threat to biodiversity (with special reference to wild life) are some among many environmental concerns,

Practicals

Collect soils from different sites and study them for texture, moisture content and pH. Correlate with the kinds of plants found in them. Study plants and animals found in dry and aquatic conditions. Collect water from any water bodies around you and study them for pH, clarity, and presence of any living organisms. Study the amount of SPM (suspended particulate matter) in air at two widely separated sites.

LIST OF PRACTICALS

Class XI

11. Study of osmosis by potato osmometer.
12. Study of plasmolysis in epidermal peels (e.g. *Rhoeo* leaves).
13. Study of imbibitions in seeds/raisins.
14. Study of distribution of stomata in the upper and lower surface of leaves.
15. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
16. Test for the presence of sugar, starch, proteins and fats. Detect them in suitable plant and animal materials.
17. Separate plant pigments through paper chromatography.
18. Study rate of respiration in flower buds/leaf tissue and germinating seeds.
19. Observation and comments on the experimental set up on:
 - a. Anaerobic respiration.
 - b. Phototropism.
 - c. Apical bud removal.

Class XII

15. Collect and study soil from different sites and study them for texture and moisture content,
16. Study the pH and water holding capacity of soil. Correlate with the kinds of plants found in them,
17. Study plants and animals found in dry conditions. Comment upon on their adaptations/ecosystems.
18. Study plants and animals of aquatic conditions. Comment upon on their adaptations/ecosystems.
19. Collect water from different water bodies around you and study them for pH, clarity and presence of any living organisms.
20. Study the amount of suspended particulate matter in air at the two widely different sites.
21. Study of plant population density by quadrat method.
22. Study of plant population frequency by quadrat method.

Subject: History

Class XI: Themes in World History

Themes Objectives

THEMES	OBJECTIVES
<p>I: EARLY SOCIETIES</p> <p>1 From the Beginning of Time Focus: Africa, Europe till 15000 BC Views on the origin of human beings. Early societies. Debate on present-day hunter-gatherer societies.</p> <p>2. Early Cities Focus: Iraq, 3rd millennium BC (a) Growth of towns. (b) Nature of early urban societies</p> <p>IV: PATHS TO MODERNIZATION</p> <p>10. The Industrial Revolution Focus on England, 18th and 19th century, (a) Innovations and technological change (c)Patterns of growth. (c) Emergence of a working class. Debate: Was there an Industrial Revolution?</p>	<p>Familiarize the learner with ways of reconstructing human evolution. Discuss whether the experience of present-day hunting-gathering peoples can be used to understand early societies. Familiarize the learner with the nature of early urban centres.</p> <p>Understand the nature of growth the period and its limits. Initiate students to the debate the idea of industrial revolution.</p>

Class XII: Themes in Indian History

THEMES	OBJECTIVES
<p>The Story of the First Cities: Harappan Archaeology. Broad overview: Early urban centres. Story of discovery: Harappan civilization. Excerpt: Archaeological report on a major site. Discussion: how it has been utilized by archaeologists/historians.</p>	<p>Familiarize the learner with early urban centres as economic and social institutions. □ Introduce the ways in which new data can lead to a revision of existing notions of history. □ Illustrate how archaeological reports are analysed and interpreted by scholars.</p>

Subject: Geography

Rationale

Its contributions lie in the content, cognitive processes, skills and values that geography promotes and thus helps the students explore, understand and evaluate the environmental and social dimensions of the world in a better manner. Since geography explores the relationship between people and their environment, it includes studies of physical and human environments and their interactions at different scales-local, state/region, nation and the world. The fundamental principles responsible for the varieties in the distributional pattern of physical and human features and phenomena over the earth's surface need to be understood properly. Application of these principles would be taken up through selected case studies from the world and India. Thus, the physical and human environment of India and study of some issues from a geographical point of view will be covered in greater detail. Students will be exposed to different methods used in geographical investigations.

Common Core Components (NPE 1986) such as India's common cultural heritage, equality of sexes, protection of environment, observance of the small family norm and inculcation of scientific temper will be reflected in the geography syllabus. The geography course will incorporate some issues of NCF 2005 such as making children sensitive to environment and its protection to nurture and preserve the environment, and using geographical knowledge in understanding various environmental and socio-economic issues of the community, region and the country, e.g. gender and marginalized groups.

Objectives

The course in geography will help learners: Search for, recognize and understand the processes and patterns of the spatial arrangement of the natural as well as human features and phenomena on the earth's surface;

Understand and analyse the inter-relationship between physical and human environments and their impact;

Apply geographical knowledge and methods of inquiry to new situations or problems at different levels - local/regional, national and global;

Develop geographical skills, relating to collection, processing and analysis of geographical knowledge in understanding issues concerning the community such as environmental issues, socio-economic concerns, gender and become responsible and effective member of the community.

Course Structure

Class XI

- A. Fundamentals of Physical Geography
- B. India - Physical Environment

CLASS XI

- A. Fundamentals of Physical Geography

Unit II: The Earth

Origin and evolution of the earth; Interior of the earth; Wegener's continental drift theory and plate tectonics; earthquakes and volcanoes;

Unit III: Landforms

Rocks and minerals - major types of rocks and their characteristics;

Landforms and their evolution

Geomorphic processes - weathering, mass wasting, erosion and deposition; soils - formation

Unit IV: Climate

- Atmosphere — compositions and structure; elements of weather and climate;
- Isolation - angle of incidence and distribution; heat budget of the earth - heating and cooling of atmosphere (conduction, convection, terrestrial radiation, advection); temperature - factors controlling temperature; distribution of temperature - horizontal and vertical; inversion of temperature;
- Pressure - pressure belts; winds-planetary seasonal and local, air masses and fronts; tropical and extra tropical cyclones.
- Precipitation- evaporation; condensation- dew, frost, fog, mist and cloud; rainfall types and world distribution;
- World climates - classification (Koeppen), greenhouse effect, global warming and climatic changes

Unit V: Water (Oceans)

- Hydrological Cycle;
- Oceans - submarine relief; distribution of temperature and salinity; movements of ocean water-waves, tides and currents

Unit VI: Life on the Earth)

- Biosphere - importance of plants and other organisms; biodiversity and conservation; ecosystems, bio-geo chemical cycle, and ecological balance.

B. India - Physical Environment

Unit III: Climate, Vegetation and Soil

- Weather and climate - spatial and temporal distribution of temperature, pressure winds and rainfall; Indian monsoons: mechanism, onset and variability -spatial and temporal; climatic types;
- Natural vegetation-forest types and distribution; wild life; conservation; biosphere reserves;
- Soils - major types (ICAR's classification) and their distribution, soil degradation and conservation.

Unit IV: Natural Hazards and Disasters: Causes, Consequences and Management (One case study to be introduced for each topic)

Floods and droughts
 Earthquakes and Tsunami
 Cyclones
 Landslides

Unit II: Topographic and Weather Maps

- Study of topographic maps (1:50,000 or 1:25,000, Survey of India maps): contour cross section and identification of landforms-slopes hills, valleys, waterfalls, cliffs; distribution of settlements; Use of weather charts: describing pressure, wind and rainfall
- Distribution

Unit III: Human Activities

Primary activities - concept and changing trends; gathering, pastoral, mining, subsistence agriculture, modern agriculture; people engaged in agriculture and allied activities -some examples from selected countries;

Unit IV: Transport, Communication and Trade

Land transport - roads, railways — rail network; trans-continental railways;
 Water transport- inland waterways; major ocean routes;
 Air transport - Intercontinental air routes;
 Oil and gas pipelines;
 Satellite communication and cyber space
 International trade-Basis and changing patterns; ports as gateways of international trade, role of WTO in International trade.

Unit V: Human Settlements

Settlement types - rural and urban; morphology of cities (case study); distribution of mega cities; problems of human settlements in developing countries

B. India: People and Economy

Unit 1: People

Population - distribution, density and growth; composition of population: linguistic and religious: rural-urban population change through time — regional variations; occupation;

Population, environment and development.

Unit III: Resources and Development

- Land resources- general land use; agricultural land use - major crops; agricultural development and problems, common property resources;
- Water resources-availability and utilization-irrigation, domestic, industrial and other uses; scarcity of water and conservation methods-rain water harvesting and watershed management (one case study related with participatory watershed management to be introduced);
- Mineral and energy resources- metallic and non-metallic minerals and their distribution; conventional and non-conventional energy sources;
- Industries - types and distribution; industrial location and clustering; changing pattern of selected industries-iron and steel, cotton textiles, sugar, petrochemicals, and knowledge based industries; impact of liberalisation, privatisation and globalisation on industrial location;
- Planning in India- target area planning (case study); idea of sustainable development (case study)

Unit V: Geographical Perspective on Selected Issues and Problems (One case study to be introduced for each topic)

- Environmental pollution; urban-waste disposal
- Urbanisation-rural-urban migration; problem of slums;
- Land Degradation

Unit II: Field Study or Spatial Information Technology

Field visit and study: map orientation, observation and preparation of sketch; survey on any one of the local concerns: pollution, ground water changes, land use and land-use changes, poverty, energy issues, soil degradation, drought and flood impacts (any one topic of local concern may be taken up for the study; observation and questionnaire survey may be adopted for the data collection; collected data may be tabulated and analysed with diagrams and maps):

Subject: Political Science

COURSE IV (CLASS XII): CONTEMPORARY WORLD POLITICS

LEARNING OBJECTIVES:

Equip student to be conscious of the way in which global events and processes shape our everyday lives.

COURSE CONTENT:

8. Environment and Natural Resources in Global Politics. Environment movement and evolution of global environmental norms. Conflicts over traditional and common property resources. Rights of indigenous people. India's stand in global environmental debates.

Subject: Psychology

The course deals with psychological knowledge and practices which are contextually rooted. It emphasizes the complexity of behavioural processes and discourages simplistic cause-effect thinking. This is pursued by encouraging critical

reasoning, allowing students to appreciate the role of cultural factors in behaviour, and illustrating how biology and experience shape behaviour. The course while developing an appreciation of subjectivity, also focuses on multiplicity of worldviews.

It is suggested that the teaching - learning processes should involve students in evolving their own understanding. Therefore, teaching of psychology should be based on the use of case studies, narratives, experiential exercises, analysis of common everyday experiences, etc.

Objectives

1. To develop appreciation about human behaviour and human mind in the context of learners' immediate society and environment.
2. To develop in learners an appreciation of multidisciplinary nature of psychological knowledge and its application in various aspects of life.
3. To enable learners to become perceptive, socially aware and self-reflective.
4. To facilitate students' quest for personal growth and effectiveness, and to enable them to become responsive and responsible citizens.

The Bases of Human Behaviour

The unit will focus on the role of biological and socio-cultural factors in the shaping of human behaviour.

Human Memory

This unit deals with how information is received, stored, retrieved and lost. It will also discuss how memory can be improved.

Thinking

This unit deals with thinking and related processes like reasoning, problem-solving, decision making and creative thinking. The relationship between thought and language will also be discussed.

Motivation and Emotion

This unit focuses on why human beings behave as they do. It also deals with how people experience positive and negative events and responds to them.

Psychology and Life

The unit focuses on the application of psychological understanding to some important social issues.

Human- environment relationship; Environmental effects on human behaviour: Noise, pollutions crowding, natural disasters; Promoting pro-environmental behaviour; Psychology and social concerns: Aggression, Violence and Peace, Discrimination and Poverty, health, impact of television on behaviour.

Subject: Business Studies

Business is a dynamic process that brings together technology, natural resources and human initiative in a constantly changing global environment, To



understand the framework in which a business operates, a detailed study of the organization and management of business processes and its interaction with the environment is required. Globalisation has changed the way firms transact their business. Information Technology is becoming a part of business operations in more and more organisations. Computerised systems are fast replacing other systems. E-business and other related concepts are picking up fast, which need to be emphasized in the curriculum.

The course in Business Studies will prepare students to analyse, manage, evaluate and respond to changes, which affect business. It provides a way of looking at and interacting with the business environment. It recognizes the fact that business influences and is influenced by social, political, legal and economic forces. It allows students to appreciate that business is an integral component of society and develops an understanding of many social and ethical issues.

Objectives

- To develop in students an understanding of the processes of business and its environment;
- To acquaint students with the dynamic nature and inter-dependent aspects of business;
- To prepare students to function more effectively and responsibly as consumers, employers, employees and citizens;
- To help students in making the transition from school to the world of work including self-employment;
- To develop in students a business attitude and skills to be precise and articulate.

Social Responsibility of Business and Business Ethics

- Concept of social responsibility;
- Case for social responsibility;
- Responsibility towards different interest groups: owners, investors, employees, consumers, government, community and public in general;
- Business and environmental protection;
- Business ethics: concept and elements

Business Environment

- Business Environment - meaning and importance
- Dimensions of Business Environment - Economic, Social, Technological, Political and Legal
- Economic Environment in India; Impact of Government policy changes on business and industry, with special reference to adoption of the policies of liberalization privatization and globalisation.

Planning

- Meaning, features, importance, limitations
- Planning process

- Types of Plans - Objectives, Strategy, Policy, Procedure, Method, Rule, Budget, Programme

Consumer Protection

- Importance of consumer protection
- Consumer rights
- Consumer responsibilities
- Ways and means of consumer protection - Consumer awareness and legal redressal with special reference to Consumer protection Act.
- Role of consumer organizations and NGOs

Entrepreneurship Development

- Concept, Functions and Need
- Entrepreneurship characteristics and Competencies
- Process of Entrepreneurship Development
- Entrepreneurial Values, Attitudes and Motivation - Meaning and Concept

Subject: Accountancy

Accounting as an information system aids in providing financial information. The emphasis at Class XI is placed on basic concepts and the process of accounting leading to the preparation of accounts for a sole proprietorship firm. With computerised accounting is becoming more and more popular with increased awareness about use of computers in business. Keeping this in view, the students are exposed compulsorily to the basic knowledge about computers and its use in accounting in the same year.

In class XII, Accounting for Not for Profit Organisations and Partnership Firms are to be taught as a compulsory part. Students will also be given an opportunity to understand further about Computerized Accounting System, as an optional course to Company Accounts and Analysis of Financial Statements.

Objectives

- To enable the students with accounting for reconstitution of partnership firms;
- To enable the students to understand and analyse the financial statements; and
- To familiarize students with the fundamentals of computerized system of accounting.

ECONOMICS

The economics courses are introduced in such a way that in the initial stage, the learners are introduced to the economic realities that the nation is facing today along with some basic statistical tools to understand these broader economic realities. In the later stage, the learners are introduced to economics as a theory of abstraction.

The economics courses also contain many projects and activities. These will provide opportunities for the learners to explore various economic issues both from their day-today life and also from issues, which are broader and invisible in nature. The academic skills that they learn in these courses would help to develop the

projects and activities. The syllabus is also expected to provide opportunities to use information and communication technologies to facilitate their learning process.

OBJECTIVES

- Understanding of some basic economic concepts and develop economic reasoning which the learners can apply in their day-to-day life as citizens, workers and consumers.
- Realisation of learners' role in nation building and sensitise them to the economic issues that the nation is facing today
- To develop an understanding that there can be more than one view on any economic issue and to develop the skills to argue logically with reasoning

Developing Projects in Economics

The students may be encouraged to develop projects, which have primary data, secondary data or both. Case studies of a few organisations / outlets may also be encouraged. Some of the examples of the projects are as follows (they are not mandatory but suggestive):

- (i) A report on demographic structure of your neighbourhood;
- (ii) Consumer awareness amongst households
- (iii) Changing prices of a few vegetables in your market
- (iv) Study of a cooperative institution: milk cooperatives

The idea behind introducing this unit is to enable the students the ways and means by which a project can be developed using the skills learned in the course. This include all the steps involved in designing a project starting from choosing a title, exploring the information relating to the title, collection of primary and secondary data, analysing the data, presentation of the project and using various statistical tools and their interpretation and conclusion.

Instruction to the textbook writers: (a) examples will have to be provided from simple economic data. The learners should not have any problem in understanding the economic data provided in those examples. Besides arriving at results using formulas of various statistical tools, the learners are also expected to interpret the results. So care must be taken to provide very simple economic information, which the learners can understand without knowing the conceptual meaning in depth and (b) many multiple choice questions can be used in the textbook.

Current challenges facing Indian Economy:

Poverty- absolute and relative; Main programmes for poverty alleviation: A critical assessment; Rural development: Key issues - credit and marketing - role of cooperatives; agricultural diversification; alternative farming - organic farming
Human Capital Formation: How people become resource; Role of human capital in economic development; Growth of Education Sector in India
Employment: Growth, in formalisation and other issues: Problems and policies
Infrastructure: Meaning and Types; Case Studies: Energy and Health: Problems and Policies- A critical assessment; Environment: Sustainable Economic Development; Limited Availability of Resources; Environmental degradation.

Development Experience of India: A Comparison with neighbours

Issues: growth, population, sectoral development and other developmental indicators
This course is expected to create opportunities for learners to know about various aspects of Indian economy, there is a need to provide information in an interesting manner. To the possible extent, data in long tabular form should be avoided. Instead, different forms of diagrams and charts, pictures and maps could be used. Since the learners study this course for the first time, those economics concepts, which are used in this course, could be explained in simple manner. Sensitising the child towards various issues such as poverty, environmental degradation and gender concerns also form part of this course. Many real examples in simple ways could be used.

SOCIOLOGY CLASS XI

INTRODUCING SOCIOLOGY

UNIT I: SOCIETY & SOCIOLOGY

- Introducing Society: Individuals and collectivities, Plural Perspectives
- Introducing Sociology: Emergence, Nature & Scope, Relationship to other disciplines

UNIT III: SOCIAL INSTITUTIONS

- Family and Kinship
- Political and Economic Institutions
- Religion as a Social Institution
- Education as a Social Institution

UNIT IV: CULTURE AND SOCIETY

- Culture, Values and Norms: Shared, Plural, Contested
- Socialization: Conformity, Conflict and the Shaping of Personality

CLASS XI

UNDERSTANDING SOCIETY

UNIT II: SOCIAL CHANGE

- Social Change: Types and Dimensions; Causes and Consequences
- Social Order: Domination, Authority & Law; Contestation, Crime & Violence
- Village, Town & City: Changes in Rural & Urban Society

UNIT III: ENVIRONMENT AND SOCIETY

- Ecology and Society
- Environmental Crises and Social Responses

CLASS XII

INDIAN SOCIETY

UNIT I: STRUCTURE OF INDIAN SOCIETY

- 
- Introducing Indian Society: Colonialism, Nationalism and Class and Community
 - Demographic structure
 - Rural-Urban Linkages and Divisions

UNIT II: SOCIAL INSTITUTIONS: CONTINUITY & CHANGE

- Family and Kinship
- The Caste System
- Tribal Society
- The Market as a Social Institution

UNIT III: SOCIAL INEQUALITY & EXCLUSION

- Caste Prejudice, Scheduled Castes and Other Backward Classes
- Marginalization of Tribal Communities
- The Struggle for Women's Equality
- The Protection of Religious Minorities
- Caring for the Differently Abled

UNIT IV: THE CHALLENGES OF UNITY IN DIVERSITY

- Problems of Communalism, Regionalism, Casteism & Patriarchy
- Role of the State in a Plural and Unequal Society
- What We Share

UNIT V: PROJECT WORK

CLASS XII

CHANGE AND DEVELOPMENT IN INDIA

UNIT II: SOCIAL CHANGE AND THE POLITY

- The Constitution as an instrument of Social Change
- Parties, Pressure Groups and Democratic Politics
- Panchayati Raj and the Challenges of Social Transformation

UNIT III: SOCIAL CHANGE & THE ECONOMY

- Land Reforms, the Green Revolution and Agrarian Society
- From Planned Industrialization to Liberalization
- Changes in the Class Structure

UNIT V: SOCIAL MOVEMENTS

- Class-Based Movements: Workers, Peasants\
- Caste-Based Movements: Dalit Movement, Backward Castes, Trends in Upper Caste Responses
- Women's Movements in Independent India
- Tribal Movements
- Environmental Movements